

MELSEC A Series

Programmable Controller

Operating Manual

AD71(SW0-AD71PE) Positioning module type

REVISIONS

※The manual number is given on the bottom left of the back cover.

[illegible]

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end user.

CONTENTS

1. INTRODUCTION	1-1 ~ 1-3
2. SYSTEM CONFIGURATION	2-1 ~ 2-3
2.1 MELSEC-A Series Equipment	2-1
2.2 Function List	2-2
3. FLOPPY DISK SPECIFICATIONS	3-1
3.1 General Specifications of SW0-AD71P (System disk)	3-1
3.2 General Specifications of SW0-GPPU (User disk)	3-1
4. HANDLING	4-1 ~ 4-3
4.1 A6GPP Nomenclature	4-1
4.2 Floppy Disk Nomenclature	4-2
4.3 Handling Instructions	4-3
5. SYSTEM START-UP	5-1 ~ 5-8
5.1 General	5-1
5.2 Operating Precautions	5-3
5.3 A6GPP Screen and Keys	5-4
5.3.1 CRT screen layout.	5-4
5.3.2 Key operation	5-5
5.4 SW0-AD71P Start-Up Screen.	5-7
6. SUMMARY OF FUNCTIONS AND OPERATIONS	6-1 ~ 6-5
6.1 Quick Reference Summary	6-2
7. DATA TRANSFER BETWEEN A6GPP AND AD71	7-1 ~ 7-3
7.1 General	7-2
7.2 All Data Read (from AD71 to A6GPP)	7-2
7.3 Data Write (from A6GPP to AD71)	7-2
7.4 Data Verify (A6GPP with AD71)	7-3
8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA	8-1 ~ 8-8
8.1 A6GPP Memory Clear	8-2
8.2 Parameter Handling in the A6GPP.	8-3
8.2.1 Reading parameters	8-3
8.2.2 Correcting and writing parameters.	8-4
8.3 Zeroing Data Handling in the A6GPP	8-6
8.3.1 Reading zeroing data.	8-6
8.3.2 Correcting and writing zeroing data.	8-7

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA	9-1 ~ 9-13
9.1 Positioning Data Menu	9-3
9.2 Read A6GPP Positioning Data	9-4
9.3 Writing and Correction of Positioning Data	9-6
9.4 Batch Write and Correction of Positioning Data	9-9
9.5 Positioning Speed Clamp	9-11
9.6 Read of M Code Comments	9-12
9.7 Write and Correction of M Code Comments	9-13
10. MONITOR	10-1 ~ 10-6
10.1 Monitor Functions	10-1
10.2 Monitor Menu Screen	10-2
10.3 Scroll Monitoring	10-3
10.4 Error List	10-5
11. TEST	11-1 ~ 11-19
11.1 Test Functions	11-1
11.2 Test Menu Screen	11-3
11.3 Zeroing	11-4
11.4 Positioning Operation (1 point)	11-6
11.5 Positioning Operation (Several points)	11-8
11.6 Jog Operation	11-10
11.7 Manual Pulser Operation	11-12
11.8 Positioning Address Teaching	11-13
11.8.1 Jog to position and teach	11-14
11.8.2 Move to position using manual pulser and teach	11-16
11.9 Present Value Write	11-18
11.10 Error Reset	11-19
12. FLOPPY DISK	12-1 ~ 12-20
12.1 Functions and File Name	12-1
12.1.1 Functions	12-1
12.1.2 File name structure	12-3
12.1.3 FDD menu screen	12-4
12.2 Directory	12-5
12.3 Read from FD	12-7
12.4 Write to FD	12-9
12.5 Verify with FD	12-11
12.6 File Delete	12-13
12.7 FD Copy	12-15
12.8 Formatting of FD	12-18
12.9 Cleaning Disk	12-20

13. PRINTER	13-1 ~ 13-14
13.1 Printers and Functions	13-1
13.1.1 Suitable printers	13-1
13.1.2 Functions	13-1
13.2 Printer Selection	13-3
13.3 Use of K6PR, K6PR-K and GT-10A	13-5
13.4 Use of K7PR	13-7
13.5 Use of A7PR	13-9
13.6 Use of General-Purpose Printer	13-11
13.7 Print Out of Print Title	13-13
13.8 Screen Copy	13-14
14. ERROR MESSAGES AND CODES	14-1 ~ 14-13
14.1 A6GPP Generated Diagnostics	14-2
14.1.1 Messages generated by the A6GPP	14-2
14.1.2 Error messages during data setting range check	14-4
14.1.3 Relative check of setting data	14-6
14.1.4 AD71 buffer memory write forbid error	14-8
14.1.5 Start-up errors	14-8
14.2 Errors Detected by AD71	14-9
14.2.1 Setting data range errors	14-10
14.2.2 AD71 hardware errors	14-12
14.2.3 AD71 buffer memory write forbid errors	14-12
14.2.4 AD71 start errors	14-13
14.2.5 AD71 BUSY stop errors	14-13
APPENDICES	APP-1 ~ APP-15
APPENDIX 1 Format Sheets	APP-1
APPENDIX 2 Processing Times	APP-7
APPENDIX 3 Floppy Disk Using Instructions	APP-8
APPENDIX 4 Printer Output Codes	APP-11
APPENDIX 5 Print Out Examples	APP-14

1. INTRODUCTION

This manual gives all the operating information necessary to use the SW0-AD71P software package when used in conjunction with the A6GPP intelligent programming device.

- (1) A sound knowledge of the information contained in the following manuals is recommended:

MELSEC-A AD72 Positioning Unit User's Manual (When using the AD72)

MELSEC-A AD71 Positioning Unit User's Manual (When using the AD71)

MELSEC-A A6GPP Intelligent GPP User's Manual

MELSEC-A A6GPP (A series) Operating Manual

- (2) The following manuals may also be useful:

MELSEC-A A1, A2, A3CPU Programming Manual

MELSEC-A A1, A2, A3CPU User's Manual

MELSEC-A A7PR Printer User's Manual

MELSEC-K K6PR Printer Instruction Manual

This manual is divided as follows:

Chapter 2 System Configuration

Gives an overview of the software functions as well as the associated hardware configurations.

Chapter 3 Specifications

Describes the SW0-AD71P specifications.

Chapter 4 Handling

Gives nomenclature and handling instructions for both the SW0-AD71P and A6GPP.

Chapter 5 System Start-Up Procedure

Describes start-up and initial data setting procedures.

Chapter 6 Summary of Functions and Operations

Gives a summary of the operations described in Sections 7 to 13.

Chapter 7 Data Transfer between A6GPP and AD71

All positioning and setting data can be transferred between the two units.

Chapter 8 Off-Line Data Handling

Describes off-line uses of the A6GPP including memory clear, parameter and zeroing data handling.

Chapter 9 On-Line Data Handling

Describes on-line uses of the A6GPP including direct accessing of the AD71 buffer memory from the A6GPP for positioning data handling.

Chapter 10 Monitoring

For monitoring the operation of the AD71

Chapter 11 Test

For setting up and commissioning

Chapter 12 Use of the Floppy Disk Facility

Describes data transfer procedures between the floppy disk and the A6GPP memory.

Chapter 13 Printer

Describes print-out procedures.

Chapter 14 Error Messages and Codes

Lists all diagnostic error messages.

Appendices

Gives reference information such as format sheets and processing times.

NOTE

The SW0-AD71PE system software is used to program both the AD71 and AD72 position control modules. In this manual references to the "AD71" imply "AD71 and AD72".

1. INTRODUCTION

MELSEC-A

ABBREVIATIONS

In this manual, equipment names are abbreviated as follows:

ACPU : A1CPU, A2CPU, A3CPU, etc. for the PC
AD71 : AD71 or AD72 positioning unit
FD : Floppy disk
FDD : Floppy disk drive
TU : AD71TU teaching unit

I/O NUMBERS

Input (X) and output (Y) numbers used in this manual assume that the AD71 is loaded in I/O slot 0 (slots 0 and 1 for the AD72) of the main base. For details, refer to Section 3.7 of the AD71 User's Manual.

Signal Direction: AD71 to ACPU		Signal Direction: ACPU to AD71	
No.	Signal	No.	Signal
X0	AD71 watch dog timer error	Y10	X axis positioning start
X1	AD71 ready	Y11	Y axis positioning start
X2	X axis positioning complete	Y12	Interpolation positioning start
X3	Y axis positioning complete	Y13	X axis zeroing start
X4	X axis busy	Y14	Y axis zeroing start
X5	Y axis busy	Y15	X axis stop
X6	X axis zeroing request	Y16	Y axis stop
X7	Y axis zeroing request	Y17	X axis forward jog start
X8	X axis positioning started	Y18	X axis reverse jog start
X9	Y axis positioning started	Y19	Y axis forward jog start
XA	Battery error	Y1A	Y axis reverse jog start
XB	Error detection	Y1B	X axis M code OFF
XC	X axis zeroing complete	Y1C	Y axis M code OFF
XD	Y axis zeroing complete	Y1D	PC ready
XE	X axis M code ON	Y1E	(Unused)
XF	Y axis M code ON	Y1F	(Unused)

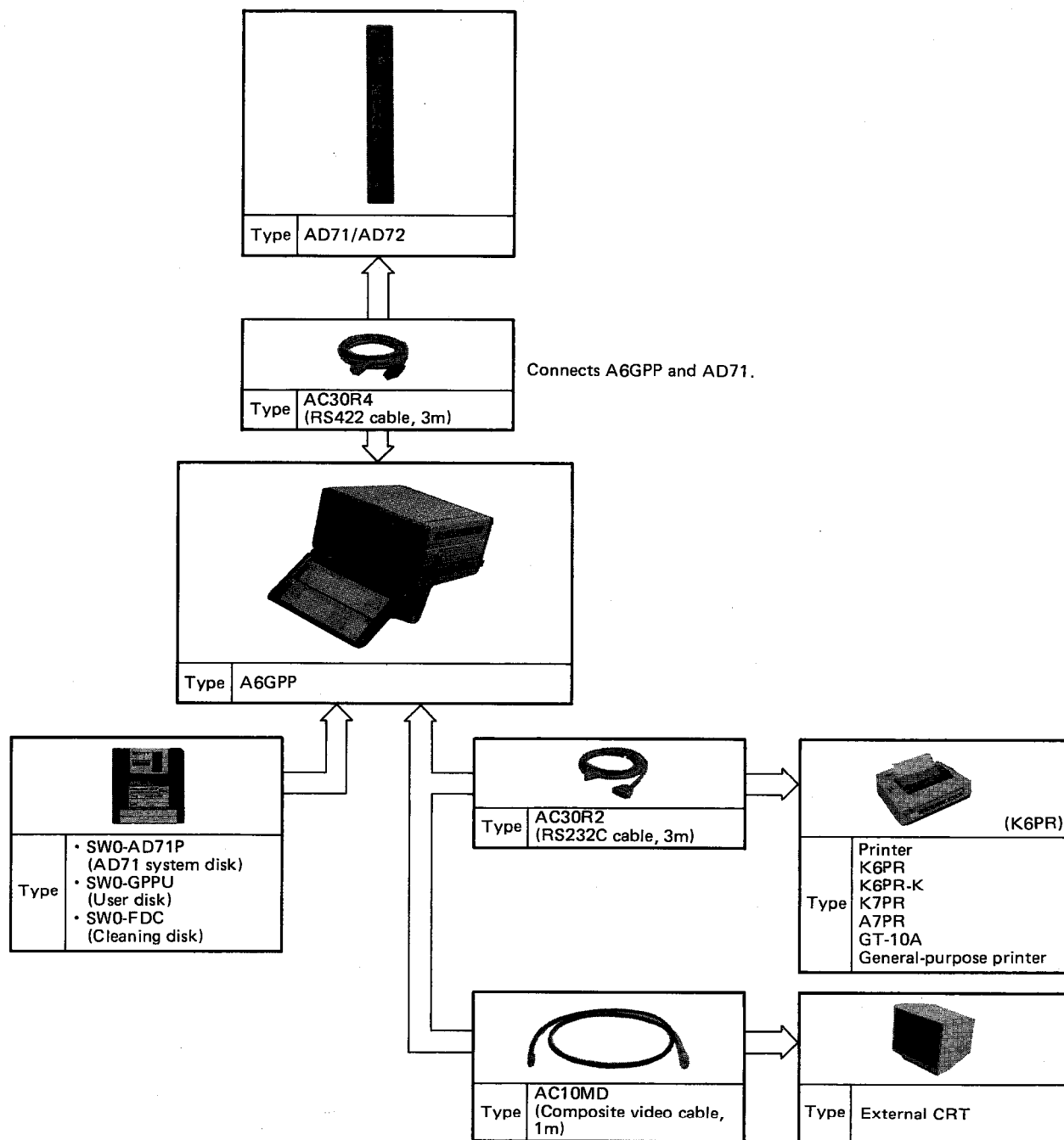
Table 1.1 I/O Signal List

2. SYSTEM CONFIGURATION

2. SYSTEM CONFIGURATION

2.1 MELSEC-A Series Equipment

This software is used with the system described below.



Description	Quantity
SW0-AD71P system disk for AD71 positioning unit	2

Table 2.1 Equipment

The second disk is supplied as a back up.

2. SYSTEM CONFIGURATION



2.2 Function List

No.	Mode	Function	Page
F1	Data transfer between AD71 and A6GPP	Read : AD71 to A6GPP Reads parameters, zeroing data, and positioning data in blocks from the AD71 buffer memory to the A6GPP internal memory.	Page 7-2 Section 7.2
		Write : A6GPP to AD71 Writes parameters, zeroing data, and/or positioning data from the A6GPP to the AD71 buffer memory. Data is automatically verified.	Page 7-2 Section 7.3
		Verify : between A6GPP and AD71 Verifies parameters, zeroing data, and/or positioning data.	Page 7-3 Section 7.4
F2	A6GPP memory clear	Clears parameters, zeroing data, positioning data, and/or M code comments in the A6GPP internal memory.	Page 8-2 Section 8.1
F3	Off-line parameter read and write	Reads, writes, and corrects parameter list. Allows parameter data range check.	Page 8-3 Section 8.2
F4	Off-line zeroing data read and write	Reads, writes, and corrects zeroing data. Allows zeroing data range check.	Page 8-6 Section 8.3
F5	On- and off-line positioning data read and write	Read and write from and to A6GPP (off-line) Reads, writes, and corrects positioning data in batches of 10 pieces. Allows data range check.	Page 9-4 Section 9.2
		Write to AD71 and A6GPP (on-line) Reads, writes, and corrects positioning data in batches of 10 pieces with the AD71 on line. Allows data range check.	Page 9-9 Section 9.3
		Batch write to A6GPP (off-line) Batch writes common data to a series of consecutive position numbers. Applicable data: positioning pattern, positioning method, positioning speed, and dwell time.	Page 9-11 Section 9.4
		Positioning speed clamp When a "clamp" speed is set all speeds greater than the clamp speed in the positioning data are changed to the clamp speed.	Page 9-12 Section 9.5
		M code comment read and write (off-line) Reads, writes, and corrects the "M code" comments in the A6GPP internal memory.	Page 9-13 Section 9.6 Section 9.7
F6	Monitoring	Provides a current status monitoring facility as well as indication of the next target value together with previous target values and any error codes present at their completion. The current status monitoring facility provides the following information. Data No. being executed Present value (address) Speed M code, M code comment, and M code ON/OFF Status (10 items such as AD71 signals, STOP, drive unit ready, and battery alarm)	Page 10-3 Section 10.3
		Error list Provides a tabulated list of errors together with the current status on their occurrence.	Page 10-5 Section 10.4
F7	Test	Operates the AD71 from the A6GPP as follows: 1. Operation is independent of the PC and AD71 ready signals. 2. M code ON/OFF is ignored.	Page 11-1
		Zeroing Allows zeroing when the machine has stopped within the stroke limit.	Page 11-4 Section 11.3
		Positioning operation (1 axis, interpolation, both axes at the same time) Starts positioning by specifying a target data number. Up to 20 start data numbers can be specified and positioning pattern, speed, etc. are valid.	Page 11-6 Section 11.4 Section 11.5
		Jog operation (1 axis, both axes at the same time) A drive signal is output for as long as the jog key is pressed.	Page 11-10 Section 11.6
		Manual pulser enable (1 axis, both axes at the same time) Enables the manual pulser facility.	Page 11-12 Section 11.7

Table 2.2 Function List (Mode List)

2. SYSTEM CONFIGURATION

No.	Mode	Function	Page
F7	Test	Teach (Jog) The machine is moved to the required position using the jog operation and the resultant address written to the AD71 position memory.	Page 11-14 Section 11.8.1
		Teach (Manual pulser) As above but using the manual pulser function.	Page 11-16 Section 11.8.2
		Present value change Changes the address (present value) at which positioning has stopped.	Page 11-18 Section 11.9
		Error reset Clears error codes.	Page 11-19 Section 11.10
F8	Floppy disk and printer	Data transfer between Floppy Disk and A6GPP internal memory, and use of the printer	Page 12-1
		Directory Lists the contents of the disk.	Page 12-5 Section 12.2
		FD read Reads operating data from the disk.	Page 12-7 Section 12.3
		FD write Writes operating data onto disk.	Page 12-9 Section 12.4
		FD verify Verifies A6GPP data with the data on the disk.	Page 12-11 Section 12.5
		FD deletion Deletes the specified file.	Page 12-13 Section 12.6
		FD copy Copies the specified files singularly or as a batch.	Page 12-15 Section 12.7
		FD formatting Format the user disk in the A6GPP.	Page 12-18 Section 12.8
		Cleaning disk For cleaning the FDD head.	Page 12-20 Section 12.9
		Printer Prints out parameters, zeroing data, and positioning data.	Page 13-3 Chapter 13

Table 2.2 Function List (Mode List) (continued)

3. FLOPPY DISK SPECIFICATIONS



3. FLOPPY DISK SPECIFICATIONS

3.1 General Specifications of SW0-AD71P (System disk)

Item		Specifications
Ambient temperature	Operated	10 to 40°C
	Non-operated	4 to 51.5°C
	Stored in protection box	−40 to 51.5°C
Ambient humidity	Operated	20 to 80%RH (non-condensing)
	Non-operated	10 to 80%RH (non-condensing)
	Stored in protection box	8 to 90%RH (non-condensing)
Operating environment		There should be no corrosive gases, and dust should be minimal.
Life		Total of 160 hours (3 million passes/track)
Application		For storage of GPP function Processing program
Size		3.5 inches

Table 3.1 General Specifications of SW0-AD71P

3.2 General Specifications of SW0-GPPU (User disk)

Item		Specifications
Ambient temperature	Operated	10 to 40°C
	Non-operated	4 to 51.5°C
	Stored in protection box	−40 to 51.5°C
Ambient humidity	Operated	20 to 80%RH (non-condensing)
	Non-operated	10 to 80%RH (non-condensing)
	Stored in protection box	8 to 90%RH (non-condensing)
Operating environment		There should be no corrosive gases, and dust should be minimal.
Life		Total of 160 hours (3 million passes/track)
Application		For storage of program and data
Size		3.5 inches
Memory capacity		*1 1M byte (double-sided, double density)
Supplied:		Formatted

Table 3.2 General Specifications of SW0-GPPU

REMARKS

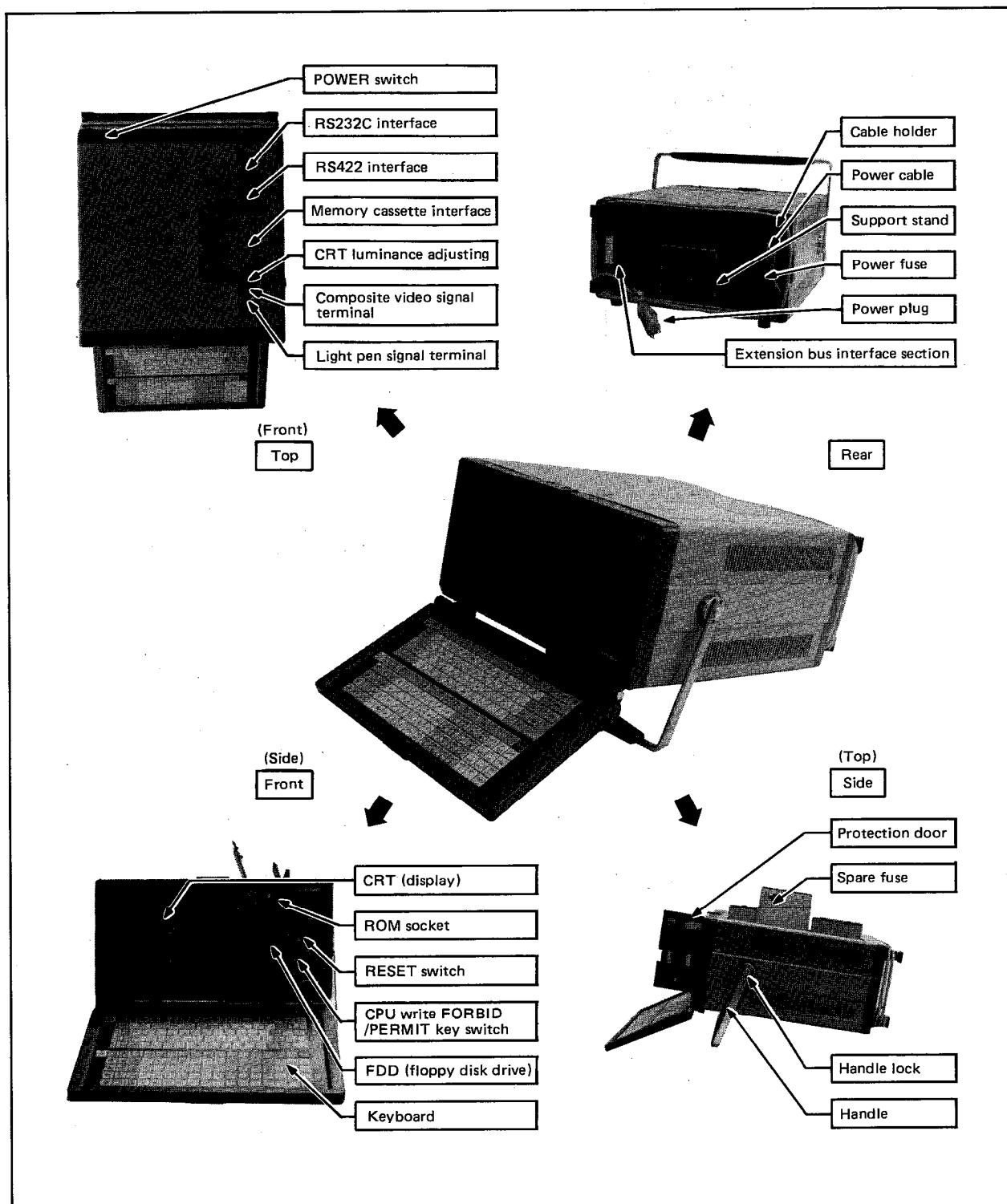
*1: After the FD is formatted, the memory capacity available to the user is 640K bytes (5120 sectors). Any one block of data (parameters, zeroing data, and positioning data) occupies 70 sectors.

4. HANDLING

MELSEC-A

4. HANDLING

4.1 A6GPP Nomenclature



4.2 Floppy Disk Nomenclature

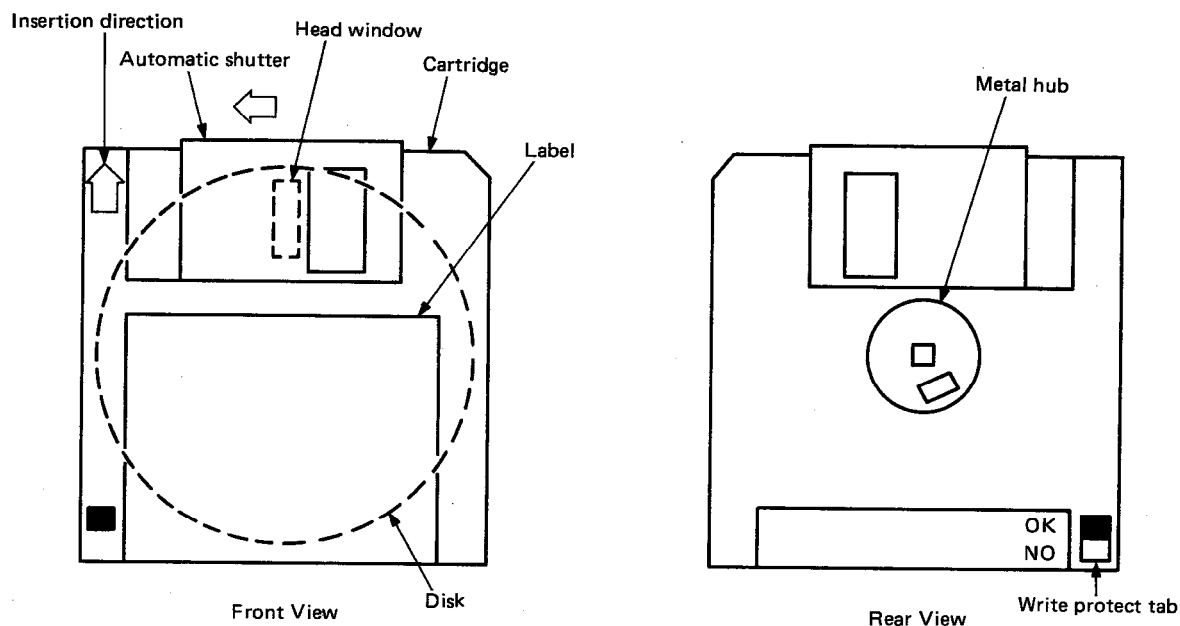


Fig. 4.1 Floppy Disk

- **Disk** : Thin disk of magnetic material on which data is stored.
- **Metal hub** : Spins the disk.
- **Cartridge** : Rigid jacket which protects the magnetic disk.
- **Automatic shutter** : The shutter slides automatically to protect the "head window."
- **Write protect tab** : Set to "OK" to enable writing to the disk and "NO" to forbid.
- **Insertion direction** : Indicates the direction in which the FD is inserted into the FDD.
- **Label** : For a list of the disk contents.

4.3 Handling Instructions

- (1) Do not touch the disk through the head window.
- (2) Insert the FD into the FDD as indicated by the arrow on the FD.
- (3) Always write protect a disk after it has been written to. This prevents accidental erasure.

IMPORTANT

**Always write protect the SW0-AD71P operating system disk.
Formatting this disk will erase the operating system.**

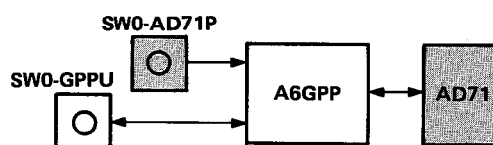
5. SYSTEM START-UP

5. SYSTEM START-UP

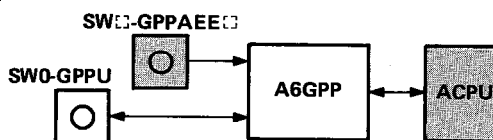
5.1 General

POINT

- (1) SW0-AD71P is used to program positioning data into the AD71 buffer memory.

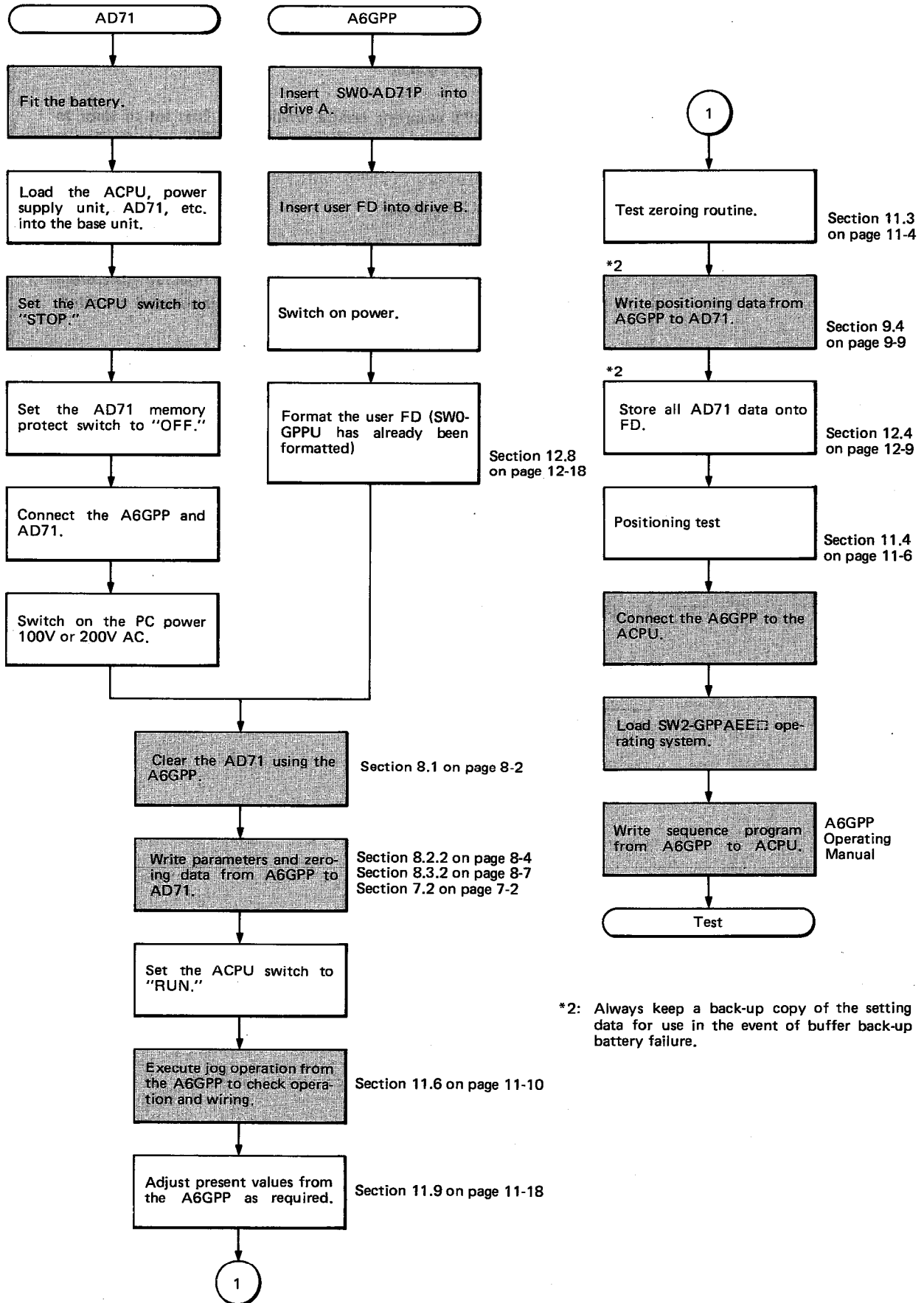


- (2) SW0-GPPAEE is used to write sequence programs to the PC CPU.



5. SYSTEM START-UP

Start-Up Flow Chart



5.2 Operating Precautions

IMPORTANT

(1) Clearing the AD71 RAM

Clear the AD71 memory before writing the first set of data to remove any random data which may have entered the buffer memory during handling.

(2) A6GPP power-off or reset

The A6GPP memory is not battery backed and data is cleared from its internal memory when it is switched off or reset. It is therefore advisable to write all data to FD every time it is changed or edited.

(3) Insertion and removal of the FD from the disk drives

The FD may be inserted or removed from the drive while the power is on, however, note:

- The FD should not be removed while the red indicator lamp (indicating that the FDD is being accessed) is lit.
- The SW0-AD71P system disk must be installed in the drive when power is restored to the A6GPP (or the reset pressed) in order to load the operating system.

(4) AD71 data arrangement

Use the format sheets in Appendix 1 to help arrange the AD71 data.

5.3 A6GPP Screen and Keys

5.3.1 CRT screen layout

The CRT screen consists of the following three areas.

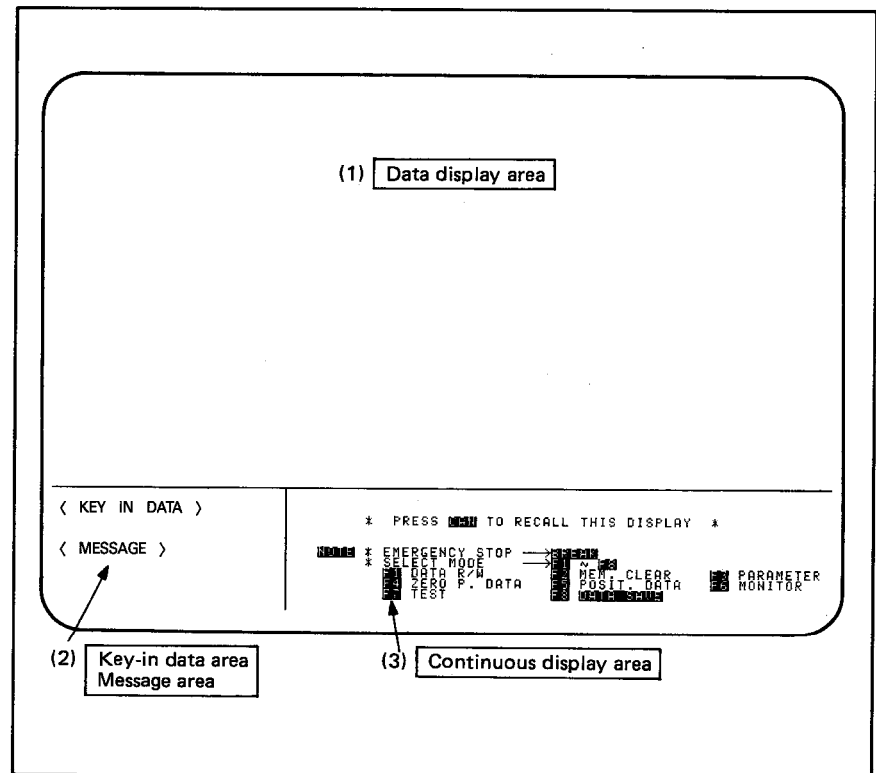


Fig. 5.1 CRT Screen Configuration

(1) Data display area

Displays data for each mode according to the key operations used.

(2) Key-in data area and message area

The key-in data area displays the data currently being entered from the keyboard. (There is no display here when selecting a code number from a menu.)

The message area displays any error codes or prompts relevant to the operation or data.

(3) Continuous display area

Is maintained in each mode and indicates main key functions.

- Emergency stop → **BREAK**

For emergency stop during positioning, press the **BREAK** key.

- Mode selection → **F1** to **F8**

To switch mode press the relevant key **F1** to **F8**. The current mode is highlighted.

REMARKS

For clarity, areas 2 and 3 are omitted in the remainder of this manual.

5.3.2 Key operation

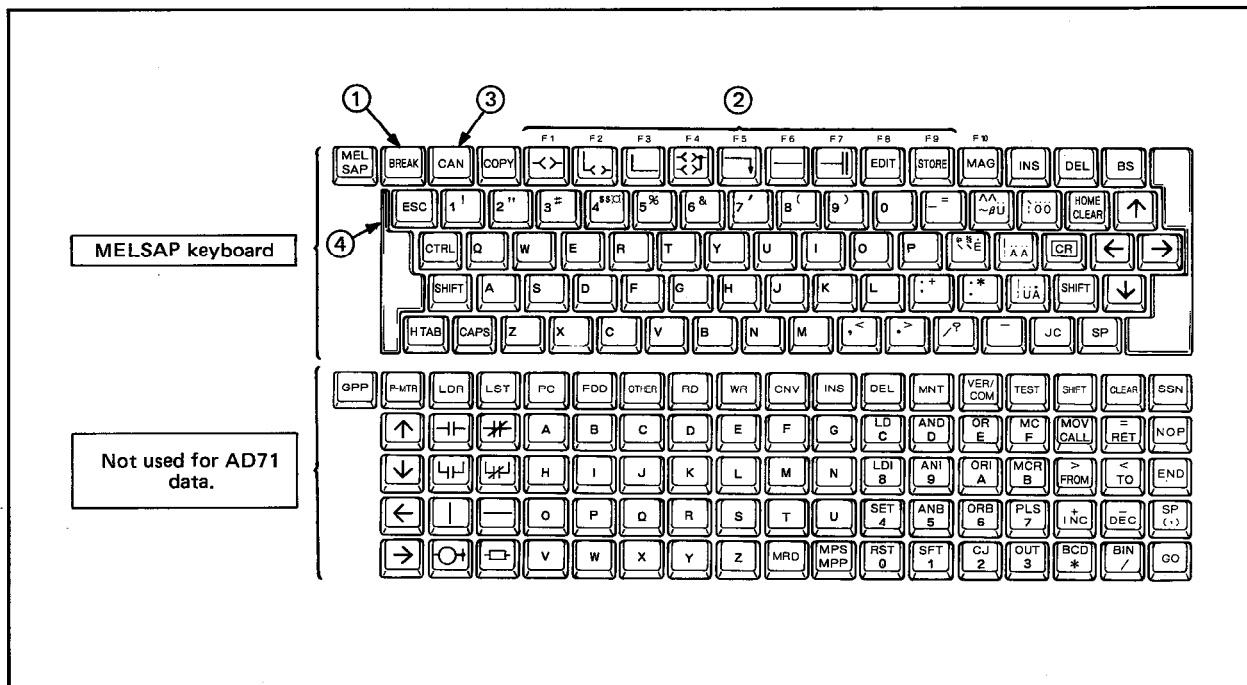


Fig. 5.2 Keyboard

Use the upper, MELSAP keyboard.

Key areas ① to ④ above and "HOME CLEAR" have the following functions.

Priority	Key	Function	Remarks
①	BREAK	AD71 emergency stop command	Always valid. Stops after deceleration.
②	F1 F8	Mode selection.	The mode may be switched at any time except during data up-load and down-load with the AD71.
③	CAN	Returns to the initial screen of the current mode.	Not valid during data up-load and down-load with the AD71.
④	ESC	To switch between monitor stop and resume.	Valid in monitor mode and monitoring in test mode.
	HOME CLEAR	Clears input data and message.	Use during key operation.

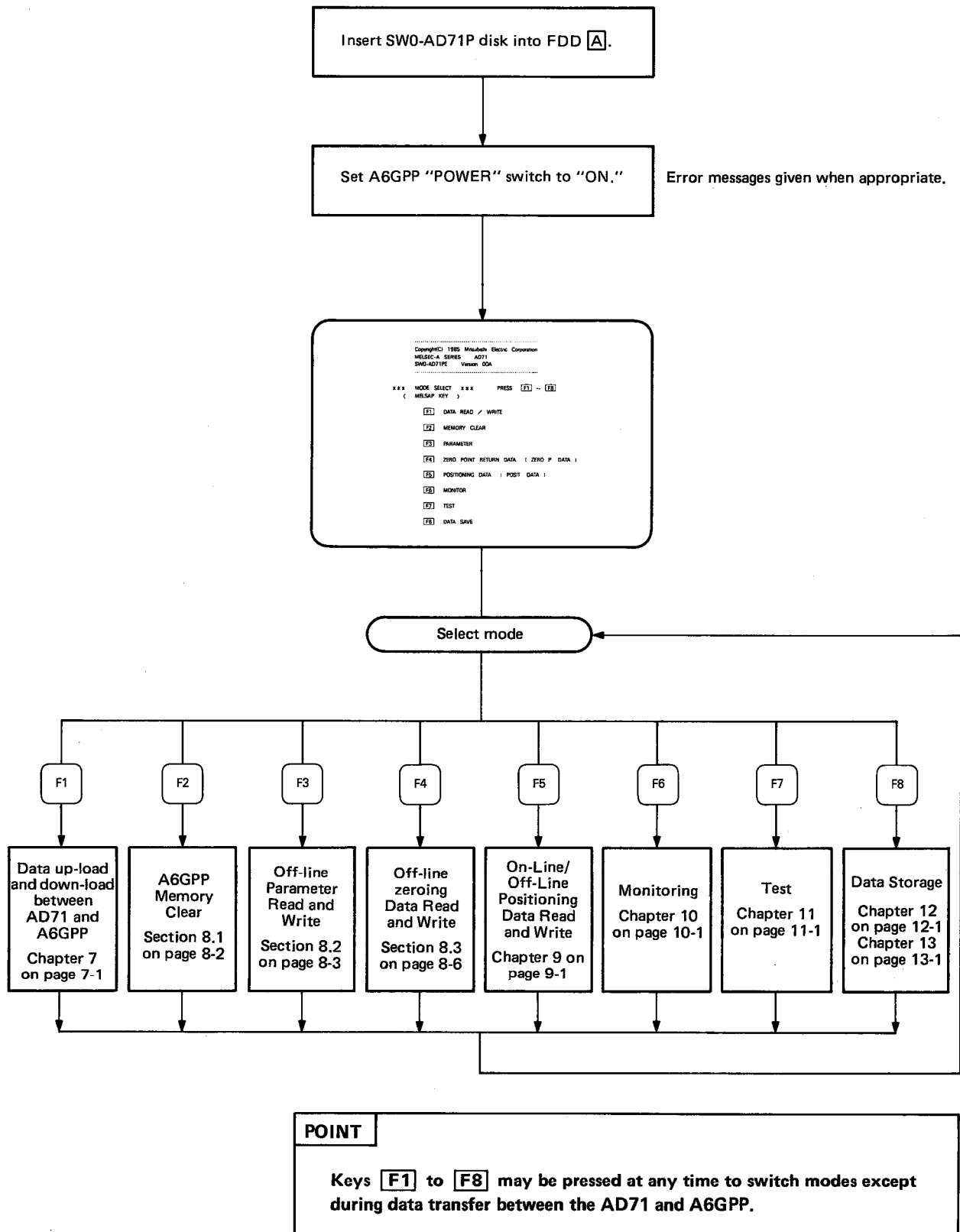
Table 5.1 Special Key Operation

POINT

The BREAK key stops both axes even if only one has been specified for operation.

5. SYSTEM START-UP

5.4 SW0-AD71P Start-Up Screen



5. SYSTEM START-UP

MELSEC-A

SW0-AD71P initial menu

**SW0-AD71P
INITIAL
MENU**

BASIC OPERATION

Load FD into FDD.
Switch on or reset the A6GPP.

OPERATION PROCEDURE

```
.....
Copyright(C) 1985 Mitsubishi Electric Corporation
MELSEC-A SERIES      AD71
SW0-AD71PE      Version 00A
.....

*** MODE SELECT ***      PRESS [F1] ~ [F8]
( MELSAP KEY )

[F1] DATA READ / WRITE
[F2] MEMORY CLEAR
[F3] PARAMETER
[F4] ZERO POINT RETURN DATA ( ZERO P. DATA )
[F5] POSITIONING DATA ( POSIT. DATA )
[F6] MONITOR
[F7] TEST
[F8] DATA SAVE
```

- (1) Load the SW0-AD71P into FDD **[A]**.
- (2) Switch the A6GPP power on.
The initial menu screen shown on the left is displayed.

EXPLANATION

- (1) For details of error messages see Section 14, page 14-1.
- (2) After the operating system has loaded, all functions except formatting can be conducted with SW0-AD71P removed from the FDD.

6. SUMMARY OF FUNCTIONS AND OPERATIONS

MELSEC-A

6. SUMMARY OF FUNCTIONS AND OPERATIONS

The following pages give a quick reference summary of the keystrokes used for each function.

6. SUMMARY OF FUNCTIONS AND OPERATIONS

6.1 Quick Reference Summary

Gives a summary of operations in Chapters 7 to 13. For further details, refer to relevant pages.

Mode	Function		Basic Operation	Ref. Page
AD71 ↔ A6GPP Data read and write	AD71→A6GPP All data	Read	F1 → 1 → CR	7-2
	A6GPP→AD71 Parameters Zeroing data Positioning data	Write	[Key switch PERMIT] → F1 → CR → Y → CR Parameters : 2 Zeroing data : 3 Positioning data : 4	7-2
	A6GPP→AD71 All data	Write	[Key switch PERMIT] → F1 → 5 → CR → Y → CR	7-2
	AD71↔A6GPP Parameters Zeroing data Positioning data	Verify	F1 → CR Parameters : 6 Zeroing data : 7 Positioning data : 8	7-3
	A6GPP↔AD71 All data	Verify	F1 → 9 → CR	7-3
A6GPP memory clear	A6GPP X axis Parameters Zeroing data Positioning data M code comments	Memory clear	F2 → CR → Y → CR Parameters : 1 Zeroing data : 2 Positioning data : 3 M code comments : 4	8-2
	A6GPP Y axis Parameters Zeroing data Positioning data M code comments	Memory clear	F2 → CR → Y → CR Parameters : 6 Zeroing data : 7 Positioning data : 8 M code comments : 9	8-2
	A6GPP X, Y both axes Parameters Zeroing data Positioning data M code comments	Memory clear	F2 → CR → Y → CR Parameters : 11 Zeroing data : 12 Positioning data : 13 M code comments : 14	8-2
	A6GPP X axis all data Y axis all data X, Y both axes all data	Memory clear	F2 → CR → Y → CR X axis all data : 5 Y axis all data : 10 X, Y both axes all data : 15	8-2
AD71 memory clear		Memory clear	F2 → 15 → CR → Y → CR → F1 → 5 → CR → Y → CR	8-2
Parameters	A6GPP Parameters	Read	F3 → X → CR Y → CR Axis setting	8-3
		Write Correction	F3 → X → CR → [↓] → [Parameter input] → CR Y → CR → [↑] Axis setting	8-4
Zeroing data	A6GPP Zeroing data	Read	F4	8-6
		Write Correction	F4 → [↓] → [Zeroing data input] → CR [↑] Axis setting	8-7
Positioning data	A6GPP Positioning data	Read	F5 → 1 → CR → X → CR → [Data No.] → CR Y → CR Axis setting	9-4
		Page turning	CR → 4 → CR → + → + → -	9-5
		Axis change	CR → X → CR → [Data No.] → CR Y → CR Axis setting	

6. SUMMARY OF FUNCTIONS AND OPERATIONS

MELSEC-A

Mode	Function		Basic Operation	Ref. Page
Positioning data	A6GPP Positioning data	Write Correction		9-6
	A6GPP } On-line AD71 } Positioning data	Write Correction		9-9
	A6GPP Common positioning pattern	Batch Write Correction		9-9
	A6GPP Common positioning method	Batch Write Correction		9-9
	A6GPP Common positioning speed	Batch Write Correction		9-9
	A6GPP Common positioning dwell time	Batch Write Correction		9-9
	A6GPP Batch clamp of positioning speed	Batch clamp		9-11
	A6GPP M code comment	Read	F5 -> 4 -> CR	9-12
		Write Correction		9-13
Monitoring	Scroll monitoring	Monitoring	F6 -> 1 -> CR	10-3
	Error list	Monitoring	F6 -> 1 -> CR -> F6 -> 2 -> CR	10-5
Test	Zeroing	Operation		11-4

6. SUMMARY OF FUNCTIONS AND OPERATIONS

MELSEC-A

Mode	Function	Basic Operation	Ref. Page
Test	Positioning operation in single mode		11-6
	Positioning operation by automatic switching of start data No.		11-8
	Jog operation		11-10
	Inching operation		11-12
	Jog to position and teach		11-14
	Inch to position and teach		11-16

6. SUMMARY OF FUNCTIONS AND OPERATIONS

MELSEC-A

Mode	Function		Basic Operation	Ref. Page
Test	Present value change	Operation	F7 → 5 → CR → [New address input] → CR	11-18
	Error reset	Operation	F7 → 6 → CR → CR	11-19
Data storage Floppy disk	Directory (File name = system name•D71)	File name setting	F8 → 1 → CR → 1 → CR → ← → B → [File name] → CR	12-5
		All files	F8 → 1 → CR → 1 → CR → ← → B → CR → CR	12-5
	Read from FD	File read	F8 → 1 → CR → 2 → CR → [System name input] → CR → Y → CR	12-7
	Write to FD	File write	F8 → 1 → CR → 3 → CR → [System name input] → CR → Y → CR	12-9
	Verify with FD	File verify	F8 → 1 → CR → 4 → CR → [System name input] → CR → Y → CR	12-11
	File deletion from FD	File deletion	F8 → 1 → CR → 5 → CR → [File name input] → CR → Y → CR	12-13
	FD copy		F8 → 1 → CR → 6 → CR → [FDD selection] → [System name] → CR → Y → CR	12-15
	FD formatting	Formatting	FDD [A] SW0-AD71P F8 → 1 → CR → 7 → CR → CR FDD [B] new FD CR → CR	12-18
	Cleaning disk	Cleaning	FDD SW0-FDC F8 → 1 → CR → 8 → CR → FDD selection → CR	12-20
Data storage (Printer)	K6PR printer setting	Printer setting	F8 → 2 → CR → Type selection → CR → [Function selection]	13-5
	K6PR-K printer setting	Printer setting	F8 → 2 → CR → Type selection → CR → [Function selection]	13-5
	K7PR printer setting	Printer setting	F8 → 2 → CR → 5 → CR → [Function selection]	13-7
	A7PR printer setting	Printer setting	F8 → 2 → CR → 6 → CR → [Function selection]	13-9
	GT-10A (old) printer setting	Printer setting	F8 → 2 → CR → 7 → CR → [Function selection]	13-5
	GT-10A (new) printer setting	Printer setting	F8 → 2 → CR → 8 → CR → [Function selection]	13-5
	General-purpose printer setting	Printer setting	F8 → 2 → CR → 9 → CR → [Function selection]	13-11
	X axis all area print	Function selection	[Printer setting] → 1 → CR	—
	Y axis all area print	Function selection	[Printer setting] → 2 → CR	—
	X, Y axes all area print	Function selection	[Printer setting] → 3 → CR	—
	X axis range setting print	Function selection	[Printer setting] → 4 → CR → [Start data No.] → CR → [Final data No.] → CR → Y → CR	—
	Y axis range setting print	Function selection	[Printer setting] → 5 → CR → [Start data No.] → CR → [Final data No.] → CR → Y → CR	—
	X, Y axes range setting print	Function selection	[Printer setting] → 6 → CR → [Start data No.] → CR → [Final data No.] → CR → Y → CR	—
	Parameter, zeroing data print	Function selection	[Printer setting] → 7 → CR → Y → CR	—
	Print title print	Function selection	[Printer setting] → [System name] → CR → [Comment] → CR → Y → CR	13-13
	Screen copy	Function selection	[Printer setting] → COPY	13-14

7. DATA TRANSFER BETWEEN A6GPP AND AD71

This allows the operating data to be transferred between the AD71 and the A6GPP. During the READ operation, all data (parameter, zeroing and positioning) is transferred from the AD71 to the A6GPP. During the WRITE operation the selected data is transferred the other way, from A6GPP to AD71. The data area in this case can be selected as one or all of parameter, zeroing and positioning data.

The AD71 memory should always be cleared when first used to remove any random data which may have entered the buffer memory during handling. This is accomplished using the memory clear function (Section 8.1).

Parameters and zeroing data are written and handled in the A6GPP memory where they can be properly and easily checked by the A6GPP's diagnostic functions. They can then be downloaded to the AD71 using the data WRITE function.

Positioning data can be written either on-line or off-line. When written off-line they are stored and handled in the A6GPP memory from where they can be written to the AD71 using the data WRITE function. When positioning data is written on line, the keyed in data updates both the A6GPP memory and the AD71 buffer memory at the same time.

POINT

Keys **F1** to **F8** may be pressed at any time to switch modes except during data transfer between the AD71 and A6GPP.

REMARKS

The number of bytes still to be processed is indicated on the CRT by rows of "*" during read, write and verify operations. See below.

Parameters	X	1K byte
Zeroing data	X	1K byte
Positioning data	X X X X X X X X	8K bytes
All data	X X X X X X X X	8K bytes . . . Total of the above three type data

Parameters and zeroing data are indicated by one "X" although they are less than 1K byte. For details of memory capacities, refer to Section 3.6 of the AD71 User's Manual.

7. DATA TRANSFER BETWEEN A6GPP AND AD71

MELSEC-A

7.1 General

OPERATION PROCEDURE

*** DATA READ/WRITE ***

	AD71 → A6GPP READ	AD71 ← A6GPP WRITE	AD71 ↔ A6GPP VERIFY
PARAMETER	—	2	6
ZERO P. DATA	—	3	7
POSIT. DATA	—	4	8
ALL DATA	1	5	9

No.7 ■

* PRESS [CAN] TO RECALL THIS DISPLAY *

Pressing **F1** calls the menu shown on the left. The operation and data to be processed are selected by pressing the appropriate number (e.g. 1 for all data read from the AD71 to the A6GPP.)

Notes:

- 1) These functions cannot be used in AD71 test mode.
- 2) Pressing the **[CAN]** key will always return this menu in this mode.

REMARKS

M code comments are included in positioning data.

7.2 All Data Read (from AD71 to A6GPP)

EXPLANATION

- (1) Select **[1]** to read all the AD71 operating data for both axes. To interrupt reading, press the **[BREAK]** key.
- (2) Switching on the PC ready signal (Y1D) during reading prompts a "PC READY ON" error and stops execution.
- (3) The execution time for this function is longer when Y1D is on. For details see Appendix 2.

7.3 Data Write (from A6GPP to AD71)

EXPLANATION

- (1) Select:
 - [2]** to write parameters from the A6GPP to the AD71.
 - [3]** to write zeroing data from the A6GPP to the AD71.
 - [4]** to write positioning data (including M code comments) from the A6GPP to the AD71.
 - [5]** to write all data from the A6GPP to the AD71.
- (2) Data is written for both axes.
- (3) Write cannot be executed while the PC ready signal (Y1D) is on.
- (4) Press **[Y]** and **[CR]** to confirm writing or **[N]** and **[CR]** to abort (as requested at the lower right of the screen) and return to the data read/write menu.
- (5) Data is automatically verified after writing.
- (6) Parameter and zeroing data is checked by the AD71 to ensure that it is within the allowed ranges as it is written from the A6GPP. Errors are signalled by appropriate error messages, see Section 14.2.1, page 14-10.
- (7) Positioning data is checked by the AD71 at the start of positioning.
- (8) A "VERIFY ERROR" is displayed if data is written to the AD71 from any other source during this process.

7.4 Data Verify (A6GPP with AD71)

EXPLANATION

- (1) Select:
 - ☐ 6 to verify parameters between the AD71 and the A6GPP.
 - ☐ 7 to verify zeroing data between the AD71 and the A6GPP.
 - ☐ 8 to verify positioning data (including M code comments) between the AD71 and the A6GPP.
 - ☐ 9 to verify all data between the AD71 and the A6GPP.
- (2) Data is verified for both axes.
- (3) To interrupt verification, press the ☐ BREAK key.
- (4) Switching on the PC ready signal (Y1D) during verification prompts a "PC READY ON" error and stops execution.
- (5) The execution time for this function is longer when Y1D is on. For details see Appendix 2.
- (6) Any error detected during verification is indicated by a message. See Chapter 14 on page 14-2.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

The first part of this section deals with clearing the A6GPP memory. When first starting out with a new AD71, its memory should be cleared. This is done by first clearing the A6GPP memory and then writing that (cleared) memory to the AD71 (Use the data transfer facility described in Section 7).

The rest of this section deals with the off-line handling of parameter and zeroing data. This may be done with the AD71 connected to the A6GPP, but the data must be written from the A6GPP to the AD71 after it has been checked for compatibility etc by the A6GPP diagnostics.

All data should be checked for compatibility (by pressing **[D]**, **[CR]**). While a parameter for example, may appear to be within its maximum range, that range may have been reduced by another parameter. An example of this is upper stroke limit and feed per pulse. As the total number of pulses that the AD71 can handle is 16292528, the upper stroke limit (in mm say) will be limited by the feedrate (in μm per pulse).

POINT

Keys **[F1]** to **[F8]** can be pressed at any time to switch modes except during data transfer between the AD71 and A6GPP.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

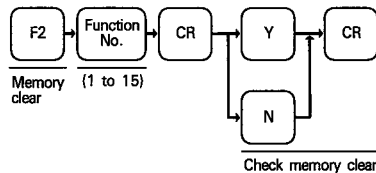
MELSEC-A

8.1 A6GPP Memory Clear

Clears the A6GPP internal memory.

**A6GPP
MEMORY
CLEAR**

BASIC OPERATION



OPERATION PROCEDURE

*** MEMORY CLEAR ***

	X-AXIS	Y-AXIS	X&Y-AXIS
PARAMETER	1	6	11
ZERO P. DATA	2	7	12
POSIT. DATA	3	8	13
M CODE COMMENT	4	9	14
ALL CLEAR	5	10	15

No. 12

CLEAR MEMORY
 OK → PRESS Y CR
 NO → PRESS N CR

Pressing CAN in this mode will always return this screen.

 Example: To clear X and Y axis zeroing data.

```

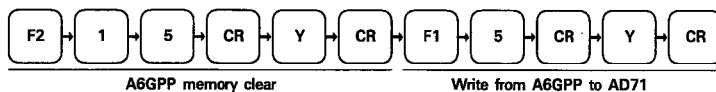
graph LR
    F2[F2] --> 1[1]
    1 --> 2[2]
    2 --> CR1[CR]
    CR1 --> Y[Y]
    Y --> CR2[CR]
  
```

EXPLANATION

- (1) Clears the specified data from the A6GPP internal memory.
- (2) The following memory areas can be selectively cleared for X, Y or both axes.
 1. Parameters
 2. Zeroing data
 3. Positioning data (other than M code comments)
 4. M code comments
 5. All areas
- (3) Press Y and CR to confirm clearing for the selected data area. Press N and CR to abort and return to the above menu.
- (4) "COMPLETED" will be displayed in the message area after the selected data has been cleared.

POINT

To clear the AD71 memory, simply write the cleared A6GPP memory to the AD71. Set the "WRITE-IN CPU" keyswitch to "PERMIT" and the ACPU to "STOP", then press:



The AD71 will now operate at its default parameter values.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

MELSEC-A

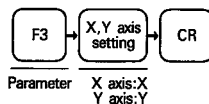
8.2 Parameter Handling in the A6GPP

8.2.1 Reading parameters

Displays the parameters stored in the A6GPP memory.

**A6GPP
PARAMETER
READ**

BASIC OPERATION



OPERATION PROCEDURE 1

*** PARAMETER ***
SELECT AXIS ■-AXIS

F3

Parameter

Pressing the **CAN** key at any time in this mode returns this screen.

* PRESS **CAN** TO RECALL THIS DISPLAY *

OPERATION PROCEDURE 2

*** PARAMETER ***
SELECT AXIS X-AXIS

* SETTING DATA COPY

X-AXIS DATA → Y-AXIS DATA PRESS **CR**

PARAMETER	SETTING DATA	SETTING RANGE
1 UNIT SETTING	■	0 0:mm 1:inch 2:degree 3:PULSE
2 MOVEMENT / PULSE	■■■■■■■■■■	10.0 0.1 ~ 10.0 (μm/PULSE)
3 SPEED RESTRICTION	■■■■■■■■■■	3000 10 ~ 120000 (mm/min)
4 JOG SPEED RESTRICTION	■■■■■■■■■■	600 10 ~ 120000 (mm/min)
5 BIAS SPEED	■■■■■■■■■■	0 10 ~ 120000 (μm/min)
6 BACKLASH	■■■■■■■■■■	3.5 0 ~ 6553.5 (μm)
7 STROKE LIMIT MAX.	■■■■■■■■■■	0 0 ~ 162000 (mm)
8 STROKE LIMIT MIN.	■■■■■■■■■■	80000 0 ~ 162000 (mm)
9 ERROR CORRECT / m	■■■■■■■■■■	70.5 -10000.0 ~ 10000.0 (μm)
10 MOVEMENT / MAN-PULSE	■■■■■■■■■■	500.0 0 ~ 10000.0 (μm)
11 AC. / DECELERATE TIME	■■■■■■■■■■	1280 64 ~ 4899 (msec)
12 COMPLETE TIME	■■■■■■■■■■	0 0 ~ 20000 (msec)
13 PULSE-OUT MODE	■	0:PULSE+SIGN 1:FOR./REVERSE PULSE
14 TURN DIRECTION	■	0:FORWARD INC. 1:REVERSE INC.
15 ABS. / INC. SET	■	0:ABS. 1:INC. 2:ABS. & INC.
16 M CODE ON/OFF TIMING	■	0:WITH 1:AFTER 2:UNUSED

X

→

CR

X axis parameter

Example: X axis parameter read (Unit: mm)

D

→

CR

Checks parameters and zeroing data

EXPLANATION

- (1) In the "SETTING DATA" column:
 - (a) The fraction part of any number input to a parameter which should be an integer will be ignored.
 - (b) Any "units" input to a parameter which must be expressed as a multiple of ten will be ignored.
- (2) To check all data press **D** and **CR**. Any errors are indicated as error codes 301 to 324 (see Section 14.1.3). Note that the allowed range for some data setting will depend on the value assigned to other settings. For example, the upper stroke limit will be determined by the feed/pulse setting.
- (3) The "SETTING RANGE" column data is shown in the appropriate units.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

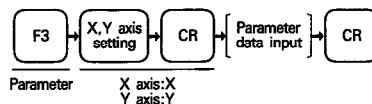
MELSEC-A

8.2.2 Correcting and writing parameters

Correction or writing of parameters stored in the A6GPP memory.

**A6GPP
PARAMETER
WRITE,
CORRECT**

BASIC OPERATION



OPERATION PROCEDURE 1

*** PARAMETER ***
SELECT AXIS ■-AXIS

F3

Parameter

* PRESS [CAN] TO RECALL THIS DISPLAY *

OPERATION PROCEDURE 2

*** PARAMETER ***
SELECT AXIS X-AXIS

* SETTING DATA COPY:

X-AXIS DATA → Y-AXIS DATA PRESS [CR]

PARAMETER	SETTING DATA	SETTING RANGE
1 UNIT SETTING	3	0:mm 1:inch 2:degree 3:PULSE
2 MOVEMENT / PULSE		
3 SPEED RESTRICTION	20000	10 ~ 200000 (PULSE/rev)
4 JOG SPEED RESTRICTION	20000	10 ~ 200000 (PULSE/rev)
5 BIAS SPEED	0	0 ~ 200000 (PULSE/rev)
6 BACKLASH	0	0 ~ 255 (PULSE)
7 STROKE LIMIT MAX.	16252928	0 ~ 16252928 (PULSE)
8 STROKE LIMIT MIN.	0	0 ~ 16252928 (PULSE)
9 ERROR CORRECT / m		
10 MOVEMENT / MAN-PULSE	1	0 ~ 1 (PULSE)
11 AC / DECELERATE TIME	1000	64 ~ 1000 (msec)
12 COMPLETE TIME	300	0 ~ 300 (msec)
13 PULSE-OUT MODE		0:PULSE+SIGN 1:FOR./REVERSE PULSE
14 TURN DIRECTION	0	0:FORWARD INC. 1:REVERSE INC.
15 ABS. / INC. SET	0	0:ABS. 1:INC. 2:ABS. & INC.
16 M CODE ON/OFF TIMING	0	0:WITH 1:AFTER 2:UNUSED

X

CR

Axis selection

* SETTING DATA CHECK PRESS [D] [CR]

Example: X axis write.
(Units default to pulse)

OPERATION PROCEDURE 3

*** PARAMETER ***

SELECT AXIS X-AXIS
* SETTING DATA COPY
X-AXIS DATA → Y-AXIS DATA PRESS [D] [CR]

PARAMETER	SETTING DATA	SETTING RANGE
1 UNIT SETTING	0	0:mm 1:inch 2:degree 3:PULSE
2 MOVEMENT / PULSE	3.5	0.1 ~ 10.0 (μm/PULSE)
3 SPEED RESTRICTION	0	10 ~ 120000 (mm/min)
4 JOG SPEED RESTRICTION	0	10 ~ 120000 (mm/min)
5 RAS SPEED	0	10 ~ 120000 (mm/min)
6 BACKLASH	0.0	0 ~ 6553.5 (μm)
7 STROKE LIMIT MAX.	0	0 ~ 162000 (mm)
8 STROKE LIMIT MIN.	0	0 ~ 162000 (mm)
9 ERROR CORRECT / m	0.0	-10000.0 ~ 10000.0 (μm)
10 MOVEMENT / MAX-PULSE	0.0	0.1 ~ 1000.0 (μm)
11 AC. / DECELERATE TIME	0	64 ~ 4999 (msec)
12 COMPLETE TIME	0	0 ~ 20000 (msec)
13 PULSE-OUT MODE	0	0:PULSE+SIGN, 1:FOR./REVERSE PULSE
14 TURN DIRECTION	0	0:FORWARD INC. 1:REVERSE INC.
15 ABS. / INC. SET	0	0:ABS. 1:INC. 2:ABS. & INC.
16 M CODE ON/OFF TIMING	0	0:WITH 1:AFTER 2:UNUSED

* SETTING DATA CHECK PRESS [D] [CR]

0

→

CR

→

3

→

.

→

5

→

CR

Unit mm Travel per pulse

Example: mm unit → 3.5μm per pulse

↓

↑

..... Moves cursor to select necessary data.

D

CR

..... Checks parameter and zeroing data for compatibility.

→

CR

..... Copy X axis data to Y axis.

←

CR

..... Copy Y axis data to X axis.

EXPLANATION

- (1) In the "SETTING DATA" column:
 - (a) The fraction part of any number input to a parameter which should be an integer will be ignored.
 - (b) Any "units" input to a parameter which must be expressed as a multiple of ten will be ignored.
 - (c) The allowed range for some data settings will depend on the value assigned to other settings. For example, the upper stroke limit will be determined by the feed/pulse setting. All data is checked relative to all other data, by pressing [D] and [CR], any errors are indicated by error codes 301 to 324. (See Section 14.1.3.)
- (2) The "SETTING RANGE" data is shown in the appropriate units.
- (3) The X-axis data can be copied to the Y axis (or vice versa) by using the "SETTING DATA COPY" function.

When X axis has been selected pressing [→] and [CR] copies X-axis data to the Y-axis and when Y axis has been selected pressing [←] and [CR] copies Y-axis data to the X-axis.
- (4) "PULSE OUT MODE" should be set as follows:

0: PULSE + SIGN B type

1: FOR./REVERSE PULSE ... A type
- (5) To correct data, simply move the cursor to the relevant parameter and over-write with the corrected value.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

MELSEC-A

8.3 Zeroing Data Handling in the A6GPP

8.3.1 Reading zeroing data

Reads the zeroing data stored in the A6GPP memory.

**A6GPP
ZEROING
DATA
READ**

BASIC OPERATION

F4

Zeroing
data

OPERATION PROCEDURE

*** ZERO POINT RETURN DATA *** * SETTING DATA COPY

X-AXIS DATA → Y-AXIS DATA PRESS ☐ ☐ ☐ ☐

X-AXIS DATA ← Y-AXIS DATA PRESS ☐ ☐ ☐ ☐

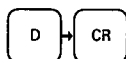
	ZERO P. DATA	SETTING DATA	SETTING RANGE
X	1 DIRECTION	0	0:FORWARD 1:REVERSE
	2 METHOD	0	0:PGO OF PG 1:STOP by DWELL 2:STOP by SIGN
	3 ADDRESS	18000000.0	0 ~ 162000000.0 (mm)
	4 SPEED	80000	10 ~ 120000 (mm/min)
	5 CREEP SPEED	500	10 ~ 120000 (mm/min)
	6 DWELL	1000	10 ~ 4000 (msec)
	7 TORQUE	10	10 ~ 250 (%)
Y	1 DIRECTION	1	0:FORWARD 1:REVERSE
	2 METHOD	2	0:PGO OF PG 1:STOP by DWELL 2:STOP by SIGN
	3 ADDRESS	9000.00000	0 ~ 16200.00000 (inch)
	4 SPEED	320	1 ~ 12000 (inch/min)
	5 CREEP SPEED	20	1 ~ 12000 (inch/min)
	6 DWELL	250.0	10 ~ 4990 (msec)
	7 TORQUE	1.90	10 ~ 250 (%)

* SETTING DATA CHECK PRESS ☐ ☐ ☐ ☐

F4

Zeroing
data

Example: X axis in mm
Y axis in inch



Checks parameters and zeroing data for compatibility.

Pressing **CAN** at any time during this mode returns this screen.

EXPLANATION

- (1) In the "SETTING DATA" column:
 - (a) The fraction part of any number input to a parameter which should be an integer will be ignored.
 - (b) Any "units" input to a parameter which must be expressed as a multiple of ten will be ignored.
 - (c) The allowed range for some data settings will depend on the value assigned to other settings. All data is checked relative to all other data, by pressing **D** and **CR**, any errors are indicated by error codes 301 to 324. (See Section 14.1.3.)
- (2) The "SETTING RANGE" data is shown in the appropriate units.

8. OFF-LINE HANDLING OF PARAMETER AND ZEROING DATA

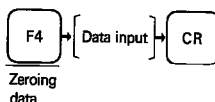
MELSEC-A

8.3.2 Correcting and writing zeroing data

Correction or writing of zeroing data stored in the A6GPP memory.

**A6GPP
ZEROING
DATA
WRITE,
CORRECT**

BASIC OPERATION



For initial menu, refer to page 5-8.

OPERATION PROCEDURE 1

*** ZERO POINT RETURN DATA *** * SETTING DATA COPY

X-AXIS DATA → Y-AXIS DATA PRESS D CR

X-AXIS DATA ← Y-AXIS DATA PRESS D CR

ZERO P. DATA	SETTING DATA	SETTING RANGE
X		
1. DIRECTION	0	0: FORWARD 1: REVERSE
2. METHOD	0	0: PG OF PG 1: STOP by DWELL 2: STOP by SIGN
3. ADDRESS	0.0	0 ~ 16200000.0 (μm)
4. SPEED	0	10 ~ 120000 (mm/min)
5. CREEP SPEED	0	10 ~ 120000 (mm/min)
6. DWELL	0	10 ~ 4000 (msec)
7. TORQUE	0	10 ~ 250 (%)
Y		
1. DIRECTION	0	0: FORWARD 1: REVERSE
2. METHOD	0	0: PG OF PG 1: STOP by DWELL 2: STOP by SIGN
3. ADDRESS	0.00000	0 ~ 16200.00000 (inch)
4. SPEED	0	1 ~ 12000 (inch/min)
5. CREEP SPEED	0	1 ~ 12000 (inch/min)
6. DWELL	0	10 ~ 4990 (msec)
7. TORQUE	0	10 ~ 250 (%)

* SETTING DATA CHECK PRESS D CR

F4

Zeroing data

Example: X axis in mm
Y axis in inch

OPERATION PROCEDURE 2

*** ZERO POINT RETURN DATA *** * SETTING DATA COPY

X-AXIS DATA → Y-AXIS DATA PRESS D CR

X-AXIS DATA ← Y-AXIS DATA PRESS D CR

ZERO P. DATA	SETTING DATA	SETTING RANGE
X		
1. DIRECTION	1	0: FORWARD 1: REVERSE
2. METHOD	0	0: PG OF PG 1: STOP by DWELL 2: STOP by SIGN
3. ADDRESS	70000.0	0 ~ 16200000.0 (μm)
4. SPEED	0	10 ~ 120000 (mm/min)
5. CREEP SPEED	0	10 ~ 120000 (mm/min)
6. DWELL	0	10 ~ 4000 (msec)
7. TORQUE	0	10 ~ 250 (%)
Y		
1. DIRECTION	0	0: FORWARD 1: REVERSE
2. METHOD	0	0: PG OF PG 1: STOP by DWELL 2: STOP by SIGN
3. ADDRESS	0.00000	0 ~ 16200.00000 (inch)
4. SPEED	0	1 ~ 12000 (inch/min)
5. CREEP SPEED	0	1 ~ 12000 (inch/min)
6. DWELL	0	10 ~ 4990 (msec)
7. TORQUE	0	10 ~ 250 (%)

* SETTING DATA CHECK PRESS D CR

1

CR

0

CR

7

0

Zeroing direction 1
Method 0
Zeroing address

0

0

0

.

0

CR

D

CR

..... Checks parameters and zeroing data for compatibility.

→

CR

..... Copies X axis data to Y axis

←

CR

..... Copies Y axis data to X axis

EXPLANATION

- (1) Write the parameters before the zeroing data. All data defaults to PULSE units when the parameters have not been set.
Data in the "DWELL" and "TORQUE" columns is ignored if these facilities are unused.
- (2) In the "SETTING DATA" column:
 - (a) The fraction part of any number input to a parameter which should be an integer will be ignored.
 - (b) Any "units" input to a parameter which must be expressed as a multiple of ten will be ignored.
 - (c) The allowed range for some data settings will depend on the value assigned to other settings. All data is checked relative to all other data, by pressing D and CR, any errors are indicated by error codes 301 to 324. (See Section 14.1.3.)

- (3) The "SETTING RANGE" data is shown in the appropriate units.
- (4) The X-axis data can be copied to the Y axis (or vice versa) by using the "SETTING DATA COPY" function.

When X axis has been selected, pressing and copies X-axis data to the Y-axis and when Y axis has been selected, pressing and copies Y-axis data to the X-axis.

- (5) To correct data, simply move the cursor to the relevant data and overwrite with the corrected value.

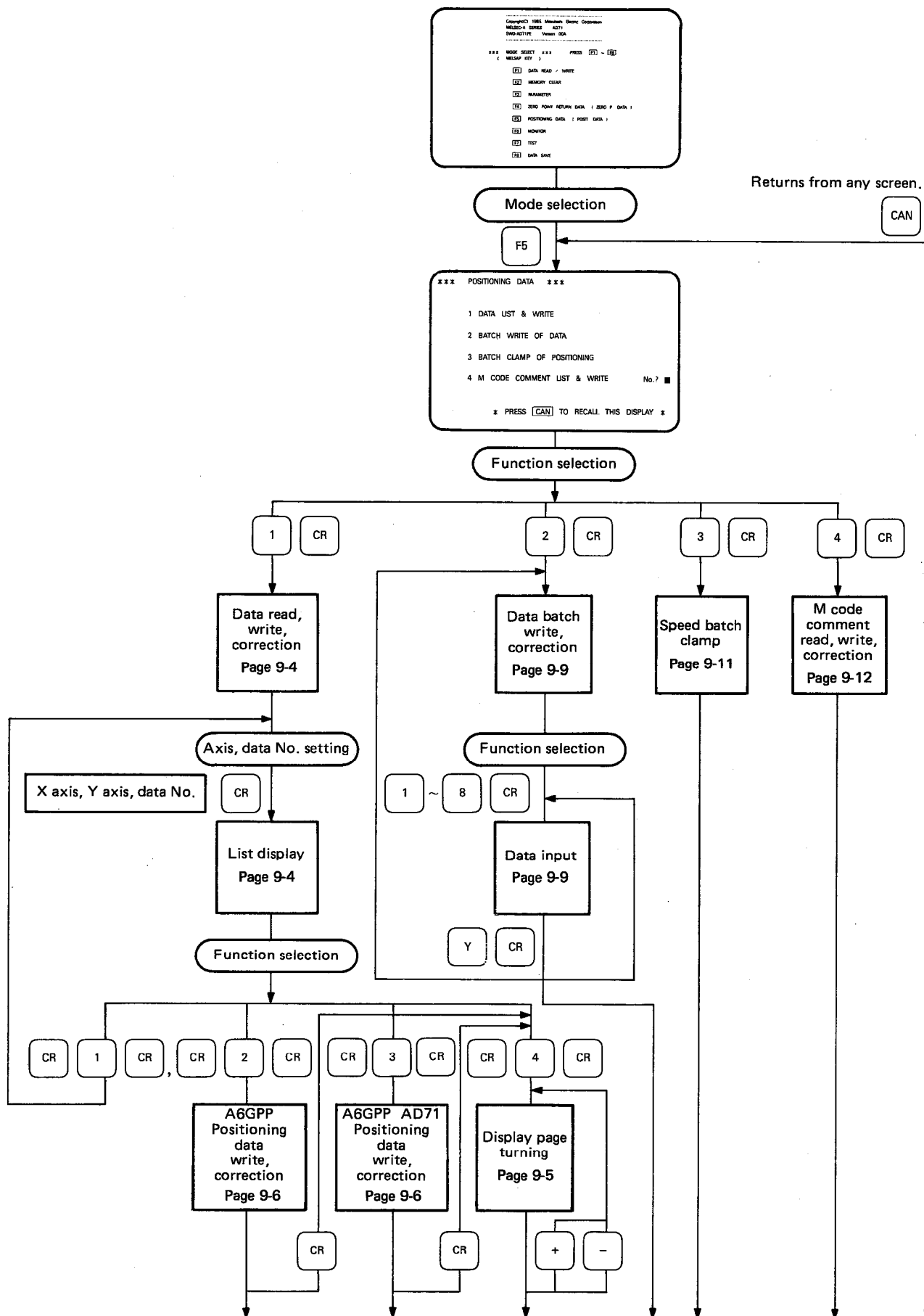
9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

Positioning data can be handled on- or off-line. When on-line, the data keyed in updates both the A6GPP memory and the AD71 buffer memory simultaneously. When off-line, the data is written to the A6GPP memory and may subsequently be written to the AD71 using the data WRITE function described in Section 7. Where the positioning data such as the positioning pattern, method, speed or dwell time, is common to a series of data blocks, this data can be "batch written" to those data blocks. This is particularly useful in conjunction with the teaching facility as an alternative to typing in all data manually.

Another useful facility described in this section is the "speed clamp". This allows a temporary speed limit to be imposed during test procedures. It has the effect of reducing all speed values greater than the clamp value, down to the clamp value (but does not change the parameter speed limit).

Finally, the writing of "M code" comments is explained. These are comments associated with specified pieces of positioning data. They are useful as references during program design and testing, and may also be used by the PC to generate display messages. These comments are written off-line and may be transferred to the AD71 using the data "WRITE" function described in Section 7.

Positioning Data Selection Flow Chart



9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

MELSEC-A

9.1 Positioning Data Menu

Pressing **F5** calls the menu shown below.

**POSITIONING
DATA
MENU
SCREEN**

BASIC OPERATION

F5

Positioning data

OPERATION PROCEDURE

*** POSITIONING DATA ***

- 1 DATA LIST & WRITE
- 2 BATCH WRITE OF DATA
- 3 BATCH CLAMP OF POSITIONING
- 4 M CODE COMMENT LIST & WRITE

No. ? ■

* PRESS **CAN** TO RECALL THIS DISPLAY *

F5

Positioning data

Pressing **CAN** at any time during this mode returns this screen.

EXPLANATION

- (1) Pressing the **CAN** key at any time during this mode returns the above menu.

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

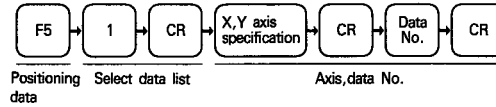
MELSEC-A

9.2 Read A6GPP Positioning Data

Displays the positioning data in the A6GPP internal memory.

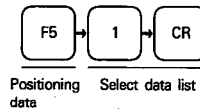
**A6GPP
POSITIONING
DATA
READ**

BASIC OPERATION



OPERATION PROCEDURE 1

*** POSITIONING DATA *** 1 AXIS & DATA No. SET AXIS-■ No.
< DATA LIST & WRITE >

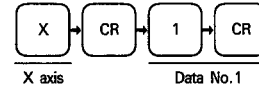


OPERATION PROCEDURE 2

*** POSITIONING DATA *** * PRESS [CR], BEFORE SELECTING THE No.
< DATA LIST & WRITE > 1 AXIS & DATA No. SET AXIS-■ No. 1
2 DATA WRITE (A6GPP MEMORY)
3 DATA WRITE (WITH AD71 MEMORY)
4 PAGE CHANGE No.?

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
1	1	0		8000	2000	100	0
2	2	0		8000	4000	50	0
3	2	0		4000	8000	50	0
4	2	0		3000	16000	50	0
5	1	0		8000	17000	50	0
6	0	0		3000	21000	50	0
7	0	0		0	0	0	0
8	0	0		0	0	0	0
9	0	0		0	0	0	0
10	0	0		0	0	0	0
0 END 1 CON 2 CHA	0 ABS. 1 INC.	0 FOR. 1 REV.	10 ~ 120000 mm/min	0 ~ 162000000.0 μm	10 ~ 4999 ms	0 ~ 255	

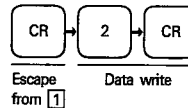
* SETTING DATA CHECK PRESS [D] [CR]



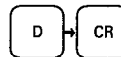
Example: Read data No. 1 for X axis

REMARKS

After the axis and start data number have been specified, pressing [CR] allows any of the functions 1 to 4 listed at the top of the screen to be called as shown below:



Example: To proceed to batch write



Checks parameters, zeroing and positioning data for compatibility.

EXPLANATION

- (1) 10 pieces of data are displayed beginning with the number and axis specified. Any of the 400 data numbers for each axis can be specified as the start.
- (2) As before, data can be checked for compatibility by pressing [D], [CR], errors are indicated by appropriate error codes (see Section 14.1.3.).

OPERATION PROCEDURE 3 Page Turning

*** POSITIONING DATA *** * PRESS **[CR]**, BEFORE SELECTING THE No.

< DATA LIST & WRITE > 1 AXIS & DATA No. SET-----AXIS-X No. 11

2 DATA WRITE (A6GPP MEMORY)

3 DATA WRITE (WITH AD71 MEMORY)

[F4] PAGE CHANGE * PRESS **[F4]** **[CR]** * No. 2 4

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
11	0	0		0	0	0	
12	2	0		300	123450	10	
13	2	0		300	67890	10	
14	1	0		300	50000	10	
15	0	0		300	500	10	
16	0	0		0	0	0	
17	0	0		0	0	0	
18	0	0		0	0	0	
19	0	0		0	0	0	
20	0	0		0	0	0	
0 END 0 ABS 0 FOR 10 ~ 0 ~ 162000000.0 10 ~ 0 ~ 255 1 CON 1 INC. 1 REV. 120000 mm/min 4990 msec 2 CUA							

* SETTING DATA CHECK PRESS **[F4]** **[CR]**

```

graph LR
    CR1[CR] --> 4[4]
    4 --> CR2[CR]
    CR2 --> Plus[+]
    CR2 --> Minus[-]
    Plus --> Next[Next page]
    Minus --> Prev[Previous page]
    1[Escape from 1]
  
```

EXPLANATION

(1) The following functions are available from this menu. They are listed at the top of the screen.

1. Read by specifying the axis and data number
2. Read, write, and correction of positioning data (A6GPP memory only)
3. Read, write, and correction of positioning data (A6GPP and AD71 on line)
4. Page turning

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

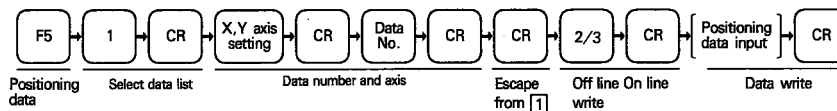
MELSEC-A

9.3 Writing and Correction of Positioning Data

Writes or corrects the positioning data either in the A6GPP internal memory (for off line programming) or in both the AD71 and A6GPP (for on-line programming).

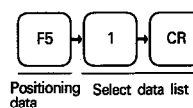
**POSITIONING
DATA
WRITE,
CORRECT**

BASIC OPERATION



OPERATION PROCEDURE 1

*** POSITIONING DATA *** 1 AXIS & DATA No. SET AXIS-■ No.
(DATA LIST & WRITE)



OPERATION PROCEDURE 2

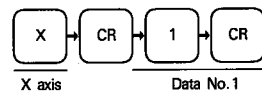
*** POSITIONING DATA *** * PRESS [CR], BEFORE SELECTING THE No.

1 AXIS & DATA No. SET.....AXIS-■ No. 1
2 DATA WRITE (A6GPP MEMORY)
3 DATA WRITE (WITH AD71 MEMORY)
4 PAGE CHANGE

(mm) No.?

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
0 END	1 CON	0 ABS	0 FOR	10 ~	0 ~ 162000000.0	10 ~	0 ~ 255
2 CHA	1 INC.	1 REV.		120000 mm/min	μm	4000 r/sec	

* SETTING DATA CHECK PRESS [D] [CR]



Example: Reading X axis data No. 1

OPERATION PROCEDURE 3

*** POSITIONING DATA *** * PRESS **[CR]** BEFORE SELECTING THE No.

1 AXIS & DATA No. P1-----AXIS **[2]** No. 1

[2] DATA WRITE (ARGPP MEMORY)

3 DATA WRITE (WITH AD71 MEMORY)

4 PAGE CHANGE

No. 7 2

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
1	1						
2							
3							
4							
5							
6							
7							
8							
9							
10							

0 END 0 ABS. 0 FOR. 10 ~ 120000 0 ~ 16200000.0 10 ~ 4990 0 ~ 255
 1 CON 1 INC. 1 REV mm/min mm msec
 2 CHA

* SETTING DATA CHECK PRESS **[D]** **[CR]**

[→] moves the cursor as shown by the arrows in the figure.

[D] **[CR]** Checks parameters, zeroing and positioning data for compatibility.

[→] **[←]** **[↑]** **[↓]** Cursor setting

[↑] **[↓]** Scrolling

EXPLANATION

- (1) Write the parameters before the positioning data. All data defaults to PULSE units when the parameters have not been set.
- (2) As shown above, pressing **[Data input]** and **[CR]** moves the cursor from left to right in the same line or from the last place of a line to the beginning of the next line.
- (3) To correct data, simply move the cursor to the relevant data and overwrite with the corrected value.
- (4) Permitted maximum data ranges are indicated under each column.
- (5) A maximum of nine consecutive positioning pattern 2 (pattern change) are allowed and their positioning methods and directions should be the same.
- (6) The positioning direction is ignored for absolute positioning.
- (7) In the "SETTING DATA" column:
 - (a) The fraction part of any number input as data which should be an integer will be ignored.
 - (b) Any "units" input to data which should be expressed as a multiple of ten will be ignored.
- (8) As before, data can be checked for compatibility by pressing **[D]**, **[CR]**, errors are indicated by appropriate error codes (see Section 14.1.3.).
- (9) The M code is written on this screen but not the M code comment (see Section 9.8).
- (10) To change pages of positioning data either scroll the display using the cursor keys (**[↑]**, **[↓]**) or select page change (No. 4) and press **[+]**, **[-]**.

OPERATION PROCEDURE 4 Page Turning

*** POSITIONING DATA *** * PRESS [CR] BEFORE SELECTING THE No.

1 AXIS & DATA No. SET-----AXIS-X No. 11

2 DATA WRITE (A6GPP MEMORY)

3 DATA WRITE (WITH AD71 MEMORY)

4 PAGE CHANGE * PRESS [2] OR [4] *

(mm)

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
11	0	0	0	0	0	0	0
12	2	0	0	8000	123450	0	0
13	2	0	0	300	67890	0	0
14	1	0	0	300	50000	10	0
15	0	0	0	300	800	10	0
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
0	END	0	ABS	0	FOR	10 ~	0 ~ 255
1	CON	1	INC	1	REV	120000	4990
2	CHA					mm/min	mm/sec

* SETTING DATA CHECK PRESS [0] [CR]

CR → 4 → CR → +
 Escape from [2] Page turning selection Turn 1 Page

CR → 2 → CR
 Escape from [4] Write to A6GPP

OPERATION PROCEDURE 5 Axis Change

*** POSITIONING DATA *** * PRESS [CR] BEFORE SELECTING THE No.

1 AXIS & DATA No. SET-----AXIS-Y No. 51

2 DATA WRITE (A6GPP MEMORY)

3 DATA WRITE (WITH AD71 MEMORY)

4 PAGE CHANGE

(mm)

DATA No.	PATTERN	METHOD	DIRECTION	SPEED	ADDRESS	DWELL	M CODE & COMMENT
51	0	0	0	0	0	0	0
52							
53							
54							
55							
56							
57							
58							
59							
60							
0	END	0	ABS	0	FOR	10 ~	0 ~ 255
1	CON	1	INC	1	REV	120000	4990
2	CHA					mm/min	mm/sec

* SETTING DATA CHECK PRESS [0] [CR]

CR → 1 → CR → Y → CR → 5 → 1 → CR
 Escape from [2] Y axis data No.51

CR → 2 → CR
 Escape from [1] Write to A6GPP

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

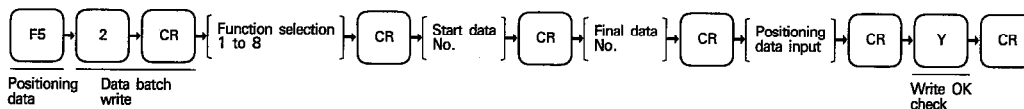
MELSEC-A

9.4 Batch Write and Correction of Positioning Data

Allows data common to a series of consecutive data numbers to be written simultaneously as a "batch."

**A6GPP
POSITIONING
DATA
BATCH WRITE,
CORRECT**

BASIC OPERATION



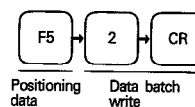
For menu screen, refer to page 9-3.

OPERATION PROCEDURE 1

*** POSITIONING DATA ***
(BATCH WRITE OF DATA)

AXIS	PATTERN	METHOD	SPEED	DWELL
X	1	3	5	7
Y	2	4	6	8

No. ? ■



OPERATION PROCEDURE 2

*** POSITIONING DATA ***
(BATCH WRITE OF DATA)

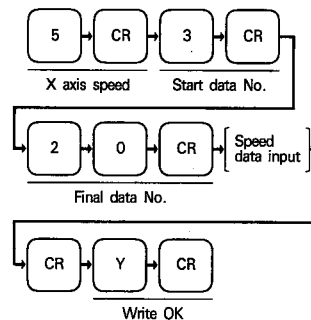
AXIS	PATTERN	METHOD	SPEED	DWELL
X	1	3	5	7
Y	2	4	6	8

No. ? 5

(mm)

DATA No.	SETTING DATA	SETTING RANGE
3 ~ 20	▶	10 ~ 120000 (mm/min)

* SETTING OK PRESS [Y] [CR]
NO SET AGAIN



Example: Batch write of speed data to X axis data No. 3 to 20

EXPLANATION

- (1) This function simplifies the input of data which is common to a series of consecutive data numbers. The following positioning data can be batch written:

- Positioning pattern : A maximum of nine consecutive positioning pattern 2 (pattern change) are allowed and their positioning methods and directions should be the same.
- Positioning method
- Positioning speed
- Dwell time

The incremental positioning direction (when used), the positioning address and the M-code must be written individually as described previously.

- (2) Write the parameters before the positioning data. All data defaults to PULSE units when the parameters have not been set.

- (3) To correct data, simply move the cursor to the relevant data and overwrite with the corrected value.
- (4) After the relevant data has been input, pressing ☐Y ☐CR causes the data to be written to the A6GPP memory and the batch write menu to be displayed.
- (5) This function can be used off line only (i.e. the data is written into the A6GPP memory, it must then be downloaded to the AD71.)

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

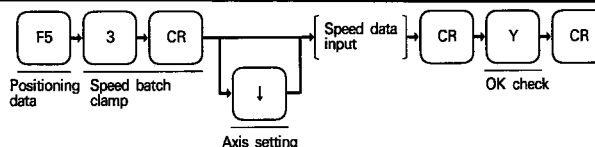
MELSEC-A

9.5 Positioning Speed Clamp

Allows control of the maximum speed from the A6GPP.

**POSITIONING
SPEED
BATCH
CLAMP**

BASIC OPERATION

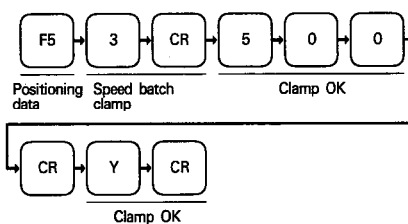


OPERATION PROCEDURE

*** POSITIONING DATA ***
(BATCH CLAMP OF POSITIONING)

AXIS	SETTING DATA	SETTING RANGE
X	500	10 ~ 120000 (mm./min)
Y	▶	1 ~ 12000 (inch./min)

* SETTING OK PRESS [Y] [CR]
NO SET AGAIN



Example: X axis speed 500mm/min.

EXPLANATION

- (1) Specifying a clamp value changes all speed settings above that value to the clamp value.
Values lower than the clamp value and the speed limit in the parameters remain unchanged.
- (2) Speed clamping is valid after the [Y] and [CR] keys have been pressed.

IMPORTANT

This operation rewrites the data in the A6GPP internal memory. For data write to the AD71 buffer memory, refer to Section 7.2 on page 7-2.

9. ON-LINE AND OFF-LINE HANDLING OF POSITIONING DATA

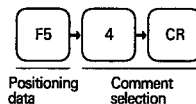
MELSEC-A

9.6 Read of M Code Comments

Reads M code comments from the A6GPP internal memory.

**M CODE
COMMENT
READ**

BASIC OPERATION



OPERATION PROCEDURE

```

*** POSITIONING DATA ***
< M CODE COMMENT LIST & WRITE >
** X-AXIS **

```

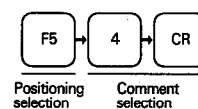
M CODE	COMMENT
1	■
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	

```

** Y-AXIS **

```

M CODE	COMMENT
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	



EXPLANATION

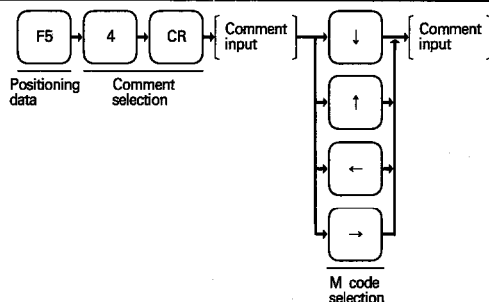
- (1) 19 comments (1 to 19) are displayed on one screen for both the X and Y axes.

9.7 Write and Correction of M Code Comments

Writes or corrects the M code comments in the A6GPP internal memory.

**M CODE
COMMENT
WRITE,
CORRECT**

BASIC OPERATION



OPERATION PROCEDURE

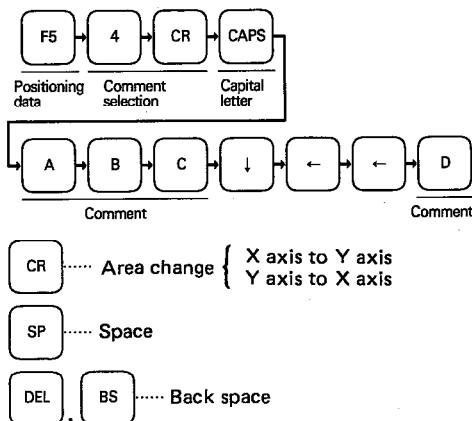
*** POSITIONING DATA ***
(M CODE COMMENT LIST & WRITE)

** X-AXIS **

M CODE	COMMENT
1	
2	ABC
3	D
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	

** Y-AXIS **

M CODE	COMMENT
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	



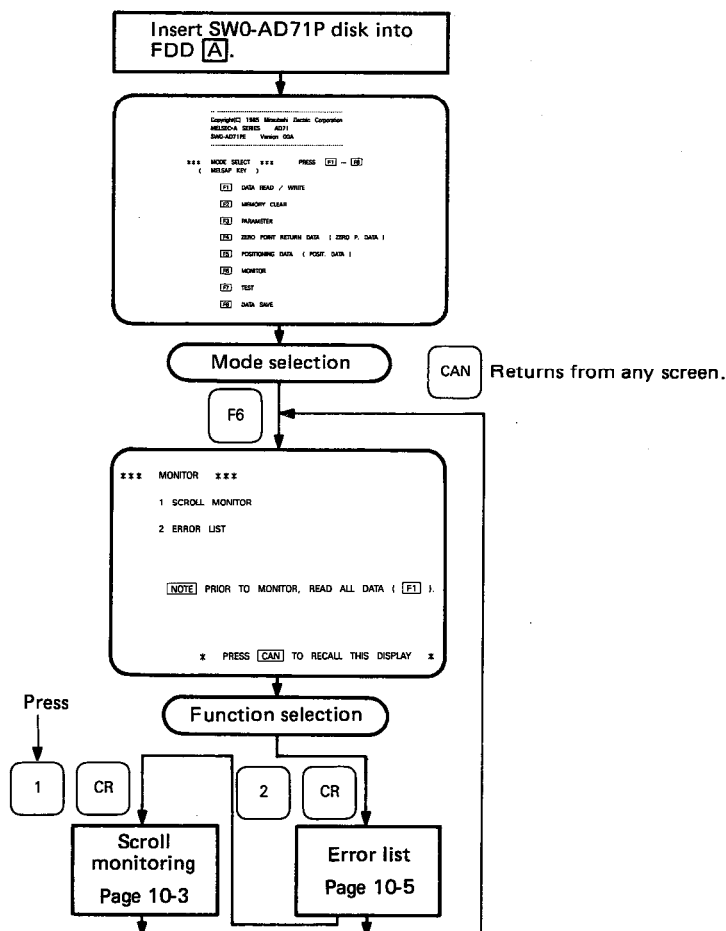
EXPLANATION

- (1) 19 M code comments (1 to 19) are displayed on one screen for both the X and Y axes.
- (2) A maximum of 16 characters may be used per comment.
- (3) The following keys are valid:
 - Numerals
 - Alphabets (Upper and lower case)
 - Standard symbols (on the MELSAP keys)
- (4) To correct a comment simply move the cursor to the relevant position and overwrite with the corrected value.
- (5) To write M code comments to the AD71 memory, refer to Section 7.2 on page 7-2.

10. MONITOR

During monitoring, the AD71's current status is displayed on the A6GPP screen.

10.1 Monitor Functions



The monitoring function has two modes, scroll monitoring and an error list. During scroll monitoring the screen is divided into two. The top part is a current value monitoring area indicating the current address, speed and data number as processed by the AD71. There is also an error indication for each axis showing the most recently occurred error and any M code and comment used at the current position. The states of the various operation signals to and from the AD71 are monitored in the "STATUS" column. These include: Drive unit ready signal, Battery error, manual pulser enable, etc. and an "ON" state for a signal is indicated when the appropriate abbreviated code is highlighted.

The lower part of the screen scrolls round the destination address as they are reached together with any relevant error messages. The error list monitor function allows the 18 most recent error codes to be recalled in a table together with relevant operating information such as: Axis data number, address, speed, etc.

10. MONITOR

MELSEC-A

10.2 Monitor Menu Screen

The initial menu screen displayed when **[F6]** is pressed.

**MONITORING
MENU
SCREEN**

BASIC OPERATION

A6GPP data must be the same as AD71 data.

- To match with AD71

[F1] → **1** → **CR** AD71 data written to A6GPP

- To match with A6GPP
"Key switch PERMIT"

[F1] → **5** → **CR** → **Y** → **CR** A6GPP data written to AD71



[F6]
Monitor

OPERATION PROCEDURE

*** MONITOR ***

1 SCROLL MONITOR

2 ERROR LIST

No.? ■

[NOTE] PRIOR TO MONITOR, READ ALL DATA (**[F1]**).

* PRESS **[CAN]** TO RECALL THIS DISPLAY *

[F6]
Monitor

Pressing **[CAN]** at any time during this mode returns this screen.

EXPLANATION

- (1) Before monitoring, write the contents of the A6GPP to the AD71 or vice versa to ensure that the two sets of data are the same.

10. MONITOR

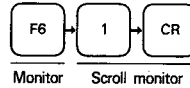
MELSEC-A

10.3 Scroll Monitoring

The screen is divided into two areas, the top half shows the present position and data number, the lower half indicates the set position currently being approached.

**SCROLL
MONITORING**

BASIC OPERATION



For menu screen, refer to page 10-2.

OPERATION PROCEDURE

*** MONITOR ***
(X/Y=INTERPOLATION X/Y/Z AXIS SIMULTANEITY)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X		inch		STOP READY DOG OP. BUSY DWE	
Y		PULSE		ZERO BAT MAN-PULSE COMP RET	
		inch/min		STOP READY DOG PGD BUSY DWE	
		PULSE/sec		ZERO BAT MAN-PULSE COMP RET	

X-AXIS			Y-AXIS		
DATA No.	SETTING ADDRESS	M CODE & COMMENT	DATA No.	SETTING ADDRESS	M CODE & COMMENT
X/Y 100	(ERR. 000)		101	(ERR. 000)	
			102	(ERR. 000)	
X/Y 103	(ERR. 000)		103	(ERR. 000)	
X/Y 200	(ERR. 000)		104	(ERR. 000)	
			300	(ERR. 000)	
			301	(ERR. 000)	

F6 → 1 → CR
Monitor Scroll monitor

ESC To change between monitoring stop and resumption or to resume monitoring after communication error.

EXPLANATION

Labels and their corresponding fields:

- Current data number:** Points to the 'DATA No.' field in the top table.
- Current address:** Points to the 'ADDRESS' field in the top table.
- Current speed:** Points to the 'SPEED' field in the top table.
- AD71 signal status:** Points to the 'STATUS' field in the top table.
- Most recent error code:** Points to the 'ERR' field in the top table.
- Current value monitoring area:** Points to the entire top table.
- Target data number:** Points to the 'DATA No.' field in the bottom table.
- Target address:** Points to the 'SETTING ADDRESS' field in the bottom table.
- Error code for last completed address:** Points to the 'ERR' field in the bottom table.

- (1) Current data number: During normal positioning the present data number is indicated. In other modes indication is as follows:
 "000" During zeroing
 "JOG" During jog operation
 "MAN" During manual pulser inching
- (2) The error display at top right is entered on completion of the relevant data number, and only the most recent error is entered.
- (3) Error codes in the lower (scroll monitoring area) are displayed immediately they occur together with the current target position.
- (4) The M code and comment are displayed in the above table during monitor only. When the M code on signal is given, the M code indication is highlighted.
- (5) Only the first "target address" is displayed for a sequence of "pattern 2" positions.
- (6) Monitoring is not in "Real time" and if eight or more consecutive starts occur in a short period, some of these may not be monitored.

- (7) Speeds below 1 are indicated by “*”.
- (8) The message “AD71 BUS ERROR. . . .PLEASE RESET PC”, indicates an accessing error from the AD71.
- (9) To resume monitoring after a “RECEIVE ERROR” press **CAN** and return to the monitor screen.
- (10) The AD71 signal status display indicates the states of the following hand-shake signals:
 - STOP : Stop signal from drive unit
 - READY : Drive unit ready signal
 - DOG : Zeroing dog
 - Z. C : Zeroing complete signal
 - BUSY : Positioning
 - DWE : Positioning dwell
 - ZERO : Zeroing request
 - BAT : Battery error
 - MAN-PULSE: Manual pulser enable
 - COMP : Positioning complete signal
 - RET : Executing zeroing return

REMARKS

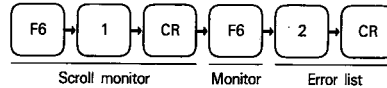
STATUS : When any of the above signals is switched on, its display is highlighted.

10.4 Error List

Lists the errors that have occurred during scroll monitoring.
Up to 18 error codes are displayed on a "first in, first out" basis.

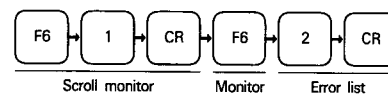
ERROR
LIST

BASIC OPERATION



OPERATION PROCEDURE

*** MONITOR *** (ERROR LIST)					
No	DATA No	ERROR CODE & MESSAGE	POSIT ADDRESS X: inch Y: PULSE	POSIT SPEED X: inch/min Y: PULSE/sec	M CODE & COMMENT
1	X 2	M CODE CN	1000.00000	100	1001
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					



EXPLANATION

- (1) Displays up to 18 error codes and messages generated during monitoring in their order of occurrence on a first in, first out basis. The error list contains the following information:
 - Axis, data number
 - Error code and message (For details, refer to Section 14.1 on page 14-2.)
 - Positioning address
 - Positioning speed
 - M code and comment
- (2) The most recent error is also indicated on the scroll monitoring screen.
- (3) When appropriate "NO ERROR" is displayed in the message area.
- (4) Speeds below 1 are indicated by "**".
- (5) Error data may be cleared by pressing:

F6 **1** **CR**; or

CAN **1** **CR**

(6) The screen display sequence is as shown below.

*** MONITOR ***

1 SCROLL MONITOR

2 ERROR LIST

NOTE PRIOR TO MONITOR, READ ALL DATA (**F1**).

* PRESS **CAN** TO RECALL THIS DISPLAY *

F6

*** MONITOR ***

DX/Y=INTERPOLATION X/Y,Z AXIS SIMULTANEITY

MONITOR STOP PRESS **ESC**
MONITOR RESUME PRESS **ESC**

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X	inch	inch/min		STOP READY DOG OP. BUSY DWE	
Y	PULSE	PULSE/sec		ZERO BAT MAIN-PULSE COMP RET	

DATA No.	SETTING ADDRESS	X-AXIS M CODE & COMMENT	DATA No.	SETTING ADDRESS	Y-AXIS M CODE & COMMENT
X/Y 100	(ERR. 000)		101	(ERR. 000)	
			102	(ERR. 000)	
X/Y 103	(ERR. 000)		103	(ERR. 000)	
X/Y 200	(ERR. 000)		104	(ERR. 000)	
			300	(ERR. 000)	
			301	(ERR. 000)	

1 → CR

Scroll monitor

*** MONITOR ***

1 SCROLL MONITOR

2 ERROR LIST

NOTE PRIOR TO MONITOR, READ ALL DATA (**F1**).

* PRESS **CAN** TO RECALL THIS DISPLAY *

F6

*** MONITOR ***

(ERROR LIST)

No.	DATA No.	ERROR CODE & MESSAGE	POST ADDRESS X:inch Y:PULSE	POST SPEED X:inch/min Y:PULSE/sec	M CODE & COMMENT
1	X 2	M CODE ON	1000.00000	100	0001
2	Y				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

2 → CR

Error list

11. TEST

11.1 Test Functions

"Test mode" allows the various functions of the AD71 to be tested manually from the A6GPP. There are seven test functions as follows:

- (1) Zeroing. This allows the zeroing operation to be started from the A6GPP keyboard for each axis individually.
- (2) Positioning. This can be started by specifying start data numbers. All positioning modes can be selected (independent X, Y, interpolation, simultaneous) and up to 20 start points can be specified for continued positioning.
- (3) Jog operation. Allows the machine to be driven manually from the keyboard. During the jog operation, a drive output is provided by the AD71 for as long as the relevant jog button is pressed. Axes can be moved independently or simultaneously (with no interpolation).
- (4) Manual pulser enable. Allows the manual pulser to be enabled from the A6GPP. During manual pulser operation, a set number of pulses (defined in the parameters) is output every time one manual pulse is received. The manual pulser can be enabled for single axis control or simultaneous control.
- (5) Move to position and teach. The machine is moved manually to the required position and the resultant address written into the AD71 and A6GPP memories. Manual movement may be either jog operation or manual pulser operation.
- (6) Present value change. This feature is useful during program development. After positioning has stopped the AD71 present value can be changed.
- (7) Error reset. This clears the error codes stored in the AD71 for both axes, it does not remove the source of the error.

During all the above testing functions (except number 7) the current value monitoring area is provided at the top of the screen. The data included in this area is the same as that described for the current value monitoring area in Section 10.3 with the exception of the "M code and comment" column which is unused in test mode.

The use of the test function is independent of the PC CPU so that no sequence program need be written to test the positioning sequence and data. (Test mode is independent of the PC ready signal Y1D and the AD71 ready signal.)

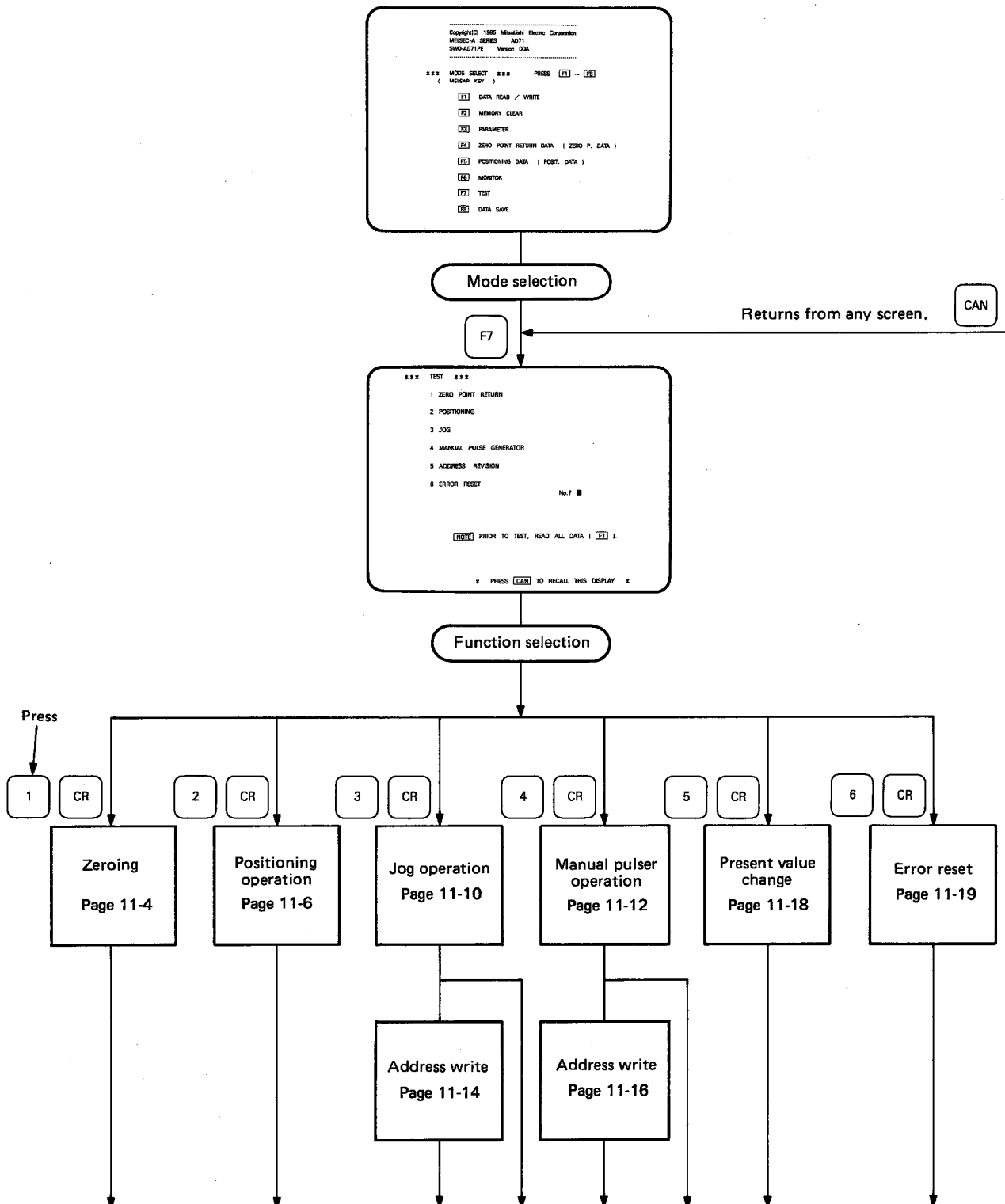
During operation the M code ON/OFF state is ignored and the M code in the buffer memory cleared.

Up loading and down loading between AD71 and A6GPP is not allowed during test mode.

The ranges of parameter and zeroing data are checked before any machine movement is made and, where appropriate, error codes displayed.

11. TEST

General Test Operation Flow Chart



POINT

Press **[F1]** to **[F8]** to change mode at any time except during data transfer between A6GPP and AD71.

11. TEST

11.2 Test Menu Screen

The initial menu screen displayed when **[F7]** is pressed.

TEST
MENU
SCREEN

BASIC OPERATION

A6GPP data must be the same as AD71 data.

○ To match with AD71

[F1] → **1** → **CR** AD71 data written to A6GPP

○ To match with A6GPP "Key switch PERMIT"

[F1] → **5** → **CR** → **Y** → **CR** A6GPP data written to AD71



[F7]

Test

OPERATION PROCEDURE

*** TEST ***

1 ZERO POINT RETURN

2 POSITIONING

3 JOG

4 MANUAL PULSE GENERATOR

5 ADDRESS REVISION

6 ERROR RESET

No.7 ■

[NOTE] PRIOR TO TEST, READ ALL DATA (**[F1]**).

* PRESS **[CAN]** TO RECALL THIS DISPLAY *

[F7]

Test

Pressing **[CAN]** at any time during this mode returns this screen.

EXPLANATION

- (1) The current value monitoring facility described in the previous section is provided during this operation. (There is no error code indication.)
- (2) Before using the test procedures write the contents of the A6GPP to the AD71 or vice versa to ensure that the two sets of data are the same.

11. TEST

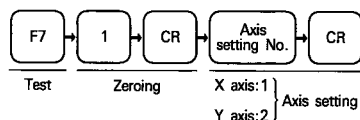
MELSEC-A

11.3 Zeroing

The zeroing procedure is started from the A6GPP.

ZEROING

BASIC OPERATION



OPERATION PROCEDURE

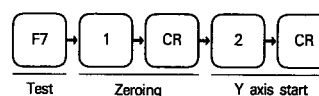
*** TEST ***				MONITOR STOP		PRESS [ESC]	
(ZERO POINT RETURN)				MONITOR RESUME		PRESS [ESC]	
DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS			ERR
X		inch		STOP	READY	DOG OP	BUSY DWE
Y		inch/min		ZERO	BAT	MAN-PULSE	COMP RET
	PULSE	PULSE sec		STOP	READY	DOG PGD	BUSY DWE
				ZERO	BAT	MAN-PULSE	COMP RET

SELECT AXIS

1 X-AXIS

2 Y-AXIS

No. 7 2



Example: Y axis zeroing

[ESC] Switches between "monitor" and "monitor stop."

EXPLANATION

- (1) Parameter and zeroing data must be written before the zeroing procedure is carried out.
- (2) Zeroing is started by pressing [CR] after specifying the axis.
- (3) "000" in the data number column indicates zeroing.
- (4) After zeroing the present address changes to the specified zeroing address.
- (5) The following conditions must be met before zeroing will be started.

Item	Condition
Drive unit ready signal (READY)	ON
Stop signal (STOP)	OFF
Relevant axis BUSY signal (X4, X5)	OFF
Relevant axis positioning started signal (X8, X9)	OFF
Relevant axis stop signal (Y15, Y16)	OFF
Relevant axis zeroing complete signal (XC, XD)	OFF

Table 11.1 Pre-Zeroing Checks

- (6) Speeds below 1 are indicated by "X".
- (7) Press [ESC] to temporarily stop monitoring and again to resume.
- (8) To stop the zeroing drive, press the [BREAK] key.

POINT

- (1) Zeroing cannot be repeated unless a different function is used first (i.e. jog, manual pulser, positioning).
- (2) Ensure that the "zeroing dog" signal has not been activated when the zeroing instruction is given (check this in the "status" column of the monitor display – the word "DOG" should not be highlighted.) If the present position is close to the zeroing position, move to a point preceding the "zeroing dog" actuator manually.

REMARKS

The states of handshake signals are indicated in the status column of the monitor display. Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

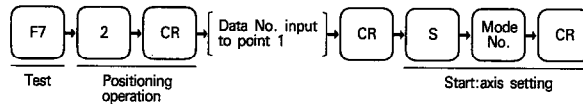
11. TEST

11.4 Positioning Operation (1 point)

Start positioning after specifying one point.

**POSITIONING
OPERATION
(1 POINT)**

BASIC OPERATION



OPERATION PROCEDURE

*** TEST ***
(POSITIONING)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X	inch	inch/min		STOP READY DOG OP. BUSY DWE	
Y	PULSE	PULSE/sec		ZERO BAT MAN-PULSE COMP RET	

POINT No.	MODE & DATA No.	POINT No.	MODE & DATA No.
	X-AXIS Y-AXIS		X-AXIS Y-AXIS
1	-	11	
2	5	12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

* POSITIONING START
PRESS [S] & [MODE No.] [CR]

MODE	No.
INTERPOLATION	0
X-AXIS ONLY	1
Y-AXIS ONLY	2
Z-AXIS SIMULTANEOUS	3

* ALL CLEAR PRESS [A] [CR]

```

graph LR
    F7[F7] --> 2[2]
    2 --> CR1[CR]
    CR1 --> CM[Cursor movement]
    CM --> 5[5]
    5 --> CR2[CR]
    CR2 --> S[S]
    S --> 1[1]
    1 --> CR3[CR]
  
```

Example: X axis operation start.

ESC Switches between "monitor" and "monitor stop."

HOME CLEAR To clear the line of data at cursor.

A CR All clear.

EXPLANATION

- (1) Parameters and positioning data must be written before the positioning procedure is carried out.
- (2) The operating procedure is as follows:
 - (a) Write the positioning start data number to Point 1. (It is not necessary to write Mode.) The data number is written to both A6GPP and AD71 memories.
 - (b) Trigger positioning start. To start positioning, specify the start axis from the mode menu and press [CR].
 - (c) After the start positioning data number has been specified, subsequent positioning depends on the pattern numbers of the data.
- (3) Previously set start points will be retained but may be overwritten.
- (4) Note the following when specifying a start point:
 - (a) The data number cannot be entered if either axis is BUSY.
 - (b) The data overwrites any previous data in both the A6GPP internal memory and AD71 memory.
 - (c) When [A] and [CR] are pressed to clear all data, both the A6GPP internal memory and AD71 memory are cleared.
 - (d) The pointer is set to "0".
 - (e) An error is indicated if positioning is started without specifying a data number at Point 1.

(5) The following conditions must be met before positioning is started:

Item	Condition
Drive unit ready signal (READY)	ON
Stop signal (STOP)	OFF
Relevant axis busy signal (X4, X5)	OFF
Relevant axis positioning started signal (X8, X9)	OFF
Relevant axis stop signal (Y15, Y16)	OFF

Table 11.2 Pre-Positioning Checks

(6) Press **HOME CLEAR** to change from "POSITIONING START" and "MODE" to "MODE & DATA NO" setting.

(7) Speeds below 1 are indicated by "X".

REMARKS

The positioning data range is checked before positioning is started from the A6GPP and any error indicated.

IMPORTANT

After the mode (0 to 3) has been specified, pressing **CR** starts positioning. Press **BREAK** to stop.

REMARKS

The states of handshake signals are indicated in the status column of the monitor display. Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

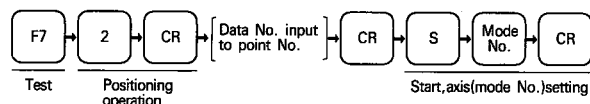
11. TEST

11.5 Positioning Operation (Several points)

Start positioning after specifying several points.

POSITIONING OPERATION (SEVERAL POINTS)

BASIC OPERATION



OPERATION PROCEDURE

*** TEST ***
(POSITIONING)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X		inch		STOP READY DOG OP. BUSY DWE	
Y		PULSE		ZERO BAT MAN-PULSE COMP RET	

POINT No.	MODE & DATA No.	POINT No.	MODE & DATA No.
	X-AXIS Y-AXIS		X-AXIS Y-AXIS
1	- 1 - 1	11	
2	0 5 0 6	12	
3	0 115 0 145	13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

POSITIONING START
PRESS [S] & [MODE No.] [CR]

MODE	No.
INTERPOLATION	
X-AXIS ONLY	1
Y-AXIS ONLY	2
2 AXIS SIMULTANGITY	3

ALL CLEAR PRESS [A] [CR]

Example: Interpolation start

ESC Switches between "monitor" and "monitor stop."

HOME CLEAR To clear the line of data at cursor.

A CR All clear

EXPLANATION

- (1) Parameters and positioning data must be written before the positioning procedure is carried out.
- (2) The operating procedure is as follows:
 - (a) Write mode numbers (i.e. start axis specification as defined in the "mode" table on the screen) and the start data number into the table at the lower left of the screen. Data is written to both the A6GPP and AD71 memories. The axis mode is not required for Point 1.
 - (b) Start positioning by pressing [S], a mode number (to define the start axis, select from the "mode" table on the screen), and finally [CR].
 - (c) Positioning is then continued as normal depending on the positioning patterns in the individual positioning data.
- (3) Note the following when specifying start points:
 - (a) Data cannot be entered if either axis is BUSY.
 - (b) The data overwrites any previous data in both the A6GPP internal memory and AD71 memory.
 - (c) When [A] and [CR] are pressed to clear all data, both the A6GPP internal memory and AD71 memory are cleared.
 - (d) The pointer is set to a value equal to the highest point number (before a blank) minus 1. After positioning is started, point numbers are checked and rewritten.
 - (e) An error is indicated if positioning is started without specifying a data number at any point.
 - (f) Ensure that the same patterns and modes are used for each axis when interpolation or simultaneous 2 axis start is specified.
- (4) The same point number must be used for an interpolation or simultaneous 2 axis start. (This is not checked by the A6GPP.)

(5) The following conditions must be met before positioning is started.

Item	Condition
Drive unit ready signal (READY)	ON
Stop signal (STOP)	OFF
Relevant axis busy signal (X4, X5)	OFF
Relevant axis positioning started signal (X8, X9)	OFF
Relevant axis stop signal (Y15, Y16)	OFF

Table 11.3 Pre-Positioning Checks

- (6) Press **HOME CLEAR** to change from "POSITIONING START" and "MODE" to "MODE & DATA NO" setting.
- (7) Speeds below 1 are indicated by X.

IMPORTANT

After the mode (0-3) has been specified, pressing **CR** starts positioning. Press **BREAK** to stop.

REMARKS

The states of handshake signals are indicated in the status column of the monitor display. Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

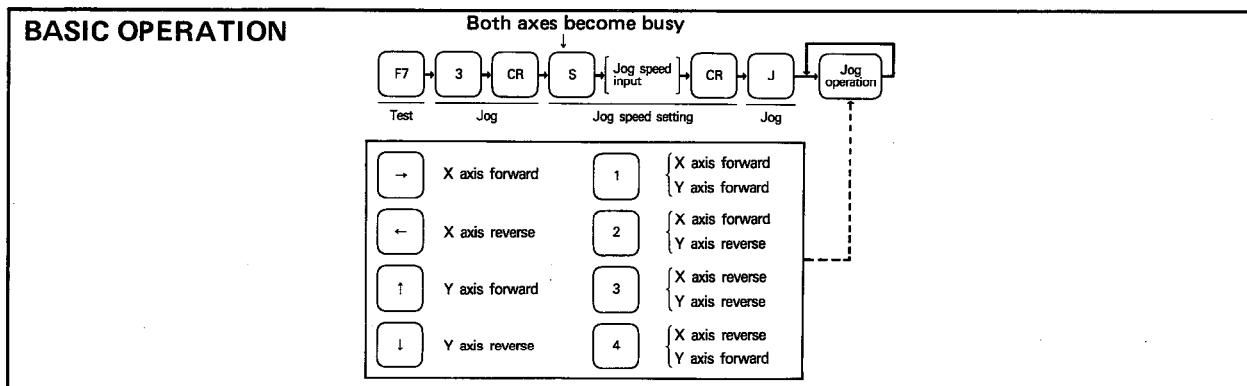
11. TEST

MELSEC-A

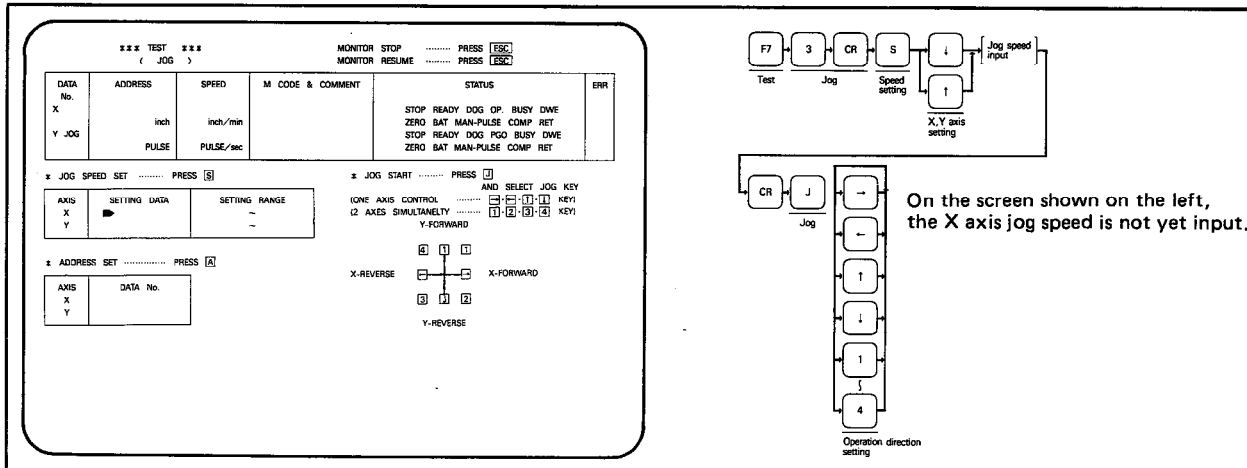
11.6 Jog Operation

Allows jog control from the A6GPP.

**JOG
OPERATION**



OPERATION PROCEDURE



EXPLANATION

- (1) Parameters must be written before jog movement.
- (2) Set the jog speed on the screen then press the required jog key (cursor or [1] to [4]). The cursor keys provide jog control for one axis only and keys [1] to [4] provide control (not interpolated) for two axes.
- (3) Jog speed is written to both the A6GPP and AD71 memories.
- (4) Jog speed is checked against the jog speed limit value and starting bias speed in the parameters. The acceleration/deceleration time is valid.
- (5) "JOG" is displayed in the DATA NO. column during this operation.
- (6) Jog speed can be changed or re-set while the AD71 is BUSY.
- (7) Speeds below 1 are indicated by "※".

POINT

- (1) Jog operation is independent of the stroke limit.
- (2) The distance moved by the jog operation should always be greater than any backlash compensation. Values displayed in the ADDRESS column on the CRT screen are true values of feed pulses after backlash compensation.

REMARKS

The states of handshake signals are indicated in the status column of the monitor display.
Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

11. TEST

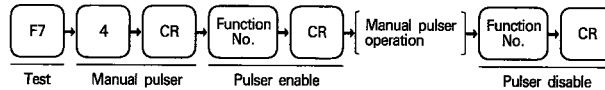
MELSEC-A

11.7 Manual Pulser Operation

Enables the manual pulser operation.

**MANUAL
PULSER
OPERATION**

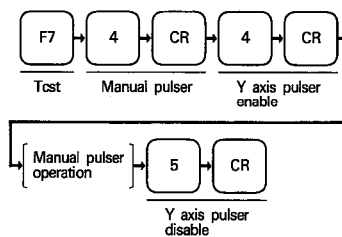
BASIC OPERATION



OPERATION PROCEDURE

*** TEST ***				MONITOR STOP		 PRESS [ESC]		
(MANUAL PULSE GENERATOR)				MONITOR RESUME		 PRESS [ESC]		
DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS				ERR
X		inch	inch./min	STOP READY DOG OP. BUSY DWE				
				ZERO BAT MAN-PULSE COMP RET				
Y MAN		PULSE	PULSE/sec	STOP READY DOG PGO BUSY DWE				
				ZERO BAT MAN-PULSE COMP RET				

	X-AXIS	Y-AXIS	X&Y-AXES
ENABLE	1	4	7
DISABLE	2	5	8
PRESERVE VALUE WRITE (DATA No.)	()	()	()



Example: Y axis pulser operation

[ESC] Switches between "monitor" and "monitor stop."

EXPLANATION

- (1) Parameters must be written before the manual pulser can be used.
- (2) "MAN" is displayed in the DATA NO. column during this operation.
- (3) Positioning speed is fixed at 20kpps (in the appropriate units).
Speeds below 1 are indicated by "X".

POINT

Always disable the manual pulser function after use to prevent accidental operation.

REMARKS

The states of handshake signals are indicated in the status column of the monitor display.
Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

11.8 Positioning Address Teaching

For some applications it may be more convenient to move the machine manually to the required position and input the resultant address to the position memory. When this teaching method is used, associated positioning data such as pattern, speed etc must be written into the positioning memory separately.

The machine may be manually moved by either the jog operation or the manual pulser operation, in both cases the resultant address is written into the AD71 buffer memory at the address defined by its data number.

The remaining positioning data is most conveniently input using the batch write facility (Section 9.4, page 9-9).

11. TEST

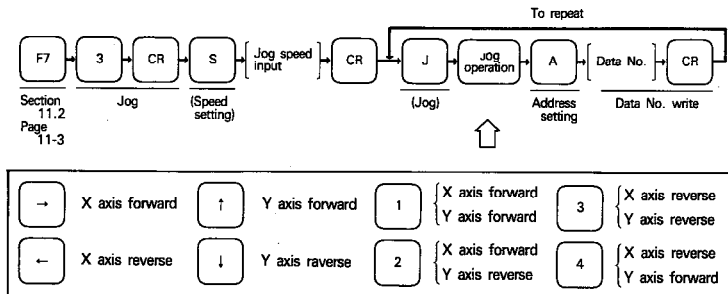
MELSEC-A

11.8.1 Jog to position and teach

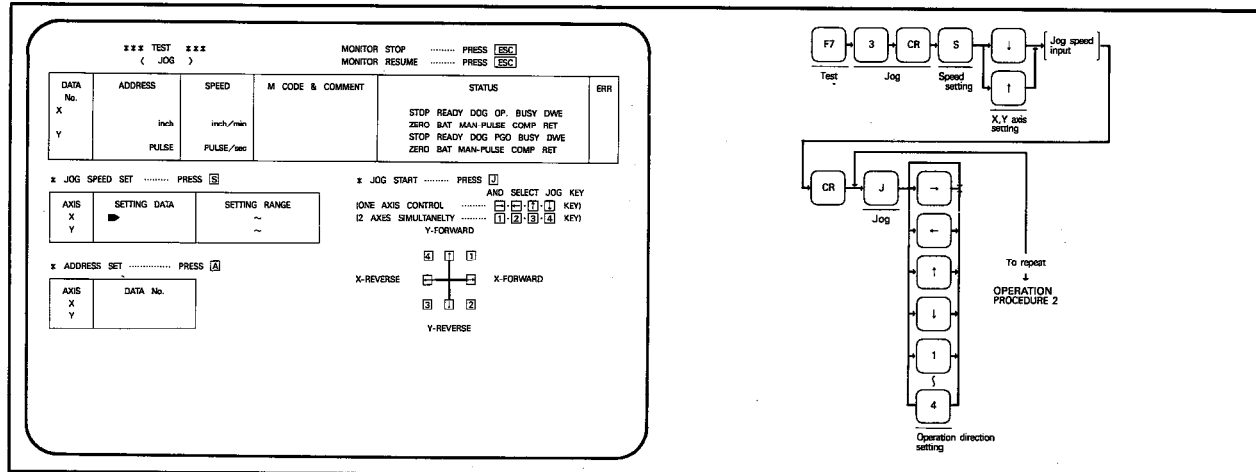
After arriving at the required position under A6GPP jog control, the address is written to the AD71 memory.

**JOG
OPERATION**
↓
**ADDRESS
WRITE**

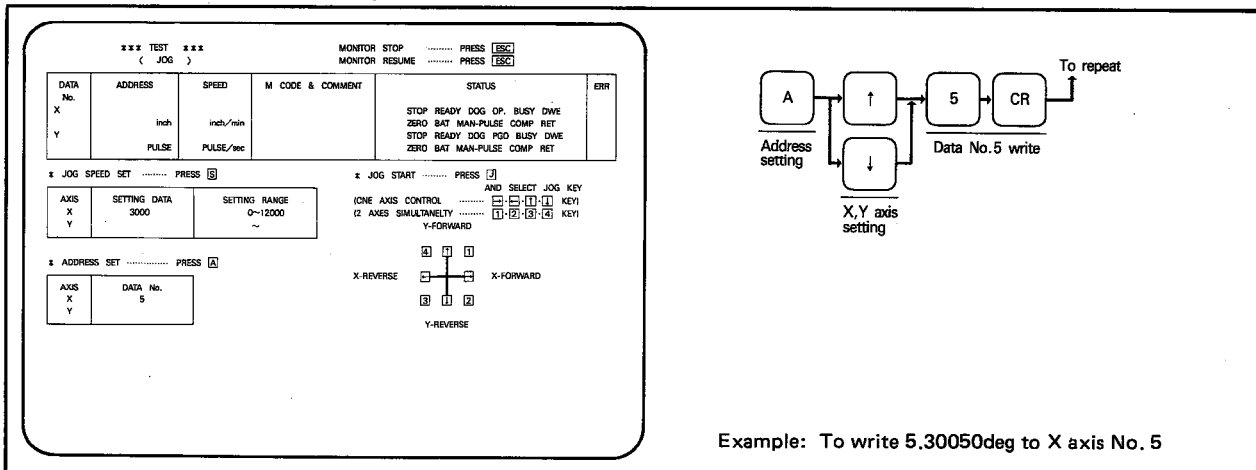
BASIC OPERATION



OPERATION PROCEDURE 1



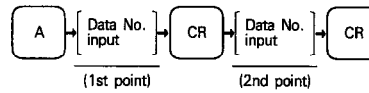
OPERATION PROCEDURE 2



EXPLANATION

- (1) Parameters must be written before jog movement.
- (2) Set the jog speed on the screen then press the required jog key (cursor or **1** to **4**). The cursor keys provide jog control for one axis only and keys **1** to **4** provide control (not interpolated) for two axes.
- (3) Jog speed is written to both the A6GPP and AD71 memories.
- (4) Jog speed is checked against the jog speed limit value and starting bias speed in the parameters.

- (5) The address is written to both the A6GPP and AD71 memories.
Only the specified data number and the current address are written during this operation. All other positioning data must be entered separately (e.g. batch write).
- (6) A repeated address can be loaded to two or more data number as follows:
See OPERATION PROCEDURE 2



- (7) Speeds less than 1 are indicated by "※".

REMARKS

The states of handshake signals are indicated in the status column of the monitor display.
Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

11. TEST

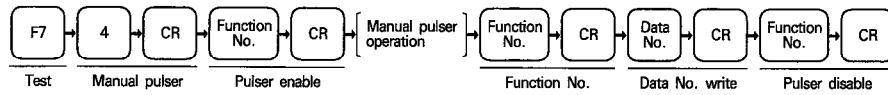
MELSEC-A

11.8.2 Move to position using manual pulser and teach

Provide the enabling signal so that the machine can be driven to position using the manual pulser and the resultant address loaded into the AD71 memory.

**MANUAL PULSER
OPERATION**
↓
**ADDRESS
WRITE**

BASIC OPERATION

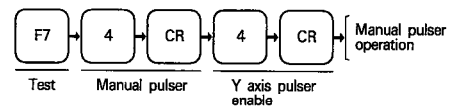


OPERATION PROCEDURE 1

*** TEST ***
(MANUAL PULSE GENERATOR)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X	inch	inch/min		STOP READY DOG OP. BUSY DWE ZERO BAT MAN-PULSE COMP RET	
Y MAN	PULSE	PULSE/sec		STOP READY DOG PGO BUSY DWE ZERO BAT MAN-PULSE COMP RET	

	X-AXIS	Y-AXIS	X&Y-AXES
ENABLE	1	4	7
DISABLE	2	5	8
PRESENT VALUE WRITE (DATA No.)	3	6	



ESC To switch between "monitor" and "monitor stop."

OPERATION PROCEDURE 2

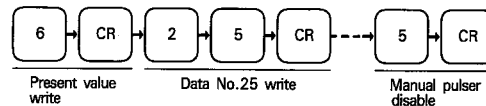
*** TEST ***
(MANUAL PULSE GENERATOR)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X	inch	inch/min		STOP READY DOG OP. BUSY DWE ZERO BAT MAN-PULSE COMP RET	
Y MAN	PULSE	PULSE/sec		STOP READY DOG PGO BUSY DWE ZERO BAT MAN-PULSE COMP RET	

	X-AXIS	Y-AXIS	X&Y-AXES
ENABLE	1	4	7
DISABLE	2	5	8
PRESENT VALUE WRITE (DATA No.)	3	6	

No. 7 6

* PRESENT VALUE WRITE PRESS DATA No. 25 *



Example: Write to Y axis data No. 25

EXPLANATION

- Parameters must be written before manual pulser operation.
- The operating procedure is as follows:
 - Enable the pulser for the relevant axis.
 - Move to the required position.
 - Select "present value write."
 - Write the data number.
 - Disable the manual pulser.
- "MAN" is displayed in the DATA NO. column during this operation.
- Positioning speed is fixed at 20kpps (in the appropriate units). Speeds less than 1 are indicated by "X".
- The address is written to both the A6GPP and AD71 memories. Only the specified data number and the current address are written during this operation. All other positioning data must be entered separately (e.g. batch write).

REMARKS

The states of handshake signals are indicated in the status column of the monitor display.
Highlighted indicates "on".

STOP	: Stop signal from drive unit
READY	: Drive unit ready signal
DOG	: Zeroing dog
Z. C	: Zeroing complete signal
BUSY	: Positioning
DWE	: Positioning dwell
ZERO	: Zeroing request
BAT	: Battery error
MAN-PULSE	: Manual pulser enable
COMP	: Positioning complete signal
RET	: Executing zeroing return

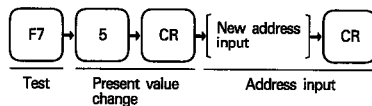
11. TEST

11.9 Present Value Write

When positioning movement has stopped, the current value is written to the AD71 as a positioning address.

**PRESENT
VALUE
WRITE**

BASIC OPERATION



For menu screen, refer to page 11-3.

OPERATION PROCEDURE

*** TEST ***
(ADDRESS REVISION)

DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS	ERR
X	inch	inch/min		STOP READY DOG OP. BUSY DWI ZERO BAT MAIN-PULSE COMP RET	
Y	PULSE	PULSE/sec		STOP READY DOG PGD BUSY DWI ZERO BAT MAIN-PULSE COMP RET	

AXIS	SETTING DATA	SETTING RANGE
X	▶	0 ~ 16200.00000
Y		0 ~ 16252928

```

graph LR
    F7[F7] --> 5[5]
    5 --> CR1[CR]
    CR1 --> XY[↑ X,Y axis setting]
    XY --> 0[0]
    0 --> CR2[CR]
    
```

Test Present value change X,Y axis setting Address write

EXPLANATION

- (1) Parameters must be written before the present value is changed.
- (2) The following condition must be met before the present value can be changed.

Item	Condition
Relevant axis busy signal (X4, X5)	OFF

Table 11.4 Present Value Change Condition

- (3) "SETTING DATA" ranges are as follows:

Unit	Setting Range
mm	0 to 162000000.0
inch	0 to 16200.00000
degree	0 to 16200.00000
PULSE	0 to 16252928

Table 11.5 Setting Data Ranges

11. TEST

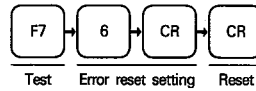
MELSEC-A

11.10 Error Reset

Clears AD71 error codes.

**PRESENT
VALUE
CHANGE
ERROR
RESET**

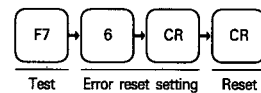
BASIC OPERATION



OPERATION PROCEDURE

```
*** TEST ***  
< ERROR RESET >
```

RESET X-AXIS ERROR & Y-AXIS ERROR PRESS **CR**



EXPLANATION

- (1) Clears X and Y axis errors independently of the error detection signal (XB) and error reset (Y1D off).
- (2) This function can be executed at any time.
This function will only clear the error code, not the source of the error.

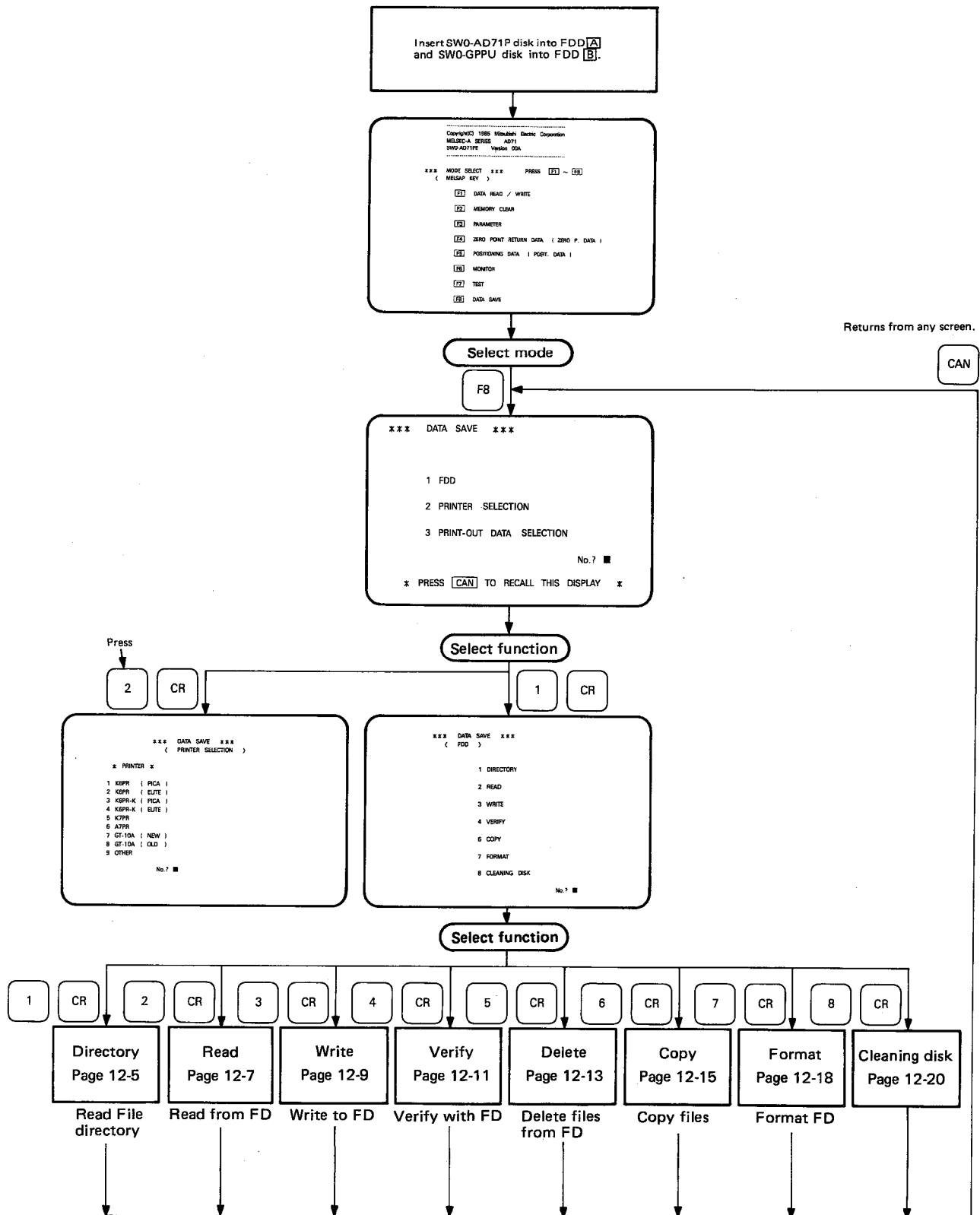
12. FLOPPY DISK

12. FLOPPY DISK

All AD71 data can be stored onto floppy disk for reference and back-up.

12.1 Functions and File Name

12.1.1 Functions



POINT**(1) A6GPP power-off or reset**

The A6GPP memory is not battery backed and data is cleared from its internal memory when it is switched off or reset. It is therefore advisable to write all data to FD every time it is changed or edited.

(2) Stored data

When the FD write function is selected, all data (parameters, zeroing data, and positioning data (including comment data)) is written to the FD, the data cannot be selected.

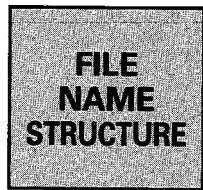
(3) FD storage capacity

5120 sectors are available on each FD.
One set of AD71 data requires 70 sectors.

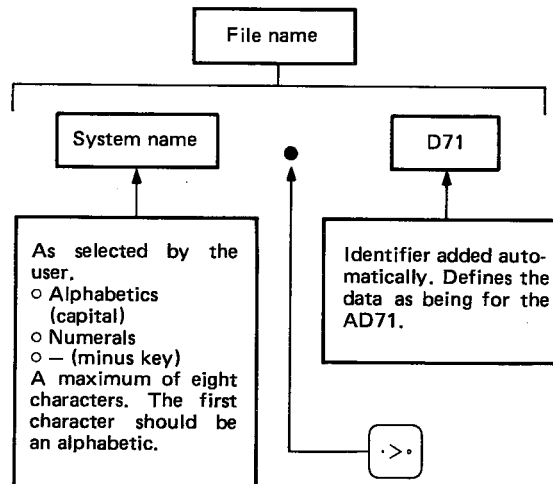
POINT

Keys **F1** to **F8** may be pressed at any time to switch modes except during data transfer between the AD71 and A6GPP.

12.1.2 File name structure



- (1) A file name is necessary to write data to the FD.
- (2) The structure of a file name is as follows:



REMARKS

Do not use the sequence of letters "ALL" in the system name. (ALL is used for batch copying.)

(3) Comment

The file name can be annotated with a comment.

A maximum of 20 characters can be used for a comment which will appear alongside its file name in the directory listing. The following characters may be used for comments:

- o Alphabetics (Upper and lower case)
- o Numerals
- o Standard symbols (on the MELSAP keyboard)

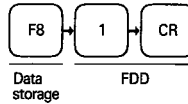
12. FLOPPY DISK

MELSEC-A

12.1.3 FDD menu screen

**F D
MENU
SCREEN**

BASIC OPERATION



OPERATION PROCEDURE 1

*** DATA SAVE ***

- 1 FDD
- 2 PRINTER SELECTION
- 3 PRINT-OUT DATA SELECTION

No.? ■

* PRESS **CAN** TO RECALL THIS DISPLAY *



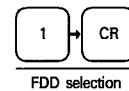
Pressing the **CAN** key at any time in this mode returns this screen.

OPERATION PROCEDURE 2

*** DATA SAVE ***
< FDD >

- 1 DIRECTORY
- 2 READ
- 3 WRITE
- 4 VERIFY
- 6 COPY
- 7 FORMAT
- 8 CLEANING DISK

No.? ■



EXPLANATION

- (1) The operating system disk, SW0-AD71P will normally be in drive **A** and the user disk in drive **B**.
- (2) The SW0-GPPU floppy disk is a standard 3-1/2" disk which has already been formatted.
Where required positioning data and sequence programs may be stored on the same disk.
- (3) The system disk can be removed from the drive for all functions except formatting.

12. FLOPPY DISK

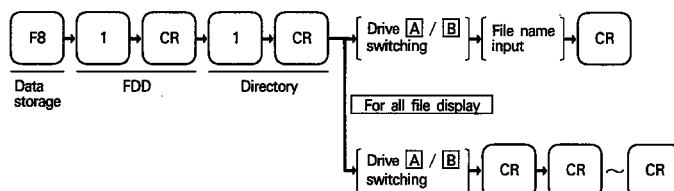
MELSEC-A

12.2 Directory

Lists all the files on the disk and the number of sectors used.

**F D
DIRECTORY**

BASIC OPERATION



OPERATION PROCEDURE

```

*** DATA SAVE ***
( FDD )

** FILE DIRECTORY **      DRIVE A:ABC.*

No.  FILE NAME      SECTOR      COMMENT
1     ABC           .D71
2     ABC           .PAR
3
4
5
6
7
8
9
10
11
12
13
14
15

USED SECTOR 1234 / 4800
          
```

Example: All file list

→

←

To move the cursor.

HOME
CLEAR

To clear file name.

DEL

BS

To delete one character
at cursor position.

Valid for all
FDD mode
operations.

EXPLANATION

- (1) The directory is normally read for drive **[B]**, to change to **[A]** move the cursor over the **[B]** and type "A".
- (2) Where required it is only necessary to specify the system name. (The identifier D71 is added automatically.)
- (3) To display all files, press the **[CR]** key without specifying a file name.
- (4) A maximum of 15 file names are displayed on one screen. By pressing **[CR]**, the next 15 are displayed.
After all file names are displayed, "USED SECTOR" / 5120 (number of used sectors/total available sectors) is displayed and the cursor moves to the "DRIVE" position and waits for data entry.
- (5) The **[X]** key may be used as a global character.

[Example 1]

To display system names with first two characters "YZ" and identifier D71:

[Y][Z][SHIFT][X][SHIFT][.][D][7][1] In this case, **[.]** → **[.]**

[Example 2]

To display all system names "ABCD":

[A][B][C][D][.][SHIFT][X][SHIFT]

(6) Display screen sequence
Example: List of all files

*** DATA SAVE ***

1 FDD

2 PRINTER SELECTION

3 PRINT-OUT DATA SELECTION

No.7 ■

* PRESS **CAN** TO RECALL THIS DISPLAY *

F8

Data
storage



*** DATA SAVE ***
(FDD)

1 DIRECTORY

2 READ

3 WRITE

4 VERIFY

6 COPY

7 FORMAT

8 CLEANING DISK

No.7 ■

1 → CR

FDD selection



*** DATA SAVE ***
(FDD)

** FILE DIRECTORY ** DRIVE A:ABC.1

No.	FILE NAME	SECTOR	COMMENT
1	ABC	.D71	
2	ABC	.PAR	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

USED SECTOR 1234 / 4800

1 → CR → CR

Directory

12. FLOPPY DISK

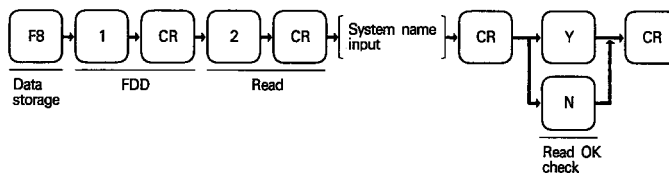
MELSEC-A

12.3 Read from FD

Reads the data from the specified system name to the A6GPP internal memory.

**F D
READ**

BASIC OPERATION



OPERATION PROCEDURE

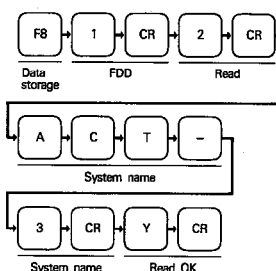
*** DATA SAVE ***
(FDD)

** READ **

DRIVE B

SYSTEM NAME	ACT-3
-------------	-------

READ
OK → PRESS
NO → PRESS

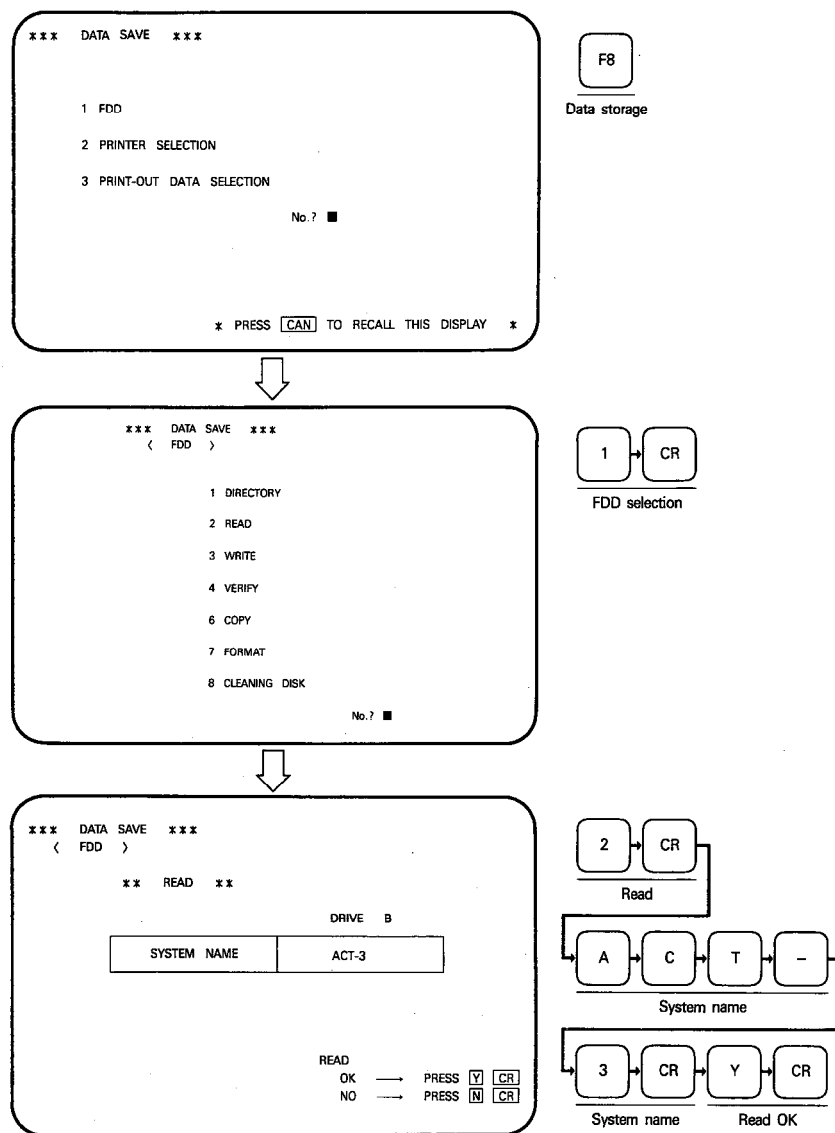


Example: Reads system name ACT-3

EXPLANATION

- (1) The screen defaults to drive **B**, to change to **A** move the cursor over the **B** and type "A".
 - (2) To execute the operation press **Y** and **CR**. By pressing **N** and **CR**, the keyed-in data is cleared and the CRT returns to the first screen and awaits data entry.
 - (3) Messages are displayed as follows:
 - During execution : "EXECUTING"
 - Upon completion : "COMPLETED"
- Any errors will be displayed as error codes. See Section 14.1.1 (page 14-2).

(4) Screen display sequence. Example: Read of system name "ACT-3"



12. FLOPPY DISK

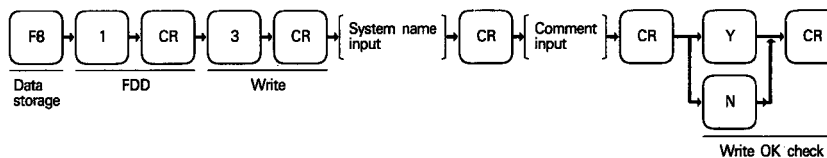
MELSEC-A

12.4 Write to FD

Writes data from the A6GPP internal memory to the FD using the specified system name for future reference.

**FD
WRITE**

BASIC OPERATION



For menu screen, refer to page 12-4.

OPERATION PROCEDURE

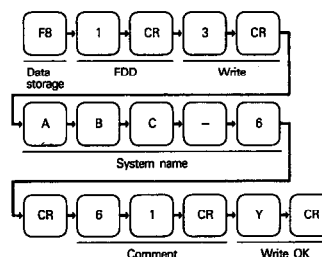
*** DATA SAVE ***
(FDD)

** WRITE **

DRIVE B

SYSTEM NAME	ABC-6
COMMENT	61 ■

WRITE
OK → PRESS **Y** **CR**
NO → PRESS **N** **CR**

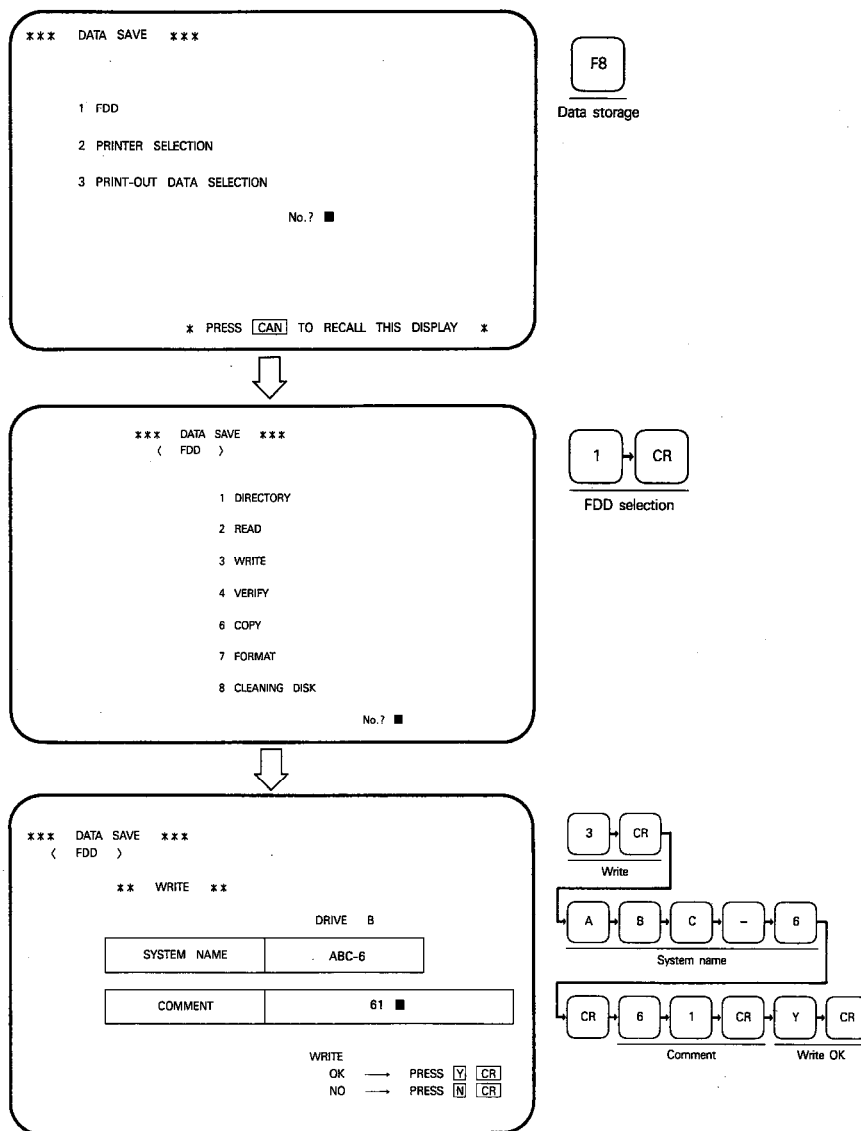


Example: Writing system name ABC-6 and comment 61

EXPLANATION

- (1) It is necessary to format a new disk. The SW0-GPPU has already been formatted.
- (2) The screen defaults to drive **B**, to change to **A** move the cursor over the **B** and type "A".
- (3) The system name can be annotated with a comment (page 12-3). After the system name has been entered, the cursor moves to the COMMENT box and a comment can be written or the **CR** key pressed to ignore.
- (4) To execute the operation press **Y** and **CR**. By pressing **N** and **CR**, the keyed-in data is cleared and the CRT returns to the first screen and awaits data entry.
- (5) Messages are displayed as follows:
 - During execution : "EXECUTING"
 - Upon completion : "COMPLETED"

(6) Screen display sequence. Example: Write of system name "ABC-6"



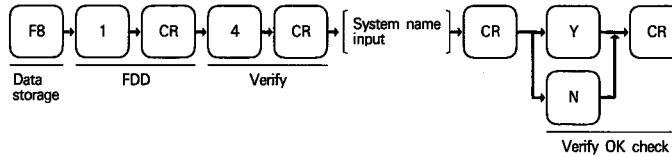
12. FLOPPY DISK

12.5 Verify with FD

Verifies that the FD data matches the A6GPP internal memory data.

**FD
VERIFY**

BASIC OPERATION



OPERATION PROCEDURE

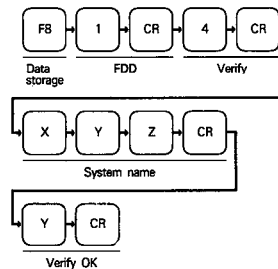
*** DATA SAVE ***
< FDD >

*** VERIFY **

DRIVE B

SYSTEM NAME	XYZ
-------------	-----

VERIFY
OK → PRESS **Y** **CR**
NO → PRESS **N** **CR**



Example: Verifying system name "XYZ"

EXPLANATION

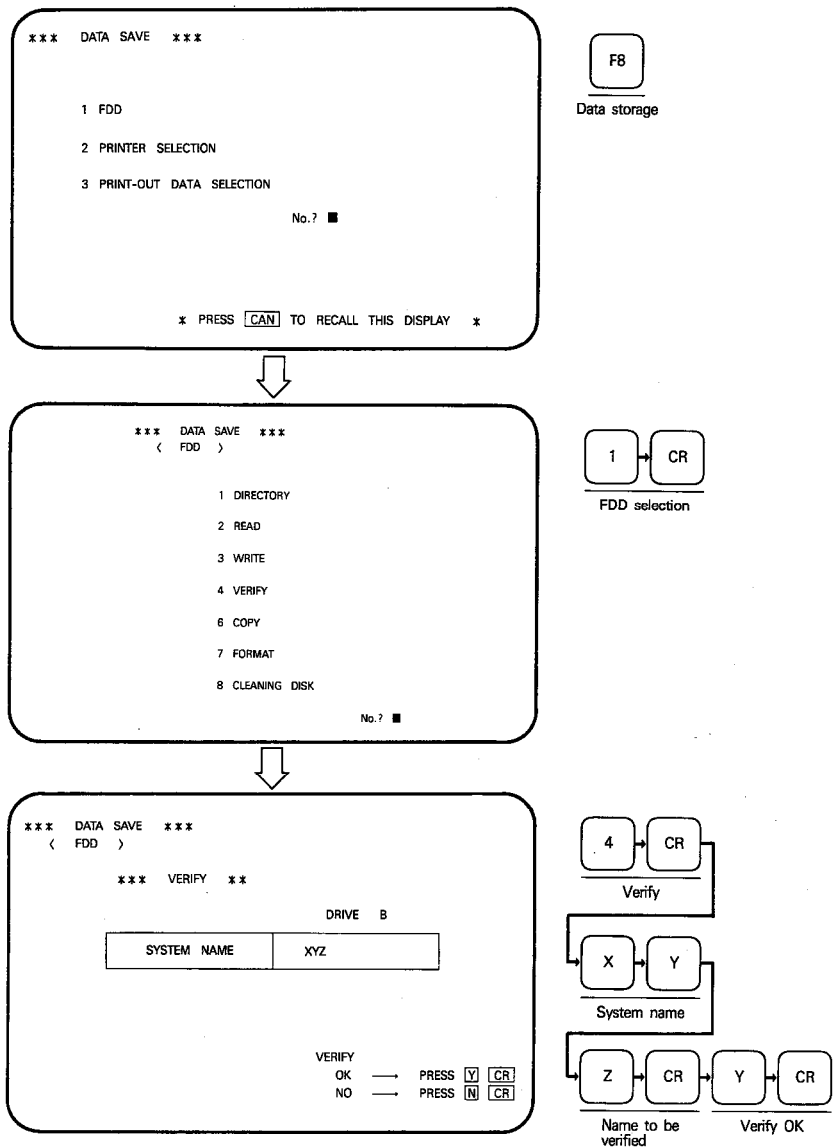
- (1) The screen defaults to drive **B**, to change to **A** move the cursor over the **B** and type "A".
- (2) To execute the operation press **Y** and **CR**. By pressing **N** and **CR**, the keyed-in data is cleared and the CRT returns to the first screen and awaits data entry.
- (3) Messages are displayed as follows:
 - During execution : "EXECUTING"
 - Upon completion : "COMPLETED"

Any error will be displayed as error codes. See Section 14.1.1 (page 14-2).

12. FLOPPY DISK

MELSEC-A

(4) Screen display sequence. Example: Verify of system name "XYZ"



12. FLOPPY DISK

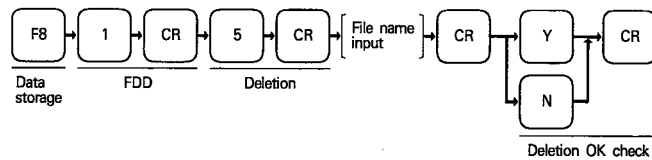
MELSEC-A

12.6 File Delete

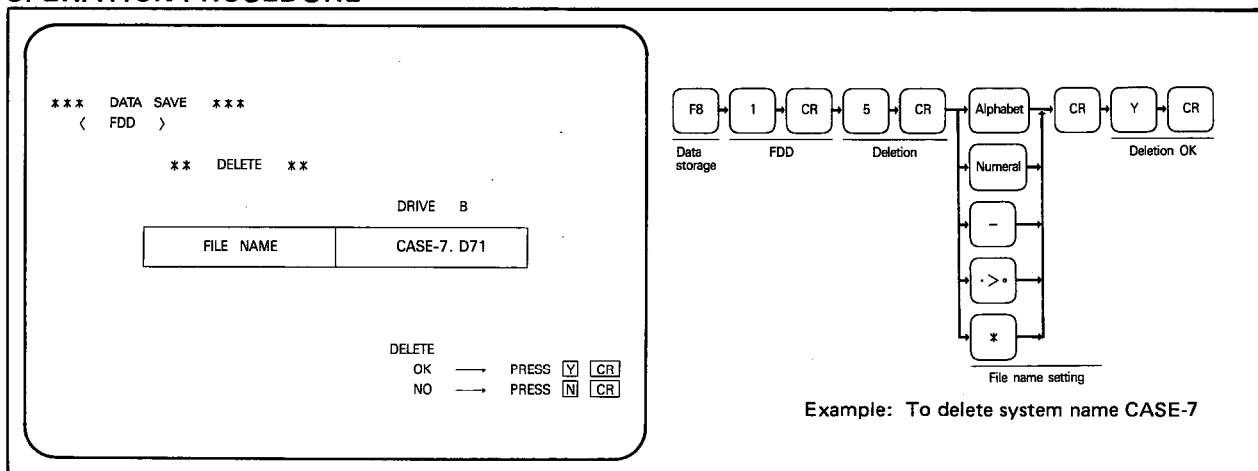
Deletes the specified file name from the FD.

**F D
DELETE**

BASIC OPERATION



OPERATION PROCEDURE

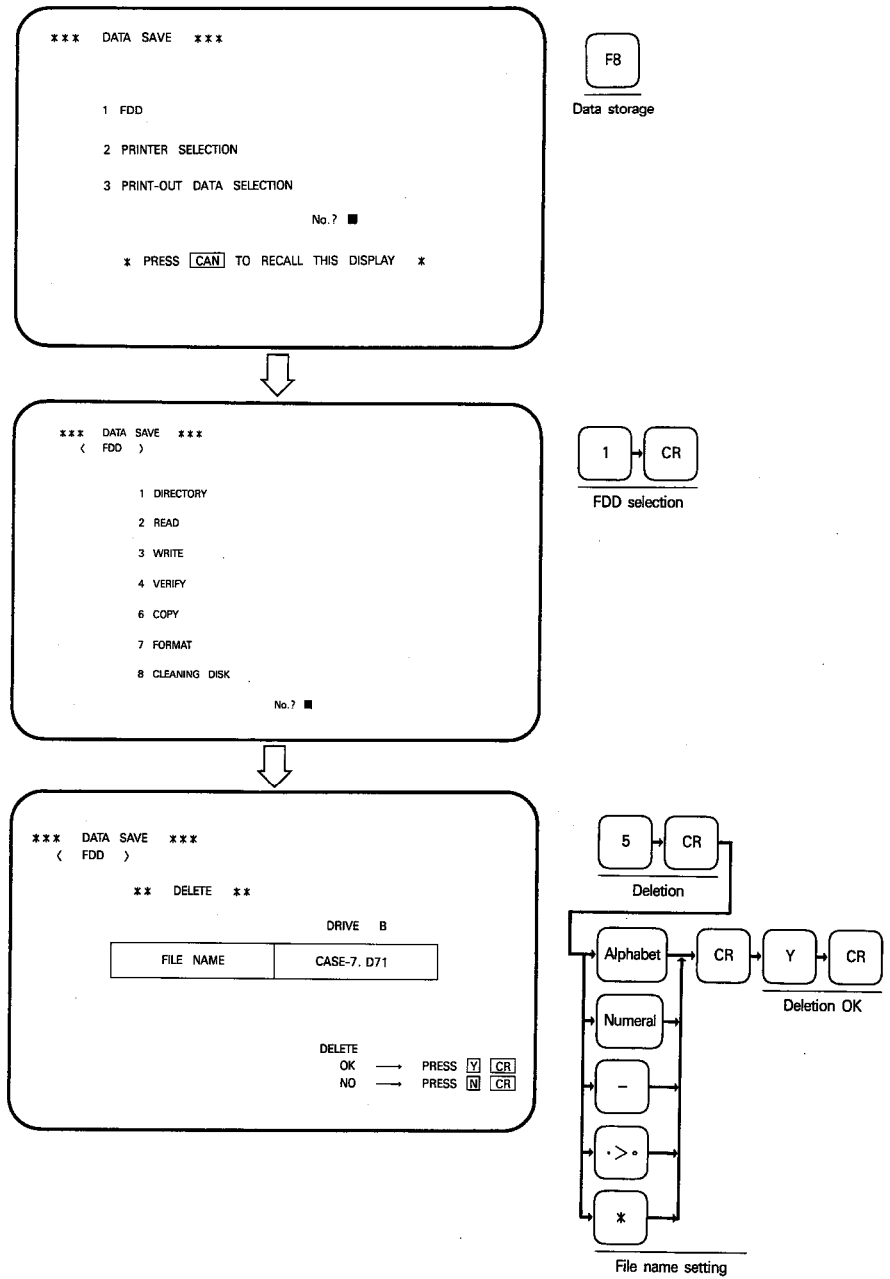


EXPLANATION

- (1) Delete all unnecessary files to conserve disk space.
- (2) The screen defaults to drive **[B]**, to change to **[A]** move the cursor over the **[B]** and type "A".
- (3) The deletion operation is the same as read, write, and verify except that the data is specified as a file name which includes the identifier "D71."
- (4) The **[X]** key may be used as a global character.
- (5) Messages are displayed as follows:
 - During execution : "EXECUTING"
 - Upon completion : "COMPLETED"

The entire contents of the FD can be deleted by formatting it. (See Section 12.8, page 12-18.)

(6) Screen display sequence.



12. FLOPPY DISK

MELSEC-A

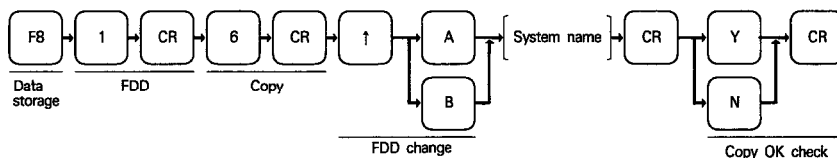
12.7 FD Copy

Copies a file, either between disks or within one disk.

**FD
COPY**

BASIC OPERATION

- 1) To copy between two FDDs, insert copy source FD into FDD **[A]** and copy destination FD into FDD **[B]**.
- 2) When copying on the same FD, the use of FDD **[B]** is recommended.



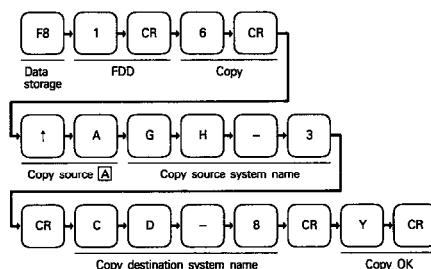
OPERATION PROCEDURE 1

*** DATA SAVE ***
(FDD)

** COPY **

	FROM	TO
DRIVE	A	B
SYSTEM NAME	GH-3	CD-8

COPY
OK → PRESS **[Y]** **[CR]**
NO → PRESS **[N]** **[CR]**

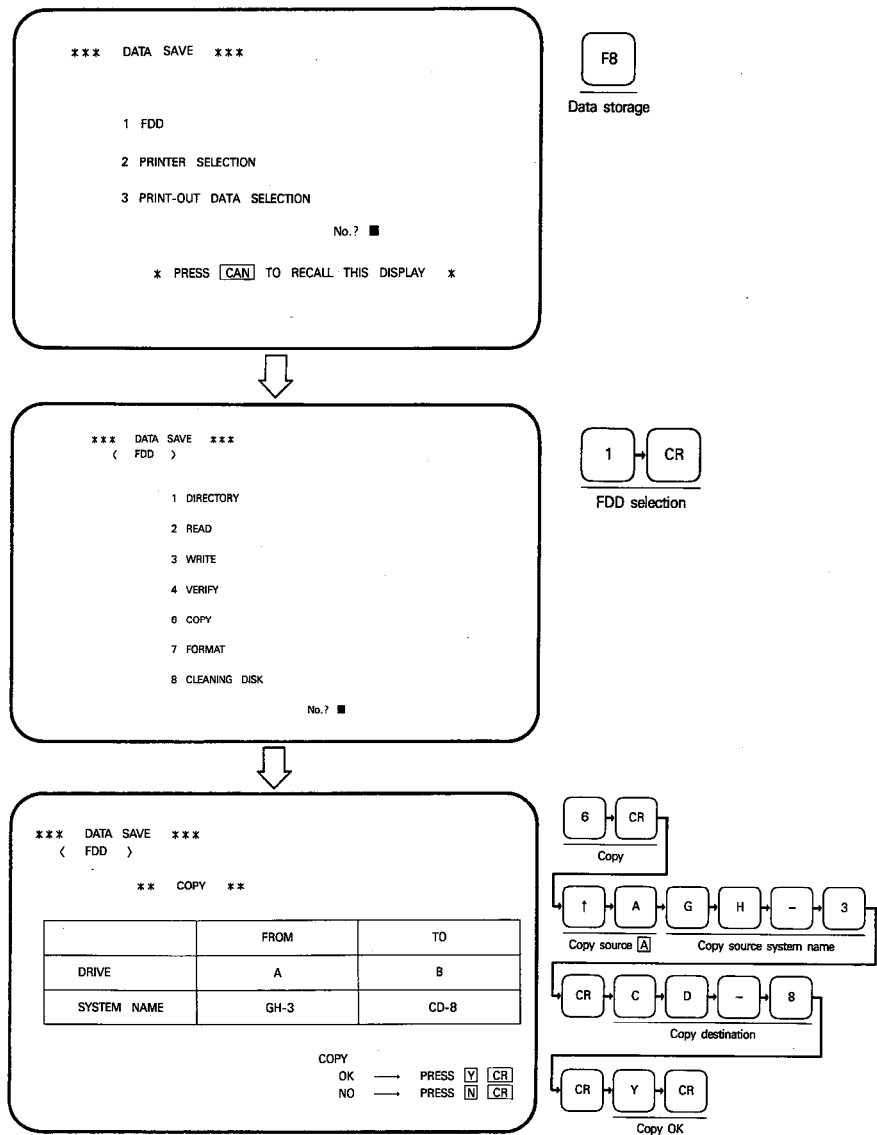


Example: To copy GH-3 (FDD **[A]**) to CD-8 (**[B]**)

EXPLANATION

- (1) Operation is available as:
 - Copy from FDD **[A]** to FDD **[B]**
 - Copy from FDD **[B]** to FDD **[A]**
 - Copy from FDD **[A]** to FDD **[A]**
 - Copy from FDD **[B]** to FDD **[B]**
- (2) When copying between disks the system names can be the same or different (the operation is more reliable however if the system names are the same). When copying within the same disk, source and destination names must be different.
- (3) If the destination FD is new, it is necessary to format it before copying. (Refer to Section 12.8 on page 12-18.)
- (4) Both the copy source and copy destination are set to FDD **[B]** on the screen. Change the setting as required using the cursor keys.
- (5) Messages are displayed as follows:
 - During execution : "EXECUTING"
 - Upon completion : "COMPLETED"

(6) Display screen sequence. Example: Copying of the system name GH-3 in FDD [A] to CD-8 in [B].



12. FLOPPY DISK

MELSEC-A

OPERATION PROCEDURE 2 Batch Copy of User FD

*** DATA SAVE ***		
< FDD >		
** COPY **		
	FROM	TO
DRIVE	A	B
SYSTEM NAME	ALL	ALL

COPY
OK → PRESS
NO → PRESS

```
graph LR
    subgraph "Data storage"
        F8[F8] --> 1[1]
    end
    subgraph "FDD"
        1 --> CR1[CR]
    end
    subgraph "Copy"
        CR1 --> 6[6]
    end
    6 --> CR2[CR]
    CR2 --> Up[↑]
    subgraph "Copy source A"
        Up --> A1[A]
    end
    A1 --> A2[A]
    A2 --> L1[L]
    L1 --> L2[L]
    L2 --> CR3[CR]
    CR3 --> A3[A]
    subgraph "Copy destination"
        A3 --> L3[L]
    end
    L3 --> L4[L]
    L4 --> CR4[CR]
    CR4 --> Y[Y]
    Y --> CR5[CR]
```

The flowchart illustrates the sequence of operations for batch copying. It starts with 'Data storage' (F8) leading to 'FDD' (1), then 'Copy' (6), and finally 'CR'. From 'CR', the sequence moves to 'Copy source A' (↑, A, A, L, L, CR), then to 'Copy destination' (A, L, L, CR), and finally to 'Copy OK' (Y, CR).

EXPLANATION

The whole contents of an FD can be batch copied as follows:
Insert the source FD into FDD and a formatted FD into FDD . Set "ALL" to both the copy source and destination as the system names.

REMARKS

The SW0-AD71P system disk cannot be copied by the user.

12. FLOPPY DISK

MELSEC-A

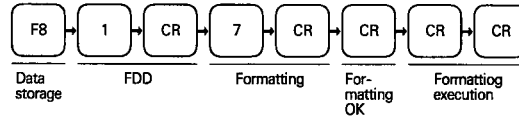
12.8 Formatting of FD

A standard 3-1/2" floppy disk must be formatted before use for data storage.

**FD
FORMATTING**

BASIC OPERATION

Insert system disk (SW0-AD71P) into FDD [A] and a new FD into FDD [B].



OPERATION PROCEDURE

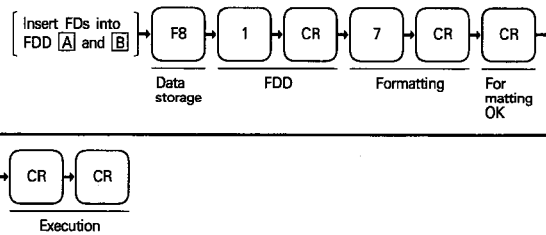
*** DATA SAVE ***
< FDD >

** FORMAT **

INSERT SYSTEM DISK INTO DRIVE [A], THEN PRESS [CR]

INSERT USER DISK INTO DRIVE [B], THEN PRESS [CR]

TO FORMAT DISK IN DRIVE [B], PRESS [CR]



EXPLANATION

- (1) The SW0-GPPU, available from Mitsubishi, has already been formatted.
- (2) To format a disk, insert the system disk (SW0-AD71P) into drive [A] and the unformatted FD into drive [B] and follow the sequence shown in the "OPERATION PROCEDURE."

During formatting, the A6GPP indicates the track number. During verification which is automatic, "VERIFYING" is displayed in the message area. After completion "COMPLETED" is displayed. Press the [CAN] or required function key to proceed.

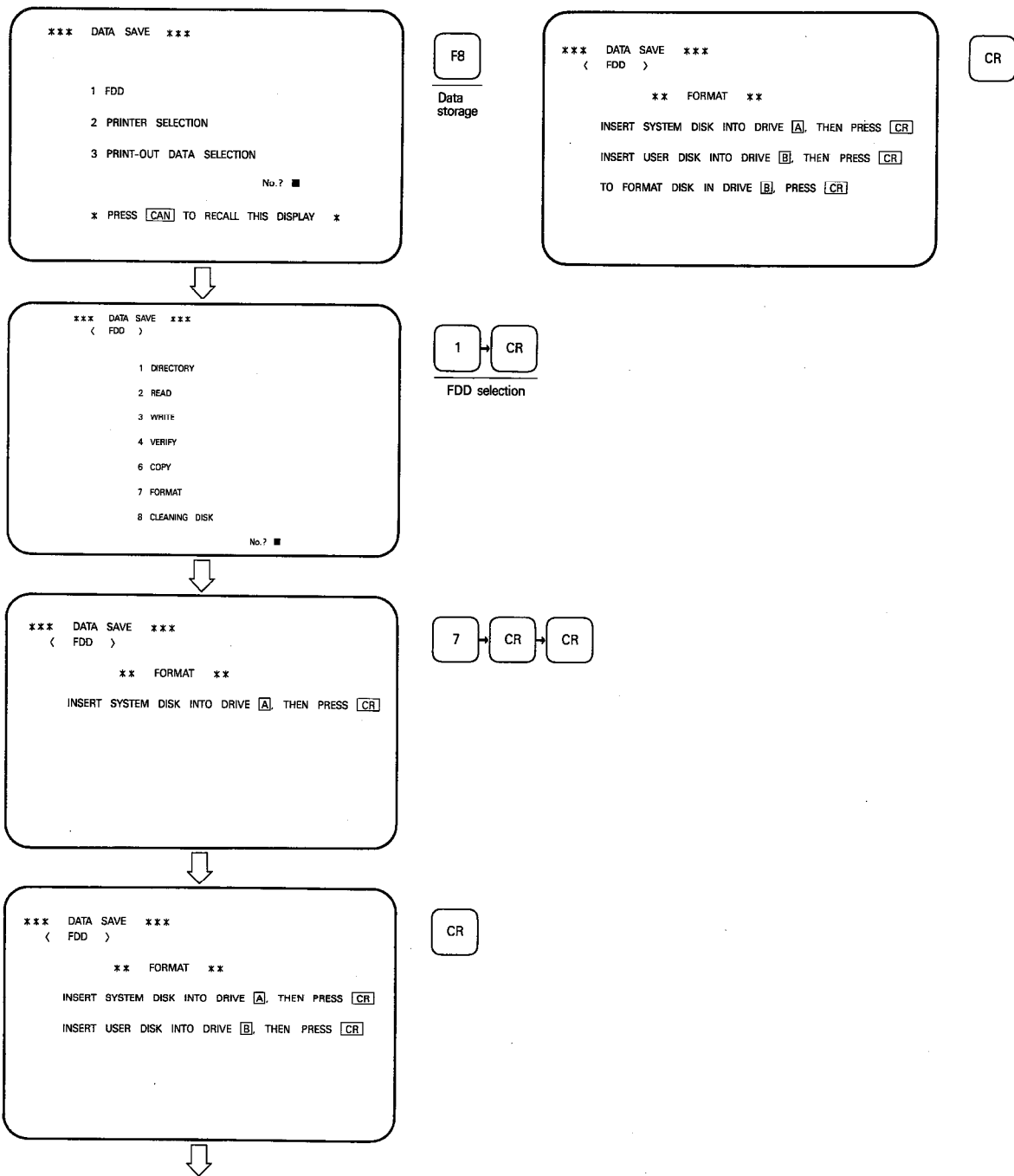
POINT

Any data on the FD will be erased by the formatting procedure.

12. FLOPPY DISK

MELSEC-A

(3) Display screen sequence



12. FLOPPY DISK

MELSEC-A

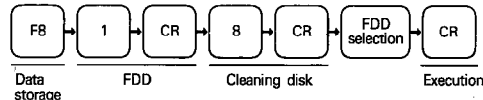
12.9 Cleaning Disk

To clean the FDD reading head a special cleaning disk, SW0-FDC, is required.

**FD
CLEANING
DISK**

BASIC OPERATION

Insert SW0-FDC into FDD to be cleaned.



For menu screen, refer to page 12-4.

OPERATION PROCEDURE

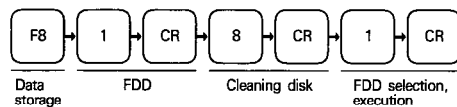
*** DATA SAVE ***
< FDD >

** CLEANING DISK **

1 DRIVE A

2 DRIVE B

No. ? 1



EXPLANATION

- (1) The cleaning disk is used as follows:
 - 1) Periodic cleaning Use the cleaning disk approximately every three months to clean the FDD head. (Maximum of four times a month)
 - 2) Frequent read errors A possible cause of frequent read errors is a dirty FDD head. Clean the head once and if the problems persist, repeat up to five times. If errors still occur the FDD or FD are faulty.
- (2) To clean the FDD head, insert the cleaning disk SW0-FDC into the relevant drive and select **[A]** or **[B]**. Then press **[CR]**. "EXECUTING" is displayed in the message area during execution followed by: "COMPLETED".
If the SW0-FDC is not inserted, "FLOPPY DISK ERR." is displayed. It takes about two minutes to complete the cleaning disk operation.
- (3) The service life of the cleaning disk is approximately one hour (30 times). After the service life has expired, change the cleaning disk.

IMPORTANT

The cleaning disk (SW0-FDC) is suitable for use with the A6GPP. Do not use any other cleaning disk.

13. PRINTER

By connecting a printer to the A6GPP, hard copy of parameters, zeroing data, and positioning data can be provided.

13.1 Printers and Functions

13.1.1 Suitable printers

The printer must have an RS232C interface for direct connection to the A6GPP. Set up data is provided for the following models:

- K6PR } Pica (standard character) or Elite (character 25% smaller in width)
- K6PR-K } can be selected.
- K7PR (select 2400bps or 9600bps)
- A6PR
- GT-10A
- General-purpose printer } All functions except screen copy.

Use the MELSEC AC30R2 printer cable.

13.1.2 Functions

Print-outs can be obtained as follows:

- (1) Parameters and zeroing data for the X and Y axes
- (2) The positioning data for a specified axis (all or a specified range)
- (3) A hard-copy title and comment
- (4) Screen dump hard-copy

POINT

- (1) Where appropriate, ensure that the printer is grounded.
- (2) The A6GPP checks for the following points before the printer is started. Any of these will cause "CHECK PRINTER" to appear in the message area.
 - 1) The printer power is off.
 - 2) The cable is not connected properly.
 - 3) The printer is "offline."When **[CR]** is pressed again after the above has been checked and corrected, printing starts.

- (3) To interrupt printing:

Press **[ESC]**.

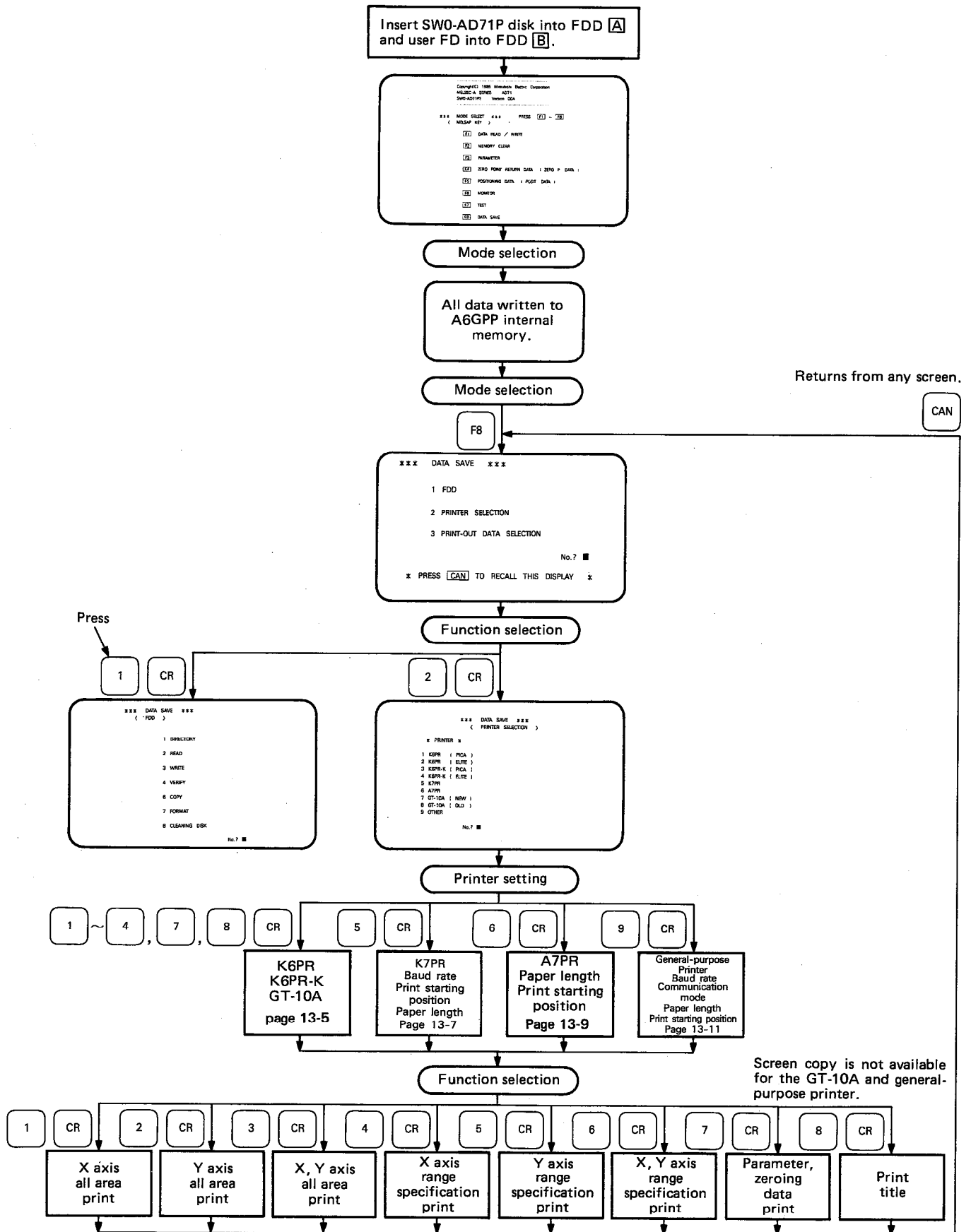
To resume printing, press **[C]**.

- (4) To stop printing press **[E]**, **[CR]**.

By pressing **[CAN]** after stopping, the CRT returns to the menu screen shown in OPERATION PROCEDURE 1 on page 13-3.

13. PRINTER

General Operation Procedure



13. PRINTER

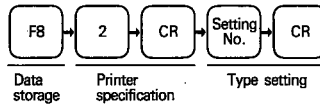
MELSEC-A

13.2 Printer Selection

To set the printer required.

PRINTER SELECTION

BASIC OPERATION



OPERATION PROCEDURE 1

*** DATA SAVE ***

- 1 FDD
- 2 PRINTER SELECTION
- 3 PRINT-OUT DATA SELECTION

No.? ■

* PRESS **CAN** TO RECALL THIS DISPLAY *

F8

Data storage

OPERATION PROCEDURE 2

*** DATA SAVE ***
< PRINTER SELECTION >

* PRINTER *

- 1 K6PR (PICA)
- 2 K6PR (ELITE)
- 3 K6PR-K (PICA)
- 4 K6PR-K (ELITE)
- 5 K7PR
- 6 A7PR
- 7 GT-10A (NEW)
- 8 GT-10A (OLD)
- 9 OTHER

No.? ■

2 → CR

Select
Printer

OPERATION PROCEDURE 3

<pre> *** DATA SAVE *** (PRINTER SELECTION) * PRINTER * 1 K6PR (PICA) 2 K6PR (ELITE) 3 K6PR-K (PICA) 4 K6PR-K (ELITE) 5 K7PR 6 A7PR 7 GT-10A (NEW) 8 GT-10A (OLD) 9 OTHER No.? 1 </pre>	1 → CR Printer K6PR Pica specification
--	--

Example: K6PR, Pica setting

EXPLANATION

- (1) Select the printer using the **1** to **9** keys.
- (2) Refer to sections as shown below for further information.

K6PR K6PR-K GT-10A	}	Section 13.3 on page 13-5
K7PR Section 13.4 on page 13-7		
A7PR Section 13.5 on page 13-9		
General-purpose printer Section 13.6 on page 13-11		
- (3) To change the printer type after setting, press **CAN**. This returns the **CRT** to the screen shown in OPERATION PROCEDURE 1 on the preceding page. (The **CAN** key is always valid.)

13. PRINTER

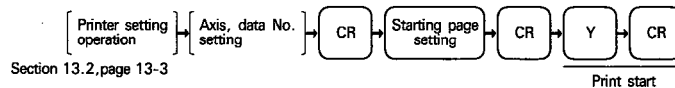
MELSEC-A

13.3 Use of K6PR, K6PR-K and GT-10A

Start print out after setting the axis, data number range, and print starting page.

**K6PR
K6PR-K
GT-10A
PRINTER**

BASIC OPERATION

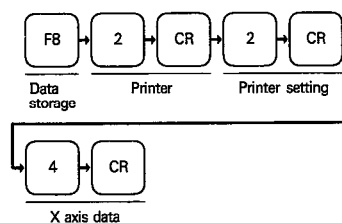


OPERATION PROCEDURE 1

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. 7 4



Example: K6PR Elite, X axis range specification

OPERATION PROCEDURE 2

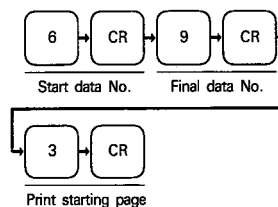
*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. 7 4

* SET DATA No. X 1 ~ 400
Y 1 ~ 400

* PAGE 3
* START OK PRESS Y CR



Example: To print out data No. 6 to 9 starting at page 3

13. PRINTER

MELSEC-A

OPERATION PROCEDURE 3

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No.7 4

* SET DATA No. X.....6~9
Y.....1~400

* PAGE 3

* START OK PRESS [Y] [CR]

PRINTER STOP PRESS [ESC]

PRINTER CONTINUE PRESS [C]

PRINTER END PRESS [E] [CR]

Y

→

CR

Print start

ESC

.....

To interrupt printing.

C

.....

To resume printing after interruption.

E

→

CR

To terminate
(stop after interruption)

EXPLANATION

- (1) In OPERATION PROCEDURE 2, the default value for page specification is 1. The allowed range is 0 to 99 999.
- (2) Pressing **[CAN]** causes the CRT to return to the menu screen in OPERATION PROCEDURE 1 on page 13-5. Before proceeding to another mode after interrupting the printing operation, always press **[E]** and **[CR]**.

REMARKS

1. For the GT-10 printer, set GT-10A (OLD).
2. To identify the GT-10A (OLD) and (NEW), check the name plate on the rear of the printer.

GT-10A OLD

GT-10A1. NEW

13-6

IB (NA) 66099-A

13. PRINTER

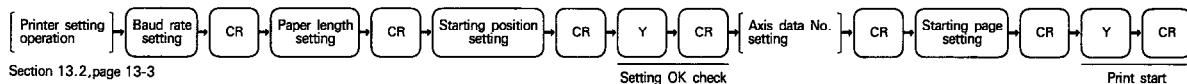
MELSEC-A

13.4 Use of K7PR

For the K7PR, set the baud rate, print start position, and paper length, then the axis, data, and print start page.

**K7PR
PRINTER**

BASIC OPERATION



OPERATION PROCEDURE 1

```

    *** DATA SAVE ***
    ( PRINTER SELECTION )

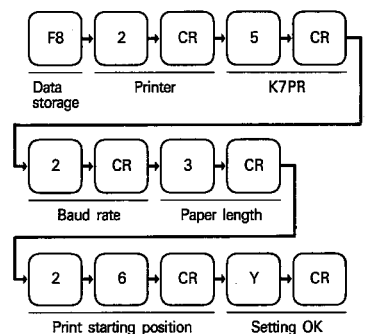
    * PRINTER *      * BAUD RATE *      * PAPER LENGTH *

    1 K6PR ( PICA )      1 2400      1 11-inch
    2 K6PR ( ELITE )     2 9600      2 12-inch
    3 K6PR-K ( PICA )    3 16-inch
    4 K6PR-K ( ELITE )
    5 K7PR
    6 A7PR
    7 GT-10A ( NEW )
    8 GT-10A ( OLD )
    9 OTHER

    No. ? 5      No. ? 2      No. ? 3

    * START POSITION ..... 26

    * SETTING OK ..... PRESS [Y] [CR]
    NO ..... SET AGAIN
  
```



OPERATION PROCEDURE 2

```

    *** DATA SAVE ***
    ( PRINT-OUT DATA SELECTION )
  
```

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

```

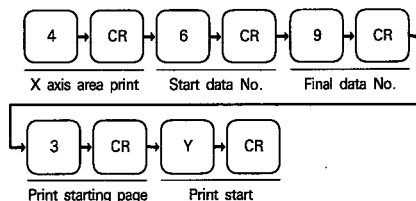
    * SET DATA No. X.....6~9
    Y.....1~400

    * PAGE ..... 3
    * START OK ..... PRESS [Y] [CR]
  
```

```

    PRINTER STOP ..... PRESS [ESC]
    PRINTER CONTINUE ..... PRESS [C]
    PRINTER END ..... PRESS [E] [CR]
  
```

No. ? 4



ESC To interrupt printing

C To resume printing after interruption.

E → CR To terminate (stop after interruption)

OPERATION PROCEDURE 3

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

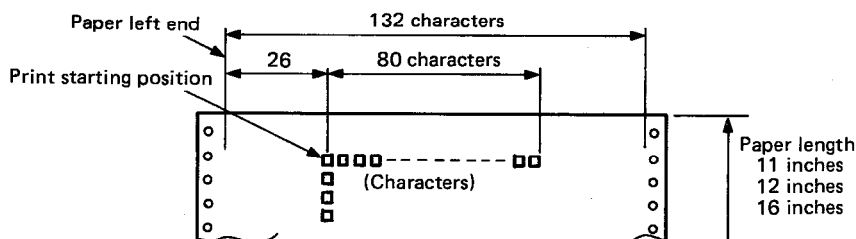
	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. 7 ■

Print out termination

EXPLANATION

- (1) Set the K7PR baud rate to either of 2400 or 9600.
Set the paper length to 11-inch, 12-inch, or 16-inch.
- (2) Print starting position
 - 1) With the starting position set to 0, printing starts from the left side of the paper. Setting a start position allows the print out start position to be moved the specified number of characters to the right of the 0 position.
 - 2) The starting position can be set between 0 and 99 (in terms of characters). The default value is 0.
 - 3) The A6GPP outputs 80 characters per line for printers with 132 characters per line.
So, for the K7PR, if the starting position is set to 26, the print out will appear as shown below.



- (3) To change a set value in OPERATION PROCEDURE 1
Use the **[CR]** key to move the cursor between BAUD RATE, PAPER LENGTH, and START POSITION and overwrite with the correct value.
- (4) OPERATION PROCEDURE 2
The default value for page specification is 1. The setting range is 0 to 99999.

13. PRINTER

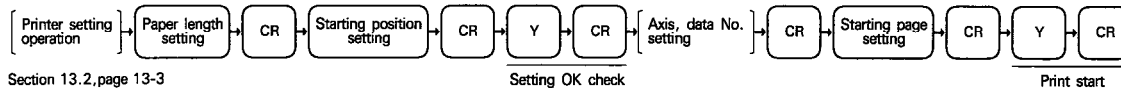
MELSEC-A

13.5 Use of A7PR

For the A7PR, it is necessary to set the paper length and print starting position.

**A7PR
PRINTER**

BASIC OPERATION



OPERATION PROCEDURE 1

```

*** DATA SAVE ***
< PRINTER SELECTION >

* PRINTER *      * PAPER LENGTH *

1 K6PR ( PICA )      1 11-inch
2 K6PR ( ELITE )     2 12-inch
3 K6PR-K ( PICA )    3 16-inch
4 K6PR-K ( ELITE )
5 K7PR
6 A7PR
7 GT-10A ( NEW )
8 GT-10A ( OLD )
9 OTHER

No.? 6              No.? 2

* START POSITION ..... 0

* SETTING OK ..... PRESS [Y] [CR]
  NO ..... SET AGAIN
        
```

Example: Paper length : 12 inches
Starting position : 10

OPERATION PROCEDURE 2

```

*** DATA SAVE ***
< PRINT-OUT DATA SELECTION >

POSITIONING DATA
  AXIS  ALL  RANGE
  X      1    4
  Y      2    5
  X&Y    3    6

PARAMETER & ZERO POINT RETURN DATA
  7

SYSTEM NAME
  8

No.? 4

* SET DATA No. X.....6~9
  Y.....1~400

* PAGE ..... [3]
* START OK ..... PRESS [Y] [CR]

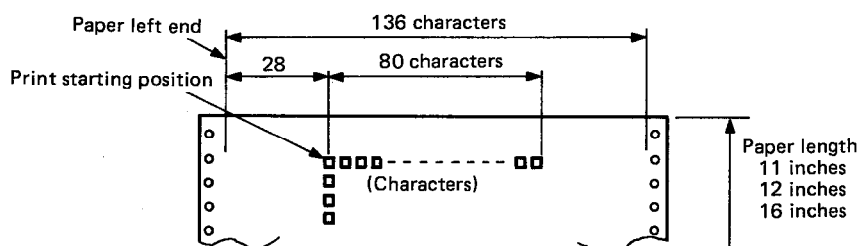
PRINTER STOP ..... PRESS [ESC]
PRINTER CONTINUE ..... PRESS [C]
PRINTER END ..... PRESS [E] [CR]
        
```

Example: To print out X axis data No. 6 to 9 starting at page 3

ESC To interrupt printing.
C To resume printing after interruption.
E -> CR To terminate (stop after interruption)

EXPLANATION

- (1) Set the paper length to 11-inch, 12-inch, or 16-inch.
- (2) Print starting position
 - 1) With the starting position set to 0, printing starts from the left side of the paper. Setting a start position allows the print out start position to be moved the specified number of characters to the right of the 0 position.
 - 2) The starting position can be set between 0 and 99 (in terms of characters). The default value is 0.
 - 3) The A6GPP outputs 80 characters per line for printers with 132 characters per line.
So, for the K7PR, if the starting position is set to 26, the print out will appear as shown below.



- (3) To change a set value in OPERATION PROCEDURE 1
Use the **CR** key to move the cursor between BAUD RATE, PAPER LENGTH, and START POSITION and overwrite with the correct value.
- (4) OPERATION PROCEDURE 2
The default value for page specification is 1. The setting range is 0 to 99999.

13. PRINTER

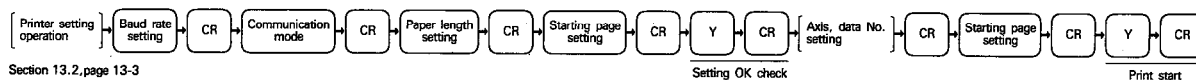
MELSEC-A

13.6 Use of General-Purpose Printer

For a general-purpose printer, it is necessary to set the baud rate, communication mode, paper length and print starting position.

GENERAL-PURPOSE PRINTER

BASIC OPERATION



OPERATION PROCEDURE 1

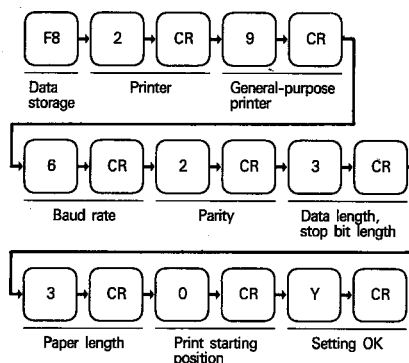
*** DATA SAVE ***
(PRINTER SELECTION)

* PRINTER *	* BAUD RATE *	* PARITY *	* CHARACTER & STOP BIT *	* PAPER LENGTH *
1 K6PR (PICA)	1 300	1 NO	1 7 & 1	1 11-inch
2 K6PR (ELITE)	2 600	2 EVEN	2 7 & 2	2 12-inch
3 K6PR-K (PICA)	3 1200	3 ODD	3 8 & 1	3 16-inch
4 K6PR-K (ELITE)	4 2400		4 8 & 2	
5 K7PR	5 4800			
6 A7PR	6 9600			
7 GT-10A (NEW)				
8 GT-10A (OLD)				
9 OTHER				

No.? 9 No.? 6 No.? 2 No.? 3 No.? 3

* START POSITION 0

* SETTING OK PRESS ☐ Y ☐ CR
NO SET AGAIN



Example: Baud rate: 9600, parity: even, data length: 8, stop bit: 1, paper length: 16 inches

OPERATION PROCEDURE 2

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

POSITIONING DATA	AXIS	ALL	RANGE
	X	1	4
	Y	2	5
	X&Y	3	6

PARAMETER & ZERO POINT RETURN DATA: 7

SYSTEM NAME: 8

No.? 4

* SET DATA No. X.....6~9
Y.....1~400

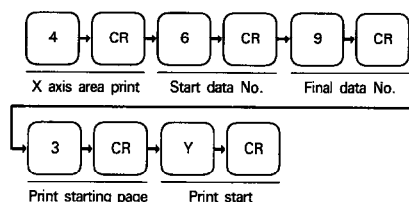
* PAGE ☐ 1

* START OK PRESS ☐ Y ☐ CR

PRINTER STOP PRESS ☐ ESC

PRINTER CONTINUE PRESS ☐ C

PRINTER END PRESS ☐ E ☐ CR



Example: To print out X axis data No. 6 to 9 starting at page 3

☐ ESC To interrupt printing.

☐ C To resume printing after interruption.

☐ E -> ☐ CR To terminate (stop after interruption)

OPERATION PROCEDURE 3

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

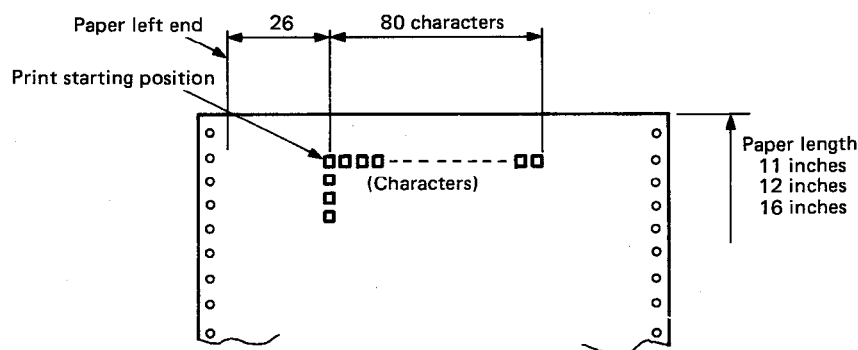
POSITIONING DATA	AXIS	ALL	RANGE
	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. ? ■

Print out complete

EXPLANATION

- (1) Set the general-purpose printer baud rate, parity check, data length, stop bit, and paper length. Set the paper length to 11-inch, 12-inch, or 16-inch.
- (2) Print starting position
 - 1) With the starting position set to 0, printing starts from the left side of the paper. Setting a start position allows the print out start position to be moved the specified number of characters to the right of the 0 position.
 - 2) The starting position can be set between 0 and 99 (in terms of characters). The default value is 0.
 - 3) The A6GPP outputs 80 characters per line for printers with 132 characters per line.
So, for the K7PR, if the starting position is set to 26, the print out will appear as shown below.



- (3) To change a set value in OPERATION PROCEDURE 1
Use the CR key to move the cursor between BAUD RATE, PAPER LENGTH, and START POSITION and overwrite with the correct value.
- (4) OPERATION PROCEDURE 2
The default value for page specification is 1. The setting range is 0 to 99999.

13. PRINTER

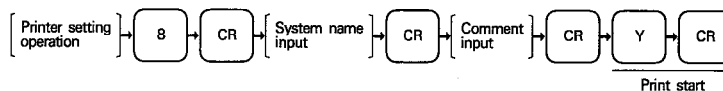
MELSEC-A

13.7 Print Out of Print Title

Print title can be printed out.

**TITLE
PRINT
OUT**

BASIC OPERATION



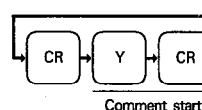
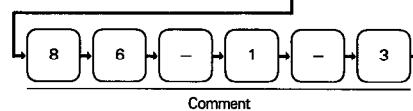
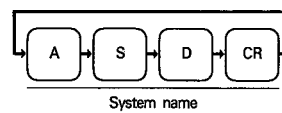
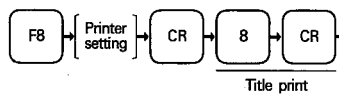
OPERATION PROCEDURE 1

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. 7 8

* SYSTEM NAME ASD
 * COMMENT 86-1-3
 * START OK PRESS ☒ CR
 NO PRESS ☒



OPERATION PROCEDURE 2

*** DATA SAVE ***
(PRINT-OUT DATA SELECTION)

	AXIS	ALL	RANGE
POSITIONING DATA	X	1	4
	Y	2	5
	X&Y	3	6
PARAMETER & ZERO POINT RETURN DATA	7		
SYSTEM NAME	8		

No. 7 ■

Print out complete

EXPLANATION

- (1) Up to 8 characters (alphabetic capitals, numerals and – (minus)) can be used to write the system name, starting with an alphabetic character.
- (2) Up to 20 characters (alphabetic upper and lower case, numerals and standard symbols) can be used to write a comment.
- (3) After entering each one press ☐ CR and then ☐ Y, ☐ CR to start printing.

13. PRINTER

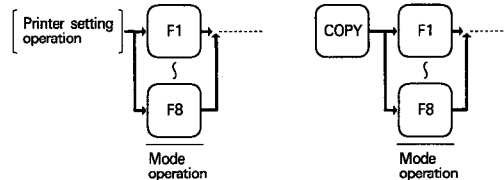
MELSEC-A

13.8 Screen Copy

Allows a hard copy screen dump to be made.

**SCREEN
COPY**

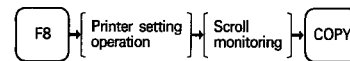
BASIC OPERATION



OPERATION PROCEDURE

*** MONITOR ***				MONITOR STOP		MONITOR RESUME		ERR	
D/X-Y=INTERPOLATION X&Y:2 AXIS SIMULTANEITY				PRESS [ESC]		PRESS [ESC]			
DATA No.	ADDRESS	SPEED	M CODE & COMMENT	STATUS					
X		inch		STOP	READY	DOG	OP.	BUSY	DWE
Y		PULSE		ZERO	BAT	MAN-PULSE	COMP	RET	
		PULSE/sec		STOP	READY	DOG	PQO	BUSY	DWE
				ZERO	BAT	MAN-PULSE	COMP	RET	

X-AXIS			Y-AXIS		
DATA No.	SETTING ADDRESS	M CODE & COMMENT	DATA No.	SETTING ADDRESS	M CODE & COMMENT



Section 10.3,
Page 10-3

Example: To print scroll monitoring screen

EXPLANATION

- (1) To print out the CRT display screen, press **COPY**.
The screen copy function is not available for the GT-10A (OLD), GT-10A (NEW), and general-purpose printer.
- (2) The A6GPP must have been set up for the printer used before a screen copy can be made. (Section 13.2 to 13.10)
- (3) To print out the monitor screen, press **COPY**. This stops monitoring and initiates print out. Upon completion of the printing, monitoring is automatically resumed.

14. ERROR MESSAGES AND CODES

Errors can be classified into the following two types:

(1) A6GPP detected errors

These include errors made when writing the operating data or when accessing the AD71.

(2) AD71 detected errors

These are detected by the diagnostic functions of the AD71 and may be displayed by the A6GPP.

For full information on AD71 errors, consult the AD71 Operating Manual.

14. ERROR MESSAGES AND CODES



14.1 A6GPP Generated Diagnostics

14.1.1 Messages generated by the A6GPP

Message	Cause	Corrective Action
AD71 ERROR	The AD71 does not complete initialization when parameters and zeroing data are written.	Defective AD71
AD71 TEST ERROR	AD71 is not set for test mode when test request is given.	Check the AD71.
	PC is accessing data bus.	
AD71 TEST MODE	AD71 is still in test mode. (In this case, data read/write mode is impossible.)	Press any of [F1] to [F8] . These keys will not effect positioning.
AD71 BUS ERROR	Bus error between CPU and AD71	May be caused by: too frequent accessing of AD71 buffer by PC or bus error (defective AD71).
NOT BUSY	AD71 is not busy when "BREAK" is pressed. (Emergency stop is valid only when any of the AD71 axes is busy.)	
PC BUS ERROR	CPU bus error	Defective AD71
PC READY ON	Y1D has been turned on during data read/write.	Do not turn on Y1D during data read/write.
X RETURNING	X axis zeroing now.	Do not attempt two or more zeroing operations consecutively.
Y RETURNING	Y axis zeroing now.	As above
NO ERROR	No error in error list display.	Normal.
WRITE-IN ERROR	Error during data write from A6GPP to AD71	Change the AD71 memory if it is ROM or RAM is faulty.
	Error during data write from A6GPP memory to FDD	
	FD capacity exceeded	Delete file or insert a formatted FD.
WRITE-IN FORBID	The write forbid switch is in "FORBID" position and data cannot be written.	Set the A6GPP switch to "PERMIT."
COMPLETED	Processing complete.	Normal.
SYSTEM NAME ERR	The set system name is incorrect.	The system name includes character(s) other than alphabets and numerals. The system name includes blanks. The first character is not an alphabetic.
RECEIVE ERROR	Transmission error between AD71 and A6GPP (other than time-out)	
VERIFYING	Displayed during FD verification	Wait for "COMPLETED".
EXECUTING	Operation is being executed.	Normal
SETTING ERROR	Specified No., axis, etc. is incorrect.	Enter correct data.
CONNECTION ERROR	The A6GPP is connected to equipment other than the AD71.	Connect to the AD71.
TIME CHECK OVER	Time-out while waiting for AD71 response.	Change the AD71.
DISCONTINUE	Displayed when print out is interrupted (after pressing ESC).	To resume printing, press [C] . To stop printing, press [E] and [CR] .
EMERGENCY STOP	Emergency stop complete	Normal
FILE MISSING	Specified file is not found in the FD.	Check all files.

Table 14.1 Messages Displayed during A6GPP Operation (Continue)

14. ERROR MESSAGES AND CODES



Message	Cause	Corrective Action
FILE NAME ERROR	The file name is incorrect. (The file name includes a character other than alphabetic, numerals, [*] and [.], or blank. The first character is not an alphabetic.)	Enter correct file name.
VERIFY ERROR	The set data is outside the range (e.g. X or Y not specified for the axis or the data number is not in the range 1 to 400.)	Enter correct data.
	Verify error between GPP memory data and file data.	
FLOPPY DISK ERR.	During formatting: procedure interrupted or impossible.	Execute operation again. If the same error occurs, change FD.
CHECK PRINTER	Printer POWER or SEL switch is OFF. Printer is offline. Cable is disconnected.	Check printer settings.
FLOPPY DISK ERR.	FD is defective.	Change FD.
	The disk is write protected.	Check whether data may be written to that FD.
CANNOT SELECT F7	[F7] (test mode) has been pressed when the A6GPP is connected to equipment other than the AD71.	Test is enabled only when the A6GPP is connected to the AD71.
DISK FULL	FD capacity exceeded.	Change FD.
READING ERROR	Error during data read from FD to A6GPP memory.	Check FDD.
READY	A6GPP self initializing	Normal

Table 14.1 Messages Displayed during A6GPP Operation

14. ERROR MESSAGES AND CODES

MELSEC-A

14.1.2 Error messages during data range check

Message	Mode	Data to be Checked	Range				Remarks
			mm	inch	deg	PLS	
SETTING ERROR	Parameter	Unit setting	0.....mm, 1.....inch, 2.....deg, 3.....PLS				
		Travel per pulse	0.1 to 10.0	0.00001 to 0.001		—	
		Speed limit value	10 to 120000	1 to 12000		10 to 200000	
		Jog speed limit value	10 to 120000	1 to 12000		10 to 200000	
		Starting bias speed	0 to 120000	0 to 12000		0 to 200000	
		Backlash	0 to 6553.5	0 to 0.65535		0 to 255	
		Upper stroke limit	0 to 162000	0 to 16200		0 to 16252928	
		Lower stroke limit	0 to 162000	0 to 16200		0 to 16252928	
		Error compensation	0 to ±1000.0	0 to ±1.00000		—	
		Travel per manual pulse	0.1 to 10000.0	0.0001 to 1.00000		1 to 100	
		Acceleration/deceleration time	64 to 499				
		Positioning complete signal output duration	0 to 20000				
		Pulse output mode	0.....PLS + SIGN, 1.....Forward pulse + reverse pulse				
		Rotating direction	0.....Present value increase by forward pulse output 1.....Present value decrease by reverse pulse output				
		Absolute/incremental specification	0.....Absolute, 1.....Incremental, 2.....Abs./Inc. combined				
		M code ON/OFF timing	0.....WITH mode, 1.....AFTER mode, 2.....Not used				
	Zeroing data	Zeroing direction	0.....Forward direction, 1.....Reverse direction				
		Zeroing method	0.....Using zero phase signal of pulse generator (PG) 2.....Mechanical stop and torque limit 1.....Mechanical stop and time out				
		Zeroing address	0 to 162000000.0	0 to 16200.00000		0 to 16252928	
		Zeroing speed	10 to 120000	1 to 12000		10 to 200000	
		Creep speed	10 to 120000	1 to 12000		10 to 200000	
		Dwell time	0 to 4990				
		Torque limit	10 to 250				
	Positioning data	Positioning pattern	0.....Positioning terminated 1.....Positioning continued 2.....Pattern changed				*1
		Positioning method	0.....Absolute, 1.....Incremental				*1
		Positioning direction	0.....Forward direction, 1.....Reverse direction				
		Positioning speed	10 to 120000	1 to 12000		10 to 200000	*1 *2
		Positioning address	0 to 162000000.0	0 to 16200.00000		0 to 16252928	
		Dwell time	0 to 4990				*1
		M code	0 to 255				
		Pattern change	Up to nine consecutive patterns				
		Data No.	1 to 400				

Table 14.2 Data Range Check (Continued)

Similar check is also made for data marked *1 at batch correction and for data marked *2 at batch clamp of speed.

14. ERROR MESSAGES AND CODES



Message	Mode	Data to be Checked	Range				Remarks
			mm	inch	deg	PLS	
SETTING ERROR	Test	Present value change	0 to 162000000.0	0 to 16200.00000		0 to 16252928	*3
		Jog speed	Starting bias speed to jog speed limit value				

Table 14.2 Data Setting Range Check

*3: For units other than "PULSE", note the following:
The total length of travel(s) should be selected such that

$$\frac{S \text{ (in the appropriate units)}}{F \text{ (Feedrate in units/pulse)}} \leq 16252928 \text{ (Pulses)}$$

14. ERROR MESSAGES AND CODES

MELSEC-A

14.1.3 Relative check of setting data

Data compatibility error codes are shown below:

Error Code	Error Occurrence	Checking Item	Checking Range	Re- marks
301	Parameter	Travel per pulse	1 to 100	
302		Speed limit value	mm, inch, degree = 1 to 12000 PULSE = 1 to 20000	*
303		Jog speed limit value	mm, inch, degree = 1 to 12000 PULSE = 1 to 20000	*
304		Starting bias speed	0 to speed limit value	
305		Acceleration/deceleration time	64 to 4999	
306		Backlash	PULSE = 0 to 255	
307		Upper stroke limit	mm = 0 to 162000 inch, degree = 0 to 16200 PULSE = 0 to 16272928	*
308		Lower stroke limit	0 to upper limit	
309		Error compensation	mm, inch, degree = 0 to 100000	
310		Travel per manual pulse	mm, inch, degree = 1 to 100000 PULSE = 1 to 100	
311		Incremental/absolute specification	Bit $b_4, b_5 = 00, 01, 10$	
312		Positioning complete signal output duration	0 to 200000	
320	Zeroing data	Zeroing address	mm = 0 to 162000 inch, degree = 0 to 16200 PULSE = 0 to 16252928	*
321		Zeroing speed	Starting bias speed to speed limit value. 0 indicates error.	
322		Creep speed	Starting bias speed to zeroing speed. 0 indicates error.	
323		Dwell time	0 to 499	
324		Torque limit	10 to 250	
330	Positioning data	Positioning speed	Starting bias speed to speed limit value. 0 indicates error.	
331		Positioning address	Within stroke limit range	
332		Dwell time	0 to 499	
333		Positioning pattern	Bit $b_0, b_1 = 00, 01, 11$	
334			Speed change pattern 11 may be set up to nine times consecutively.	
335			Consecutive 11 patterns must be in the same positioning direction.	
336			Consecutive 11 patterns must use the same positioning method.	

Table 14.3 Data Compatibility Check Error Codes

Note 1: Relevant to error codes 1 to 12 and 20 to 36 in Table 14.8.

*2: * is subject to the same check as in Table 14.8.*

3: Examples:

Example 1: When travel per pulse has been set to 0.1 (μs/pulse) in the parameter, the upper stroke limit (lower stroke limit) is 0 to 1 620 (mm).

Example 2: Restriction: Jog speed limit value is less than or equal to speed limit value.

14. ERROR MESSAGES AND CODES

MELSEC-A

Compatibility checks are made in the following order:

- 1) X axis parameters → Zeroing data → positioning data
- 2) Y axis parameters → Zeroing data → positioning data

Sequence	Data		Data Used for Compatibility Check	Remarks
1	Parameter	Travel per pulse		*1
2		Speed limit value	Travel per pulse	*2
3		Jog speed limit value	Speed limit value	
4		Starting bias speed	Speed limit value	
5		Acceleration/deceleration speed		
6		Backlash		*2
7		Upper stroke limit	Travel per pulse	*3
8		Lower stroke limit	Upper limit	
9		Error compensation		*1
10		Travel per manual pulse		
11		Incremental/absolute specification		
12		Positioning complete signal output duration		
13	Zeroing data	Zeroing address	Travel per pulse	*3
14		Zeroing speed	Starting bias speed, speed limit value	
15		Creep speed	Starting bias speed, speed limit value	
16		Dwell time		
17		Torque limit		
18	Positioning data	Positioning speed	Starting bias speed, speed limit value	
19		Positioning address	Upper, lower stroke limits	
20		Dwell time		
21		Positioning pattern		
22		"Pattern change" nine continuously	Positioning pattern	
23		Positioning method	Preceding data number positioning pattern, Inc./Abs. specification	
24		Positioning direction	Preceding data number positioning pattern, Inc./Abs. specification, positioning method	

Table 14.4 Data Checking Order

*1: check made for units other than PLS.

*2: check made for PLS units.

*3: Not for PULSE units.

14. ERROR MESSAGES AND CODES

14.1.4 AD71 buffer memory write forbid error

Occurs when data is written to the AD71 buffer memory in "test" mode.

Error Code	Error Message	Buffer Memory Address	Error Definition
362	BUSY	42, 42, 341, 342	"Present value change" has been written in BUSY condition.

Table 14.5 Buffer Memory Write Forbid Error

Note: Relevant to error code 62 in Table 14.10.

14.1.5 Start-up errors

Errors given below occur when the AD71 is started.

Error Code	GPP Error Message	Cause	Corrective Action
370	DU READY OFF	Drive unit "READY" off.	Set the drive unit ready.
371	DU STOP ON	Drive unit "STOP" on.	Set STOP input to OFF.
372	PC, AD71 UNREADY	AD71 ready (X1) and PC ready (Y1D) are off at start.	1) Switch on the PC power and set the ACPU to RUN. 2) Check for hardware fault.
373	BUSY	Relevant axis is busy at start.	Do not start in BUSY state.
374	START COMP. ON	Relevant axis start complete signal is on at start.	Restart after turning off the start signal.
375	M CODE ON	AD71 is not started because the M code ON signal is on at start.	Turn off the ON signal using the M code OFF signal.
376	STOP ON	Stop signal is on at start.	Turn off the STOP signal.
377	SECOND TIME	Zeroing request given more than once consecutively.	Zeroing not allowed more than once at a time. Restart after: 1) moving the axis in front of the zeroing dog using jog operation; or 2) normal positioning or stopping.
378	RETURN COMP. ON	Zeroing request received while zeroing complete signal is on.	Zeroing operation already complete — proceed.
379	ADDRESS OVER	Present value is outside the stroke limit range.	Return axis manually to within the stroke limit range.

Table 14.6 Starting Errors

Note 1: Start includes:

- Zeroing start
- Jog operation start
- Start using manual pulser

2: Errors are given for both axes at interpolation start even if only one has an error.

3: The above errors correspond to errors 70 to 79 in Table 14.11.

14.2 Errors Detected by AD71

These errors are displayed on the right side of the screen during "scroll monitoring."

When any of these errors occur, the relevant error code is written to address 45 (X axis) and 345 (Y axis) of the buffer memory. Note:

(1) Only the most recent error is stored, this error is displayed at the bottom left of the A6GPP screen.

(2) Error code "000" indicates no error.

(3) Error reset

This can be done from the A6GPP. The M code ON signal is reset at the same time.

(4) Error detection

When an error is detected, the error detection signal (XB) turns on. Resetting the error also resets XB.

The above error codes are classified as shown in Table 14.7.

Error Code	Error Classification	Remarks
1 to 49	Data range check error	Table 14.8 in Section 14.2.1.
50 to 59	AD71 hardware error	Table 14.9 in Section 14.2.2.
60 to 69	Buffer memory write forbid error	Table 14.2.3 in Section 14.2.3.
70 to 79	AD71 starting error	Table 14.2.4 in Section 14.2.4.
80 to 89	AD71 BUSY stop error	Table 14.2.5 in Section 14.2.5.

Table 14.7 Error Code Classification

14. ERROR MESSAGES AND CODES

MELSEC-A

14.2.1 Setting data range errors

The AD71 checks the ranges of data written from the A6GPP.

The following lists the data range error codes used by the AD71.

Error Code	Error Message	Error Occurrence	Data Checked	Checking Range	Re- marks
000				Normal	
1	SETTING DATA ERROR	Parameter	Travel per pulse	1 to 100	
2			Speed limit value	$\left(\begin{array}{l} \text{mm, inch, degree} = 1 \text{ to } 12000 \\ \text{For feedrate "F" (unit/PLS), speed V} \\ \text{range is restricted as given below:} \\ \frac{V \text{ (unit/PLS)}}{F \text{ (unit/PLS)}} \leq 200000 \text{ PLS/sec} \\ \text{PULSE} = 1 \text{ to } 20000 \end{array} \right)$	
3			Jog speed limit value	1 to parameter speed limit value	
4			Starting bias speed	1 to parameter speed limit value	
5			Acceleration/deceleration time	54 to 4999	
6			Backlash	PULSE = 0 to 255	
7			Upper stroke limit	$\begin{array}{l} \text{mm} = 0 \text{ to } 162000 \\ \text{inch, degree} = 0 \text{ to } 16200 \\ \text{PULSE} = 0 \text{ to } 16252928 \end{array}$	*1
8			Lower stroke limit	0 to upper stroke limit	
9			Error compensation	mm, inch, degree = 0 to ± 100000	
10			Travel per pulse of manual pulser	$\begin{array}{l} \text{mm, inch, degree} = 1 \text{ to } 100000 \\ \text{PULSE} = 1 \text{ to } 100 \end{array}$	
11			Positioning method	Bit $b_4, b_3 = 00, 01, 10$	
12			Positioning complete signal output duration	0 to 20000	
20		Zeroing data	Zeroing address	$\begin{array}{l} 1) \text{ mm, inch, degree} = 0 \text{ to } 1620000000 \\ \text{PULSE} = 0 \text{ to } 16252928 \\ 2) \text{ Zero point has been shifted.} \end{array}$	*1
21			Zeroing speed	Starting bias speed to parameter speed limit value 0 results in error.	*2
22			Creep speed	Starting bias speed to parameter zeroing value 0 results in error.	
23			Dwell time	0 to 499	
24			Torque limit	10 to 250	

Table 14.8 Error Messages and Error Codes Generated by AD71 (Continue)

14. ERROR MESSAGES AND CODES

MELSEC-A

Error Code	Error Message	Error Occurrence	Data Checked	Checking Range	Re- marks
30	SETTING DATA ERROR	Positioning data	Positioning speed	Starting bias speed to parameter speed limit value 0 results in error.	*2
31			Positioning address	Within stroke limits	
32			Dwell time	0 to 499	
33			Consecutive pattern 11s positioning pattern	Bit b ₀ , b ₁ = 00, 01, 11 00 only if start data No. is 400	
34				Change pattern 11 may be set up to nine times consecutively.	
35				Consecutive 11 patterns must be in the same positioning direction.	
36				Consecutive 11 patterns must use the same positioning method.	
37				Interpolation start setting for both axes must be the same (00 or 01).	
40		Positioning start data	Start number	1 to 400	
41			Pointer	0 to 19	
42			Speed change	Starting bias speed to parameter speed limit value 0 results in error.	*2
43			Present value change	mm, inch, degree = 0 to 1620000000 PULSE = 0 to 16252928	*1
44			Jog speed	Starting bias speed to parameter jog speed limit value 0 results in error.	
45			Start axis	Must be the same in X and Y axes for interpolation start (00) and both-axes start (11).	*2
46			Start axis	At interpolation start (00) and both-axes start (11), the other axis must not: be busy, or: be executing positioning processing in front of an automatic point.	

Table 14.8 Error Messages and Error Codes Generated by AD71

*1: If the unit is mm, inch, or degree and travel per pulse is "a" (unit/PLS), the address S range is restricted as given below:

$$\frac{S \text{ (unit)}}{F \text{ (unit/PLS)}} \leq 16252928 \text{ (PLS)}$$

*2: If a set speed exceeds the parameter speed limit value, positioning is controlled at the speed of the parameter speed limit value.

14. ERROR MESSAGES AND CODES

14.2.2 AD71 hardware errors

Error Code	Error Message	Check Point	Error Definition
50	TIME OVER	Operation element (8231)	Operation time-out error (hardware fault)
51	OVER FLOW		Operation error (overflow, underflow, etc.)
	AD71 BUS ERROR	AD71 bus	The PC is accessing the AD71 data bus too frequently or with too much data so preventing the AD71 from accessing the buffer memory (or the data bus is disabled).

Table 14.9 Error Message and Code List

Any of the above errors render the AD71 inoperable and: 1) The AD71 ready (X1) is turned off and 2) BUSY processing is forced to stop. The "HOLD" LED on the front panel is lit and the start signal is not accepted.

For errors 50 and 51 the AD71 must be replaced. For the "BUS ERROR" check the PC program or replace the AD71.

14.2.3 AD71 buffer memory write forbid errors

Error Code	GPP Error Message	Buffer Memory Address	Error Definition
60	BUSY	39, 339	Data written to "pointer" while AD71 is "BUSY". (Pointer is not 0 if the 20th point is reached.)
61	INTERPOLATION	40, 340	"Speed change" has been written during interpolation positioning.
62	BUSY	41, 42, 341, 342	"Present value change" has been written in BUSY state.
63	PC READY ON	7872 to 7931	Data has been written from the PC while Y1D is on.
64	WRITE ADD. ERR.	Monitoring present value area Speed area	Data has been written from the PC to a write forbid area.

Table 14.10 Error Message and Code List

[Corrective Action]

Check and modify the sequence program.

14. ERROR MESSAGES AND CODES



14.2.4 AD71 start errors

Error Code	GPP Error Message	Cause	Corrective Action
70	DU READY OFF	Drive unit "READY" off.	Set the drive unit ready.
71	DU STOP ON	Drive unit "STOP" on.	Set STOP input to OFF.
72	PC, AD71 UNREADY	AD71 ready (X1) and PC ready (Y1D) are off at start.	1) Switch on the PC power and set the ACPU to RUN. 2) Check for hardware fault.
73	BUSY	Relevant axis is busy at start.	Do not start in BUSY state.
74	START COMP. ON	Relevant axis start complete signal is on at start.	Restart after turning off the start signal.
75	M CODE ON	AD71 is not started because the M code ON signal is on at start.	Turn off the ON signal using the M code OFF signal.
76	STOP ON	Stop signal is on at start.	Turn off the STOP signal.
77	SECOND TIME	Zeroing request given more than once consecutively.	Zeroing not allowed more than once at a time. Restart after: 1) moving the axis in front of the zeroing dog using jog operation; or 2) normal positioning or stopping.
78	RETURN COMP. ON	Zeroing request received while zeroing complete signal is on.	Zeroing operation already complete — proceed.
79	ADDRESS OVER	Present value is outside the stroke limit range.	Return axis manually to within the stroke limit range.

Table 14.11 Error Message and Code List

Note 1: Start includes:

- Zeroing start
- Jog operation start
- Start using manual pulser

2: Errors are given for both axes at interpolation start even if only one has an error.

3: The above errors correspond to errors 70 to 79 in Table 14.11.

14.2.5 AD71 BUSY stop errors

Error Code	GPP Error Message	Cause	Corrective Action
80	DU READY OFF	READY signal has turned off in BUSY state.	Check the drive unit and turn on the READY signal.
81	RETURNING	Zeroing has been stopped during execution.	Zeroing is not allowed more than once at a time. Move the axis in front of the zeroing dog using jog operation or positioning by specifying a data number, and then start zeroing again.

Table 14.12 Error Message and Code List

APPENDIX 1 Format Sheets

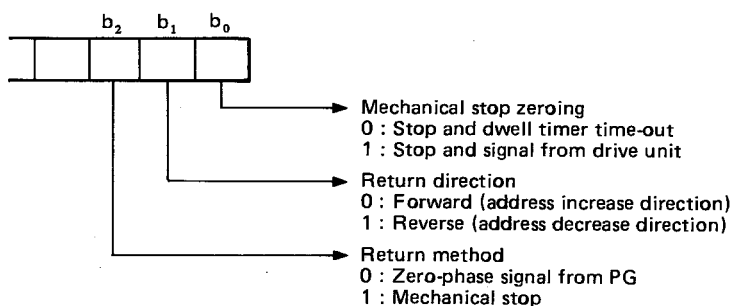
[illegible]

(1) Parameters

[illegible]

(2) Zeroing data

	Item	X Axis	Y Axis	mm		inch		degree		PULSE (PLS)	
				Setting range	Unit	Setting range	Unit	Setting range	Unit	Setting range	Unit
1	Zeroing direction			0 : forward direction (address increase) 1 : reverse direction (address decrease)							
2	Zeroing method			See below.							
3	Zeroing address			0 to 1,620,000,000	$\times 10^{-1}$ μm	0 to 1,620,000,000	$\times 10^{-5}$ inch	0 to 1,620,000,000	$\times 10^{-5}$ deg	0 to 16,252,928	PLS
4	Zeroing speed			1 to 12,000	$\times 10$ mm/min	1 to 12,000	$\times 1$ inch/min	1 to 12,000	$\times 1$ deg/min	1 to 20,000	$\times 10$ PLS/sec
5	Creep speed			1 to 12,000	$\times 10$ mm/min	1 to 12,000	$\times 1$ inch/min	1 to 12,000	$\times 1$ deg/min	1 to 20,000	$\times 10$ PLS/sec
6	Dwell			0 to 499 $\times 10$ msec							
7	Torque limit			1 to 25 $\times 10\%$							



1.3 Positioning data (Data No. to)

X AXIS						
Data No.	Pattern	Abs./ Inc.	Direction	Speed	Address	M Code
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						

00 : END
 01 : Continue
 11 : Change

0 : Abs.
 1 : Inc.

For Inc.
 0 : Address increase direction
 1 : Address decrease direction

0 to 255
 0 : Without M code
 1 to 19 : With comment

Y AXIS						
Data No.	Pattern	Abs./ Inc.	Direction	Speed	Address	M Code
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						

00 : END
 01 : Continue
 11 : Change

0 : Abs.
 1 : Inc.

For Inc.
 0 : Address increase direction
 1 : Address decrease direction

0 to 255
 0 : Without M code
 1 to 19 : With comment

1.4 M code comments

M CODE	X AXIS	M CODE	Y AXIS
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	

Maximum 16 characters per comment

1.5 Positioning operation by automatic switching of start data number

Point No.	X Axis		Y Axis	
	Mode No.	Start data No.	Mode No.	Start data No.
1	—		—	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Mode	Mode No.
Interpolation start	0
X axis start	1
Y axis start	2
Both axes simultaneous start	3

APPENDIX 2 Processing Times

Processing times of the A6GPP and AD71 are as given below.

2.1 SW0-AD71P start-up

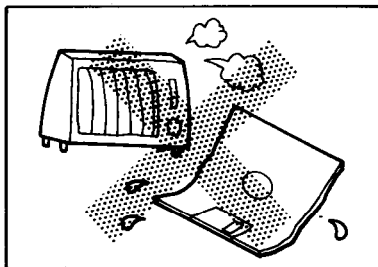
Approximately 60 seconds

2.2 Read, write, and verify between A6GPP and AD71 (in seconds)

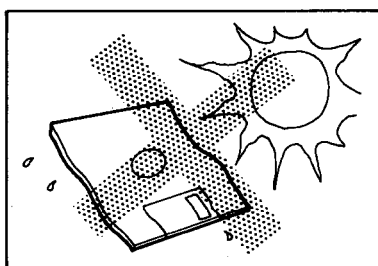
Item	Read	Write	Verify
Parameter	—	2	1
Zeroing data	—	2	1
Positioning data	—	145	70
All setting data	75	150	75

Note: When the PC ready signal (Y1D) is on, processing time is about two to seven times more than the above.

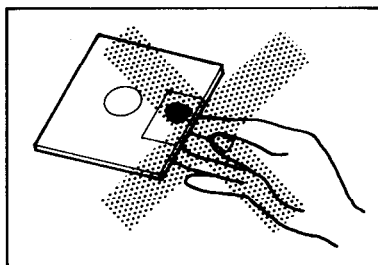
APPENDIX 3 Floppy Disk Using Instructions



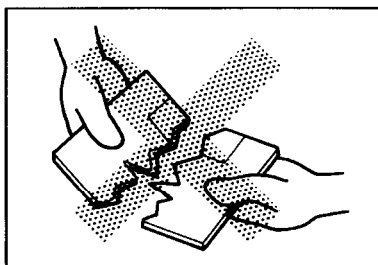
High temperatures and humidity will damage the disk. Allow the disk temperature to stabilize with its surroundings before use to prevent the danger of condensation.



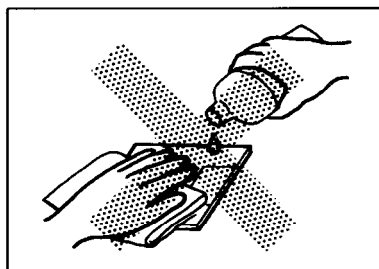
Protect the disk from direct exposure to the sun.



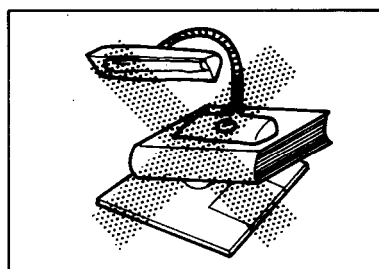
Do not touch the recording surface of the disk. Any grease on the magnetic media will lead to corrupted data being read and will effect the disk drive reading head.



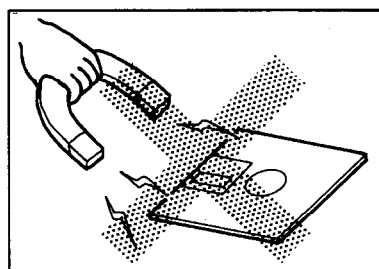
Do not attempt to use a broken or distorted disk — it may jam in the drive or damage the motor mechanism.



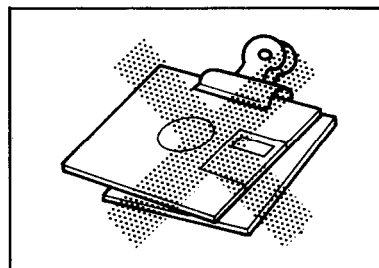
Do not use any solvents (such as thinner, alcohol, freon etc.) to clean the disk.



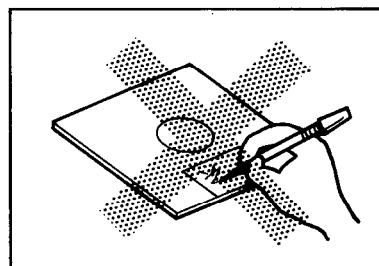
Do not place anything heavy on the disk which may distort it.



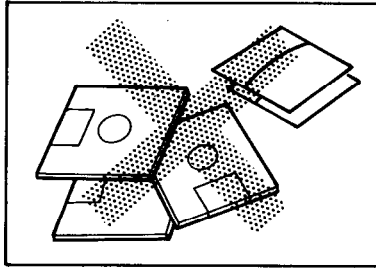
Magnetic fields will corrupt the data stored on the disk. Avoid using the disk near large CRTs, motors etc.



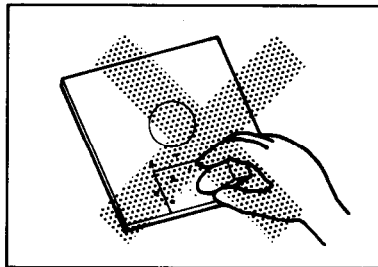
Avoid holding the disk in any sort of clip which may distort the case.



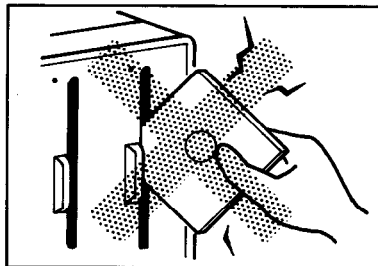
Write information onto the index label before attaching it to the jacket. Writing with it on the jacket can distort the disk.



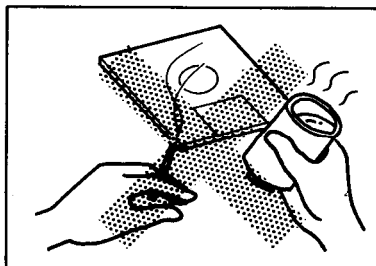
Store all disks vertically, preferably in a plastic box and protected from dust.



Small pieces of eraser material can jam the shutter so do not erase label entries etc.



Insert the disk into the drive carefully without forcing it. Careless handling can easily damage both disk and drive.



Smoke particles can sometimes become attached to the disk, so avoid smoking during use. Never use a disk that has had any liquid spilt over it.

APPENDIX 4 Printer Output Codes

4.1 Printer output codes

The codes of alphanumeric characters output from the A6GPP to the printer conform to ASCII code specifications.

[Application] K6PR
K6PR-K
K7PR
General-purpose printer

Line Col- umn	HEX															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	,	p			SP	-				
1			!	1	A	Q	a	q			O					
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			\$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8	BS		(	8	H	X	h	x								
9	HT		)	9	I	Y	i	y								
A	LF		*	:	J	Z	j	z								
B		ESC	+	;	K	[	k									
C			.	<	L	\	l									
D	CR		-	=	M	]	m	}								
E	SO		^	>	N	^	n	-								
F	SI		/	?	O	_	o	DEL								

4.2 A7PR printer output codes

b8	b7	b6	b5	b4	b3	b2	b1	Column Line	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
				0	0	0	0	0			SP	0	@	P	,	p			SP	-				
				0	0	0	1	1		DC1		1	A	Q	a	q			°					
				0	0	1	0	2			"	2	B	R	b	r			ˆ					
				0	0	1	1	3		DC3	#	3	C	S	c	s			j					
				0	1	0	0	4			\$	4	D	T	d	t			"					
				0	1	0	1	5			%	5	E	U	e	u			.					
				0	1	1	0	6			&	6	F	V	f	v								
				0	1	1	1	7			'	7	G	W	g	w								
				1	0	0	0	8		CAN	(	8	H	X	h	x								
				1	0	0	1	9			)	9	I	Y	i	y								
				1	0	1	0	A	LF		*	:	J	Z	j	z								
				1	0	1	1	B	VT ESC	+	;	K	(	k	l									
				1	1	0	0	C	FF CEX	,	<	L	¥	l	l									
				1	1	0	1	D	CR		-	=	M	)	m	l								
				1	1	1	0	E			.	>	N	^	n	-						"		
				1	1	1	1	F			/	?	O	-	o	x						°		x

2. GT-10A Printer Output Codes

Codes output from the A6GPP to the GT-10A are as indicated in the following table.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		P	SP	0					NUL		!	*	SP	p		
1	A	Q		1							#		a	q		SP
2	B	R		2						DC2	\$	SP	b	r		SP
3	C	S		3							%	SP	c	s		SP
4	D	T		4						DC4	&	SP	d	t		SP
5	E	U		5							(	SP	e	u		SP
6	F	V		6							)	SP	f	v		SP
7	G	W		7					BEL		.	SP	g	w		SP
8	H	X		8					BS		~	SP	h	x		SP
9	I	Y		9							/	SP	i	y		SP
A	J	Z							LF		(	SP	j	z		SP
B	K	'	+						VT	ESC	)	SP	k			SP
C	L								FF		-	SP	l			SP
D	M								CR		.	SP	m			SP
E	N								SO		.	SP	n	SP		SP
F	O			?					SI		→	SP	o	SP		SP

GT-10A Code Specifications

REMARKS

In the above table, the "shaded" codes cannot be used when the GT-10A (old) is employed. Among symbols printed by the GT-10A (old), the symbols shown in the following table are different from those of the GT-10A (new).

GT-10A (NEW)	GT-10A (OLD)
*	×
/	
>	]
<	[

REMARKS

To identify the GT-10A (old) and the GT-10A (new), check the name plate located at the rear of GT-10A printer. "GT-10A" is indicated on the name plate of old type GT-10A. "GT-10A 1" is indicated on the name plate of new type.

APPENDIX 5 Print Out Examples

K6PR printer with Pica

SYSTEM NAME * : DATA ERROR

*** PARAMETER ***

	X-AXIS	Y-AXIS
UNIT SETTING	3: PULSE	3: PULSE
MOVEMENT / PULSE		
SPEED RESTRICTION	200000 (PULSE/sec)	200000 (PULSE/sec)
JOG SPEED RESTRICTION	20000 (PULSE/sec)	20000 (PULSE/sec)
BIAS SPEED	0 (PULSE/sec)	0 (PULSE/sec)
BACKLASH	0 (PULSE)	0 (PULSE)
STROKE LIMIT MAX.	1625292 (PULSE)	1625292 (PULSE)
STROKE LIMIT MIN.	0 (PULSE)	0 (PULSE)
ERROR CORRECT		
MOVEMENT / MAN-PULSE	1 (PULSE)	1 (PULSE)
AC / DECELERATE TIME	1000 (msec)	1000 (msec)
COMPLETE TIME	300 (msec)	300 (msec)
PULSE-OUT MODE	0: PULSE+SIGN	0: PULSE+SIGN
TURN DIRECTION	0: FORWARD INC.	0: FORWARD INC.
ABS. / INC. SET	0: ABS.	0: ABS.
M CODE ON/OFF TIMING	2: UNUSED	2: UNUSED

*** ZERO POINT RETURN DATA ***

	X-AXIS	Y-AXIS
DIRECTION	0: FORWARD	0: FORWARD
METHOD	0: PG0 of PG	0: PG0 of PG
ADDRESS		
SEARCH SPEED	2000 (PULSE/sec)	2000 (PULSE/sec)
CRUISE SPEED	200 (PULSE/sec)	60 (PULSE/sec)
DWELL	500 (msec)	800 (msec)
TORQUE	100 (%)	150 (%)

[Print Title]

When the K6PR printer is used, the print title is printed nearly in the center.

*** POSITIONING DATA *** (X-AXIS)							SYSTEM NAME	* DATA ERROR
DATA NO.	PAIT-ERN	METH-OD	DIREC-TION	SPEED (PULSE/sec)	ADDRESS (PULSE)	DWELL (msec)	M CODE & COMMENT	
1	2	1	0	100000	100000	0	1 APPROACH	
2	2	1	0	200000	500000	0	2 MOVE TO DATUM	
3	2	1	0	30000	700000	0	0	
4	2	1	0	50000	1000000	100	3 START SEQUENCE	
5	2	1	0	3000	1600000	250	4 RETURN	
6	0	1	0	600	1800000	400	1 APPROACH	
7	1	1	1	20000	3700000	200	0	
8	0	0	0	20000	4566440	2000	0	
9	1	0	0	17000	690000	40	0	
10	1	1	1	47000	987000	0	0	
11	0	0	0 *	0	0	0	0	
12	0	0	0 *	0	0	0	0	

IMPORTANT

The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

- (1) Ground human body and work bench.**
- (2) Do not touch the conductive areas of the printed circuit board and its electrical parts with any non-grounded tools etc.**

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.

Positioning module type AD71(SW0-AD71PE)

Operating Manual

MODEL	SWO-AD71P-OPE-E
MODEL CODE	13J707
IB(NA)66099-B(9003)MEE	



HEAD OFFICE : MITSUBISHI DENKI BLDG MARUNOUCHI TOKYO 100-0005 TELEX : J24532 CABLE MELCO TOKYO
NAGOYA WORKS : 1-14 , YADA-MINAMI 5 , HIGASHI-KU, NAGOYA , JAPAN

When exported from Japan, this manual does not require application to the Ministry of International Trade and Industry for service transaction permission.

Specifications subject to change without notice.

HEADQUARTERS	
MITSUBISHI ELECTRIC EUROPE B.V. German Branch Gothaer Straße 8 D-40880 Ratingen Phone: +49 (0)2102 / 486-0 Fax: +49 (0)2102 / 486-1120	EUROPE
MITSUBISHI ELECTRIC EUROPE B.V.-org.sl. Czech Branch Avenir Business Park, Radlická 714/113a CZ-158 00 Praha 5 Phone: +420 - 251 551 470 Fax: +420 - 251-551-471	CZECH REP.
MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets F-92741 Nanterre Cedex Phone: +33 (0)1 / 55 68 55 68 Fax: +33 (0)1 / 55 68 57 57	FRANCE
MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount IRL-Dublin 24 Phone: +353 (0)1 4198800 Fax: +353 (0)1 4198890	IRELAND
MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Viale Colleoni 7 I-20041 Agrate Brianza (MB) Phone: +39 039 / 60 53 1 Fax: +39 039 / 60 53 312	ITALY
MITSUBISHI ELECTRIC EUROPE B.V. Poland Branch Krakowska 50 PL-32-083 Balice Phone: +48 (0)12 / 630 47 00 Fax: +48 (0)12 / 630 47 01	POLAND
MITSUBISHI ELECTRIC EUROPE B.V. 52, bld. 3 Kosmodamianskaya nab 8 floor RU-115054 Moscow Phone: +7 495 721-2070 Fax: +7 495 721-2071	RUSSIA
MITSUBISHI ELECTRIC EUROPE B.V. Spanish Branch Carretera de Rubí 76-80 E-08190 Sant Cugat del Vallés (Barcelona) Phone: 902 131121 // +34 935653131 Fax: +34 935891579	SPAIN
MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane UK-Hatfield, Herts. AL10 8XB Phone: +44 (0)1707 / 27 61 00 Fax: +44 (0)1707 / 27 86 95	UK
MITSUBISHI ELECTRIC CORPORATION Office Tower "Z" 14 F 8-12, 1 chome, Harumi Chuo-Ku Tokyo 104-6212 Phone: +81 3 622 160 60 Fax: +81 3 622 160 75	JAPAN
MITSUBISHI ELECTRIC AUTOMATION, Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061 Phone: +1 847 478 21 00 Fax: +1 847 478 22 53	USA
EUROPEAN REPRESENTATIVES	
GEVA Wiener Straße 89 AT-2500 Baden Phone: +43 (0)2252 / 85 55 20 Fax: +43 (0)2252 / 488 60	AUSTRIA
TEHNIKON Oktyabrskaya 16/5, Off. 703-711 BY-220030 Minsk Phone: +375 (0)17 / 210 46 26 Fax: +375 (0)17 / 210 46 26	BELARUS
ESCO DRIVES & AUTOMATION Culliganlaan 3 BE-1831 Diegem Phone: +32 (0)2 / 717 64 30 Fax: +32 (0)2 / 717 64 31	BELGIUM
Koning & Hartman b.v. Woluwelaan 31 BE-1800 Vilvoorde Phone: +32 (0)2 / 257 02 40 Fax: +32 (0)2 / 257 02 49	BELGIUM
INEA BH d.o.o. Aleja Lipa 56 BA-71000 Sarajevo Phone: +387 (0)33 / 921 164 Fax: +387 (0)33 / 524 539	BOSNIA AND HERZEGOVINA
AKHNATON 4 Andrej Ljapchev Blvd. Pb 21 BG-1756 Sofia Phone: +359 (0)2 / 817 6044 Fax: +359 (0)2 / 97 44 06 1	BULGARIA
INEA CR d.o.o. Losinjska 4 a HR-10000 Zagreb Phone: +385 (0)1 / 36 940 - 01 / -02 / -03 Fax: +385 (0)1 / 36 940 - 03	CROATIA
AutoCont C.S. s.r.o. Technologická 374/6 CZ-708 00 Ostrava-Pustkovec Phone: +420 595 691 150 Fax: +420 595 691 199	CZECH REPUBLIC
Beijer Electronics A/S Lykkegårdsvej 17 DK-4000 Roskilde Phone: +45 (0)46 / 75 76 66 Fax: +45 (0)46 / 75 56 26	DENMARK
Beijer Electronics Eesti OÜ Pärnu mnt.160i EE-11317 Tallinn Phone: +372 (0)6 / 51 81 40 Fax: +372 (0)6 / 51 81 49	ESTONIA
Beijer Electronics OY Peltioie 37 FIN-28400 Ulvila Phone: +358 (0)207 / 463 540 Fax: +358 (0)207 / 463 541	FINLAND
UTECO 5, Mavrogenous Str. GR-18542 Piraeus Phone: +30 211 / 1206 900 Fax: +30 211 / 1206 999	GREECE
MELTRADE Kft. Fertő utca 14. HU-1107 Budapest Phone: +36 (0)1 / 431-9726 Fax: +36 (0)1 / 431-9727	HUNGARY
Beijer Electronics SIA Ritausmas iela 23 LV-1058 Riga Phone: +371 (0)784 / 2280 Fax: +371 (0)784 / 2281	LATVIA
Beijer Electronics UAB Savanoriu Pr. 187 LT-02300 Vilnius Phone: +370 (0)5 / 232 3101 Fax: +370 (0)5 / 232 2980	LITHUANIA
ALFATRADER Ltd. 99, Paola Hill Malta- Paola PLA 1702 Phone: +356 (0)21 / 697 816 Fax: +356 (0)21 / 697 817	MALTA
INTEHSIS srl bld. Traian 23/1 MD-2060 Kishinev Phone: +373 (0)22 / 66 4242 Fax: +373 (0)22 / 66 4280	MOLDOVA
HIFLEX AUTOM.TECHNIEK B.V. Wolweverstraat 22 NL-2984 CD Ridderkerk Phone: +31 (0)180 - 46 60 04 Fax: +31 (0)180 - 44 23 55	NETHERLANDS
Koning & Hartman b.v. Haarlerbergweg 21-23 NL-1101 CH Amsterdam Phone: +31 (0)20 / 587 76 00 Fax: +31 (0)20 / 587 76 05	NETHERLANDS
Beijer Electronics AS Postboks 487 NO-3002 Drammen Phone: +47 (0)32 / 24 30 00 Fax: +47 (0)32 / 84 85 77	NORWAY
Fonseca S.A. R. João Francisco do Casal 87/89 PT - 3801-997 Aveiro, Esgueira Phone: +351 (0)234 / 303 900 Fax: +351 (0)234 / 303 910	PORTUGAL
Sirius Trading & Services srl Alleea Lacul Morii Nr. 3 RO-060841 Bucuresti, Sector 6 Phone: +40 (0)21 / 430 40 06 Fax: +40 (0)21 / 430 40 02	ROMANIA
Craft Con. & Engineering d.o.o. Bulevar Svetog Cara Konstantina 80-86 SER-18106 Nis Phone: +381 (0)18 / 292-24-4/5 Fax: +381 (0)18 / 292-24-4/5	SERBIA
INEA SR d.o.o. Izletnicka 10 SER-113000 Smederevo Phone: +381 (0)26 / 617 163 Fax: +381 (0)26 / 617 163	SERBIA
SIMAP s.r.o. Jána Derku 1671 SK-911 01 Trenčín Phone: +421 (0)32 743 04 72 Fax: +421 (0)32 743 75 20	SLOVAKIA
PROCONT, spol. s r.o. Prešov Kúpeľná 1/A SK-080 01 Prešov Phone: +421 (0)51 7580 611 Fax: +421 (0)51 7580 650	SLOVAKIA
INEA d.o.o. Stegne 11 SI-1000 Ljubljana Phone: +386 (0)1 / 513 8100 Fax: +386 (0)1 / 513 8170	SLOVENIA
Beijer Electronics AB Box 426 SE-20124 Malmö Phone: +46 (0)40 / 35 86 00 Fax: +46 (0)40 / 93 23 01	SWEDEN
Omni Ray AG Im Schörl 5 CH-8600 Dübendorf Phone: +41 (0)44 / 802 28 80 Fax: +41 (0)44 / 802 28 28	SWITZERLAND
GTS Bayraktar Bulvari Nutuk Sok. No:5 TR-34775 Yukarı Dudullu-Ümraniye-İSTANBUL Phone: +90 (0)216 526 39 90 Fax: +90 (0)216 526 3995	TURKEY
CSC Automation Ltd. 4-B, M. Raskovoyi St. UA-02660 Kiev Phone: +380 (0)44 / 494 33 55 Fax: +380 (0)44 / 494-33-66	UKRAINE
EURASIAN REPRESENTATIVES	
Kazpromautomatiks Ltd. Mustafina Str. 7/2 KAZ-470046 Karaganda Phone: +7 7212 / 50 11 50 Fax: +7 7212 / 50 11 50	KAZAKHSTAN
MIDDLE EAST REPRESENTATIVES	
ILAN & GAVISH Ltd. 24 Shenkar Str., Kiryat Arie IL-49001 Petah-Tiqva Phone: +972 (0)3 / 922 18 24 Fax: +972 (0)3 / 924 0761	ISRAEL
TEXEL ELECTRONICS Ltd. 2 Ha'umanut, P.O.B. 6272 IL-42160 Netanya Phone: +972 (0)9 / 863 39 80 Fax: +972 (0)9 / 885 24 30	ISRAEL
CEG INTERNATIONAL Cebaco Center/Block A Autostrade DORA Lebanon - Beirut Phone: +961 (0)1 / 240 430 Fax: +961 (0)1 / 240 438	LEBANON
AFRICAN REPRESENTATIVE	
CBI Ltd. Private Bag 2016 ZA-1600 Isando Phone: + 27 (0)11 / 977 0770 Fax: + 27 (0)11 / 977 0761	SOUTH AFRICA