MELSOFT

Programmable Logic Controllers

Operating Manual

Positioning Module Software Package SW1IVD-AD75P

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● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".

DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.
⚠CAUTION	Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by ⚠**CAUTION** may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

⚠CAUTION

- Before conducting test modes, such as OPR, JOG operation, or positioning data tests, carefully read this manual and be sufficiently familiar with the safety precautions. An operation mistake could damage the machine or cause trouble.

Revisions

* The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Jan. 1997	IB (NA)-66714-A	First printing

INTRODUCTION

Thank you for choosing a Mitsubishi MELSEC-A Series General Purpose Programmable Controller.
Before using your new PC, please read this manual thoroughly to gain an understanding of its functions so you can use it properly.
Please forward a copy of this manual to the end user.

Table of Contents

1 OVERVIEW

This manual explains the functions and operation procedures for the following software packages.

- Model SW1IVD-AD75P software package (hereafter called SW1IVD-AD75P)

(1) What are the SW1IVD-AD75P?

The SW1IVD-AD75P are software packages that provide the following which are necessary for conducting the settings and positioning test operation and monitoring required for position control in the positioning module shown in (2).

- Parameters
- Positioning data
- Start block
- Servo parameters

(2) Target positioning module

The SW1IVD-AD75P support the positioning module shown in Table 1.1.

Table 1.1 Target positioning module

Name	AD75P ☐	AD75P ☐-S3	AD75M ☐
Positioning module model name	• A1SD75P1 • A1SD75P2 • A1SD75P3 • AD75P1 • AD75P2 • AD75P3	• A1SD75P1-S3 • A1SD75P2-S3 • A1SD75P3-S3 • AD75P1-S3 • AD75P2-S3 • AD75P3-S3	• A1SD75M1 • A1SD75M2 • A1SD75M3 • AD75M1 • AD75M2 • AD75M3

In this manual the names AD75P ☐, AD75P ☐-S3, and AD75M ☐ are abbreviated as "AD75."

(3) Screen specifications

(a) When the AD75P is started up the positioning module to be used (AD75P ☐, AD75P ☐-S3, AD75M ☐) is selected and the setting screen for the selected positioning module is displayed.

(b) The AD75P screen was created for the 3 axes positioning module.

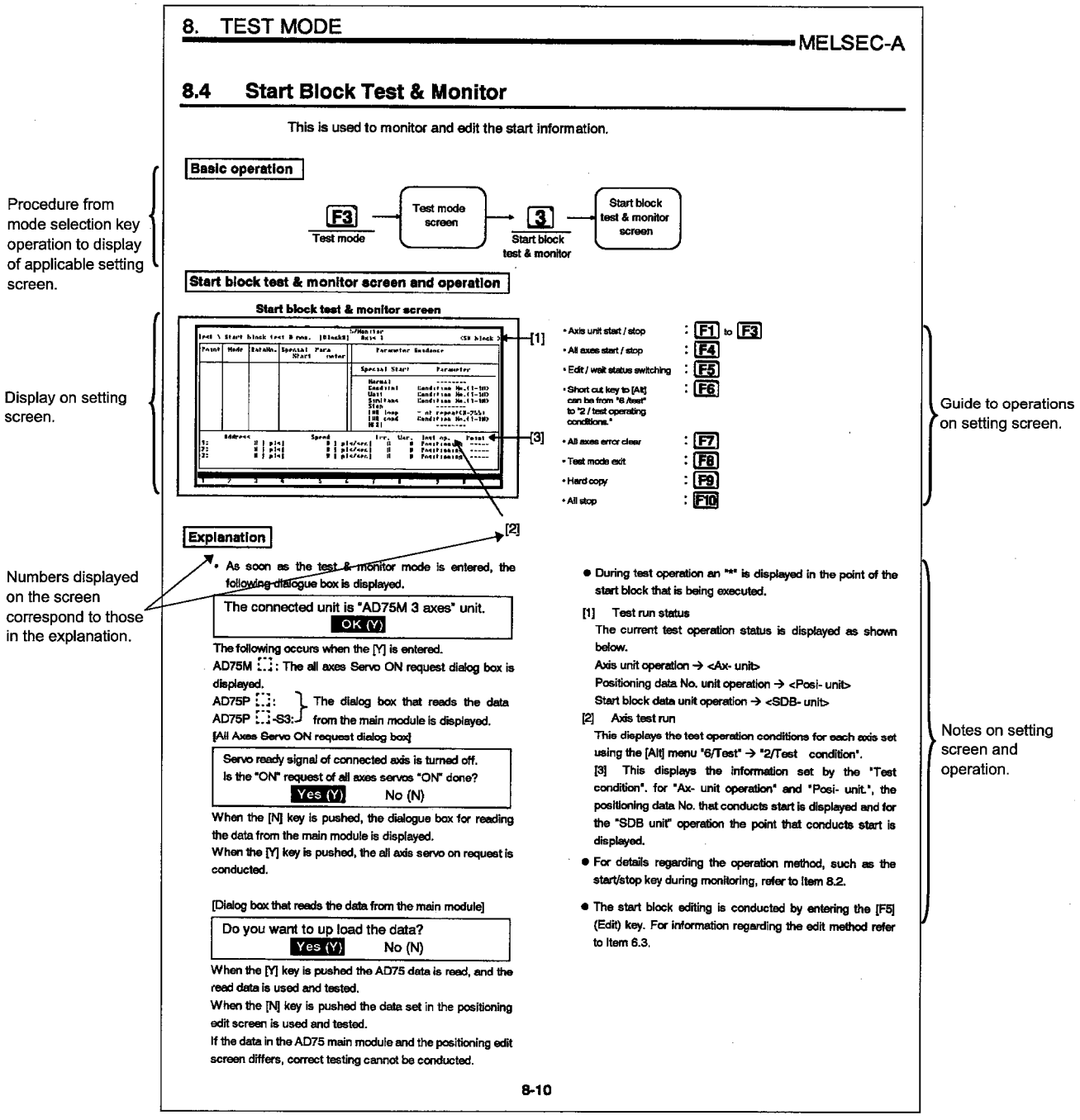
- Even if a 1 axis positioning module is selected when the AD75P is started up, settings can be done for 2 or 3 axes. However, the data set for 2 or 3 axes cannot be run by a 1 axis positioning module.
- Even if a 2 axes positioning module is selected when the AD75P is started up, settings can be made for 3 axes. However, the data set for 3 axes cannot be run by a 2 axes positioning module.

(4) IBM PC/AT

The AD75P can be installed in the hard disk (HD) and run on the following IBM PC/AT or 100% compatible.

1.1 How to Read This Manual

From Chapter 6 and on of this manual a simple explanation is given for each mode. The instructions follow the basic operation and are meant to be explained while the operator is actually conducting the operations, so those who are not familiar with the AD75P functions should first try conducting the operations from the beginning to understand the functions.



1.2 Features

The main features of the SW1IVD-AD75P are shown below.

(1) Supports three types of positioning module

When the peripheral equipment is started up the AD75P □, AD75P □-S3, or AD75M □ can be selected.

(2) Easy operation

(a) Operation is made easy by using pull-down menus, dialog boxes, and other devices. In addition, operation can be made simple by assigning often used functions and mode selection, etc., to function keys.

(b) Each menu window displays a list of all of the items that can be selected and these items can be selected by either moving the cursor and clicking to make the selection or by entering the item No.

(3) The online mode can be used while editing positioning data

It is possible to move to the online mode (monitor mode, test mode) while editing positioning data.

(4) Converting from AD71 to AD75

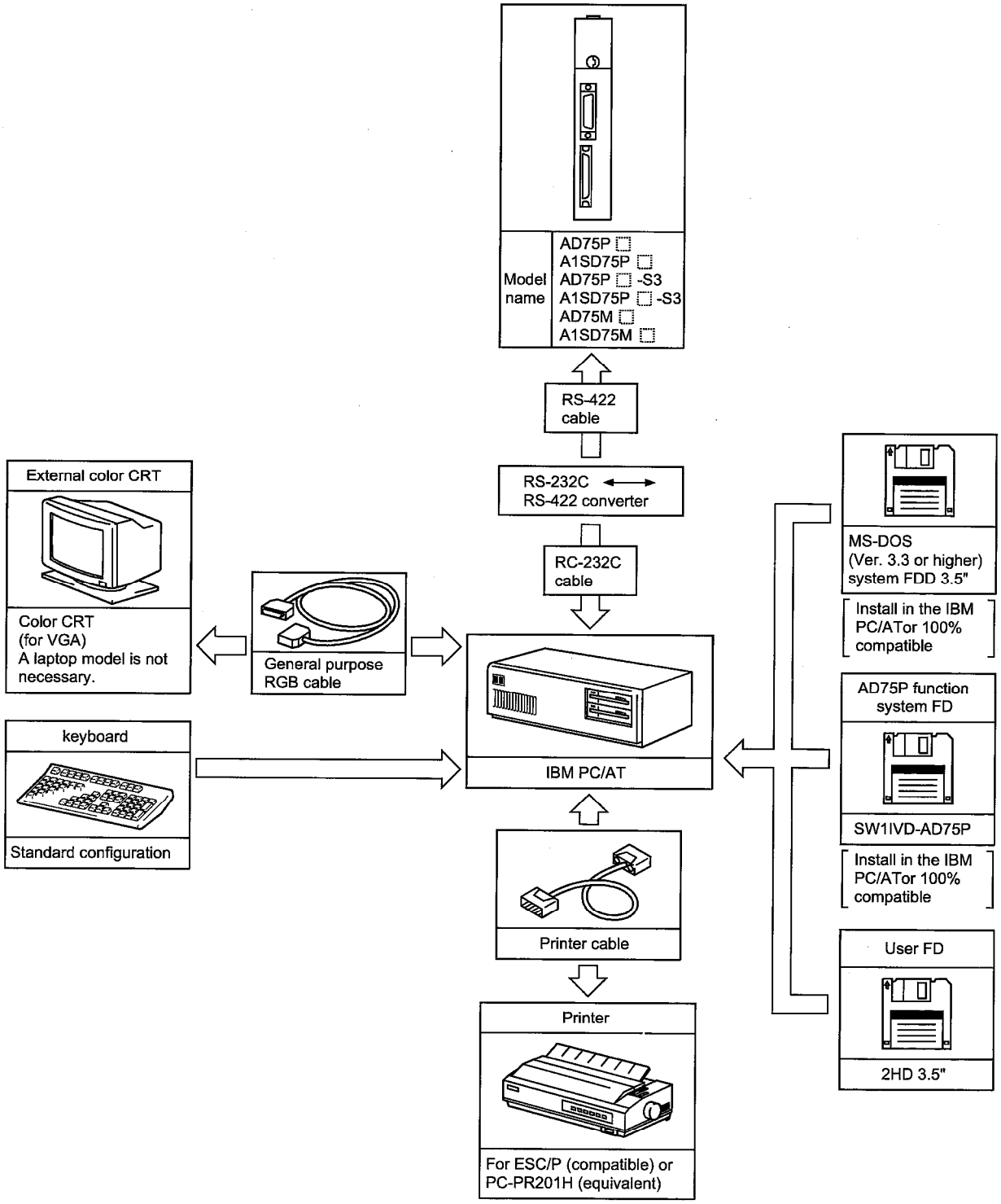
The AD71 positioning data (position/speed data) can be converted to be used by the AD75. However, after conversion the positioning mode must be reset. In addition, the programmable sequence program must be written. (Refer to Item 22.4)

2 SYSTEM CONFIGURATION

2.1 System Configuration

2.1.1 When using IBM PC/AT or 100% compatible

The system configuration when using SW1IVD-AD75P in the IBM PC/AT or 100% compatible is shown below.



Remarks

- When the SW1IVD-AD75P is used the following memory is required in the IBM PC/AT or compatible.
  * Internal memory: 400 kB or more
  * Extension memory: 2 MB or more is required
- OS must be MS-DOS version 3.3D or higher.
- An IBM PC/AT without an EMS memory cannot be used (the EMS memory must have an available capacity in excess of 1MB in operation).
- The user FD can be used even if formatted for MS-DOS (1.44MB).

A converter for communications between and IBM PC/AT and a programmable controller. (commercoal product)

Mitsubishi recommences the following converter for connection
between IBM PC/AT and PC CPU
SC-02N converter
Connecting the PC/AT to the SC-02N

The pin assignments for the cable connecting the 9-pin connector on the PC/AT personal computer to the 25-pin connector on the SC-02N converter unit are as follows:

PC/AT 9-PIN (RS-232C port)			SC-02N 25-PIN
DCD	1	⟷	8
RD	2	⟷	3
TD	3	⟷	2
DTR	4	⟷	20
GND	5	⟷	7
DSR	6	⟷	6
RTS	7	⟷	4
CTS	8	⟷	5

- When connecting the A1SD75P □, A1SD75P □-S3, or AD75M □ to the PC/AT personal computer, then a conversion cable (A1SD75-C01H(A)) is required in addition to the RS-232C ↔ RS-422 converter.
- A mouse cannot be used with this system.
- 5 MB or more of space is required on the startup drive hard disk. (When SW1IVD-AD75P is installed: 2 MB, when executing: 3 MB)
- Operation by using DOS compatible box of Windows/Windows 95 for SW1IVD-AD75 is not guaranteed.
  SW1IVD-AD75 can be used after the PC/AT personal computer is started up by MS-DOS.

MEMO

3 LIST OF FUNCTIONS

The functions that can be used by the AD75P differ depending on the conditioning module that is used. Under the functions that can be used for the positioning module model name that is selected when the AD75P is set up are displayed.

3.1 Functions by the AD75P Mode

The functions used in the AD75P are shown by the mode in which they can be used in Table 3.1.

Table 3.1 List of AD75P functions

Mode	Functions	Positioning module used			Reference items
		AD75P □	AD75P □-S3	AD75M □	
Edit	Positioning data edit	○	○	○	Item 6.2
	Start block edit	○	○	○	Item 6.3
	OPR basic parameter edit	○	○	○	Item 6.4.1
	OPR extended parameter edit	○	○	○	Item 6.4.2
	Basic parameter #1 edit	○	○	○	Item 6.4.3
	Basic parameter #2 edit	○	○	○	Item 6.4.4
	Extended parameter #1 edit	○	○	○	Item 6.4.5
	Extended parameter #2 edit	○	○	○	Item 6.4.6
	M code comment edit	○	○	○	Item 6.5
	Condition data edit	○	○	○	Item 6.6
	Servo basic parameter edit	×	×	○	Item 6.7.1
	Servo adjustment parameter edit	×	×	○	Item 6.7.1
	Servo expansion parameter edit	×	×	○	Item 6.7.1
Monitor	Operation monitor	○	○	○	Item 7.2
	Positioning data monitor	○	○	○	Item 7.3
	Start block monitor	○	○	○	Item 7.4
Test	Operation test & monitor	○	○	○	Item 8.2
	Positioning data test & monitor	○	○	○	Item 8.3
	Start block test & monitor	○	○	○	Item 8.4
Servo start-up	Initial check	×	×	○	Item 9.2
	Model name check	×	×	○	Item 9.3
	U/L limit check	×	×	○	Item 9.4
	RPM check	×	×	○	Item 9.5
Servo	Position control gain 1	×	×	○	Item 10.2
Trace	Wavy trace	×	○	○	Item 11.2
	Tracks trace	×	○	○	Item 11.3
	Torque trace	×	×	○	Item 11.4
Initial	Create	○	○	○	Item 12.2
	File read	○	○	○	Item 12.3
	AD75 read	○	○	○	Item 12.4
	AD75 type change	○	○	○	Item 12.5
Environment	Color selection	○	○	○	Item 13.2
Exit	File save exit	○	○	○	Item 14.1
	Forced exit	○	○	○	Item 14.1

○: Can be used ×: Cannot be used

3.2 Pull Down Menus That Can be Selected in Each Mode

Table 3.2 shows the pull down menus that can be selected for each AD75P mode.

Table 3.2 List of pull down menus that can be selected for each mode

Mode	Functions (reference items)	Pull down menu					
		File	AD75 (Chapter 16)			Settings	
		(Chapter 15)	P	M	S3	(Chapter 17)	
Edit	Positioning data edit	○	○	△	○	△	
	Start block edit	○	○	△	○	△	
	OPR basic parameter edit	○	○	△	○	△	
	OPR extended parameter edit						
	Basic parameter #1 edit						
	Basic parameter #2 edit						
	Extended parameter #1 edit						
	Extended parameter #2 edit						
	M code comment edit	○	×	×	×	△	
	Condition data edit	○	○	△	○	△	
	Servo basic parameter edit	○	△			△	
	Servo adjustment parameter edit						
	Servo expansion parameter edit						
Monitor	Operation monitor	△	×			×	
	Positioning data monitor	△	×			△	
	Start block monitor	△	×			△	
Test	Operation test & monitor	△	△			△	
	Positioning data test & monitor	△	△			△	
	Start block test & monitor	△	△			△	
Servo start-up	Initial check	△	△			×	
	Model name check	△	△			×	
	U/L limit check	△	△			×	
	RPM check	△	△			×	
Servo	Position control gain 1	△	△			△	
Trace	Wavy trace	△	×			×	
	Tracks trace	△	×			×	
	Torque trace	△	×			×	
Environment	Color selection	△	×			×	

Pull down menu									
	Edit (Chapter 18)			Monitor (Chapter 19)	Test (Chapter 20)	Servo (Chapter 21)	Options (Chapter 22)		
	P	M	S3				P	M	S3
	○	△	△	×	×	×	○	△	△
	○	○	○	×	×	×	○	△	△
	△	△	△	×	×	×	△	△	△
	△	△	△	×	×	×	△	△	△
	△	△	△	×	×	×	△	△	△
	△			×	×	×	△		
	×			○	×	×	×		
	×			×	×	×	×		
	×			×	×	×	×		
	×			○	○	×	×		
	△			×	○	×	△		
	△			×	○	×	△		
	×			×	×	○	×		
	×			×	×	○	×		
	×			×	×	○	×		
	×			×	×	○	×		
	×			×	×	×	×		
	×			×	×	×	△		
	×			×	×	×	△		
	×			×	×	×	×		

Remarks

1) The ○, △, and × used in Table 3.2 are as follows.
   ○: All items can be selected
   △: Some items can be selected
   ×: Selection is not possible
2) The symbols P, M, and S3 used in Table 3.2 are as follows.
   P: AD75P □
   M: AD75M □
   S3: AD75P □-S3

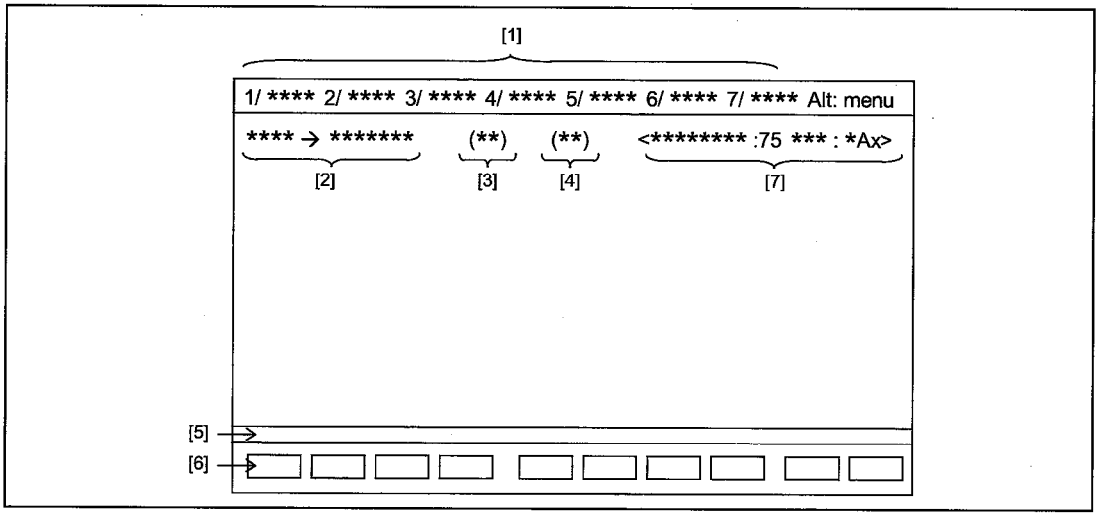
4 COMMON ITEMS

4.1 Screen Specifications

This section explains the basic screen and the windows to be opened following the operation flow.

4.1.1 Basic screen

The basic screen used for function operations for each mode is displayed.



[1]: The menus that can currently be selected are displayed. (Selected using [Alt].)
[2]: This displays the currently selected mode and function.
[3]: This displays the currently setup axis No.
[4]: The key entry mode is displayed using "<Insert>" and "<Overwrite>".
The [Insert] key is used to switch between "<Insert>" and "<Overwrite>".
[5]: This displays operation guidance.
[6]: This displays the functions assigned to function keys.
[7]: This displays the name of the file being edited, the model name of the selected module, and the number of axis of the selected module.

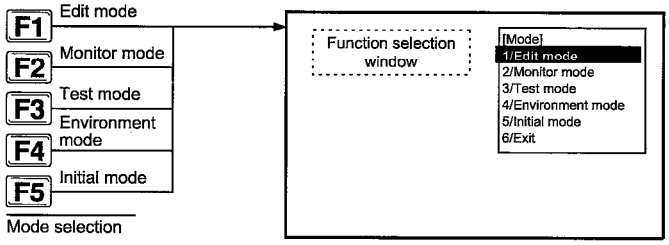
4.1.2 Windows

Windows are screens that are used to select designation of operation items for particular purposes.

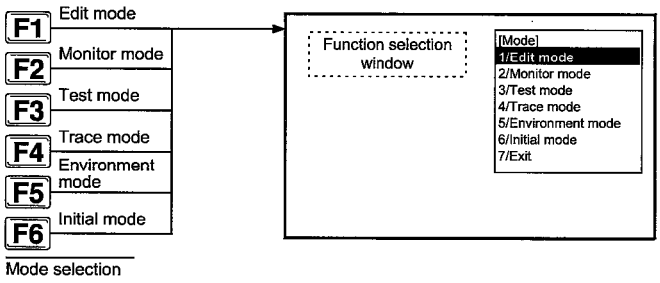
(1) Mode selection window

The mode selection window can be switched using the [F ⬚] keys. (When a mode is selected the function selection window that corresponds to that mode is displayed.)

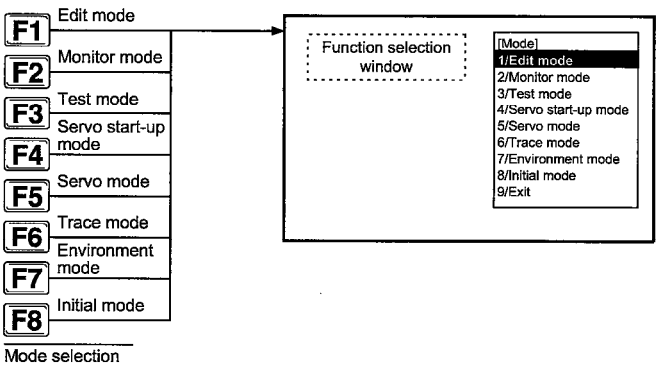
- For AD75P ⬚



- For AD75P ⬚-S3



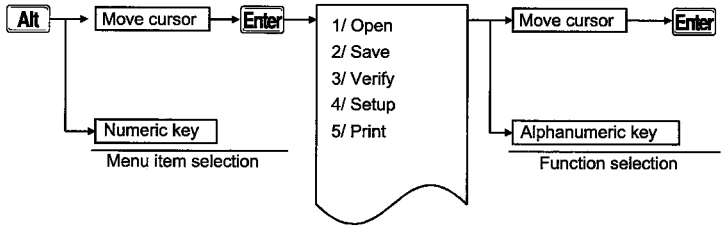
- For AD75M ⬚



- In the function selection mode, move the cursor to the item to be set and then press the [Enter] key or enter the alphanumeric character on the left side of the item to be set.

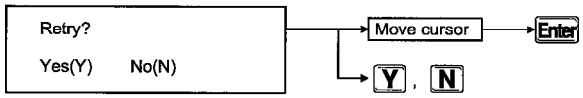
(2) Menu window

The menu window is opened by keying in [Alt] and then by entering [Enter] after selecting a menu item.



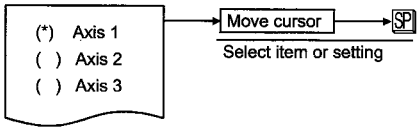
(3) Option window

Set "Yes (Y)" or "No (N)" in response to the displayed message.

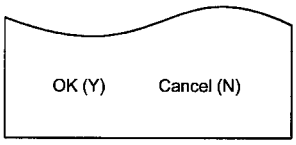


(4) Setting and execution window

(a) Select the item and setting information.



(b) Set "OK (Y)" or "Cancel (N)" for the setting information.



Point

- Selection method
  There are two ways to select an item from a window display: direct selection by pressing an alphanumeric key, and indirect selection by moving the cursor to the item.

4.2 Basic Operation

This item explains the overall operation of common keys and the operation method for common functions for several modes. Be sure to read this once before operating each mode.

4.2.1 Basic key operation

The applications of the keys used for AD75P are shown in the following table.

(1) Key application

Key	Application	Key	Application
[Esc]	Closing windows, canceling execution, selecting instructions, Opening/closing windows	[Delete]	Deletion of character at the cursor position (Clear all settings)
[Tab]	TAB code input, cursor motion.	[F9]	Screen hard copy
[Ctrl]	Used in combination with alphanumeric keys and function keys	[↑], [↓], [←], [→]	Used to move the cursor and scroll the screen line by line (e.g. when positioning data is displayed) ([←], [→])
[Shift]	Selecting the characters designated as shift characters	[Back Space]	Deleting the character to the left of the cursor position
[Caps Lock]	Selecting upper/lower case	[Enter]	Executing a carriage return
[Alt]	Menu selection	[Print Screen]	Screen copy
[Page Up]	Scrolling the positioning edit screen Used to display other pages during operation monitor/test.	[Scroll Lock]	Disabling scrolling (up and down)
[Page Down]	Scrolling the positioning edit screen Used to display other pages during operation monitor/test.	[Num Lock]	Limiting use of ten-key panel to numeral input
[Insert]	Inserting a space at the cursor position	[F10]	Exiting the system

4.3 List of Shortcut Keys

The shortcut keys that can be used with the AD75P are shown in Table 4.1.

Table 4.1 List of shortcut keys that can be used with the AD75P.

Screen / Shortcut key	Edit Mode						Test mode	
	Positioning data	Start block	Positioning parameter	M code comment	Condition data	Servo parameter	Positioning test	Start test
Ctrl + A	Initialization	Initialization	Initialization	Initialization	Initialization	Initialization		
Ctrl + B	10-data AD75 transmission							
Ctrl + C								
Ctrl + D	JUMP command extended setting						JUMP command extended setting	
Ctrl + E						Servo parameter initialization		
Ctrl + F		Block switch			Block switch			Block switch
Ctrl + G								
Ctrl + H								
Ctrl + I								
Ctrl + J	Jump	Jump					Jump	Jump
Ctrl + K	Axis switch	Axis switch	Axis switch	Axis switch	Axis switch	Axis switch	Axis switch	Axis switch
Ctrl + L								
Ctrl + M								
Ctrl + N								
Ctrl + O								
Ctrl + P	Print	Print	Print	Print	Print	Print	Print	Print
Ctrl + Q								
Ctrl + R	File read	File read	File read	File read	File read	File read		
Ctrl + S								
Ctrl + T	Position data AD75 transmission	Start data AD75 transmission	Parameter AD75 transmission		Condition data AD75 transmission	Parameter AD75 transmission		
Ctrl + U								
Ctrl + V								
Ctrl + W	File write	File write	File write	File write	File write	File write	File write	File write
Ctrl + X								
Ctrl + Y	1-line initialization	1-line initialization					1-line initialization	1-line initialization
Ctrl + Z								

Remarks

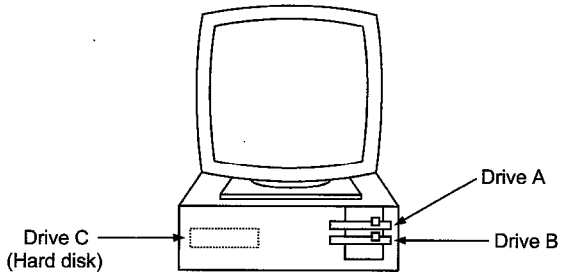
1) Ctrl + Y initializes 1 line of data at the cursor position. If this Ctrl + Y is key input, the data cannot be scrolled up after the cursor position.
2) During start data transmission the data is set at the time of "Start block access" is transmitted.
3) Because the conditions data is included in the start data, start data transmission and conditions data transmission are processed at the same time.
4) Transmission to the AD75 using the Ctrl + B and the Ctrl + T determines whether or not write to the flash ROM is executed by the "F-ROM auto write".

5 PREPARATIONS BEFORE STARTUP AD75P AND STARTUP PROCEDURE

This section explains the procedure for SW1IVD-AD75P registration and startup environment settings and AD75P function startup.

5.1 Software Package Registration

Following is shown the procedure for installing the SW1IVD-AD75P in the hard disk of a IBM PC/AT. The explanation of the installation procedure assumes that the following system is used.



IBM PC/AT personal computer power supply on or reset —MS-DOS is used for the OS (Operating system).

↓

C:\> .....MS-DOS command wait switch.

↓

Insert the system disk 1 in the specified drive. .....The insertion drive differs depending on the system.

↓

C:\>A:\INSTHD .....Enter the command shown at left.

↓

Enter

↓

Select the transmission source and transmission destination drives. *1 .....The following screen will be displayed.

↓

(Y/N selection) *2

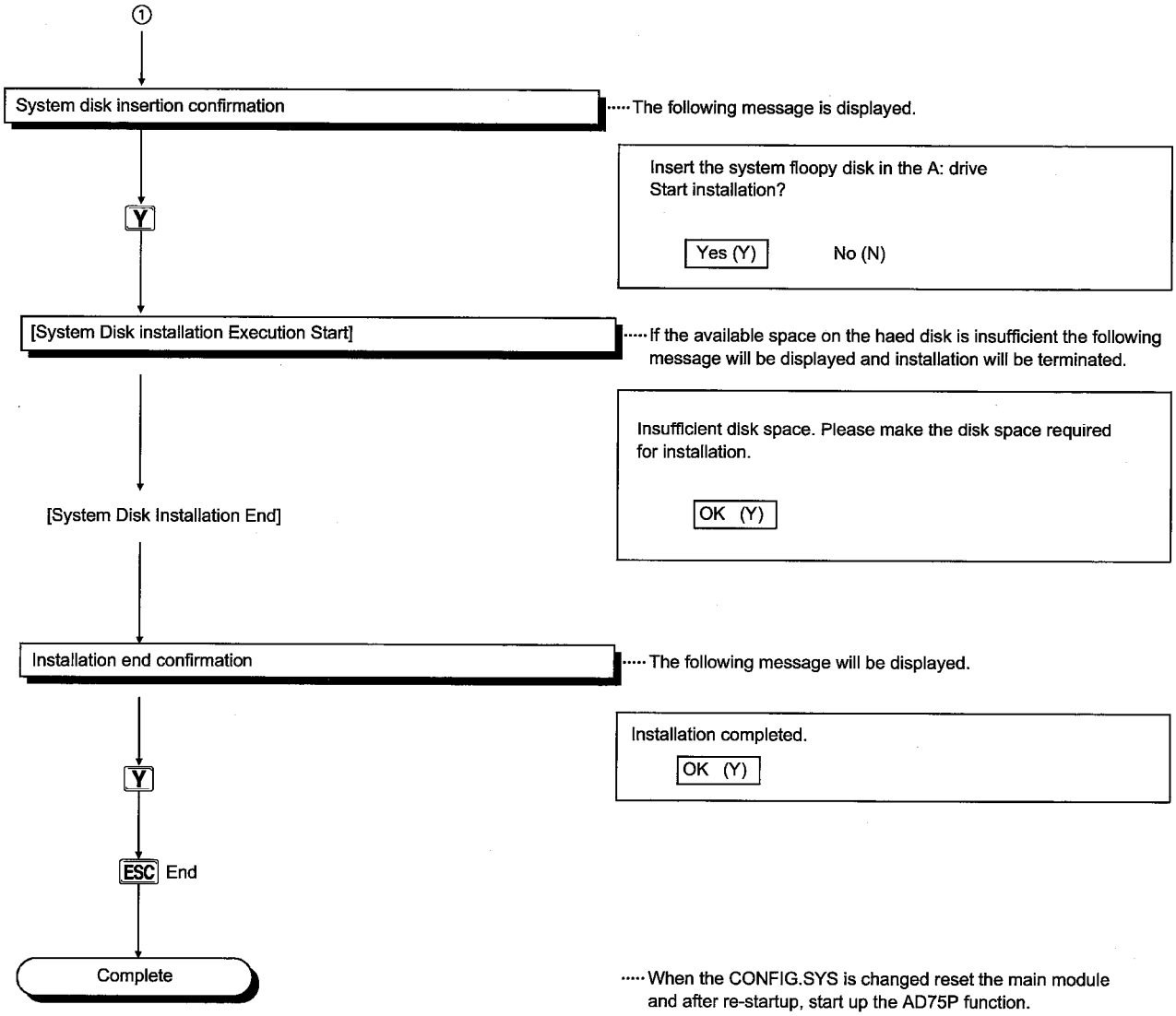
↓

①

[FDD or Installation Setting Screen]
Transmission source [A]
Transmission destination [C]

Execute (Y) Cancel (N)

Transmission source: The drive in which the system disk 1 is inserted.
Transmission destination: The drive in which the AD75P functions will be installed.



Remarks

1) *1: Conduct the following procedure to change the displayed drive.
   - Select the item to be changed (Transmission source/transmission destination) using the [↑]/[↓] keys. (The selected items will be displayed in reverse.)
   - Push the [SP] key to display a cursor in the drive column.
   - Key in the post-change drive.
   - Push the [Enter] key.

2) *2: When end is selected the system returns to the MS-DOS command write state.

5.2 Startup Environment Settings

(1) When the CONFIG.SYS and AUTOEXEC.BAT are in multiple drives or permanent commands are included and enough space cannot be procured in the main memory (Link area), then there will be insufficient memory and the AD75P cannot be started up. In this case, remove the unnecessary drives and permanent commands from the CONFIG.SYS and AUTOEXEC.BAT, or if the FILES size is large, make it smaller to secure the amount of available memory shown below and then re-start up the DOS/V personal computer.

- Main memory of 400 KB or more and expansion memory of 2 MB (Recommended 4 MB) is required.
- 3 MB or more of available space is required in the startup drive hard disk.

Important

When using AD75P functions, turn off the IBM PC/AT resume function. If the resume function is left on and the AD75P function is used then the system operation will stop.

5.3 AD75P Startup

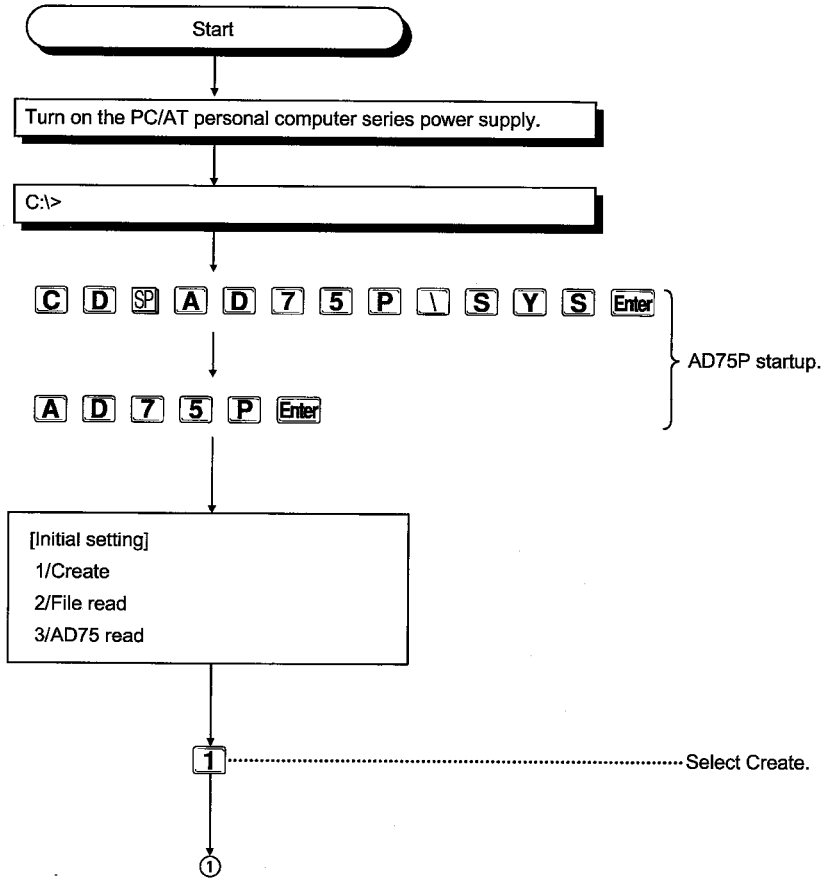
This section explains the startup procedure for the AD75P registered in the PC/AT personal computer series hard disk.

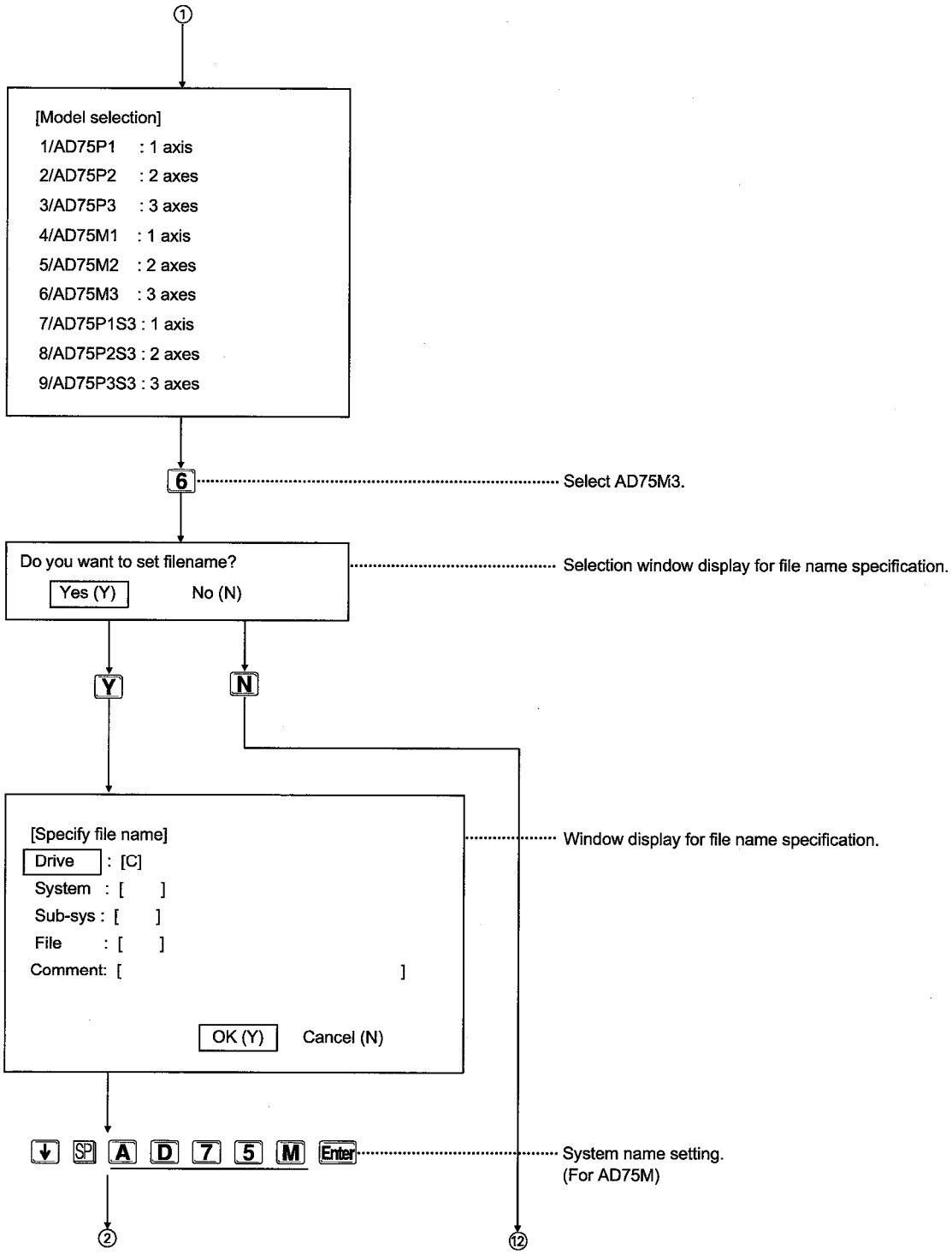
For the AD75P the "Create", "File read", and "AD75 read" can be selected when the AD75P is started up.

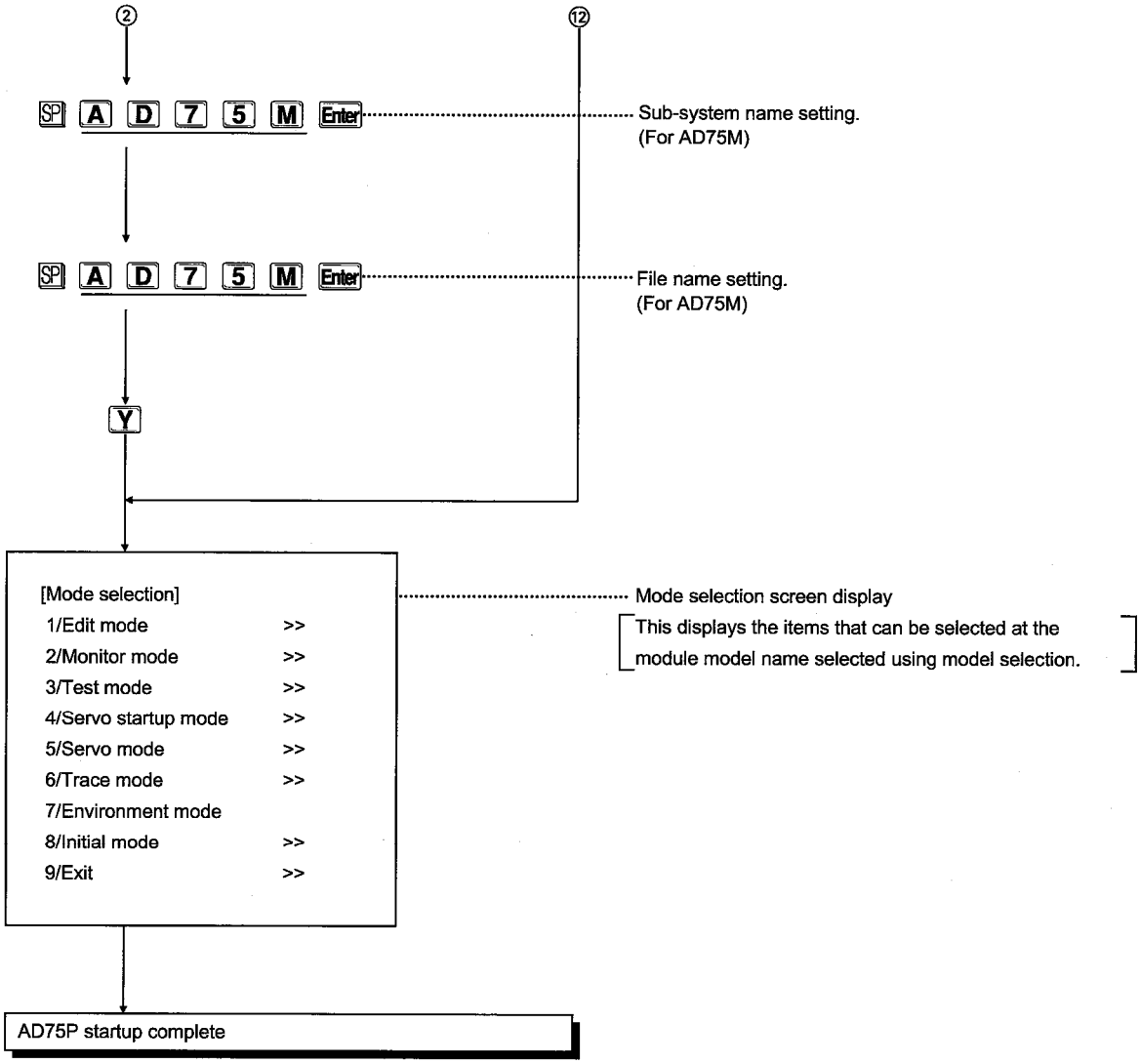
- Create: Select this when entering the new positioning parameters or positioning data.
- File read: Select this to read the positioning parameters and positioning data registered in the hard disk (HD)/floppy disk (FD).
- AD75 read: Select this to read the positioning parameters and positioning data registered in the AD75.

(1) Startup procedure for Create

The procedure for when AD75M3 is Create selected is shown below.

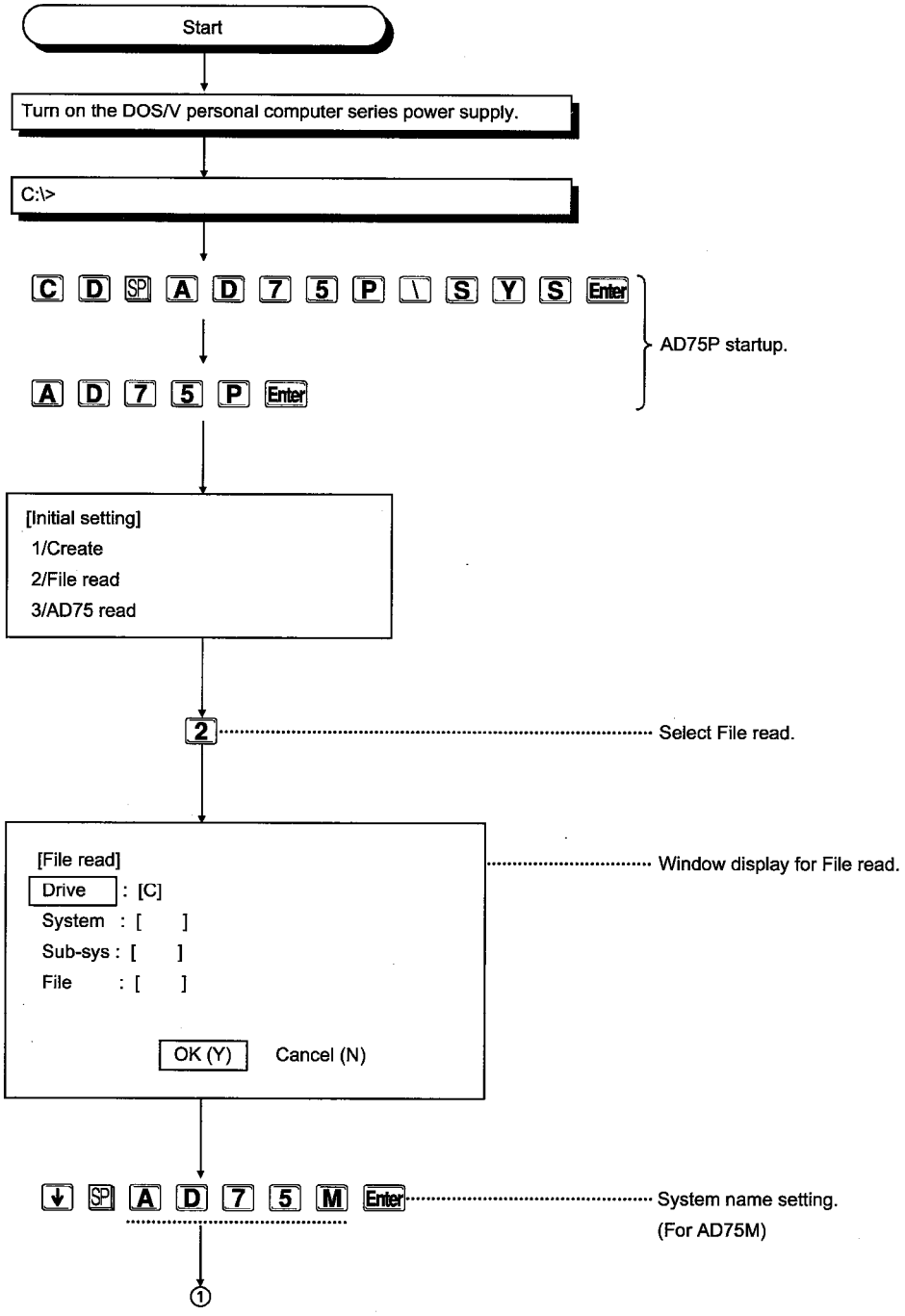


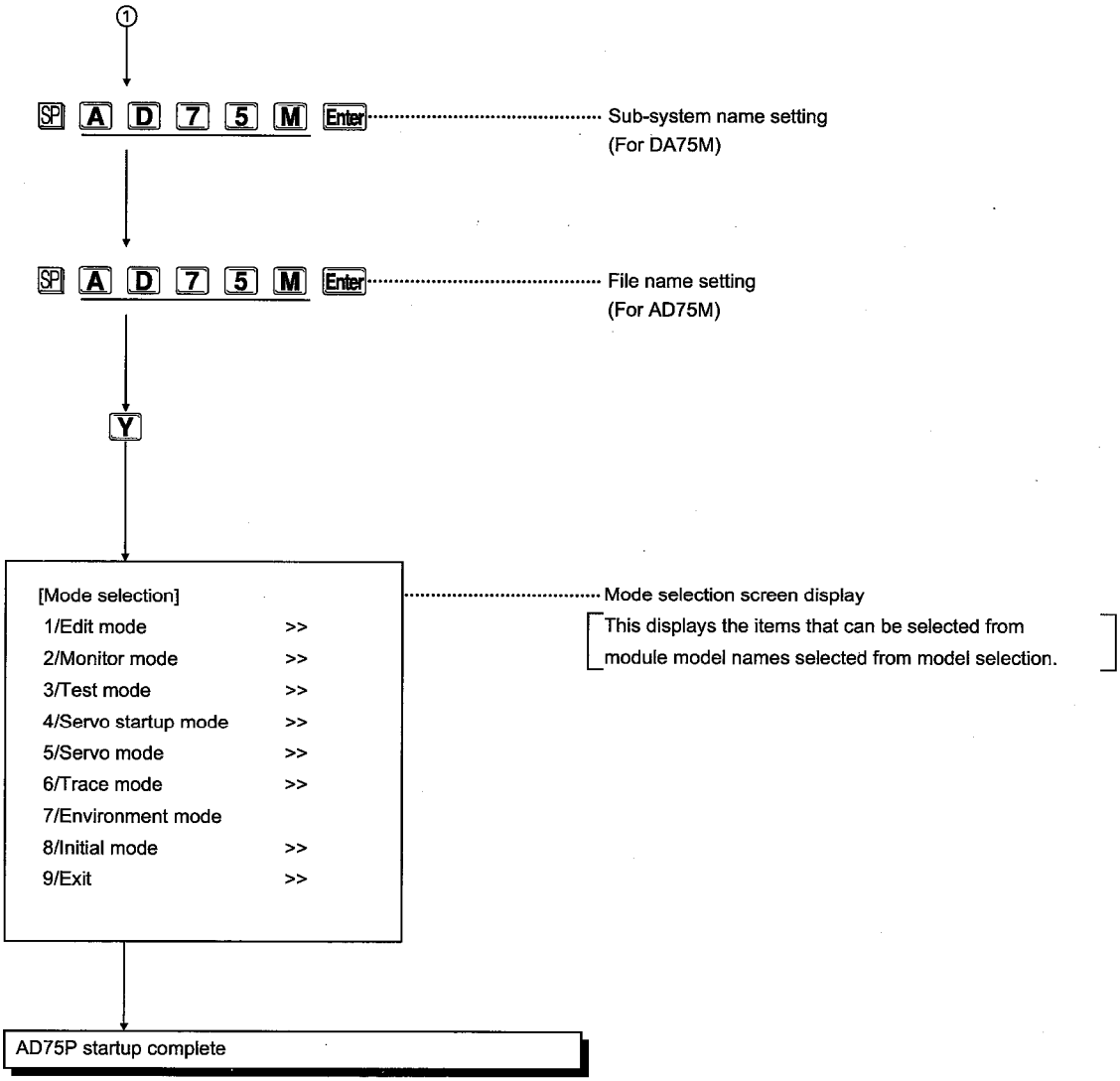

①
[Model selection]
1/AD75P1 : 1 axis
2/AD75P2 : 2 axes
3/AD75P3 : 3 axes
4/AD75M1 : 1 axis
5/AD75M2 : 2 axes
6/AD75M3 : 3 axes
7/AD75P1S3 : 1 axis
8/AD75P2S3 : 2 axes
9/AD75P3S3 : 3 axes
6
Select AD75M3.
Do you want to set filename?
Yes (Y)
No (N)
Selection window display for file name specification.
Y
N
[Specify file name]
Drive : [C]
System : [ ]
Sub-sys : [ ]
File : [ ]
Comment: [ ]
OK (Y)
Cancel (N)
Window display for file name specification.
↓ SP A D 7 5 M Enter
System name setting.
(For AD75M)
②
⑫


②
⑫
SP A D 7 5 M Enter
Sub-system name setting.
(For AD75M)
SP A D 7 5 M Enter
File name setting.
(For AD75M)
Y
[Mode selection]
1/Edit mode >>
2/Monitor mode >>
3/Test mode >>
4/Servo startup mode >>
5/Servo mode >>
6/Trace mode >>
7/Environment mode
8/Initial mode >>
9/Exit >>
Mode selection screen display
This displays the items that can be selected at the module model name selected using model selection.
AD75P startup complete

(2) File read

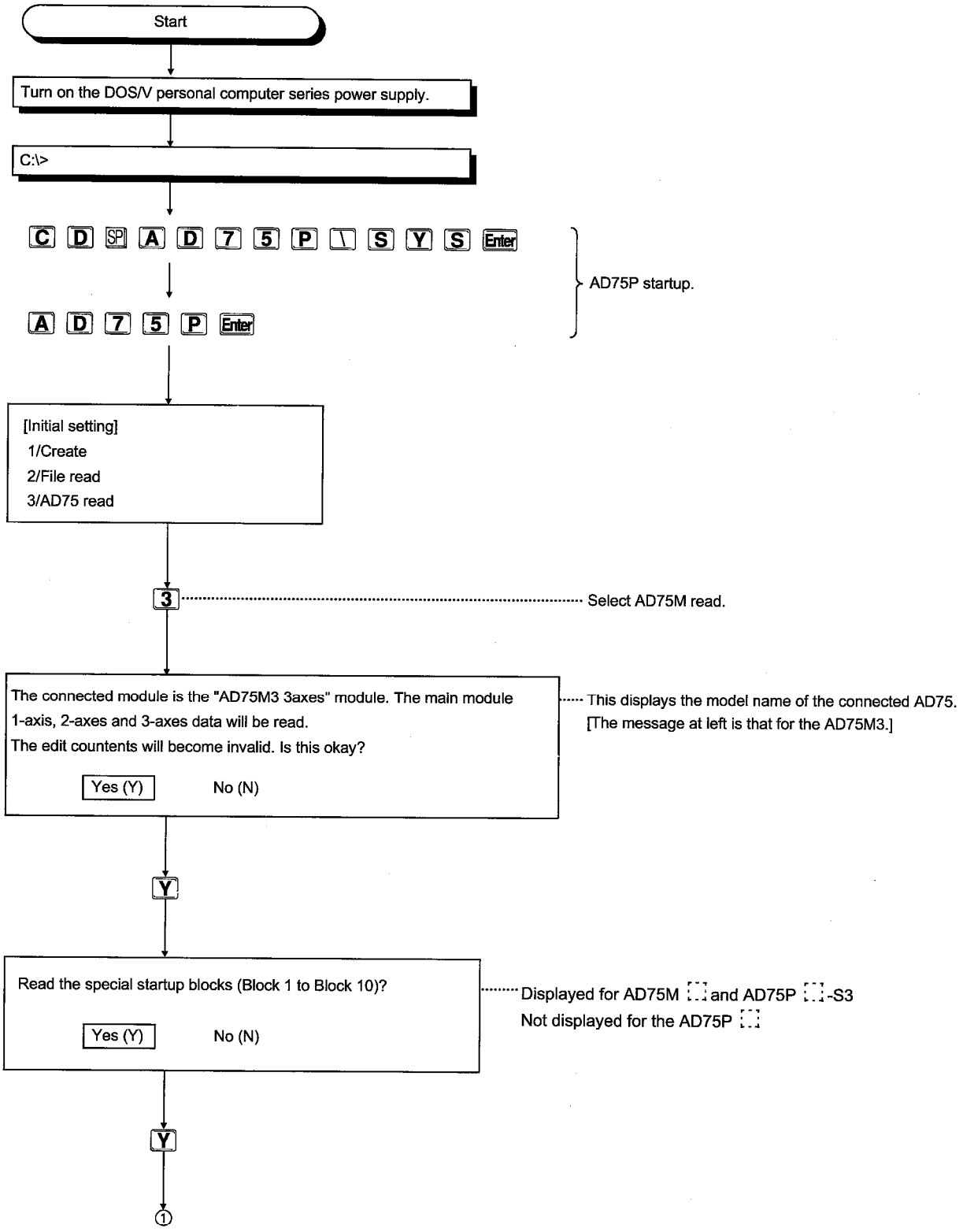
The procedure for reading data from the file created File read is shown below.

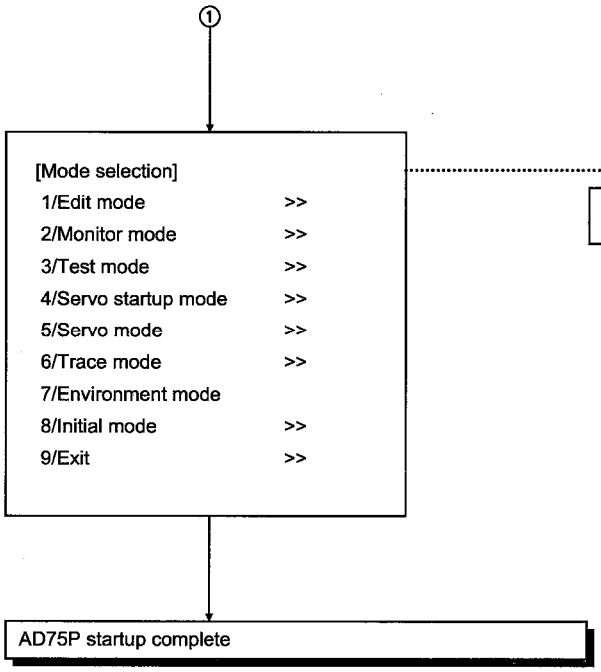



①
SP A D 7 5 M Enter
Sub-system name setting
(For DA75M)
SP A D 7 5 M Enter
File name setting
(For AD75M)
Y
[Mode selection]
1/Edit mode >>
2/Monitor mode >>
3/Test mode >>
4/Servo startup mode >>
5/Servo mode >>
6/Trace mode >>
7/Environment mode
8/Initial mode >>
9/Exit >>
Mode selection screen display
This displays the items that can be selected from module model names selected from model selection.
AD75P startup complete

(3) AD75 read

The procedure for reading data from the AD75 connected to IBM PC/AT is shown below.





Mode selection screen display

This displays the items that can be selected from module model names selected from mode selection.

6 EDIT MODE

6.1 Item Titles

The edit mode contains the following functions.

(1) Edit mode functions

Edit mode

Positioning data edit	This sets the pattern, Control Method, Ac (acceleration time), Dc (deceleration time), Address, Arc Address, Speed, Dwell Time, and M Code.
Start block edit	This sets the Mode, Data No., Special Start, and Parameter.
OPR basic parameter edit	This sets the Method, Direction, Address, Return speed; Creep speed; and Return retry.
OPR extended parameter edit	This sets the OPR dwell time, Travel distance after DOG, OPR accel/decel time, OP distance from Zero and OPR torque limit.
Basic parameter #1 edit	This sets the Unit, Pulse per/Travel per revolution, Unit multiplier, pulse output mode, and rotation direction.
Basic parameter #2 edit	This sets the Speed limit and the Accel/Decel time #0.
Extended parameter #1 edit	This sets the Back lash compensation, the Upper/Lower S/W stroke limit, and the S/W stroke limit mode.
Extended parameter #2 edit	This sets the Accel/Decel time, JOG speed limit value, and JOG operation acceleration/deceleration time selection.
M code comment edit	This sets the M code comment.
Condition data	This sets the Condition data.
Servo basic parameter	This sets the Servo amplifier series connected to the AD75M□, the absolute position detection system valid/non valid, Regenerative brake, External dynamic brake, and Motor type.
Servo adjustment parameter	This sets the servo amplifier Load inertia ratio, Pos-loop gain, and Vel-loop gain.
Servo expansion parameters	This sets the servo amplifier Monitor out offset, Before-alarm data, sampling time selection, and Zero speed.

(2) Alt menu function

File

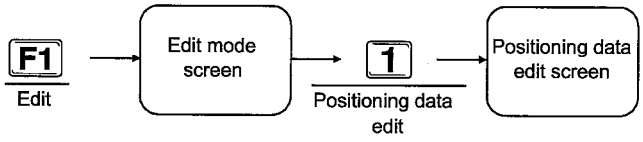
Open	This reads the file in the FD/HD.
Save	This writes the set data to the disk in the specified drive and file name.
Verify	This verifies the specified file with the peripheral equipment contents.
Setup	This sets the required printing conditions when a printout is made.
Print	This prints the set contents specified by print setting.
Delete	This deletes the specified file.
Copy	This copies the file specified in the transfer source to the file specified in the transfer destination.
DOS	This displays the DOS prompt.
Exit	This ends the executing mode and displays the mode selection menu.

AD75	AD75 Upload	This reads the data set by the AD75 main module to the peripheral equipment contents memory.
	AD75 Download	This batch writes the peripheral equipment contents to the AD75 main module buffer memory.
	AD75 Verify	This compares the AD75 main module setting data with the peripheral equipment contents.
	OS	This displays the version of the OS installed in the main module side.
	F-ROM request	This sets the settings required for reading and writing between the AD75 main module buffer memory and the flash ROM.
Config.	Axis switch	This switches the axis that is the target of the display screen.
	Aux. Menu disable (Display)	This deletes the auxiliary menu window that is displayed and linked to the cursor movement by the positioning data edit, start block edit, condition data edit, positioning test, and start test.
	F-ROM auto write	This sets whether or not F-ROM write is automatically executed when the peripheral equipment data is written to the AD75 main module.
	Start block access	This sets whether or not the special start block is affected when reading, writing, or browsing from the AD75P□-S3/ AD75M□.
Edit	Copy	This copies the positioning data, start block, and M code comment.
	Jump	This moves the cursor position to the specification No. in the positioning data, start block, and parameter screen.
Option	Initialization	This initializes the positioning data, start block, parameters, and conditions data.
	Error check	This checks the data for the set positioning.
	AD71 → AD75 conv	This converts the AD71 data to AD75 data. (When the AD71 data is stored in a DOS formatted floppy disk.)

6.2 Setting Positioning Data

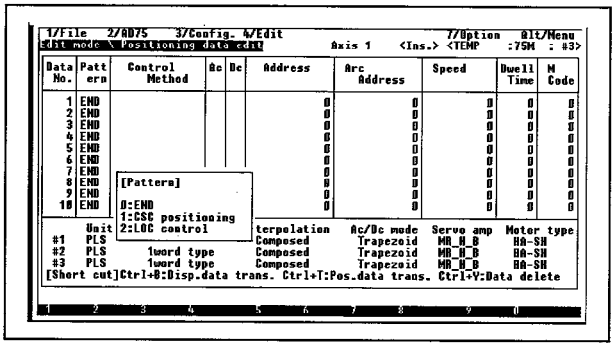
The pattern, control format, acceleration time, deceleration time, positioning address, specified speed, dual time, and M code are set in the positioning data edit screen.
The setting range of the items displayed by a cursor are displayed in the menu window, so they can be se by selecting the displayed No. or by setting the value displayed within the range.

Basic operation



Positioning data edit screen and operation

Positioning data edit screen



- Move cursor : ↑, ↓, ←, →
- Other interpolation control axis address setting : Tab
- Data : [Numeric value] → Enter

Explanation

- **Positioning edit screen display**
  The following axis edit screens are displayed in the positioning data edit screen.
  When switching to another axis, make the axis switch using Alt menu's 3/settings axis switch. (Refer to Item 17.2.)

- **Data No.**
  This displays the positioning data No. when positioning is started. The positioning data can be set in the range of positioning data No. 1 to 600.

- **Control Method**
  This displays the Control Method that can be set using the positioning module (AD75P [ ], AD75M [ ], and AD75P [ ]-S3) selected using model selection during the AD75P startup. Set the Control Method to be displayed.

- **Ac (Acceleration time setting)**
  This displays the acceleration time value set using the basic parameter #2 or the extended parameter #2.
  - 0: Basic parameter #2 acceleration time 0 value
  - 1: Extended parameter #2 acceleration time 1 value
  - 2: Extended parameter #2 acceleration time 2 value
  - 3: Extended parameter #2 acceleration time 3 value

- **Dc (Deceleration time setting)**
  This displays the deceleration time value set using basic parameter #2 or the extended parameter #2.
  - 0: Basic parameter #2 deceleration time 0 value
  - 1: Extended parameter #2 deceleration time 1 value
  - 2: Extended parameter #2 deceleration time 2 value
  - 3: Extended parameter #2 deceleration time 3 value

  Set the deceleration time used for 0 to 3.

- **Address**
  This displays the setting range for the unit (mm, inch, degree, PULSE) set using basic parameter 1. Set an Address that is within the displayed range.

● **Arc Address**

This displays the setting range for the unit (mm, inch, degree, PULSE) set using basic parameter #1. Set the address within the displayed range. The Arc Address is only required when arc interpolation control is conducted.

- Auxiliary point specification:
  This sets the address of the points to which the arc passes when arc interpolation is conducted from the start point address (Current stop address) to the end point address.
- Center point specification:
  This sets the arc center point address when arc interpolation is conducted from the start address (Current stop address) to the end point address.

● **Speed**

This displays the setting range for the unit (mm, inch, degree, PULSE) set using basic parameter #1. Set the speed within the displayed range. Enter -1 when setting to use the current speed.

● **Dwell Time**

Set the Dwell Time within the range of "1 to 65535". When Dwell Time is not specified, set the setting 0.

● **M Code**

Set the M Code to within the range of "1 to 32767". When the M Code is not specified, set the setting 0.

Points

● **Setting from the auxiliary menu**

(1) Items that can be specified by using No. within the auxiliary menu window.
- Pattern, Control Method, Ac (acceleration time), Dc (deceleration time)

(2) Items for which numeric value can be entered by following the auxiliary menu window guidance.
- Address, Arc Address, Speed, Dwell Time, and M Code

● **Other interpolation control axis address settings**

Other axis addresses can be set when interpolating Addresses and Arc Addresses. The setting procedure is as follows.

[1] Move the cursor to the Address or Arc Address setting column.

[2] Push the [Tab] key.

[3] Enter the numeric value.
Push the [Enter] key to set the interpolated axis address.

● **Setting item check**

An error check can be conducted for the positioning data setting.

<Check contents>

[1] Is the Control Method set?

[2] Is the Speed set?

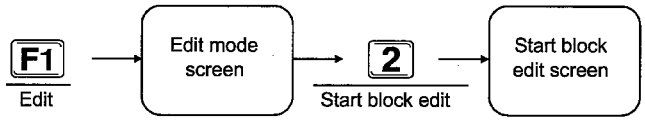
For information regarding the error check refer to Item 22.3.

● **When the Control Method is a JUMP instruction, set the JUMP destination data in the Dwell Time setting column and the JUMP conditions in the M Code setting column.**

6.3 Start Block Edit

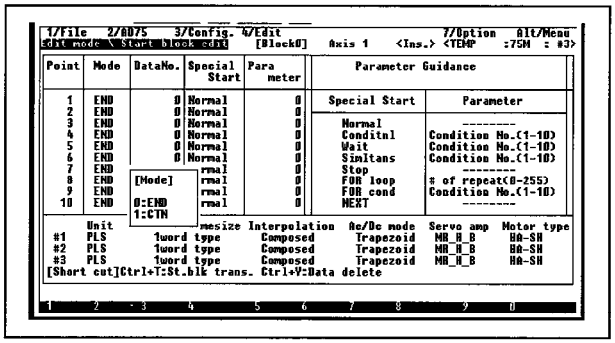
This sets the positioning data No. and start method that conduct block start contained in the positioning data set in the positioning data edit screen. The possible setting range is from 1 to 50 points.
When the cursor is displayed in the shape and special start, the setting range is displayed in the auxiliary menu window, so select the displayed No.

Basic operation



Start block edit screen and operation

Start block edit screen



- Move cursor : ↑, ↓, ←, →
- Data : [Numeric value] → Enter

Explanation

- **Data No. setting range**
  This sets the positioning data No. that conducts block movement for the positioning data specified in the Positioning data edit screen. Set the positioning data No. within the range of 1 to 600.

- **Mode**
  This sets whether to end or continue the positioning start. The data No. set in points after the "Exit" is set are not started.

- **Special Start**
  Select the Special Start items displayed in the auxiliary menu window by their No.

- **Parameters**
  Parameters do not need to be set when "Normal", "Stop", and "NEXT" are set using Special Start. The relationship between the Special Start and the Parameter settings is shown below.

Special Star	Parameters
Conditnl Wait Simltans FOR cond	Condition No. 1 to 10 (Refer to Item 6.11)
FOR loop	0: Infinite loop 1 to 255

Points

- 0 is set for the Parameter initial value. This corresponds to "Infinite loop" when "For loop" is set, so be careful.
- For AD75P□-S3 and AD75M□, the blocks 0 to 10 can be switched using the Alt menu setting start block switch. The start blocks 1 to 10 data is stored in the AD75P□-S31/AD75M□ flash ROM.

6.4 Setting Positioning Parameters

The positioning parameters are divided into the following six types.

- OPR basic parameter
- OPR extended parameter
- Basic parameter #1
- Basic parameter #2
- Extended parameter #1
- Extended parameter #2

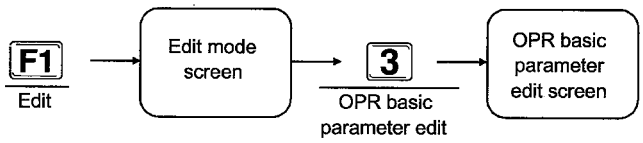
Set these to match the system that conducts positioning control in the AD75.

Conduct an error check (Refer to Item 22.3) before writing the set positioning parameters in the AD75 to be sure that no errors occur in the set data.

6.4.1 Setting OPR basic parameters

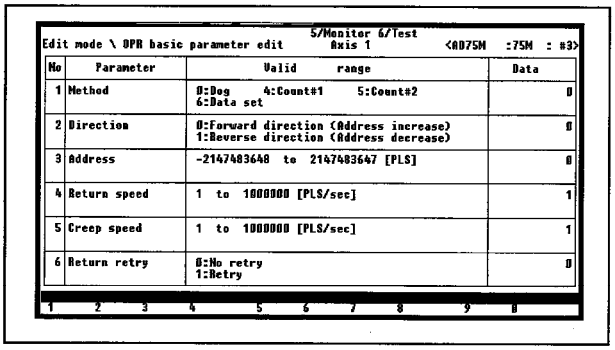
The Method/Direction, Address, Return speed, Creep speed, and Return retry can be set.

Basic operation



OPR basic parameter edit screen and operation

OPR basic parameter edit screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

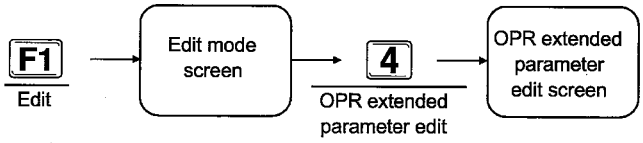
Explanation

- The setting range is displayed in the OPR basic parameter edit screen.
  Set the data within the displayed setting range.

6.4.2 Setting OPR extended parameters

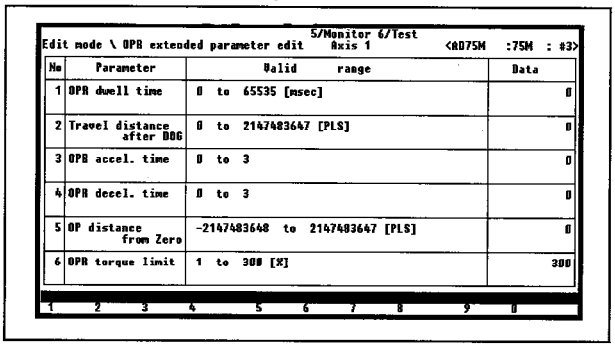
This sets the OPR dwell time, Travel distance after DOG, OPR accel/decel time, OP distance from Zero, and OPR torque limit.

Basic operation



OPR extended parameter edit screen and operation

OPR extended parameter edit screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

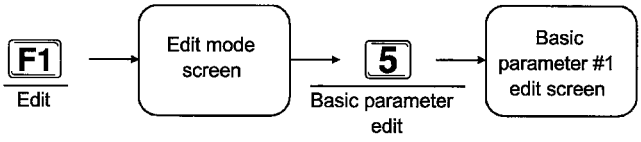
Explanation

- The setting range is displayed in the OPR extended parameter edit screen.
  Set the data within the displayed setting range.

6.4.3 Setting basic parameter #1

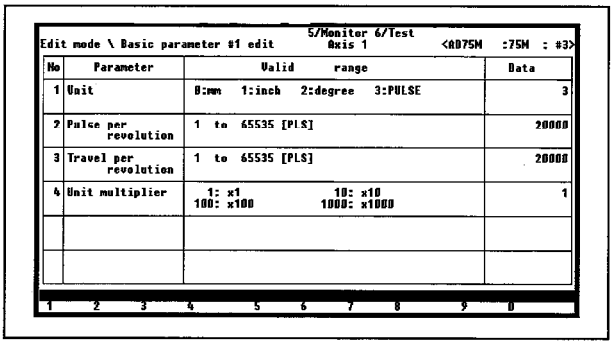
This sets the Unit, Pulse per/Travel per revolution, Unit multiplier, pulse output mode, and rotation direction.

Basic operation



Basic parameter #1 edit screen and operation

Basic parameter #1 edit screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

Explanation

- The setting range for the module set in setting unit is displayed in the basic parameter #1 edit screen. Set the data within the displayed setting range.

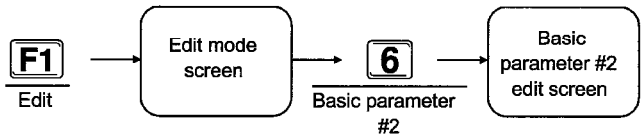
Caution

- Changing the Unit to no create could cause the positioning data Address and Arc Address, etc. to exceed the setting range, so be sufficiently careful.

6.4.4 Setting basic parameter #2

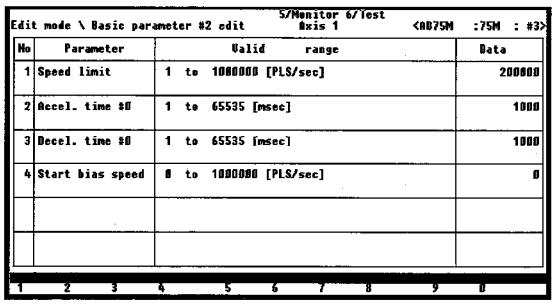
This sets the Speed limit and the Accel/Decel time #0.

Basic operation



Basic parameter #2 edit screen and operation

Basic parameter #2 edit screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

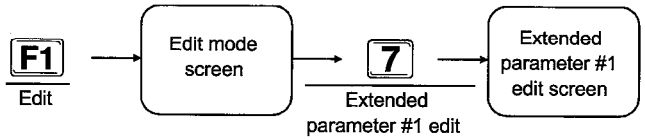
Explanation

- This sets the setting range for the module set in the basic parameter #1 in the basic parameter #2 edit screen. Set the data within the displayed setting range.

6.4.5 Setting extended parameter #1

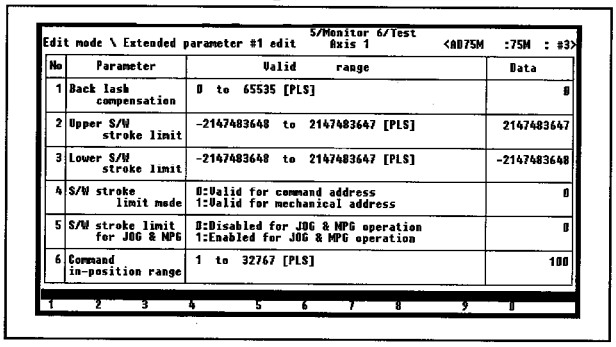
This sets the Back lash compensation, the Upper/Lower S/W stroke limit, the S/W stroke limit mode, etc.

Basic operation



Extended parameter #1 edit screen and operation

Positioning data edit screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

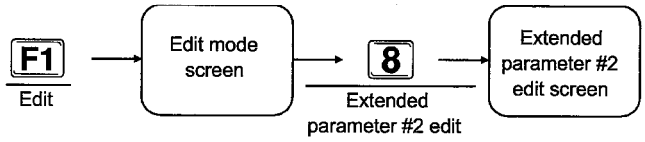
Explanation

- This displays the setting range for the module set in basic parameter #1 in the extended parameter #1 edit screen. Set the data within the displayed setting range.

6.4.6 Setting extended parameter #2

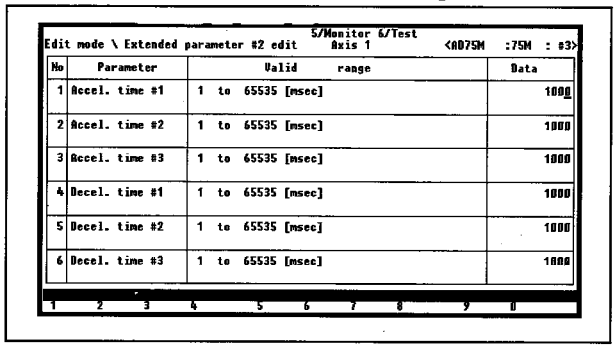
This sets the Accel/Decel time, JOG limit value, and JOG operation acceleration/deceleration time selection.

Basic operation



Extended parameter #2 edit setting screen and operation

Extended parameter #2 edit setting screen



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter

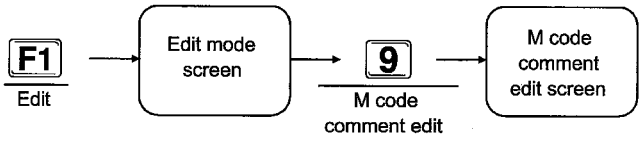
Explanation

- This displays the setting range for the module set in the basic parameter #1 in the extended parameter #2 edit screen. Set the data to within the displayed setting range.

6.5 Setting M Code Comment

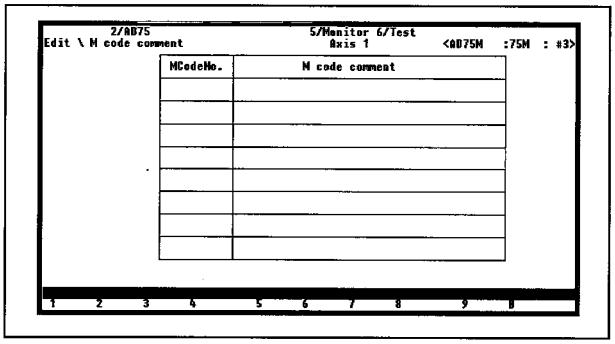
This sets the M code comment.

Basic operation



M code comment edit screen and operation

M code comment edit screen



- Move cursor : [↑], [↓], [←], [→]
- M code No. : [M code No.] → Enter
- M code comment : [M code comment] → Enter

Explanation

- The M code can be set in the range of 1 to 32767. The M code comment can be set for a maximum 50 for axis 1 to axis 3.
- There is no problem even if the same M code is set in multiple different M code comments. However, the error check will issue an error because it will view this as there being multiple frame M codes existing.
- The M code comments are sort controlled inside the peripheral equipment, so the M Code No. order is automatically rearranged when the screen is switched or [Alt] is pushed twice.
- The M code comment can be set using alphanumeric in a 32-character half width space.

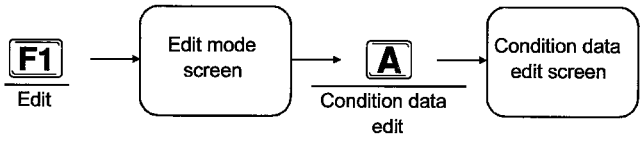
Point

- The M code comment cannot be transmitted to the AD75 main module.

6.6 Setting Condition Data

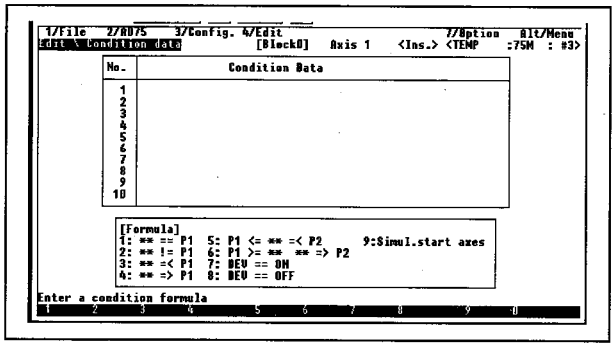
This sets the condition data when conditions are started.

Basic operation



Conditions data edit screen and operation

Condition date edit screen



- Move cursor : [↑], [↓]
- Address : [Address] → Enter
- Parameter : [Parameter] → Enter
- Device : [Device] → Enter
- Positioning data No. : [Data No.] → Enter

Explanation

(1) The symbols used in the auxiliary menu window are explained below.
**.....Address
P1, P2.....Parameter
DEV.....X, Y device

- **Selection of condition operator**
  Enter the No. of the Formula displayed in the auxiliary screen.
- This can be terminated by pushing the [Esc] key. When terminated the original condition data becomes valid.

- **Enter the parameter, condition target**
  <Example>
  [Parameter] ≤ (Address), (Address) ≥ [Parameter]
  Enter the numeric value of the address within the parentheses. When there are two address entry locations set them using the same numeric value.
  In the auxiliary menu window like the one below will be displayed what parameters are input.

[Type]
1: WORD
0 to 65535
2: DOUBLE WORD
-2147483648 to 2147483647

Enter the numeric value after selecting the numeric value type (word, double word). When there are two parameter entry locations then the numeric value type will become the same.

- **Device input**

  <Example>

  [ ] = ON
  Device

  An auxiliary menu window like that shown below is displayed during device entry.

[Device]	
X device	X00-X0F
Y device	Y10-Y1F

  When conducting entry first input either X or Y and in the X device enter 00 to 0F, and for the Y device enter 10 to 1F.

- **Simultaneous start axis designation**

  <Example>

  { } 1 axis No.( ), 2 axis No. ( ), 3 axis No.( )
  corresponding axis — Positioning data No. — Positioning data No. — Positioning data No.

  An auxiliary menu window like the one below is displayed during axis specification.

[Corresponding axis]	
1: 1 axis	4: 3 axis
2: 2 axis	5: 1 - 3 axes
3: 1 - 2 axes	6: 2 - 3 axes

  Enter the affected corresponding axis specification No. to specify the 1 axis, 2 axis, and 3 axis positioning data No. The 1 axis, 2 axis, and 3 axis positioning data No. can be set regardless of the effected corresponding axis specification, but the settings will be ignored.

- When new Formula is selected for items that are already set in the condition data, the prior condition data is deleted and the newly selected Formula is displayed.

- **Axis switch**

  Condition data is set for each axis. For information regarding changing axes, refer to item 17.2.

Model Name	AD75P □	AD75P □-S3	AD75M □
Application			O

6.7 Setting Servo Parameter

The servo parameters are the data that is used for the servo amplifier connected to the AD75M □, and consists of the following three types.

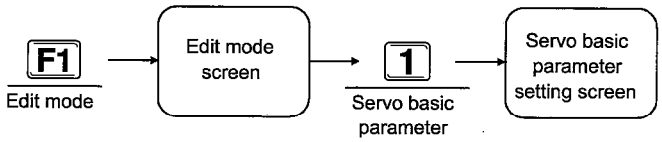
- Servo basic parameters
- Servo adjustment parameters
- Servo expansion parameters

For information regarding the servo parameter setting range, refer to the instruction manual of the servo being used.

6.7.1 Setting servo basic parameters

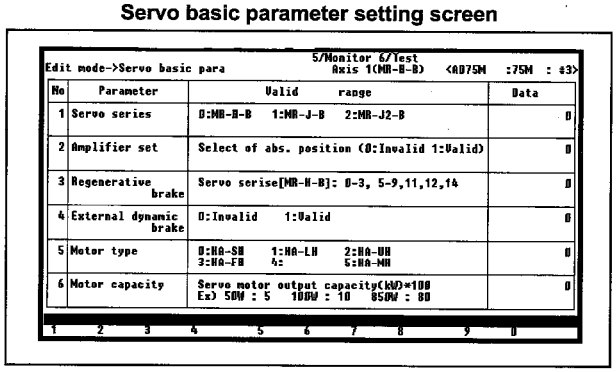
This sets the series of the Servo amplifier connected to the AD75M □, whether the absolute position system is valid/non valid, the Regenerative brake, the External dynamic brake, and the Motor type.

Basic operation



Servo basic parameter setting screen and operation

Servo basic parameter setting screen



Explanation

- **Servo series**
  This sets the servo amplifier connected to the AD75M □.
- **Amplifier set**
  Set whether there is the absolute positioning detection device or not.
  - 0: Used for incremental
  - 1: Used for absolute position system
    The positioning address setting range is changed when "1" is set.
    Confirm the positioning address setting range of the absolute positioning system by AD75M □ User's Manual.
- **Regenerative brake**
  This is used to select the regenerative option used.
- **External dynamic brake**
  This sets whether or not the External dynamic brake is valid.
- **Motor type**
  This selects the Motor type used.
- **Motor capacity**
  This sets the motor output capacity (kW) at x100. (With the exception of 50W, numerals in the module position are rounded down.)
  - Set 50W to 5.
  - Set 850W to 80.
  - Set 10 kW to 1000.
- **Motor RPM**
  This sets the motor rated rpm (r/min) 10^{-3} value.
  - 1000 (r/min): 1
  - 2000 (r/min): 2
  - 3000 (r/min): 3

- **Feed back pulse**
  This sets the Feed back pulse (resolution per servo motor rotation).

- **Rotation direction**
  This sets the rotation direction from the servo motor load side.

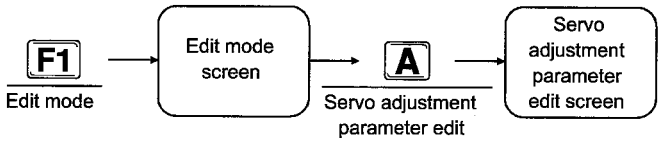
- **Auto-tuning (ATU)**
  This sets the Auto-tuning.
  When MR-JB is used: Even if the 0/1 is selected the setting automatically becomes "2" after auto tuning.

- **Servo response set**
  This sets the Auto-tuning responsiveness.
  - Make the setting value smaller when hatching occurs in the machine or when the gear sound becomes loud.
  - When increasing performance, such as making the stop setting time quicker, make the Data larger.

6.7.2 Setting servo adjustment parameters

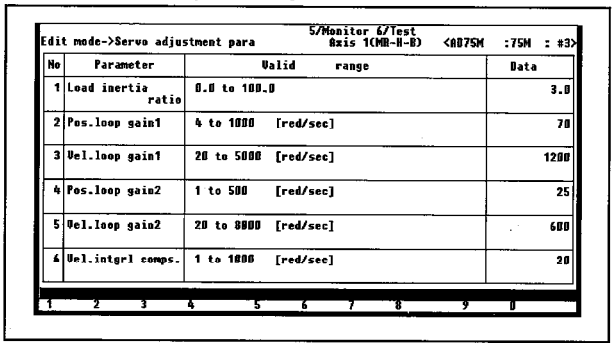
Set the servo adjustment parameters to match the servo amplifier that is used. The displayed setting information differs depending on the "Servo series" set in the servo basic parameters.

Basic operation



Servo adjustment parameter edit screen and operation

Servo adjustment parameter edit screen



• Move cursor : ↓, ↑

Explanation

- **Load inertia ratio (DG2)**
  This sets the load inertia moment ratio for the servo motor.
  When auto tuning is executed, it automatically becomes the auto tuning result.
- **Pos-loop gain 1 (PG1)**
  This sets the Pos-loop 1 gain.
  Making the Pos-loop gain 1 larger increases the followability of the position instruction.
- **Vel-loop gain 1 (VG1)**
  Normally this is used as an initial value.
  Making a Vel-loop gain 1 larger increases the responsiveness, but this also makes vibration and noise occur more easily.
- **Pos-loop gain 2 (PG2)**
  This sets the Pos-loop 2 to gain.
  This increases the responsiveness of the load outside column. Making the Pos-loop gain 2 larger increases the responsiveness but makes it easier for vibration and noise to occur.
- **Vel-loop gain 2 (VG2)**
  This sets the Vel-loop 2 to gain.
  Set this when vibration occurs, such as for machines with low rigidity or machines with large backlash.
- **Vel-intgrl comps. (VIC)**
  This sets the constant for integral compensation.
- **Notch Filter (NCH)**
  This sets the machinery resonance frequency.
- **Feed forward gain (FFC)**
  - This sets the Feed forward gain coefficient during position control. When operating at a constant velocity more accumulated pulse is generated when set to 100%. However, the overshoot will become larger during rapid acceleration and deceleration. (The scale for the acceleration and deceleration time when set at 100% is 1s or more.)
  - When this parameter is set, set the servo basic parameter auto tuning to "Invalid".

- **In-position range (INP)**
  This is the servo amplifier deviation counter residual pulse amount setting.

- **Solenoid break out (MBR)**
  This sets the delay time from when the Solenoid break interlock signal (MBR) turns off to when the base circuit is broken.

- **Monitor out 1 select (MON)**
  This is used to select the signal that is output by the servo amplifier analog motor CH1.

- **Monitor out 2 select (MON)**
  This is used to select the signal that is output from the servo amplifier analog motor CH2.

- **Amplifier EMG selection**
  This is used to select whether or not the external emergency stop signal (EM1) is valid/Invalid.
  Valid: used
  Invalid: not used

- **Carrier frequency selectivity**

- **Serial encoder cable selection**
  This selects the Serial encoder cable to be used.

- **Min. vibration CTL. func. select**
  This is used to set the vibration suppression during stop.

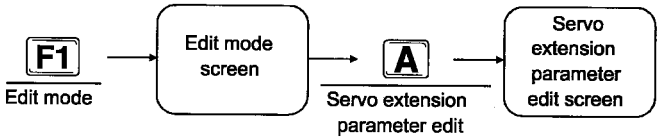
- **Selected motorless operation**
  This is used to make no motor operation valid

- **Solenoid break inter-lock out**
  This is used to select the Solenoid break inter-lock out timing.
  - 0:
    The next state is output regardless of the servo motor RPM.
    [1] Servo OFF
    [2] Alarm being generated
    [3] Emergency stop input OFF (valid)
  - 1:
    Output for the above [1] to [3] conditions and when the servo motor rotation speed is below the servo parameter "zero speed".

6.7.3 Setting servo extension parameters

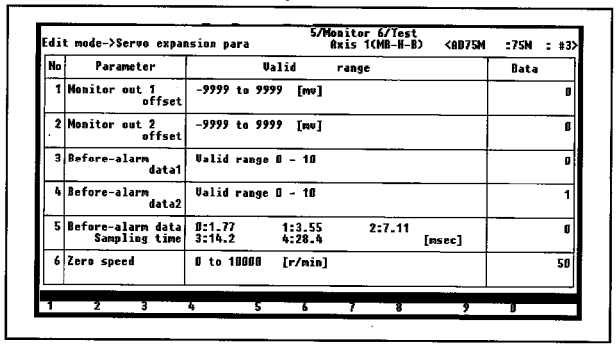
Set the servo extension parameters to match the servo amplifier that is used.

Basic operation



Servo extension parameter edit screen and operation

Servo extension parameter edit screen



• Move cursor : ↓, ↑

Explanation

- **Monitor out 1 offset**
  This sets the Monitor out 1 offset.
- **Monitor out 2 offset**
  This sets the Monitor out 2 offset.
- **Before-alarm data**
  This sets the data to the analog output when an alarm occurs.
- **Zero speed**
  This sets the motor speed to be determined as zero.
- **Ex. error alarm lvl.**
  This sets the value to the output during excessive residual pulse alarm.
- **PI-PID switching position droop**
  This sets the position droop value to be switched in the PI-PID control during position control.
- **Servo amplifier type**
- **Torque limit revision**
  This is set when the torque control range increases up to the velocity limit value during torque control.
- **Vel. intgrl comps. (Actual velocity differential compensation)**
  This sets the actual velocity loop differential compensation value.

6.8 Alt Menu Operation

6.8.1 File menu

For details regarding the File menu, refer to Chapter 15.

6.8.2 AD75 menu

For details regarding the AD75 menu, refer to Chapter 16.

6.8.3 Config. menu

For details regarding the Config. menu, refer to Chapter 17.

6.8.4 Edit menu

For details regarding the Edit menu, refer to Chapter 18.

6.8.5 Option Menu

For details regarding the Option menu, refer to Chapter 22.

7 MONITOR MODE

7.1 Monitor Mode Functions List

The monitor more contains the following functions.

(1) Monitor mode functions

Monitor mode	Operation monitor	This conducts the operation status monitor.
	Positioning data monitor	This conducts the positioning data monitor.
	Start block monitor	This conducts the start block monitor.

(2) Alt Menu Functions

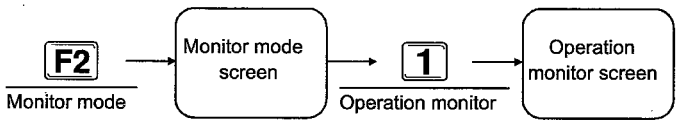
File	Setup	This sets the required printing conditions when a printout is made.
	Print	This prints the set contents specified by print settings.
	Delete	This deletes the specified file.
	Copy	This copies the file specified in the transfer source to the file specified in the transfer destination.
	DOS	This displays the DOS prompt.
	Exit	This ends the executing mode and displays the mode selection menu.

Monitor	Error history	This displays 16 items of error occurrence axis, error No., error contents, and occurrence time.
	Warning history	This displays 16 items for warning occurrence axis, warning No., contents, and occurrence time.
	Start history	This displays the 16 startup history items such as the started axis, start type, start time, and error determination.
	Start with errors	This displays the 16 start history items since the error occurred.
	X device	This displays the X device signal.
	Y device	This displays the Y device signal.
	External I/O	This displays the external I/O signal on/off state status.
	Status information	This displays the status signal on/off status.
	Address monitor	This monitors the target value and sending sub-system value for each axis.
	Speed monitor	This monitors the target speed, current speed, and the send speed of each axis.
	Axis data	This monitors the skip valid flag, skip mode flag, skip command, and external start valid flags for the current value change value for each axis, velocity change value, override value, and axis control data.
	OPR	This monitors the zero signal, near-point signal, and upper and lower limit signal for the origin position of movement amount after near-point dog, torque limit value, and OPR for each axis.
	Special start	This displays the special start information and condition data during condition start.
	JOG & man-pls op	This monitors the JOG speed/direction during JOG operation and the allowable/unallowable information during manual pulser operation, and the multiplier.
	V/P control	This monitors the movement amount after switch on, movement amount change register, switch latch flag, switch allowable flag, flag during velocity control, velocity and position switch allowable flag, and velocity and position switch control movement amount change value for each axis.
	M code comment	This displays the M code comment added to the operation No. of each axis.
	Servo monit	This monitors the motor RPM of the servo motor connected to the AD75M □, the motor current, the deviation counter value, and the servo status.
	Torque control data	This monitors the torque limit setting value of the servo connected to the AD75M □, the torque output setting value, torque change value, and torque limit storage value.
	Servo parameter	This monitors the auto tuning of the servo amplifier connected to the AD75M □, load inertia ratio, position/velocity control gain, and velocity interval compensation value.

7.2 Operation Status Monitor

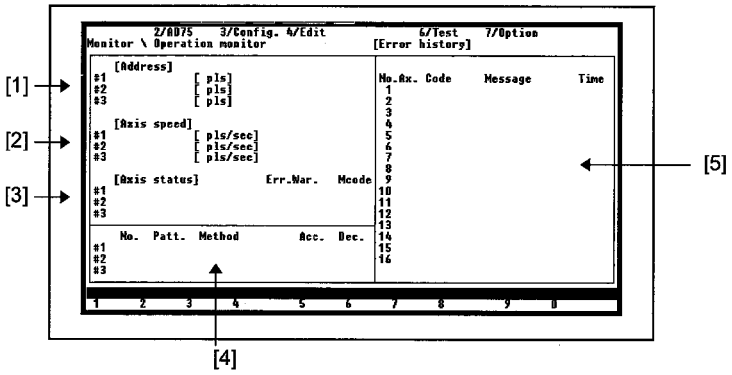
This monitors the operation status.

Basic operation



Operation monitor screen and operation

Operation monitor screen



Explanation

[1] Address

This displays the current executing feed position of each axis. The feed current value becomes the coordinate value and the positioning method is absolute. The OPR address is displayed when OPR is completed. The feed current value is changed by the current value change function.

- The software stroke limit can be applied with the feed current value using the parameter settings.

[2] Axis speed

This displays the actual speed reached during the operation of each axis. 0 is displayed when the axis is stopped.

[3] The Axis status of each axis, Err., War., and M code monitor axis status have the following statuses.

- Stand-by (Starts from the beginning when start is entered.)
- Stop (Restarts when start is entered.)
- JOG operation
- Man-pls operation
- Interpolating
- Analyzing
- Waiting for S start
- Returning to OP
- P-controlling
- Servo unloading } This displays only the
- Servo OFF } AD75M
- V-controlling
- V-controlling in V/P
- P-controlling in V/P
- Error occurrence
- Stepping wait
- Stepping stop
- Step error

The codes corresponding to the status of Err., War., and M code are displayed and other than this, (when normal, when invalid) the value is zero.

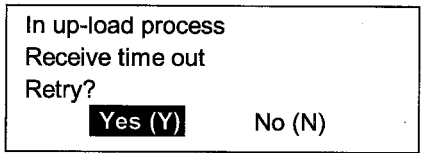
[4] Positioning data monitor

When the operation is switched between JOG operation and manual pulser operation, and when not operating, then there is also no display in the No., Patt., Method, Acc., and Dec. columns. In addition, when returning to the origin and when returning to the high speed origin, then "OPR" and "Rapid OPR" are displayed in the control method.

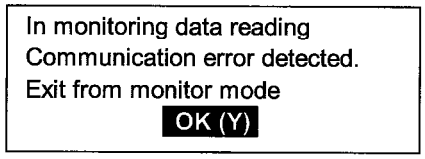
[5] Small screen monitor display

The small screen display can be switched to another small screen by using [Alt] menu's 5/ monitor menu. When starting up the Error history screen is displayed. Small screens can be switched by entering [Page Up] and [Page Down]. For details regarding the monitor menu, refer to chapter 19.

- Normally, the message "Monitoring," is displayed at the bottom of the screen during monitoring. If this message is not displayed, then monitoring is not being conducted.
- When a communication error occurs during operation monitoring, the following dialogue box is displayed.



Press [Y] key to retry.
The following dialogue box will be displayed when the [N] key is entered.

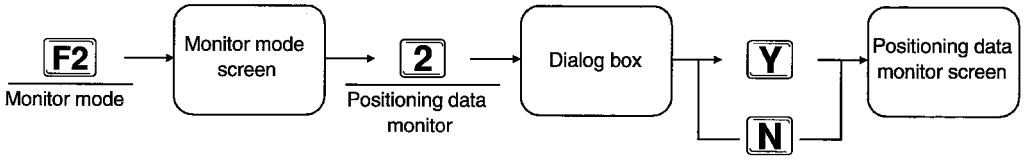


When you want to continue monitoring, then once more re-enter the monitor mode.

7.3 Positioning Data Monitor

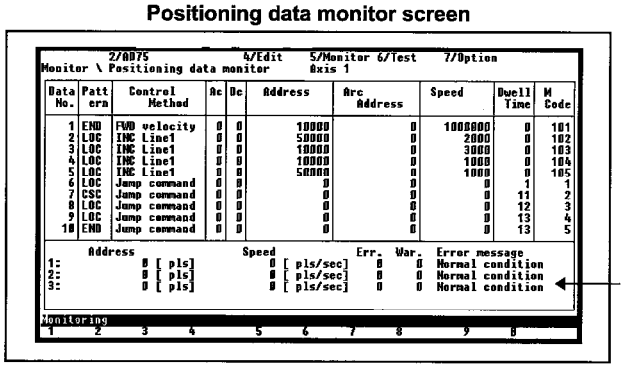
This monitors the positioning data.

Basic operation



Positioning data monitor screen and operation

Positioning data monitor screen



[1]

Explanation

- When 2/positioning data monitor is selected from the monitor mode screen the following dialog box is displayed.

  Do you want to up load the data?
  Yes (Y) No (N)

  When the [Y] key is pushed the AD75 data is read, and the read data is used and monitored.
  When the [N] key is pushed the data set in the positioning edit screen is used and monitored.
  If the data in the AD75 main module and the positioning edit screen differs, correct monitoring cannot be conducted.

- The setting screen of the data No. that is being executed is displayed. An "*" is added next to data Nos. that are being executed.

- Axis setting

  The first time the 1 axis is set then the setting for the second time on is the same as the previous setting. When the specific axis is not executing, then an * is not displayed. For information regarding axis switching refer to Item 17.2.

- Ten modules at a time can be displayed on the screen, including the data No. being executed.

[1] The Address, Axis speed, Err., War., and Error messages for axis 1 to 3 are displayed.

- When a communication error occurs, during operation monitoring, the following dialogue box is displayed.

  In up-load process
  Receive time out
  Retry?
  Yes (Y) No (N)

  Press [Y] key to retry.
  If the [N] key is pushed, the setting dialogue box is displayed.

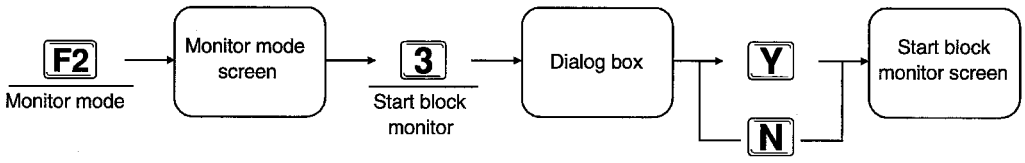
  In monitoring data reading
  Communication error detected.
  Exit from monitor mode
  OK (Y)

  When you want to conduct monitoring, then once more re-enter the monitor mode.

7.4 Start Block Monitor

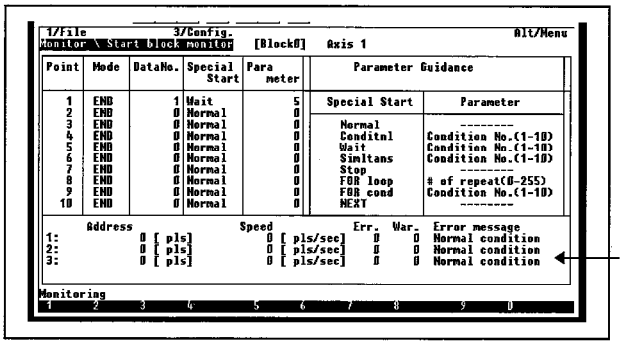
This executes start block monitoring.

Basic operation



Start block monitor screen and operation

Start block monitor screen



[1]

Explanation

- When 3/start block monitor is selected from the monitor mode screen the following dialog box is displayed.

  Do you want to up load the data?
  Yes (Y) No (N)

  When the [Y] key is pushed the AD75 data is read, and the read data is used and monitored.
  When the [N] key is pushed the data set in the positioning edit screen is used and monitored.
  If the data in the AD75 main module and the positioning edit screen differs, correct monitoring cannot be conducted.

- The executing point setting screen is displayed. An "*" is added next to points that are being executed.

- Axis setting

  The setting for 1 axis is set the first time and the settings from the second time on are the same as for the previous axis. For information regarding axis switching, refer to Item 17.2.

- Ten modules at a time can be displayed on the screen, including the executing point.

- For AD75P [ ]-S3 and AD75M [ ], the blocks 0 to 10 can be switched using the Alt menu setting special start block switch.

[1] The Address, Axis speed, Err., War, and Error message for axis 1 to 3 are displayed.

- When a communication error occurs during operation monitoring, the following dialogue box is displayed.

  In up-load process
  Receive time out
  Retry?
  Yes (Y) No (N)

  Press [Y] key to retry.
  If the [N] key is entered, the following dialogue box is displayed.

  In monitoring data reading
  Communication error detected.
  Exit from monitor mode
  OK (Y)

  When you want to conduct monitoring, then once more re-enter the monitor mode.

7.5 Alt Menu Operation

7.5.1 File menu

For details regarding the File menu, refer to Chapter 15.

7.5.2 Monitor menu

For details regarding the Monitor menu, refer to Chapter 19.

8 TEST MODE

8.1 Test Mode Functions List

The test mode functions are as follows.

(1) Test mode functions

Test mode	Operation test & monitor	This monitors the operating status.
	Positioning data test & monitor	This monitors the positioning data and conducts editing.
	Start block test & monitor	This monitors the start block and conducts editing.

(2) Alt menu functions

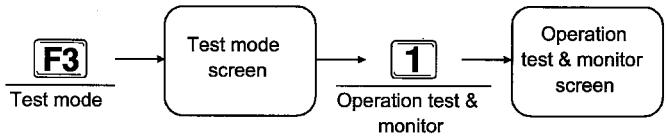
File	Save	This writes the set data to the disk in the specified drive and file name.
	Setup	This sets the required printing conditions when a printout is made.
	Print	This prints the set contents specified by print settings.
	Delete	This deletes the specified file.
	Copy	This copies the file specified in the transfer source to the file specified in the transfer destination.
AD75	OS	This displays the version of the OS installed in the main module side.
	All axes servo ON	This puts the servo amplifier connected to the AD75M ⬚ in the servo ON/OFF status.
	Servo OFF	This puts the servo amplifier connected to the AD75M ⬚ in the servo ON/OFF status for each axis.
Config.	Axis switch	This switches the axis that is the target of the display screen.
	Aux. menu disable (display)	This deletes the auxiliary menu window that is displayed and linked to the cursor movement by the positioning data edit, start block edit, condition data edit, positioning test, and start test.
	Test reconfirm	When the AD75 main module is started up from the peripheral equipment, this sets whether or not to display the execution confirmation.
	Special start block change	This switches the start block 0 to 10.
Edit	Jump	This moves the cursor position to the specification No. in the positioning data, start block, or parameter screen.

Monitor	Error history	This displays 16 items of error occurrence axis, error No., error contents, and occurrence time.
	Warning history	This displays 16 items for warning occurrence axis, warning No., contents, and occurrence time.
	Start history	This displays 16 start up history items such as the started axis, start type, start time, and error determination.
	Start with error	This displays the 16 start history items since the error occurred.
	X device	This displays the X device signal.
	Y device	This displays the Y device signal.
	External I/O	This displays the external I/O signal on/off status.
	Status information	This displays the status signal on/off status.
	Address monitor	This monitors the target value and sending sub-system value for each axis.
	Speed monitor	This monitors the target speed, current speed, and the send speed of each axis.
	Axis data	This monitors the skip valid flag, skip mode flag, skip command, and external start valid flags for the current value change value for each axis, velocity change value, override value, and axis control data.
	OPR	This monitors the zero signal, near-point signal, and upper and lower limit signal for the origin position of movement amount after near-point dog, torque limit value, and OPR for each axis.
	Special start	This displays the special start information and condition data during condition start.
	JOG & man-pls op	This monitors the JOG speed/direction during JOG operation and the allowable/unallowable information during manual pulser operation, and the multiplier.
	V/P control	This monitors the movement amount after switch on, movement amount change register, switch latch flag, switch allowable flag, flag during velocity control, velocity and position switch allowable flag, and velocity and position switch control movement amount change value for each axis.
	M code comment	This displays the M code comment added to the operation No. of each axis.
	Servo monit	This monitors the motor RPM of the servo motor connected to the AD75M □, the motor current, deviation counter value, and servo status.
	Torque control data	This monitors the torque limit setting value of the servo connected to the AD75M □, the torque output setting value, torque change value, and torque limit storage value.
	Servo parameter	This monitors the auto tuning of the servo amplifier connected to the AD75M □, load inertia ratio, position/velocity control gain, and velocity interval compensation value.
Test	Teaching	This sets the teaching method.
	Test condition	This sets the test operation conditions.
	Address change	This changes the current value.
	OPR	This sets the axis that conducts OPR.
	Operation test & monitor	This switches to the operation test & monitor screen.
	Positioning data test & monitor	This switches to the positioning data test & monitor screen.
	Start block test & monitor	This switches to the start block test & monitor screen.
Option	Error check	This checks the data for the set positioning.

8.2 Operation Status Test & Monitor

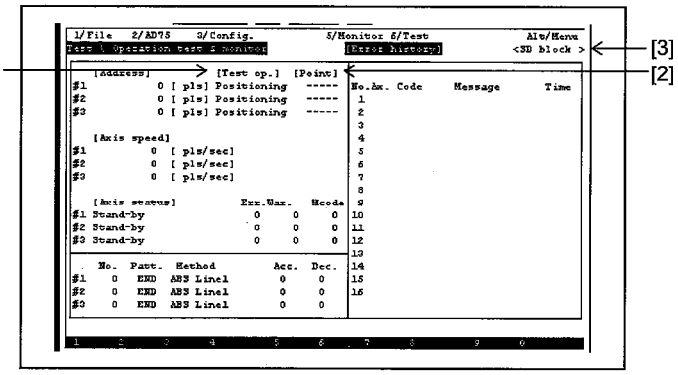
This monitors the operation information.

Basic operation



Operation test & monitor screen and operation

Operation test & monitor screen



- Axis unit start / stop / error clear : F1 to F3
- All axes start / stop : F4
- Edit / stand-by status switching : F5
- Short cut key to [Alt] can be from "6 /test" to "2 / test operating conditions." : F6
- M code ON signal turn off : F6
- All axes error clear : F7
- Test mode exit : F8
- Hard copy : F9
- All stop : F10

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

The following occurs when the [Y] is entered.

AD75M [ ]: The all axes Servo ON request dialog box is displayed.

AD75P [ ] } : The dialog box that reads the data
AD75P [ ]-S3 } from the main module is displayed.

[All Axes Servo ON request dialog box]

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.

When the [Y] key is pushed, the all axis servo on request is conducted.

[Dialog box that reads the data from the main module]

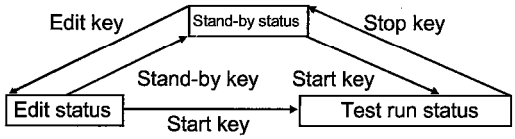
Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75 data is read, and the read data is used and tested.

When the [N] key is pushed the data set in the positioning edit screen is used and tested.

If the data in the AD75 main module and the positioning edit screen differs, correct testing cannot be conducted.

- The test mode is divided into three main states. The states change as shown below when the various keys are entered.



(1) Stand-by status

(a) This is the first status when the peripheral equipment displays the test mode screen. The system also enters the stand-by status when the following operations are conducted.
- When the "Stand-by" key is pushed when in the "Edit status".
- When all of the standard positioning has ended.
- When the user has stopped all axis.
- When a communication error has occurred.

(b) The main module data is displayed on the monitor.

(c) All axis for the AD75 main module are stopped.

(2) Edit status

(a) The changeable "Positioning data" and "Start block data", etc., can be edited and changed. In addition, with a few exceptions, the data cannot be edited or changed when in another status.

(b) The main module data is not displayed on the monitor.

(c) All axes for the AD75 main module are stopped.

(3) Test run status

(a) This is the status that executes positioning data and test operations.
This status starts the AD75 main module axis. Test operation is stopped by pushing the "Stop" key, but when stopping axis from the peripheral equipment a "100: Operating Peripheral Equipment Stop" error will occur. After the error has occurred conducting a "Error reset" will change the main module to the "Stand-by status".

(b) During the test operating state the peripheral equipment monitors the AD75 main module axis status and the system enters the wait status under the following cases.
The system only enters the wait status from the test operation status when the axis status of all axis is "Stand-by status", "Stop status", "STEP wait status", or "STEP stop status".
For this reason, if an error occurs during operation if the axis status that conducts "Error clear" is not in the "Stand-by status" then any peripheral equipment cannot enter the wait state from the test operation status.

(c) During the test mode the peripheral equipment and AD75 main module conduct transmissions at regular intervals to confirm that a connection is still established. (Hereafter this is called the regular transmission.)
If the cable is loose preventing regular transmission, then the "103: Error during operation test mode" is generated in the AD75 main module and requests can no longer be received from peripheral equipment.
When the above conditions occurs in the peripheral equipment during the test operation status, an "Error clear" cannot be conducted from the peripheral equipment which prevents the peripheral equipment from entering the stand-by status.
When the above state occurs press the "SHIFT + [F5] key" (No function displays will be conducted).
This changes the state in the peripheral equipment from "Test run status" to the "Stand-by status".

(d) [F6]: M code off enters the on status when an M code No. is attached to the positioning data No. and the "M code ON signal" enters the off status.
For the AD75 main module, when the "M code ON signal" is in the on state and the "M code on signal" for the operation pattern is off for the "Continue" positioning data No., the system enters the wait status.
When the positioning data No. with M code No. is started, push the [F6]: M code off key to turn off the "M code ON signal".
When a "536: M code on signal on start" error occurs during start up, be sure to push the [F6]: M code off key before conducting the error clear to put the "M code ON signal" in the off status.

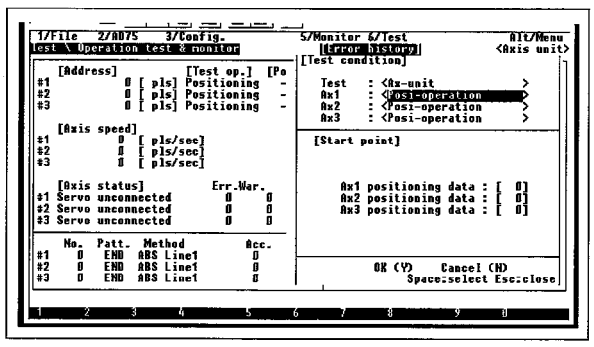
- In the peripheral equipment the settings data for "Positioning data", "Start block data", and "Parameter data", are each independently contained by the "Test mode" and "Edit mode".
  For this reason, the data edited in the "Edit mode" is saved without being changed even when other setting data is read from the AD75 main module following the "Test mode".
- The test operation conditions ([F6]) can be set in the operation test & monitor mode. There are three types of operations in the test operation conditions. There are "Axis unit operation", "Positioning data No. unit operation", and "Start block data unit operation".
- Test operation conditions and setting method
  - Align the cursor with the 1 to axis operation setting items, and push the [SP] key to make the switch and setting as shown below.

<Axis unit > ⟶ <Positioning data No. unit >
<Start block data unit >

  - For the test operation conditions, align the cursor with the test operation item and push the [SP] key to make a switch and setting as shown below.

<Positioning operation > → < Step automatic deceleration operation >
<Step data No. unit operation >

  The start position setting contents are changed in accordance with the switch in test operation.
- Move the cursor between each setting item and press the [Tab] key.
- When the peripheral equipment are in the "Test run status", the data cannot be changed.
- Start position setting contents
  (1) For axis unit operation
  When "Axis position" is selected during test run the following screen is displayed.



(a) To reset the axis 1, axes 2, and axes 3 operating conditions.

(b) Pushing the [Tab] key moves the cursor to the start condition.

(c) Enter the positioning data No.

(d) Push the [Tab] key to move the cursor to the execute (Y) and then press the [Y] key.

(e) The controllable items for theeaxis set by the data No. are [F1] to [F4] ([F4] is also displayed when all axis are specified).

[F1] : Axis 1

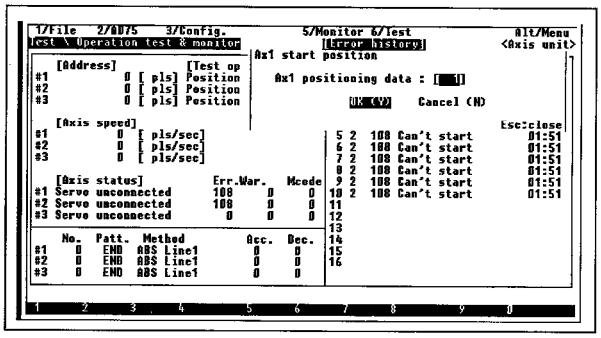
[F2] : Axes 2

[F3] : Axes 3

[F4] : All Axes

(f) When the function key of the axis to be tested is pushed, the Dialog Box asking whether to start is displayed.

(g) When the [Y] key is pushed, the following window is displayed.



New "Positioning data No." to be started is specified here.

The axis data can also be displayed in axis status such as "Stop status" → "Stop" and "Stand-by status" → "Stand-by". To restart an axis that has been stopped using "Stop status", push the [Y] key without changing the "Positioning data No".

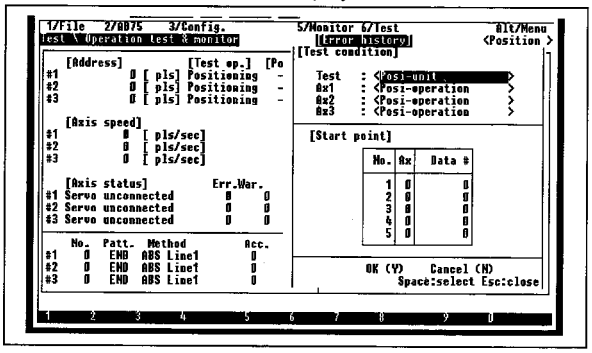
The range in which positioning data No. can be entered for each axis is 1 to 600. This setting is reflected in the setting value of the "Axis start position setting menu" displayed during test monitor axis module operation.

Monitoring the AD75 main module axis status makes it possible to display the following controllable contents for the subject axis. The display items and their contents are shown below.

Classification	Display	Description
Axis unit	Start	Started using the specified positioning data No.
	Stop	Axis is stopped during start.
	Restart	Restart is conducted for the stop axis.
	Error	This conducts error clear when an error has occurred.
	ST start	This starts the step operation.
	ST stop	This stops the step operation.
	ST restart	This restarts the step operation.
All axes	All start	All axes in simultaneous start. It is the same as when all the [Start] buttons are pushed for axis 1 to 3, however start is conducted in the order of axis 1, axes 2, and axes 3.
	All stop	All axes simultaneous stop It is the same as when all the [STOP] buttons are pushed for axis 1 to 3, however stop is conducted in the order of axis 1, axes 2, and axes 3.

(2) For positioning data No. unit operation

When "Pos-unit" is selected from test operation the following screen is displayed.



(a) The axis 1, axes 2, and axes 3 operation conditions can be freely set.

(b) Move the cursor to the start position by entering the [Tab] key.

(c) Enter the axis No. and data No.

(d) Move the cursor to the No. column and enter the [SP] key at the position where you want to start and an "*" will be added.

(e) Use the [Tab] key to move the cursor to the execution (Y) and then enter the [Y] key.

(f) The items that can be controlled by the function keys [F1] to [F3] for the axis with an "*" will be displayed. (Refer to the axis unit operation table.)

(g) When the function key of the axis to be tested is entered a dialog box asking whether or not to start is displayed.

(h) Start is begun by entering the [Y] key.

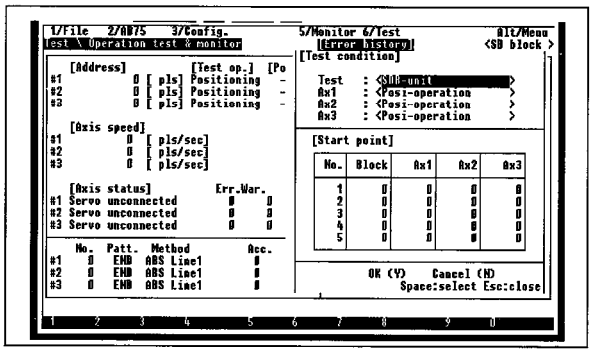
- Specify the axis No. (0 to 3) to be started and the positioning data No. (1 to 600) that corresponds to that axis. When the axis or positioning data No. is "0", data setting completed is displayed. Up to a maximum of 20 items can be specified for the start position.

- When operation begins it begins from the positioning data No. of the No. 1 start position and an "*" is added to that start position No. In addition, it is possible to select the start position where operation will be begun by moving the cursor to the "No." portion and making a selection using the [SP] key. An "*" will be added to the selected starting position to show that operation will begin there. To start operation from the positioning data "No." of the Stop State, enter the [SP] key at the No. that has an "*" added.

- When the positioning data No. 1 has positioning ended and the main module has entered the "Stand-by status", conducting the following operation will start operation from the positioning data No. 2 and operations will restart from the positioning data No. 1 when the main module is in the "Stop status".

(3) For start block data unit

When the "SDB-unit" is selected from the test operation the following screen is displayed.



(a) Clearly set the axis 1, axes 2, and axes 3 operating conditions.

(b) Use the [Tab] key to move the cursor to the start position.

(c) Enter the start block data No.

(d) Move the cursor to the No. column and enter the [SP] key to add an "*" at the position from where operation will start.

(e) Move the cursor to the OK (Y) using the [Tab] key and enter the [Y] key.

(f) When the [F4] key is entered a dialog box asking whether or not to start is displayed.

(g) When the [Y] key is entered the items that can be controlled using function keys are displayed.

(h) Set the step operation using the operation method for the axis and when the axis for which step operation will be done is in he "Step wait status", "n: ST start" will be displayed at the axis unit area. When the "n: ST start" key is pushed the step operation will be restarted.

- Set the "SD block" point (0 to 50) to be started. A "0" is displayed when operation is not possible, so axis for which is this is set cannot be operated. In addition, when "0" is set for all axis, it means the data has ended. Start positions can specify maximum 20 items.

- Normally the positioning is executed from the "Positioning data No." specified in "SD block", but making a specification here makes it possible to execute from any point.

- When all axis have finished the positioning from the No. 1 start position enters the "Stand-by status". Not until after entering the wait state or when you want to start operation can the positioning from the No. 2 start position be executed. In addition, if the positioning for all axes is not completed, then the stop axis will be restarted.

- It is possible to select the start position from which operations will be begun by moving the cursor to the "No." and making a selection using the [SP] key at which time an "*" will be placed at the selected start position to show that operation will start from there. When you want to start from the "Stop status" positioning data No., enter the [SP] key at the "No." portion that is added with an *.

- Move the cursor with the [Tab] key to the OK (Y) or Cancel (N) items and then enter the [Y] key to execute the setting and begin test operation from the beginning. In this case, operation will be started from the beginning even for stop axis, so it is not possible to reexecute stop axis.

- Operation test & monitor screen explanation

[1] Test run status

The current test operation status is displayed as shown below.

Axis unit operation → <Ax-unit>

Positioning data No. unit operation → <Posi-unit>

Start block data unit operation → <SDB block>

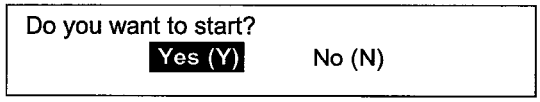
[2] Axis test run

This displays the test operation conditions for each axis set in the "6/Test" → "2/Test conditions" of the [Alt] menu.

[3] The information set in the "Test condition" is displayed. For the "Ax-unit" and the "Posi-unit" the positioning data No. that will conduct the start is displayed and for the "SDB-unit" Operation the point that will conduct the start is displayed.

- Start and stop key operation method

  When the axis is stopped by the "Stand-by status" or "Edit status" and one of the "Start" key's [F1] to [F4] is entered, the following dialog box is displayed.

  The axis is started when the [Y] key is entered. In addition, whether or not this dialog box's display can be set. For setting details refer to Item 17.6.

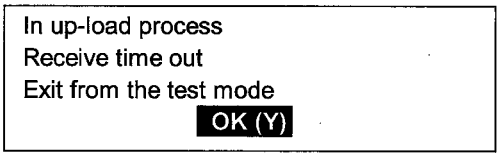
- As with the monitor mode, the monitor information can be seen by switching the small screens using the [Alt] menu's "5/Monitor". In addition, pushing the [F5] (Edit) key makes it possible to conduct some editing using the operation method displayed in the small screen. The small screens and data for which editing can be done are shown below.

Window	Data that can be edited
Axis data	Current value change value, speed change value, overwrite value, step valid flags, step mode, skip command, external start valid.
JOG & man-pls op.	Direction, JOG speed, manual pulser selection, multiplier

  For information regarding the edit method refer to Chapter 19. In addition, depending on the edit state it is possible to switch to other small screens, but editing cannot be conducted.

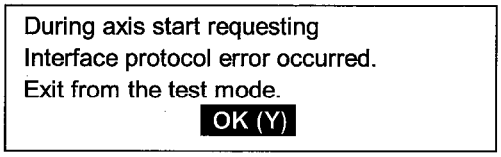
- When the started axis is stopped and the "JOG operation" and "Manual pulser operation" are conducted or commission data is changed, execution is begun from the selected positioning data No., so restart is not possible. In addition, when restarting and the positioning data control method is "Interpolation", the interpolation axis will also be started but the function key on the interpolation side cannot be changed. Therefore, after startup only the axis condition of the started up axis can be checked.

- When a communication error occurs during the test & monitor mode, a dialog box like that shown below is displayed.

  Enter the [Y] key.

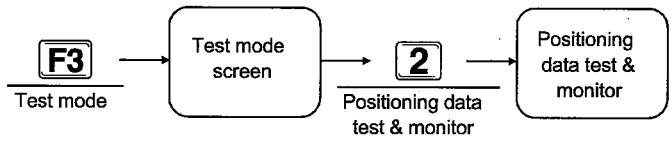
- When a communication error occurs due to an error in the operation procedure during the test & monitor mode, a dialog box like that shown below will be displayed.

8.3 Positioning Data Test & Monitor

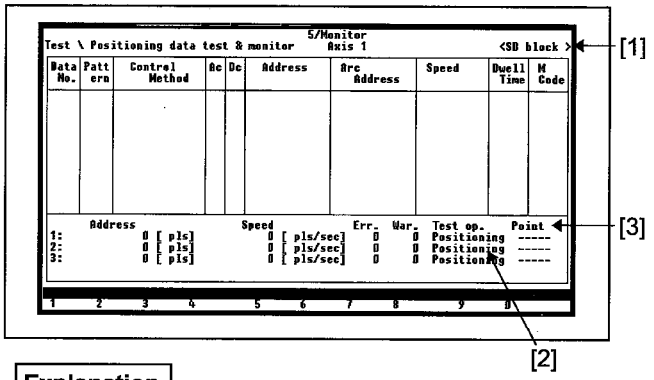
This conducts the positioning data monitoring and editing.

Basic operation



Positioning data test & monitor and operation

Positioning data test & monitor



- Axis unit start / stop : F1 to F3
- All axes start / stop : F4
- Edit / stand-by status switching : F5
- Short cut key to [Alt] can be from "6 /test" to "2 / test operating conditions." : F6
- All axes error clear : F7
- Test mode exit : F8
- Hard copy : F9
- All stop : F10

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

The following occurs when the [Y] is entered.
AD75M ☐: The all axes Servo ON request dialog box is displayed.
AD75P ☐ } : The dialog box that reads the data
AD75P ☐-S3 } from the main module is displayed.

[All Axes Servo ON request dialog box]

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.
When the [Y] key is pushed, the all axis servo on request is conducted.

[Dialog box that reads the data from the main module]

Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75 data is read, and the read data is used and tested.
When the [N] key is pushed the data set in the positioning edit screen is used and tested.
If the data in the AD75 main module and the positioning edit screen differs, correct testing cannot be conducted.

- During test operation (During axis operation) an "*" is displayed at the executing positioning data No. portion.

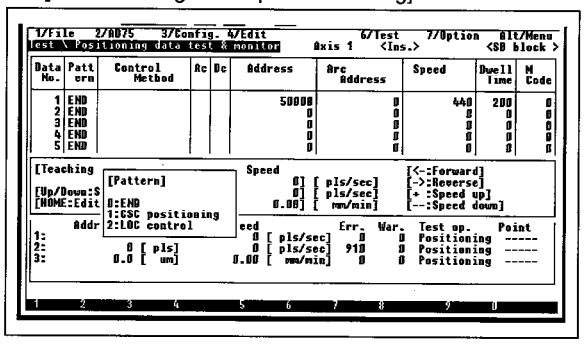
[1] Test run status
The current test operation status is displayed as shown below.
Axis unit operation → <Ax-unit>
Positioning data No. unit operation → <Posi-unit>
Start block data unit operation → <SDB-unit>

[2] Axis test run
The test operation conditions for each axis set in the [Alt] menu "6/Test" → "2/Test conditions".

[3] The information set using "Test condition" is displayed. For "Ax-unit" and "Posi-unit", the positioning data No. that conducts the startup is displayed and for the "SDB-unit" the point that conducts startup is displayed.

- For details regarding the operation method, such as for startup during monitoring and stop key, refer to Item 8.2.
- Entering the F5 (Edit) key displays the screen shown below and makes it possible to conduct positioning data edit and checking.

[Screen During JOG Operation Setting]



[4] Positioning data edit screen

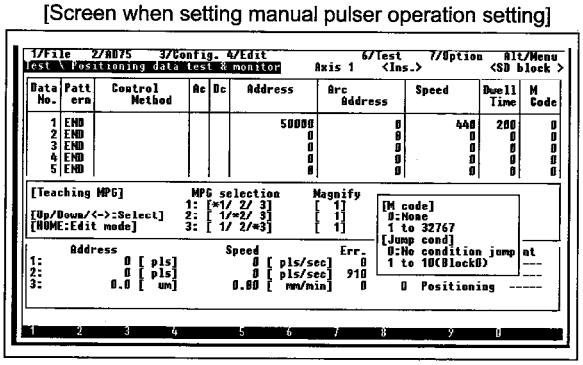
Here the edit method is the same as that for "Positioning information edit", so refer to Item 6.2. When conducting the setting for the "Address" and "Arc address" using teaching, after moving the cursor to "Address" or "Arc address" press the [Esc] key.

The address (Feed current value) named by the JOG operation/manual pulser operation is set to be the "Address" or "Arc address". However, setting cannot be done when the positioning data control method is the "INC method". When the control format of the positioning data that conducts the setting is straight line interpolation or "Arc interpolation", the feed current value is also automatically set in the interpolation axis positioning data.

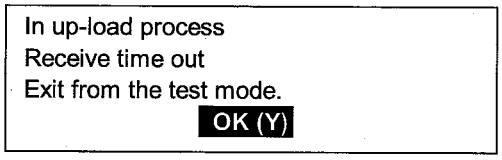
[5] Teaching screen

The two types of teaching screens are "JOG operation" and "Manual pulser operation", and it is possible to switch between them. For information regarding switching operations refer to Item 20.2. In addition, for information regarding the operation method refer to Item 19.15.

[Screen when setting manual pulser operation setting]

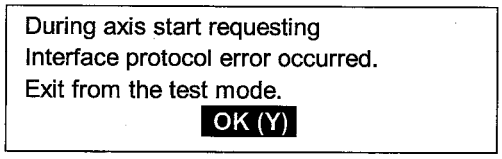


- Entering the [HOME] key makes it possible to switch the screen to be edited between the "Positioning data edit screen" and the "Teaching screen".
- The following dialog box is displayed when a communication error occurs during test & monitor mode.



Enter the [Y] key.

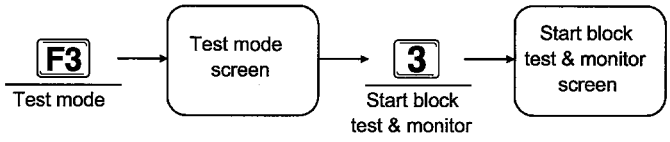
- When a communication error occurs because of a mistaken operation procedure during the test monitoring mode, a dialog box like the one below is displayed.



8.4 Start Block Test & Monitor

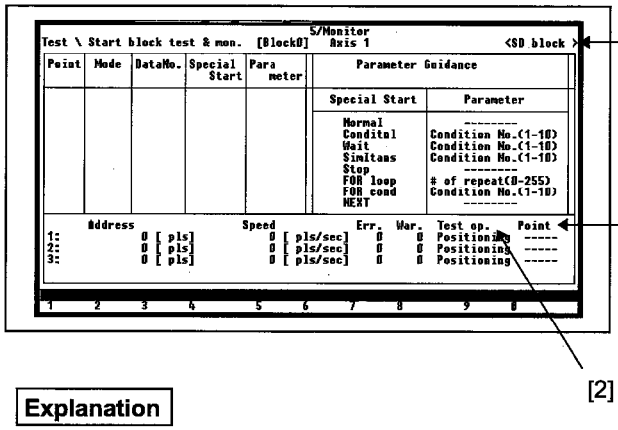
This is used to monitor and edit the start information.

Basic operation



Start block test & monitor screen and operation

Start block test & monitor screen



- Axis unit start / stop : F1 to F3
- All axes start / stop : F4
- Edit / stand-by status switching : F5
- Short cut key to [Alt] can be from "6 /test" to "2 / test operating conditions." : F6
- All axes error clear : F7
- Test mode exit : F8
- Hard copy : F9
- All stop : F10

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

The following occurs when the [Y] is entered.

AD75M ☐: The all axes Servo ON request dialog box is displayed.

AD75P ☐ } : The dialog box that reads the data from the main module is displayed.
AD75P ☐-S3 }

[All Axes Servo ON request dialog box]

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.

When the [Y] key is pushed, the all axis servo on request is conducted.

[Dialog box that reads the data from the main module]

Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75 data is read, and the read data is used and tested.

When the [N] key is pushed the data set in the positioning edit screen is used and tested.

If the data in the AD75 main module and the positioning edit screen differs, correct testing cannot be conducted.

- During test operation an "*" is displayed in the point of the start block that is being executed.

[1] Test run status

The current test operation status is displayed as shown below.

Axis unit operation → <Ax- unit>

Positioning data No. unit operation → <Posi- unit>

Start block data unit operation → <SDB- unit>

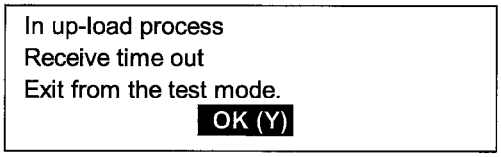
[2] Axis test run

This displays the test operation conditions for each axis set using the [Alt] menu "6/Test" → "2/Test condition".

[3] This displays the information set by the "Test condition". for "Ax- unit operation" and "Posi- unit.", the positioning data No. that conducts start is displayed and for the "SDB unit" operation the point that conducts start is displayed.

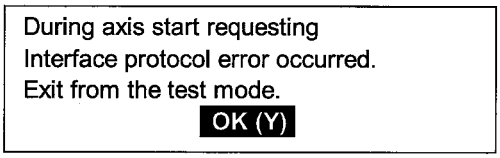
- For details regarding the operation method, such as the start/stop key during monitoring, refer to Item 8.2.
- The start block editing is conducted by entering the [F5] (Edit) key. For information regarding the edit method refer to Item 6.3.

- When a communication error occurs during the test & monitor mode, a dialog box like the one below is displayed.



Enter the [Y] key.

- When a communication error occurs due to an operation procedure mistake during the test & monitor mode, a dialog box like the one below is displayed.



8.5 Alt Menu Operation

8.5.1 File menu

For details regarding the File menu refer to Chapter 15.

8.5.2 AD75 menu

For details regarding the AD75 menu refer to Chapter 16.

8.5.3 Config. menu

For details regarding the Config. menu refer to Chapter 17.

8.5.4 Edit menu

For details regarding the Edit menu refer to Chapter 18.

8.5.5 Monitor menu

For details regarding the Monitor menu refer to Chapter 19.

8.5.6 Test menu

For details regarding the Test menu refer to Chapter 20.

8.5.7 Option menu

For details regarding the Option menu refer to Chapter 22.

9 SERVO START-UP MODE

9.1 Servo Start-up Mode Functions List

The servo start-up mode functions are as follows.

(1) Servo start-up mode functions

Servo start-up mode	Initial check	This displays the error and warning information stored in the AD75M ☐ main module error history and warning history buffer memory. In addition, the error and warning detailed information can also be displayed.
	Model name check	This reads and displays from the servo amplifier the information for the servo parameters that were transmitted to the servo amplifier from the AD75M ☐ when the power supply was turned on to the PC.
	U/L limit check	This conducts forward and reverse JOG to check if the upper limit switch/lower limit switch connected to the AD75M ☐ operates correctly.
	RPM check	This conducts forward and reverse JOG to check if the servo motor RPM during the maximum command speed is below the motor RPM set by the servo parameters.

(2) Alt menu functions

File	Setup	This sets the required printing conditions when a printout is made.
	Print	This prints the set contents specified by print settings.
	Delete	This deletes the specified file.
	Copy	This copies the file specified in the transfer source to the file specified in the transfer destination.
AD75	All axes servo ON	This puts the servo amplifier connected to the AD75M ☐ in the servo ON/OFF status.
	Servo OFF	This puts the servo amplifier connected to the AD75M ☐ in the servo ON/OFF status for each axis.
Servo	Initial check	This displays the error and warning information stored in the AD75M ☐ main module error history and warning history buffer memory. In addition, the error and warning detailed information can be displayed.
	Model name check	This reads and displays from the servo amplifier the information of the servo parameters transmitted to the servo amplifier from the AD75M ☐ when the power supply was turned on to the PC.
	U/L limit check	This conducts forward and reverse JOG to check if the upper limit switch and lower limit switch connected to the AD75M ☐ works correctly.
	RPM check	This conducts forward and reverse JOG to check if the servo motor RPM during the maximum command speed is less than the motor RPM set by the servo parameters.

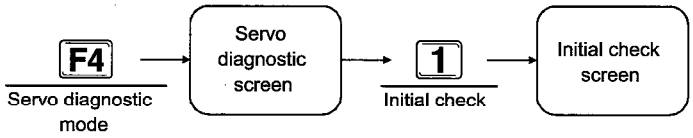
Model Name	AD75P □	AD75P □-S3	AD75M □
Application			O

9.2 Initial Check

This displays the error and warning information stored in the AD75M □ main module error history and warning history buffer memory. In addition, the selected error and warning detailed information (cause of occurrence, countermeasures) can be displayed.
When the error and warning information is displayed, please remove the displayed error and warning. The display error and warning can be reset using the [F7] key.

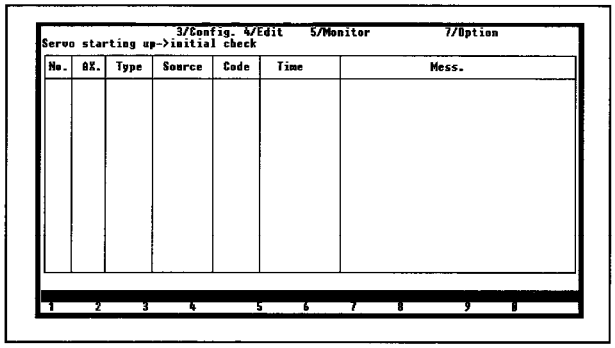
(1) Initial check screen display

Basic operation



Initial check screen and operation

Initial check screen



- Next screen (Model name check screen) display : F4
- Error clear of all axes servo amplifier : F7
- Exit servo start-up : F8

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

When the [Y] key is entered, the following dialogue box is displayed.

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.
When the [Y] key is pushed, the all axis servo on request is conducted.

Do you want to up load the data?
Yes (Y) No (N)

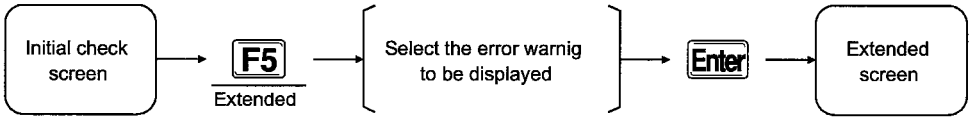
When the [Y] key is pushed the AD75M □ data is read, and the read data is used and checked.
When the [N] key is pushed the data set in the positioning edit screen is used and checked.
If the data in the AD75M □ main module and the positioning edit screen differs, correct checking cannot be conducted.

Model Name	AD75P □	AD75P □-S3	AD75M □
Application			O

- **Ax.**
  This displays the axis No. for the error or warning that is occurring.
- **Type**
  This displays the code type of the code being displayed.
  - Err: error
  - Warn: warning
- **Source**
  This displays the error or warning detection source.
  - Servo amp: servo amplifier
  - AD75: AD75 main module
- **Code**
  This displays the error or warning code.
  The details of the error or warning being displayed can be checked using the [F5] key.
- **Time**
  This displays the error or warning occurrence time.
- **Mess.**
  This displays the message of the error or warning that is displayed.
- This switches the [Alt] manual option to another servo startup screen.

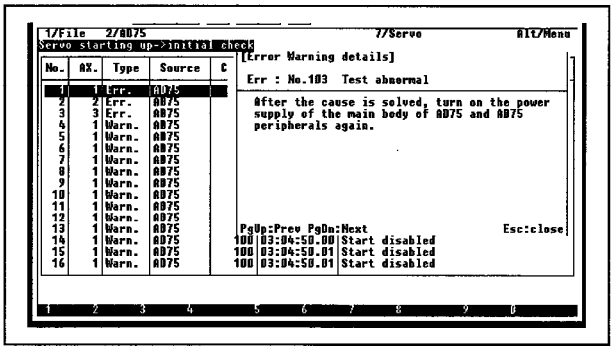
(2) Extended screen display

Basic operation



Extended screen and operation

Extended screen



- Move cursor : ↓, ↑
- Initial check screen display : F5

Explanation

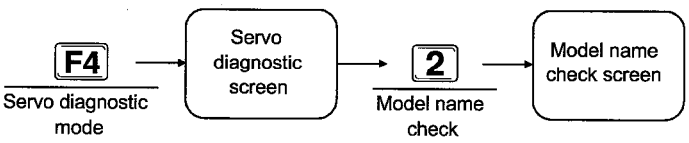
- This displays the cause of occurrence and countermeasures for the error or warning selected in the initial check screen. Please check and take measures for the error or warning cause of occurrence and countermeasures.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application			O

9.3 Model Name Check

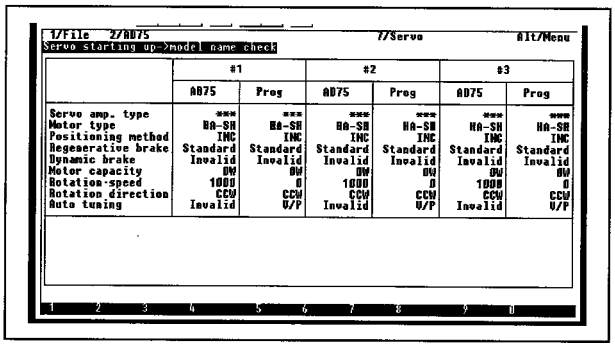
This reads and displays from the servo amplifier the information of the servo parameters transmitted to the servo amplifier from the AD75M ⬚ when the power supply to the PC is turned on. In addition, the serial parameters stored in the peripheral equipment can also be displayed.
Whether or not communication with the servo amplifier is being conducted correctly can be checked by comparing the servo parameters read from the servo amplifier and the servo parameters of the peripheral equipment.
The displayed serial parameter items cannot be changed in the model name check screen. Change servo parameters in the "Edit mode".

Basic operation



Model name check screen and operation

Model name check screen



- Next screen (U/L limit check) display : F4
- Re-read the data from AD75 : F5
- Exit servo start-up : F8

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

When the [Y] key is entered, the following dialogue box is displayed.

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.
When the [Y] key is pushed, the all axis servo on request is conducted.

Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75M ⬚ data is read, and the read data is used and checked.
When the [N] key is pushed the data set in the positioning edit screen is used and checked.
If the data in the AD75M ⬚ main module and the positioning edit screen differs, correct checking cannot be conducted.

- The main module and peripheral equipment are displayed as follows.
  - AD75: servo parameter data read from the servo amplifier
  - Prog: servo parameters stored in the peripheral equipment.
- Auto tuning display

  MR-H-B ·····> This displays the auto tuning setting
  MR-J2-B ····' information
  MR-J-B ····· This displays the servo amplifier current value
- To re-read the servo parameters from the servo amplifier, enter the [F5] key.
- Refer to the following manuals for information regarding the displayed servo parameter items.
- A1SD75M1/M2/M3, AD75M1/M2/M3 User's Manual.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application			O

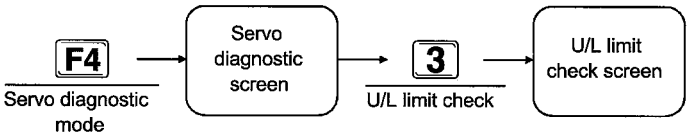
9.4 U/L Limit Check

The U/L limit check conducts forward and reverse JOG to check if the upper limit switch and Lower limit switch connected to the AD75M ⬚ is actually operating.
The servo amplifier forward limit switch and reverse limit switch cannot be checked using the U/L limit check.

The U/L limit check can be executed when the following conditions are met.

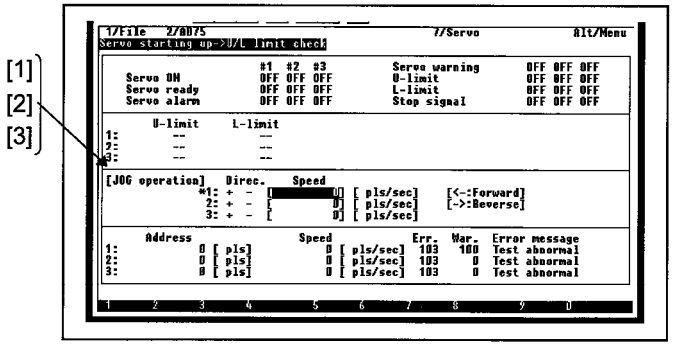
- Servo ON signal : ON
- Servo ready signal : ON
- Upper limit signal : ON
- Lower limit signal : ON
- During test mode : ON
- During servo alarm signal : OFF
- Stop signal : OFF
- JOG speed : when other than 0

Basic operation



U/L limit check screen and operation

U/L limit check screen



- Next screen (RPM check) display : F4
- U/L limit check data clear : F5
- M code ON signal turns off : F6
- Error clear of all axes servo amplifier : F7
- Exit servo start-up : F8
- Stop all axes : F10

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

When the [Y] key is entered, the following dialogue box is displayed.

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.

When the [Y] key is pushed, the all axis servo on request is conducted.

Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75M ⬚ data is read, and the read data is used and checked.
When the [N] key is pushed the data set in the positioning edit screen is used and checked.
If the data in the AD75M ⬚ main module and the positioning edit screen differs, correct checking cannot be conducted.

- The JOG speed default is set to "0". After setting the JOG speed of the axis that will conduct JOG operation, conduct the JOG operation.
- The servo motor will stop and the U- limit and L- limit of the AD75M ☐ that conducts JOG operation is off. After the U/L limit check is completed, use the JOG operation to turn on the U- limit and L- limit of the AD75M ☐.

[1] Status display
- OFF is displayed.
- ON is displayed.

[2] When JOG operation is conducted, "OK" is displayed when the AD75M ☐ U- limit and L- limit is turned from on to off.

[3] An "*" is displayed on the left side of the selected axis. When an * is displayed, the JOG speed can be set.
*+−: Forward JOG start
+*−: Reverse JOG start
After entering the JOG speed, press the [Enter] key to confirm the JOG speed. After confirm the JOG speed, use the +/- key to make fine adjustments to the JOG speed.
- +: increase speed
- −: reduce speed

The JOG speed can be set in the following range.

Model name	Setting range	Unit
AD75P ☐	0.01 to 6000000.00	mm/min
AD75M ☐	0.001 to 600000.000	inch/min
AD75P ☐-S3	0.001 to 600000.000	degree/min
(Basic mode)	1 to 1000000	pulse/s
AD75P ☐-S3 (Stepping motor mode)	0.01 to 375000.00	mm/min
	0.001 to 37500.000	inch/min
	0.001 to 37500.000	degree/min
	1 to 62500	pulse/s

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application			O

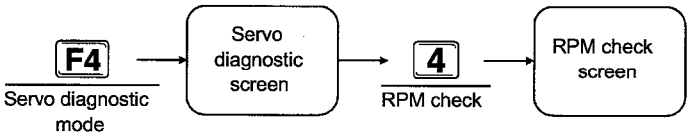
9.5 RPM Check

The RPM check conducts forward and reverse JOG to check that the RPM of the servo motor when at maximum command speed is less than the motor RPM set by the servo parameter.

The upper and lower limit check is conducted when the following conditions are met.

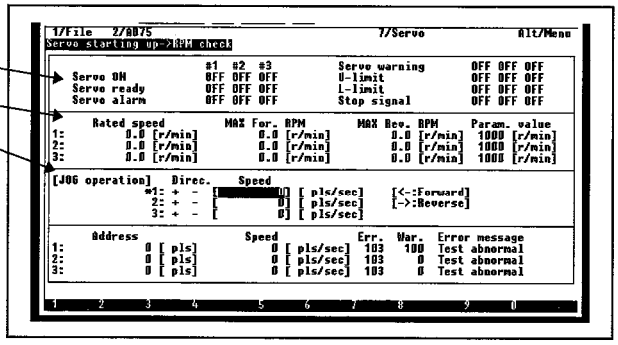
- Servo ON signal :ON
- Servo ready signal :ON
- Upper limit signal :ON
- Lower limit signal :ON
- During test mode :ON
- During servo alarm signal :OFF
- Stop signal :OFF
- JOG speed :when other than 0

Basic operation



RPM check screen and operation

RPM check screen



- U/L limit check data clear : F5
- M code ON signal turns off : F6
- Error clear of all axes servo amplifier : F7
- Exit servo start-up : F8
- Stop all axes : F10

Explanation

- As soon as the test & monitor mode is entered, the following dialogue box is displayed.

The connected unit is "AD75M 3 axes" unit.
OK (Y)

When the [Y] key is entered, the following dialogue box is displayed.

Servo ready signal of connected axis is turned off. Is the "ON" request of all axes servos "ON" done?
Yes (Y) No (N)

When the [N] key is pushed, the dialogue box for reading the data from the main module is displayed.

When the [Y] key is pushed, the all axis servo on request is conducted.

Do you want to up load the data?
Yes (Y) No (N)

When the [Y] key is pushed the AD75M ⬚ data is read, and the read data is used and checked.

When the [N] key is pushed the data set in the positioning edit screen is used and checked.

If the data in the AD75M ⬚ main module and the positioning edit screen differs, correct checking cannot be conducted.

- The JOG speed default is set to "0". After setting the JOG speed of the axis that will conduct the JOG operation, conduct the JOG operation.
- This is displayed in reverse when the RPM during forward/reverse JOG execution exceeds that of the RPM set by the servo parameter.

[1] Status display
- OFF is displayed.
- ON is displayed.

[2] RPM display
- RPM:
  The average value when RPM check is displayed.
- MAX For. RPM:
  This displays the maximum value when forward JOG is conducted.
- MAX Rev. RPM:
  This displays the maximum value when reverse JOG is conducted.
- Param. value:
  This displays the motor RPM set by the servo parameter.

[3] An "*" is displayed on the left side of the selected axis. When the * is displayed, the JOG speed can be set.
*+−: Forward JOG start
+*−: Reverse JOG start
After re-entering the JOG speed, press the [Enter] key to confirm the JOG speed. After confirm the JOG speed, the + sign and - sign keys can be used to make fine adjustments to the JOG speed.
- +: increase speed
- −: reduce speed

The JOG speed can be set in the following range.

Model name	Setting range	Unit
AD75P ☐	0.01 to 6000000.00	mm/min
AD75M ☐	0.001 to 600000.000	inch/min
AD75P ☐-S3	0.001 to 600000.000	degree/min
(Basic mode)	1 to 1000000	pulse/s
AD75P ☐-S3	0.01 to 375000.00	mm/min
(Stepping motor	0.001 to 37500.000	inch/min
mode)	0.001 to 37500.000	degree/min
	1 to 62500	pulse/s

9.6 Alt Menu Operation

9.6.1 File menu

For details regarding the File menu, refer to Chapter 15.

9.6.2 AD75 menu

For details regarding the AD75 menu, refer to Chapter 16.

9.6.3 Servo menu

For details regarding the Servo menu, refer to Chapter 21.

10 SERVO MODE

10.1 Servo Mode Functions List

The servo diagnostic mode functions are listed below.

(1) Servo mode functions

Servo mode	Position control gain 1	The servo motor responsiveness and stability is checked for the input command (RPM) from the AD75M.

(2) Alt menu functions

File	Setup	This sets the required printing conditions when a printout is made.
	Print	This prints the set contents specified by print settings.
	Delete	This deletes the specified file.
	Copy	This copies the file specified in the transfer source to the file specified in the transfer destination.
AD75	Servo ON	This puts the servo amplifier connected to the AD75M ⬚ in the servo ON/OFF status.
	Servo OFF	This puts the servo amplifier connected to the AD75M ⬚ in the servo ON/OFF status for each axis.
Config.	Axis switch	This switches the axis that is the target of the display screen.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application			O

10.2 Position Control Gain 1 Confirm

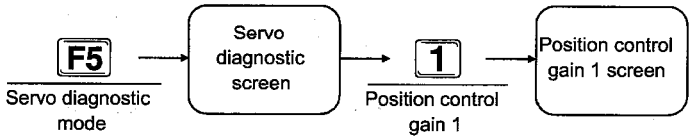
This checks the servo motor responsiveness and stability for the command (RPM) entered from the AD75 in position control gain 1.

This displays the adjustment time, undershoot amount, and if there is vibration during stop, then the servo motor is rotated 1.5 times.

The position control gain 1 is checked when the following conditions are met.

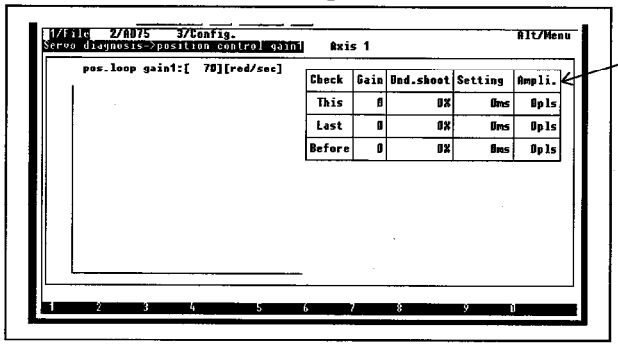
- Servo ON signal : ON
- Servo ready signal : ON
- Upper limit signal : ON
- Lower limit signal : ON
- During test mode : ON
- During servo alarm signal : OFF
- Stop signal : OFF
- During in-position
- When servo parameter's auto tuning invalid.
- This is set when the fixed parameter stroke and the limit upper value/lower value pulse conversion is 18000 pulses or more.

Basic operation



Position control gain 1 screen and operation

Position control gain 1 screen



Explanation

- When auto tuning is set to be valid by the peripheral equipment or the AD75M servo parameter the following error box is displayed.

Auto tuning is set to be valid. The axis 1 servo parameter cannot be changed. The axis 3 servo parameter cannot be changed. OK (Y)

Select the servo diagnostic mode after making auto tuning invalid using servo parameter editing after entering the [Y] key.

- When the Position control gain 1 screen is displayed, the connected AD75M model name confirm window is displayed. Check the model name of the connected AD75M and then press the "Y" key.
- When the data is read from the AD75M, the confirm window is displayed.
  - Selecting Yes (Y) will read the parameter and positioning data from the AD75M.
  - When No (N) is selected, the parameters and positioning data is not read from the AD75M.

- When the connected servo amplifier is not in the servo ready status, the all axes servo ON request confirm window is displayed. Put the all axes servo into the ON status.
- The position control gain 1 for the forward direction and reverse direction can be checked using the [F1]/[F2] keys.
- The position control gain 1 can be changed by entering the [F3] key. However, when auto tuning is set for valid, then the AD75M peripheral equipment, the Position control gain 1 cannot be changed.
- When [F4] is entered, Gain, Und. shoot, Setting, and Ampli. can be cleared.
- When the [F5] key is entered, the data, such as servo status and feed current value, can be monitored. Pushing the [F5] key again will return the display to the Positioning gain 1 screen.
- When the [F6] key is entered the M code ON signal can be turned off.
- When the [F8] key is entered, the Position control gain 1 is ended.
- When the [F10] key is entered all axes can be stopped.

[1] The under shoot amount, correction time, and amplitude are as follows.

Under shoot amount:
(maximum RPM when rotating in the reverse direction while the motor is stopped) ÷ 100 (r/min) x 100 (%)
Correction time:
The time from when the command value becomes 0 to when motor stops.
Amplitude:
The maximum value of the offset with the positioned position when the motor stopped. (Position droop maximum value)

Points

- The display screen will be distorted in the following cases. This phenomenon is caused by the machine's graphics board which starts up the AD75P, so there is no problem with the CRT.
  - When the servo diagnostic mode is entered
  - When the [Alt] key is pushed
  - When a function that was started up by the [Alt] key is exited
  - When a popup menu is returned using the [Alt] key
- If the set value is too low when the position control gain is changed, a servo error (excessive error) will occur during high-speed operation. Set an appropriate value so that the position control gain is not set too low.

10.3 Alt Menu Operation

10.3.1 File menu

For details regarding the File menu, refer to Chapter 15.

10.3.2 AD75 menu

For details regarding the AD75 menu, refer to Chapter 16.

10.3.3 Config. menu

For details regarding the Config. menu, refer to Chapter 17.

11 TRACE MODE

11.1 Trace Mode Functions List

The trace mode functions are as follows.

(1) Trace mode functions

Trace mode	Wavy trace	This checks the specified axis position command, motor RPM, motor current, speed command, and position droop related to the time.
	Tracks trace.....	This checks the specified axis position command and the actual current value.
	Torque trace	This checks the specified axis peak torque and effective torque.

(2) Alt menu function

File	Open.....	This reads the file in the FD/HD.
	Save	This writes to disk the trace data of the specified drive, system name, sub-system name, and file name.
	Delete	This deletes the specified file.
	Exit	This ends the executing mode and displays the mode selection menu.
Option	Trace condition.....	This sets the conditions under which tracing is conducted.
	Trace interval.....	This sets the draw interval for when the Wavy trace and Tracks trace results are displayed.

Model Name	AD75P□	AD75P□-S3	AD75M□
Application		O	O

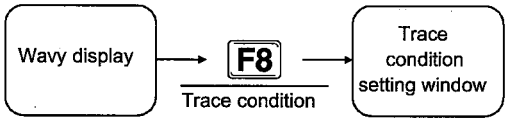
11.2 Wavy Trace

This displays the specified axis position command, motor RPM, motor current, speed command, and position group for the time in the wavy trace.
When A7PHP/A7HGP is used, the wavy trace is conducted when the SW1RX-AD75P (2) is started up.

11.2.1 Trace conditions setting

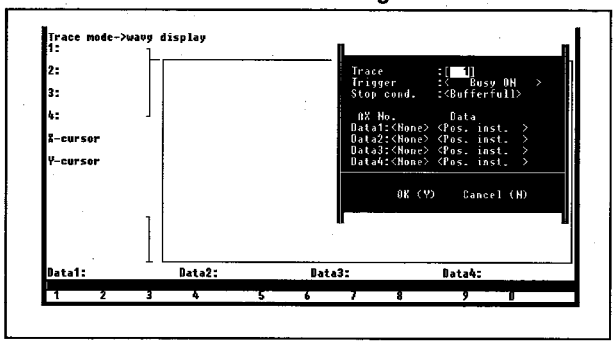
This sets the conditions under which wavy trace is conducted.

Basic operation



Trace conditions setting window and operation

Trace conditions setting window



- Move cursor : ↓, ↑, →, ←
- Item selection : SP

Explanation

[For AD75M□]

- After selecting the item to be set using the cursor key, select the numeric value setting using the [SP] key.

- **Trace (Unit time: 3.555 ms)**
  This sets the time for which the AD75M conducts one trace. The setting range is from 1 to 256.
  The trace time for one cycle is as follows.
  [Trace time for one cycle] = 3.555 x [Trace interval] (ms)

- **Trigger**
  Use the [SP] key to select the conditions under which the AD75M starts tracing.
  - Busy ON:
    This begins the trace when the start/end signal is turned on.
  - PC trigger ON:
    This starts the trace when "1: ON" is written into the PC CPU memory area 5050.
  - Unconditional:
    This begins the trace on a command from the peripheral equipment.

- **Stop cond.**
  The conditions for when the AD75M stops the trace are selected using the [SP] key.
  - Bufferfull:
    This stops the trace when the buffer for the trace data is full.
  - Trace point:
    This stops tracing when the number of specified points has been reached. The setting range is from 1 to 8192.
  - Error step:
    This stops tracing when an error occurs.
  - Endless:
    Tracing is stopped by a "Trace stop request" from the AD75P.

  If a trace stop request is received from the AD75P, then tracing can be stopped even when bufferfull, number of trace points, or error step are set.

- Ax No.
  This uses the __ key to select the axis No. that conducts the tracing.

● **Data**

The data that will conduct the trace is selected using the [SP] key.

- Pos. inst.:
  This is the position command from the AD75M to the servo amplifier.
- Rasted speed:
  This is the RPM at which the motor is actually turning.
- Motor value:
  This is the motor current value when the rate of current is 100% time.
- Speed inst.:
  This is the command speed from the AD75M to the servo amplifier.
- Posi. droop:
  This is the actual current value error for the position command from the AD75M.

● When the [Tab] key is entered, OK/Chancel can be selected.

- When OK (Y) is selected, the set trace conditions are checked.
- When Cancel (N) is selected, the set trace conditions are deleted.

● The following restrictions exist for the AD75P□-S3.

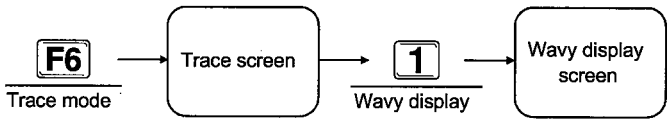
- Number of axes that can conduct tracing:
  Up to 2 axes
- Types of data that can conduct tracing:
  Only the speed command
- Trace stop conditions:
  Bufferfull only
- Trigger conditions:
  Only unconditional and start reception

Model Name	AD75P□	AD75P□-S3	AD75M□
Application		O	O

11.2.2 Trace operation

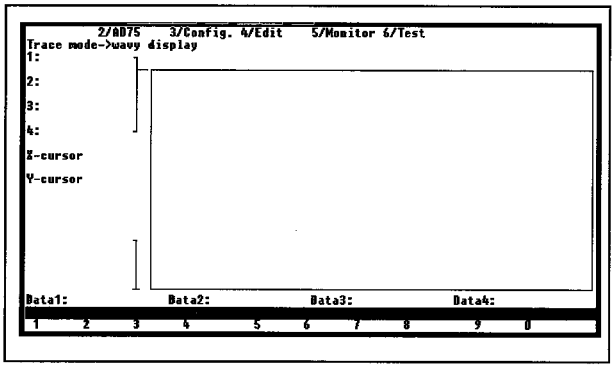
This conducts the trace under the set trace conditions.

Basic operation



Wavy display screen and operation

Wavy display screen



Explanation

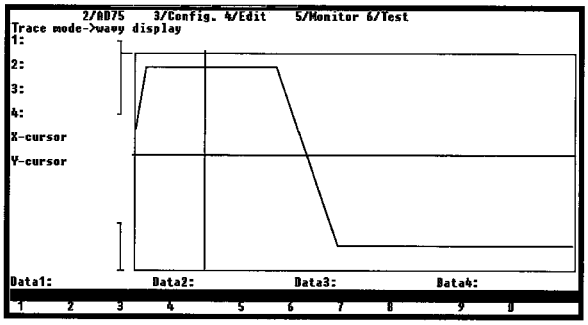
- The trace conditions that conduct tracing are set using the trace condition setting ([F8]/[Alt] menu option). In addition, when the trace data is written in a file, the trace conditions are written at the same time.

  For this reason, when the trace data is read from the file, the trace conditions are read at the same time.

- When the [F1] key is entered, the trace start request is conducted by the set trace conditions.
  - When the trigger condition set by the trace condition setting is reached, the trace condition reaches the wait state. (The "Waiting for" is displayed in the message column.)
  - If the trigger conditions are reached for even 1 axis when multiple axis are set, "AD75 is tracing" is displayed in the message column.
- When tracing is stopped because the trace stop conditions have been reached, if even 1 axis has reached the trace condition reach wait, then tracing is not stopped.
- When tracing is stopped because the trace stop conditions have been reached or the [F1] key was pushed during tracing, the traced data can be read and displayed. At this time, if there is a trace condition reached wait axis, "NG" is displayed in the data explanation display column when the trace conditions reached wait axis. For details regarding the display information, refer to item 11.2.3.
- The displayed, trace data can be registered in the file written to the [Alt] menu file. At this time, the trace conditions are also registered in the file.

11.2.3 Wavy trace display

When tracing stops, the trace data is read and displayed. In addition, when trace data is registered in the file, the [Alt] menu file can be read and read to and displayed on the peripheral equipment.
Following is an explanation of the wavy display display.



- When displaying the trace data, X cursor which is parallel to Y axis and the Y cursor which is parallel to X axis are displayed.
- The X axis shows the time the graph was displayed. The display is from 0.0 ms to 7398040.3 ms.
- The Y axis displays the data 1 to data 4 maximum value and minimum value in the range that displays the graph.
- When the [F2] key is entered, the time axis is 100% reduced. To increase the range that can be displayed, increase the display time.
- When the [F3] key is entered, the time axis is magnified by 50%. To reduce the range that can be displayed, shorten the display time.
- F4 and F5 can be used to scroll the display 50% left and right.
- When the [F6] key is entered all the trace data can be displayed.
- When the [F7] key is entered the cursor can be turned on/off.
- The cursor can be moved by entering the following keys.
  - [→]/[←]:
    Moves the X cursor 1 dot left or right.
  - [↑]/[↓]:
    Moves the Y cursor 1 dot up or down.
  - Shift + ([→]/[←]):
    Moves the X cursor 5 dots left or right.
  - Shift + ([↑]/[↓]):
    Moves the Y cursor 5 dots up or down.

Model Name	AD75P□	AD75P□-S3	AD75M□
Application		O	O

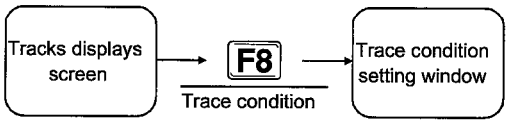
11.3 Tracks Trace

This displays the tracks specified axis position command and the actual current value. Two types of interpolation tracks can be displayed during interpolation operation.

11.3.1 Trace conditions setting

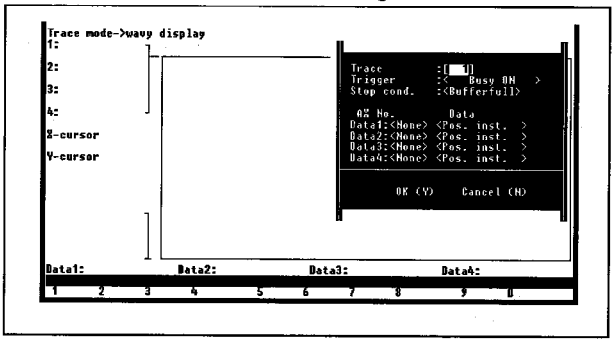
This sets the conditions that conduct the tracks trace.

Basic operation



Trace conditions setting window and operation

Trace conditions setting window



• Move cursor : ↓, ↑, →, ←

• Item selection : SP

Explanation

- After the items are set using the cursor key the numeric value settings/[SP] key are selected.

- **Trace (Unit time: 3.555ms)**
  This sets the times at which 1 trace is conducted by the AD75. The setting range is from 1 to 256.
  The trace time for one cycle is as follows.
  [Trace time for one cycle] = 3.555 x [Trace interval] (ms)

- **Trigger**
  The conditions at which trace is started by the AD75M are selected using the [SP] key.
  - Busy ON:
    This starts the trace when the start end signal is turned on.
  - PC trigger ON:
    This starts the trace when "1: ON" is written into the PC CPU memory area 5050.
  - Unconditional:
    Tracing is begun by a command from the peripheral equipment.

- **Stop cond.**
  The conditions under which the AD75M stops tracing are selected using the [SP] key.
  - Bufferfull:
    This stops tracing when the trace data buffer is full.
  - Trace point:
    This stops tracings when the specified number of points is reached. The setting range is from 1 to 8192.
  - Error step:
    This stops tracing when an error occurs.
  - Endless:
    This stops tracing when there is a "Trace stop request" from the AD75P.

  Tracing can be stopped even when a "Trace stop request" is conducted by the AD75P even when the buffer full, number of trace points, and error step are set.

- **Ax No.**
  The axis No. that conducts the trace is selected using the [SP] key.

● **Data**

The data that conducts the trace is selected using the [SP] key.

- Pos. inst.: This is the position command from the AD75M to the servo amplifier.
- Real value: This is the servo motor actual current value

● When the [Tab] key is entered, OK/Chancel can be selected.

- When OK (Y) is selected, the set trace conditions are checked.
- When Chancel (N) is selected, the set trace conditions are deleted.

● The following restrictions exist for the AD75P□-S3.

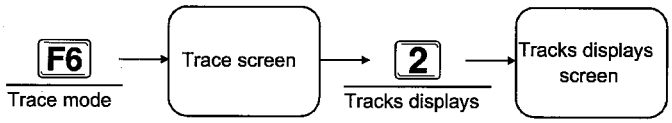
- Number of axes that can conduct tracing:
  Up to 2 axes
- Types of data that can conduct tracing:
  Only the speed command
- Trace stop conditions:
  Bufferfull only
- Trigger conditions:
  Only unconditional and start reception

Model Name	AD75P[ ]	AD75P[ ]-S3	AD75M[ ]
Application		O	O

11.3.2 Trace operation

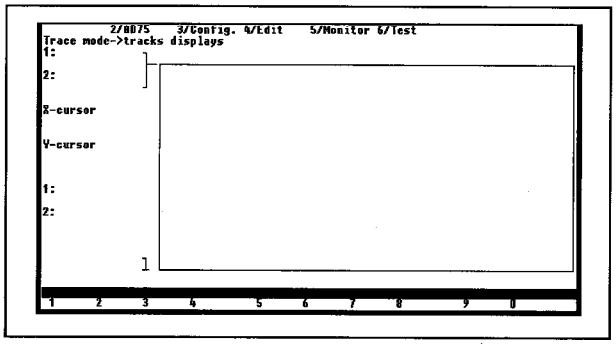
This conducts the trace under the set trace conditions.

Basic operation



Tracks displays screen and operation

Tracks displays screen

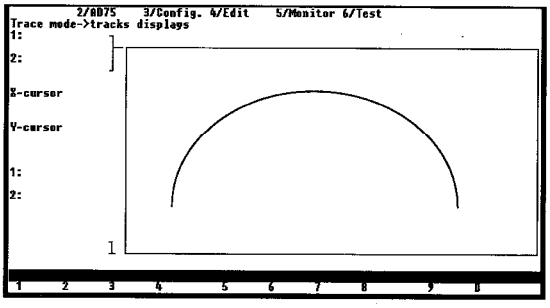


Explanation

- The trace conditions that conduct tracing are set using the trace condition settings ([F8]/[Alt] menu option). In addition, when the trace data is written in a file, the trace conditions are written at the same time. For this reason, when the trace data is read from the file the trace conditions are read at the same time.
- When the [F1] key is entered, the trace start request is conducted under the set trace conditions.
  - When the trigger condition set by the trace condition setting is reached, the trace condition reaches the wait state. ("Waiting for" is displayed in the message column.)
  - If the trigger conditions are reached for even 1 axis when multiple axis are set, "AD75 is tracing" is displayed in the message column.
- When tracing is stopped because the trace stop conditions have been reached, if even 1 axis has reached the trace condition reach wait, then tracing is not stopped.
- When tracing is stopped by plessing the [F1] key for the trace stop condition reached stop or while tracing is being executed, the trace data is read and displayed. At this time, if there is an axis for which the trace conditions reached wait has been reached, then "NG" is displayed in the set data explanation display column. For information regarding the display contents, refer to Item 11.3.3.
- The displayed, trace data can be registered in the file by being written by the [Alt] menu file. At this time, the trace conditions are also registered in the file.

11.3.3 Tracks trace display

When the trace is stopped the trace data is read and displayed. In addition, when trace data is registered in the file, by "File" "Open" of the [Alt] menu and displayed on the peripheral equipment.
An explanation of the tracks trace display is given below.



- When the trace data is displayed, the X cursor that is parallel to the Y axis and the Y cursor that is parallel to the X axis are displayed.
- The data set in the X axis and Y axis are the trace conditions setting is displayed on the graph.
- When the [F2] key is entered, the screen is miniaturized 100%.
- When the [F3] key is entered, the set range is increased. The procedure for increasing the range is as follows.
  - Use the arrow key to move the plus-shaped cursor in the magnification range and then press the [Enter] key. (Specified the peak from which magnification will be done.)
  - Use the arrow keys to move the plus-shaped cursor to the other peak that is to be magnified and then enter the [Enter] key.
- Enter the [F4] key and moving the plus-shaped cursor to the position where the graph central coordinate and enter the [Enter] key, it possible to move the graph to the plus-shaped cursor position.
- The cursor can be turned on and off by pressing the [F7] key.
- The cursor can be moved by pushing the following keys.
  - [→]/[←]:
    Moves the X cursor 1 dot left or right.
  - [↑]/[↓]:
    Moves the Y cursor 1 dot up or down.
  - Shift + ([→]/[←]):
    Moves the X cursor 5 dots left or right.
  - Shift + ([↑]/[↓]):
    Moves the Y cursor 5 dots up or down.

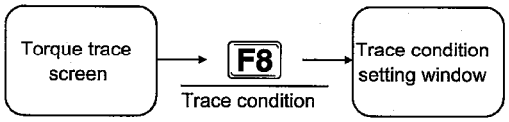
11.4 Torque Trace

This displays the peak torque and effective torque of the specified axis.

11.4.1 Trace conditions setting

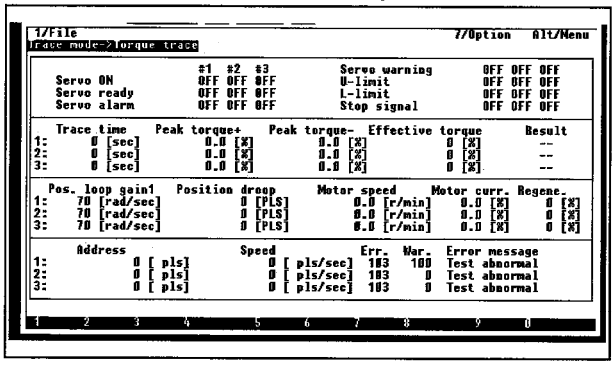
This sets the conditions under which torque trace is conducted.

Basic operation



Trace conditions setting window and operation

Trace conditions setting window



- Move cursor : ↓, ↑, →, ←
- Item selection : SP

Explanation

- After selecting the item to be set using the cursor key, make the selection using the [SP] key.

- **Trigger**

  Use the [SP] key to select the conditions under which AD75M starts tracing.
  - Busy ON:
    Tracing starts when the start end signal is turned on.
  - PC trigger ON:
    Tracing starts when "1:ON" is written to the PC CPU main memory area 5050.
  - Unconditional:
    Tracing is started by a command from the peripheral equipment.

- **Stop cond.**

  Use the [SP] key to select the conditions under which tracing will be stopped by the AD75M.
  - Bufferfull:
    Tracing is stopped when the trace data buffer is full.
  - Trace point:
    Tracing is stopped when the specified number of points is reached. The setting range is from 1 to 8192.

  The trace time for one cycle is as follows.

  [Trace time for one cycle]

  = 3.555 x 8192 x [Trace points] (ms)

  = 29122.56 x [Trace points] (ms)
  - Error step:
    Tracing is stopped when an error occurs.
  - Endless:
    Tracing is stopped by a "Trace stop request" from the AD75P.

  Tracing can be stopped by sending a "Trace stop request" from the AD75P even when bufferfull, number of trace points, and error step are set.

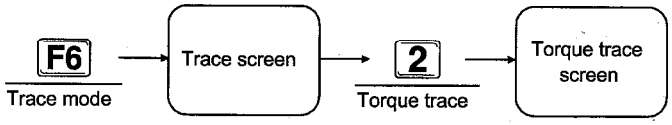
- Ax 1 to 3 No.

  Use the [SP] key to select "Not trace" or "Trace".

11.4.2 Trace operation

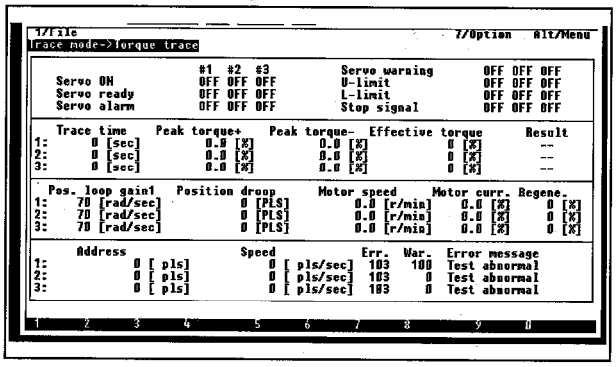
This conducts tracing under the set trace conditions.

Basic operation



Torque trace screen and operation

Torque trace screen

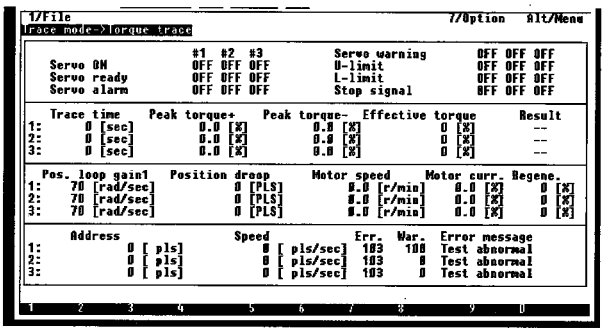


Explanation

- The trace conditions under which tracing is conducted are set using the trace conditions setting ([F8]/[Alt] menu option). In addition, when the trace data is written to a file, the trace conditions are also written at the same time. For this reason, when the trace data is read from the file, the trace conditions are also read.
- When the [F1] key is pressed, a trace start request is sent in accordance with the set trace conditions.
  - Until the trigger conditions set by the trace condition setting are reached, the system is in the trace conditions reached wait status. ("Waiting for" is displayed in the message column.)
  - When multiple axes are set, when the trigger conditions for even on axis is reached, "AD75 is tracing" is displayed in the message column.
- When tracing is stopped, when the trace stop conditions are reached, tracing will not stop even if one axis is in the trace conditions reached wait state.
- When tracing is made to stop because the trace stop conditions were reached or because the [F1] key was pressed while tracing was executing the trace data is read and displayed. If there is a trace condition reached wait axis at this time then "NG" is displayed in the execution results column of the data set in the trace conditions reached wait axis. For details regarding the display information, refer to Item 11.3.3.
- The displayed trace data can be registered in a file by the [Alt] menu file write. At this time the trace conditions will also be registered in the file.

11.4.3 Torque trace display

When tracing is stopped, the trace data is read and displayed.
Following is an explanation of the torque trace display.



- **Trace time**
  This displays the time from trace start to trace stop.
- **Peak torque +, -**
  This displays the percent (%) when the maximum torque during torque trace is 100% of the rated torque.
- **Effective torque**
  This displays the percent (%) when the effective torque during torque trace is 100% of the rated torque.
- **Result**
  This displays the torque trace execution results.
  - OK: When torque trace complete normally.
  - NG: When torque trace does not complete normally.
  - - - : When "Not trace" is set by the trace conditions.
- The trace results can be cleared by entering the [F5] key.
- **Pos. loop gain 1**
  This displays the speed of the control response during positioning control.
- **Position droop**
  This displays the error between the feed present value and the actual present value.
- **Motor speed**
  This displays the motor's actual RPM.
- **Motor curr.**
  This displays the motor current value when at 100% of the rated current.
- **Regene.**
  This is the data used to monitor the regenerative resistance load.

11.5 Alt Menu Operation

11.5.1 File menu

For details regarding the File menu, refer to Chapter 15.

11.5.2 Option menu

For details regarding the Option menu, refer to Chapter 22.

12 INITIAL MODE

12.1 Initial Mode Functions List

The initial mode has the following functions.

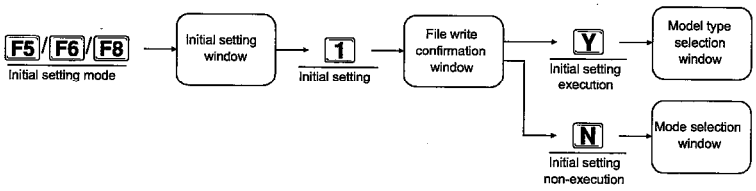
(1) Initial mode functions

Initial mode	Create	All the data edited by the peripheral equipment is returned to the initial value.
	File read	The data stored in HD/FD is read to the peripheral equipment.
	AD75 read	The data stored in the AD75 is read to the peripheral equipment.
	AD75 type change	This changes the positioning module model name during editing by the peripheral equipment.

12.2 Create

Create is an operation that returns all of the data edited by the peripheral equipment to the initial values (default values).
To save the data edited by the peripheral equipment, write the data to a file before selecting "Create".

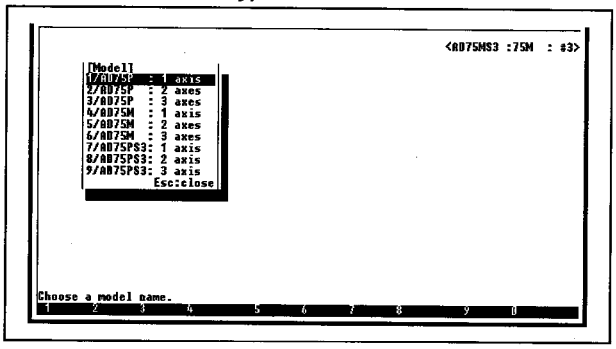
Basic operation



- F5 : When AD75P□ is selected.
- F8 : When AD75M□ is selected.
- F6 : When AD75P□-S3 is selected.

Model type selection window and operation

Model type selection window



- Move cursor : ↑, ↓

Explanation

- When "1/Create" is selected from the initial settings window the following window is displayed.

  Was the file written?
  Yes (Y) No (N)

  - Selecting "Yes (Y)" will display the "Model type selection window" after the edited data is initialized. The model type of the AD75 to conduct the editing can be changed.
  - Selecting "No (N)" will return the screen to the "Mode selection window" without initializing the edited data.

- When the model type is set, the following window will be displayed.

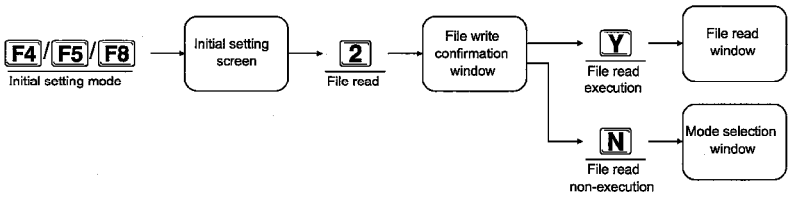
  Do you want to set filename?
  Yes (Y) No (N)

  - Selecting "Yes (Y)" will display the "File name specification window". Set the drive, system name, Sub-system name, and file name that will conduct the editing.
  - Selecting "No (N)" will return the screen to the "Mode edit window".

12.3 File Read

File read is an operation that reads the data stored in the HD/FD. (When a file is read the edited data will be deleted.)
To save the data edited by the peripheral equipment, write the data to a file before selecting "File read".

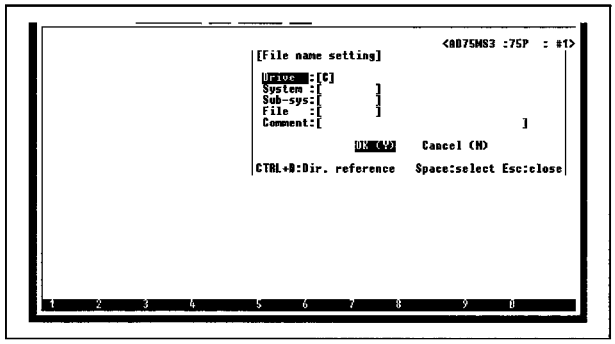
Basic operation



- F5 : When AD75P☐ is selected.
- F8 : When AD75M☐ is selected.
- F6 : When AD75P☐-S3 is selected.

File read window and operation

File read window



• Move cursor : ↑, ↓

Explanation

- * When "2/File read" is selected from the initial setting screen the write file confirmation window is displayed.

  Was the file written?
  Yes (Y) No (N)

  - Selecting "Yes (Y)" displays the read file window after initializing the edited data. Set the drive, system name, sub-system name, and file name where the data to be read will be stored.
  - Selecting "No (N)" returns the screen to the "Mode edit window" without initializing the edited data.

- When the drive, system name, sub-system name, and file name are specified and OK (Y) is selected, the following window will be displayed.

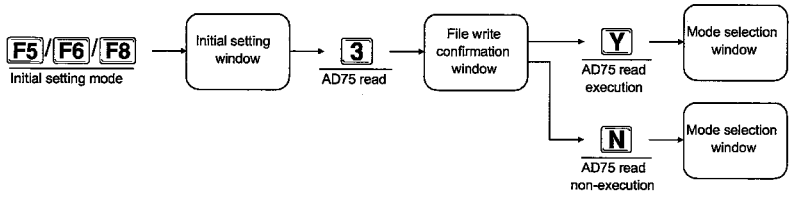
  File name:☐:\AD75P\USR\☐\☐\☐D75
  Model type:☐
  Read the specified file?
  Yes (Y) No(N)

  - Selecting "Yes (Y)" returns the screen to the "Mode selection window" after the data is read from the specified file.
  - Selecting "No (N)" makes it possible to reset the drive, system name, sub-system name, and file name.

12.4 AD75 Read

AD75 read is an operation that reads the data stored in the AD75. (When AD75 read is conducted, the data edited by the peripheral equipment is deleted.)
To save the data edited by the peripheral equipment, write the data to a file before selecting "AD75 read".

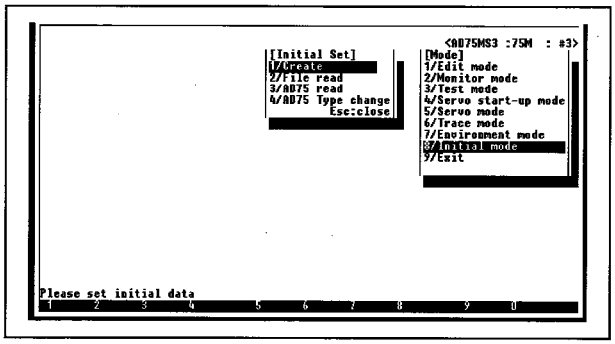
Basic operation



- F5 : When AD75P□ is selected.
- F8 : When AD75M□ is selected.
- F6 : When AD75P□-S3 is selected.

Initial set window and operation

Initial set window



- Move cursor : ↑, ↓

Explanation

- Selecting "3/AD75 read" from the initial set window will display the following file write confirmation window.

  Was the file written?
  Yes (Y) No (N)

  - Selecting "Yes (Y)" will cause the data to be read from the AD75 after initializing the edited data.
  - Selecting "No (N)" will display the "Mode edit window" without initializing the edited data.

- When communication cannot be done with the AD75, the following window will be displayed. Check the connection with the AD75 and the connector connection, etc.

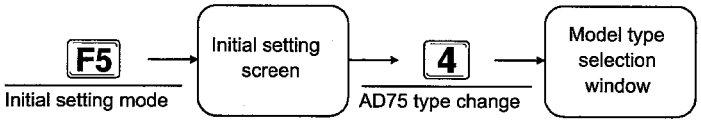
  During connected module type check process
  Receive time out
  Retry?
  Yes (Y) No (N)

  - Selecting "Yes (Y)" again reads the data from the AD75.
  - Selecting "No (N)" will return the screen to the "Initial set window".

12.5 AD75 Model Type Change

The AD75 model type change is an operation that changes the model name of the positioning module during editing.

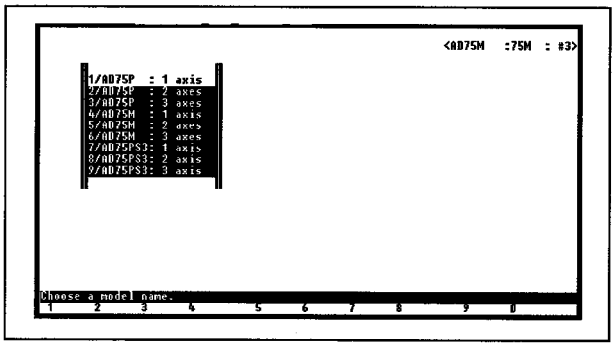
Basic operation



- F5 : When AD75P□ is selected.
- F8 : When AD75M□ is selected.
- F6 : When AD75P□-S3 is selected.

Model type selection window and operation

Model type Selection window



- Move cursor : ↑, ↓

Explanation

- The data edited by the peripheral equipment will be saved even if the AD75 model type is changed.

  However, the following data will be initialized.

  - For AD75P□ → AD75P□-S3
    - Start information Blocks 1 to 10
    - Conditions data Blocks 1 to 10
  - For AD75P□ → AD75M□
    - Start information Blocks 1 to 10
    - Conditions data Blocks 1 to 10
    - Servo basic parameter
    - Servo expansion parameter
    - Servo adjustment parameter
  - AD75P□-S3 → AD75M□
    - Servo basic parameter
    - Servo expansion parameter
    - Servo adjustment parameter

13 ENVIRONMENT MODE

13.1 Environment Mode Functions List

The environment mode has the following functions.

(1) Environment mode functions

Environment mode	Environment mode	This sets the characters and background color to be displayed in the display color setting screen.

(2) Alt menu functions

File	Setup	This sets the required printing conditions when a printout is made.
	DOS	This displays the DOS prompt.
	Exit	This ends the executing mode and displays the mode selection menu.

13.2 Setting Display Colors

This sets the characters and background color to be displayed in the screen.

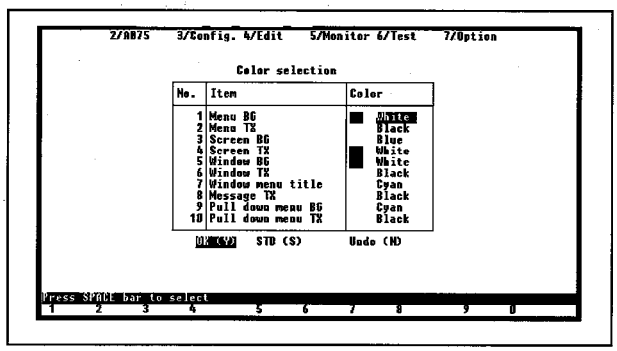
Basic operation

F4/F7/F5 (Environment mode) → Color selection screen

- F4 : When AD75P□ is selected.
- F7 : When AD75M□ is selected.
- F5 : When AD75P□-S3 is selected.

Color selection screen and operation

Color selection screen



- Move cursor : ↑, ↓
- Color selection : SP
- Confirmation : Y
- Return to standard : S
- Return to the begining : N

Explanation

- The colors are changed in the following order by entering the [SP] key. Black, blue, green, cyan (water blue), red, magenta (purple), yellow, white, black. Immediately to the left of the specification column of the selected colors is displayed a "□" that displays a sample of that color.
- The list of items for which the display color can be specified is as follows.

Items that can be specified and their standard settings

No.	Item Name	Standard Settings	
		A7PHP	DOS/V
1	Menu BG	Black	White
2	Menu TX	White	Black
3	Screen BG	Black	Blue
4	Screen TX	White	White
5	Window BG	White	White
6	Window TX	Black	Black
7	Window menu title	White	Cyan
8	Message TX	Black	Black
9	Pull down menu BG	White	Cyan
10	Pull down menu TX	Black	Black
11	Menu select. bar BG	White	Cyan
12	Menu select. bar TX	Black	Black
13	Entered TX BG	White	Blue
14	Entered TX	Black	White
15	Auxiliary menu BG	White	Green
16	Auxiliary menu TX	Black	Black
17	Alert box (error) BG	White	Red
18	Alert box (error) TX	Black	White
19	Alert box (guide) BG	Black	White
20	Alert box (guide) TX	White	Red

- Entering the [Y] key:

  Confirm the changed information.

  Entering the [S] key:

  Return the display color to the standard setting.

  Entering the [N] key:

  Return the display to the status before the change.

13.3 Alt Menu Operation

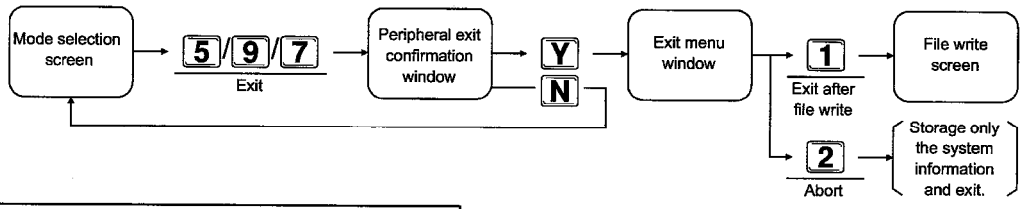
13.3.1 File menu

For details regarding the File menu refer to Chapter 15.

14 EXIT MODE

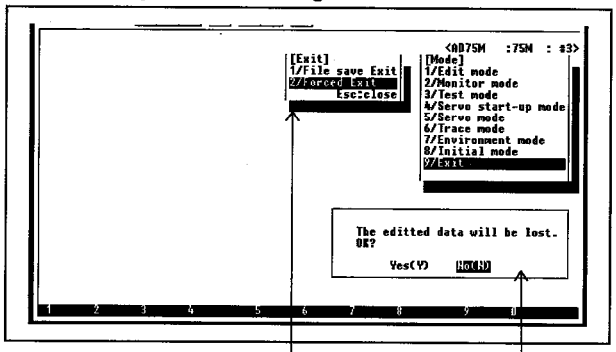
This exits the AD75P functions.

Basic operation



Peripheral data storage selection window and operation

Peripheral data storage selection window



- Exit after storing data : Y
- Exit : N

Exit menu window

Peripheral exit confirmation window

Explanation

- Entering the [Y] key ends the function after writing the peripheral data to a file.

  Entering the [N] key ends the function without writing the peripheral data.

- When the [1] key is pushed from the exit menu, the file write screen is displayed. Set the drive name, system name, sub-system name, and file name to which the positioning data, etc. will be written.

- When the [2] key is pushed from the exit menu, only the system information is saved and then the operation is exited. The parameters and positioning data, etc., are not saved.

15 FILE MENU

15.1 File Menu Restrictions on Any Mode

The file menus restrictions on any mode are shown below.

File menu / Mode	Open	Save	Verify	Setup	Print	Delete	Copy	DOS	Exit
Edit	O	O	O	O	O	O	O	O	O
Monitor	—	—	—	O	O	O	O	—	O
Test	—	—	—	O	O	O	O	—	—
Servo start-up	—	—	—	O	O	O	O	—	—
Servo	—	—	—	O	O	O	O	—	—
Trace	O	O	—	—	—	O	—	—	O
Environment	—	—	—	O	O	O	O	O	O

O: Setting possible, —: Setting not possible

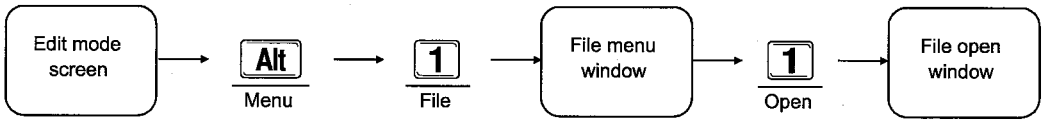
Remark

1) The items for which setting is not possible in any mode are not displayed in the file menu.

15.2 Open

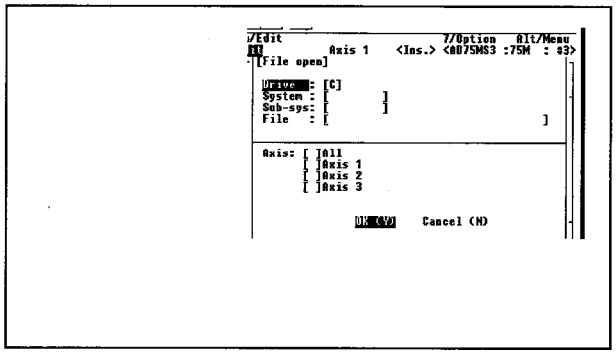
This opens the specified file from the HD/FD.

Basic operation



File open window and operation

File open window



- Move cursor : ↑, ↓, Tab
- Open file : Y
- Cancel open function : N or Esc

Explanation

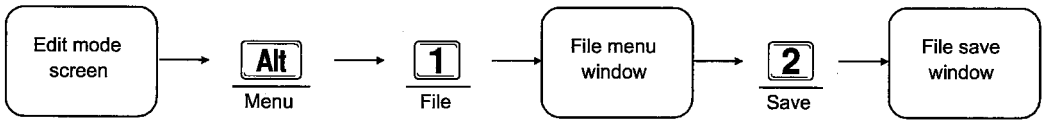
- Set the drive, system name, sub-system name, and file name of the data to be opened. Each item can be set by moving the cursor to the drive, system name, sub-system name, and file name and then pressing the [SP] key.
- **Axis**
  After specifying the file name the axis is specified by moving the cursor using the [Tab] key. The axis specification is confirmed/canceled using the [SP] key. When "All" items are selected then a "*" is added to the displayed items.
- Pushing the [Y] key starts the open.
- When an error occurs because of a mistaken open specification to the HD/FD, etc., the following dialog box will be displayed and processing will stop.

Press [Y] key to retry.

15.3 Save

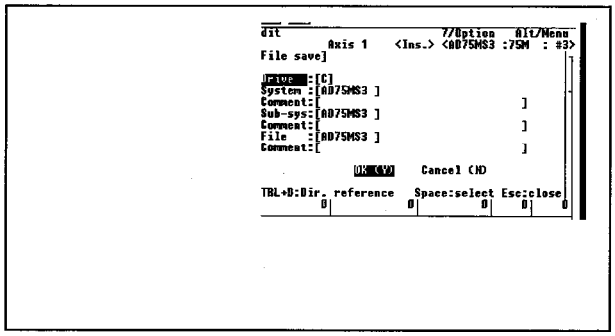
This saves the set data to the HD/FD.

Basic operation



File save window and operation

File save window



- Move cursor : ↑, ↓
- Move cursor to setting area : SP
- Execute save : Y
- Cancel (discontinue) save : N or Esc

Explanation

- Specify the drive, system name, sub-system name, and file name to where the data will be saved. The items can be set by moving the cursor to the drive, system name, sub-system name, and file name position and then entering the [SP] key.
- When file save is conducted a write is made to the specified drive AD75P\USR\ directory.
- When the [Y] key is entered and the same file is already stored in the HD/FD, the following dialog box is displayed.

Do you want to overwrite?
Yes (Y) No (N)

Entering the [Y] key will overwrite the existing file.
Entering the [N] key will cancel the save.

- When an error occurs because of a mistaken save command to the HD/FD, etc., the following dialog box is displayed and processing stops.

Retry?
Yes (Y) No (N)

Press [Y] key to retry.

- An error message is displayed when the system name, sub-system name, or file name are not set.
- The following alarm box is displayed when the drive specified for the system name or sub-system name does not exist.
  - When the [Y] key is entered regeneration will start automatically.
  - When the [N] key is entered the display will be returned to the File save window.

[When the system name does not exist]

System name: ********** does not exist. Newly regenerate? Yes (Y) No (N)

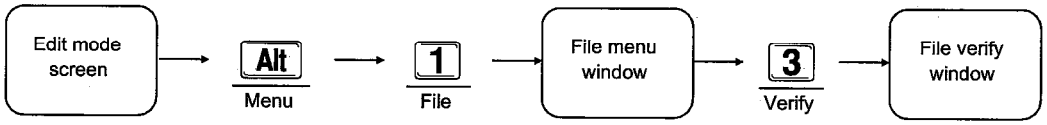
[When the sub-system name does not exist]

Sub-system name: ********** does not exist. Newly regenerate? Yes (Y) No (N)

15.4 Verify

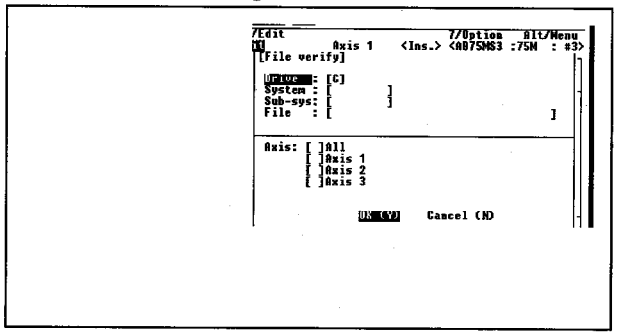
This verifies the specified file contents from the HD/FD and the contents currently being edited.

Basic operation



Positioning data monitor screen and operation

Positioning data monitor screen



- Move cursor : ↑, ↓, Tab
- Designate drive : SP
- Designate directory : SP
- Confirm/clear axis designation : SP
- Execute verify : Y
- Print of verify result : Ctrl + P

Explanation

- Specify the drive, system name, sub-system name, and the file name for which data verification will be conducted. The items can be set by moving the cursor to the drive, system name, sub-system name, and file name and then entering the [SP] key.

- **Axis**
  After specifying the file name specify the axis by moving the cursor by using the [Tab] key. The axis specification can be confirmed/cleared by entering the [SP] key. When "All" items are selected a "*" is added to the displayed items.

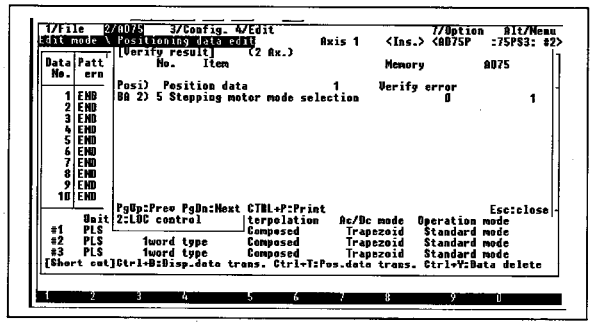
- The file is verified when the [Y] key is entered.

- When an error occurs because of a mistaken verification specification to the HD/FD, etc., the following dialog box is displayed and processing stops.

  Retry?
  Yes (Y) No (N)

  Press [Y] key to retry.

- When the verification results do not match, the following non matching information list screen is displayed in the axis units.



(1) The data verification order and a display form are as follows.

Verification order	Display form
[1] Positioning data	Posi
[2] Start block	Str
[3] Conditions data	Cond
[4] OPR basic parameter	OPRB
[5] OPR extended parameter	OPRE
[6] Basic parameter #1	BA1
[7] Basic parameter #2	BA2
[8] Extended parameter #1	EX1
[9] Extended parameter #2	EX2
[10] M code comment	M C

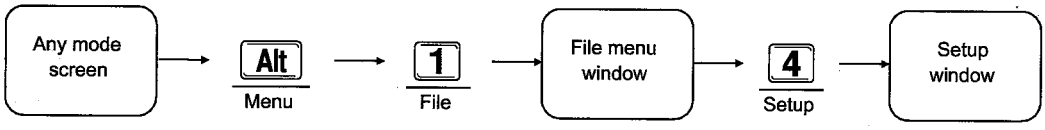
(2) Up to 10 items can be displayed in the screen and the items can be scrolled through by pushing the [Page Up] and [Page Down] keys. Pushing the [ESC] key closes the screen and continues verification of the 2-axis and 3-axis. If a large number of verification errors are detected during verification, the following dialog box is displayed and verification is stopped.

  Too many verify error

15.5 Setup

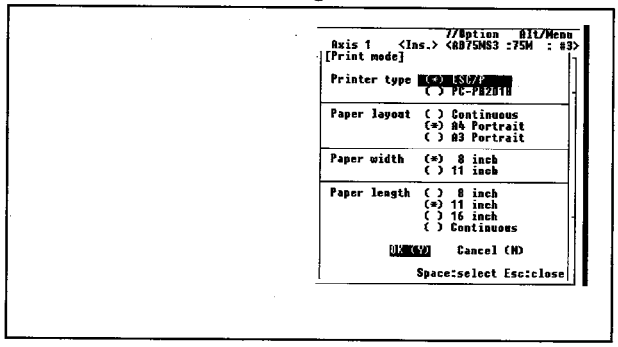
This conducts the various settings related to printing.

Basic operation



Print settings window and operation

Print settings window



- Move cursor : ↑, ↓, Tab
- Confirm/clear selected item : SP
- Exit : Y

Explanation

- The [Tab] key is used to move the cursor between setting items.

  Use the [SP] key to confirm/clear setting items.
- The setting item details are displayed below.

No.	Setting item	Selection item	Description
1	Printer type	ESC/P PC-PR201H	This selects the type of printer on which printing will be conducted.
2	Printer layout	Continue Cutform (A4 height) Cutform (A3 height)	This sets the paper on which printing will be conducted.
3	Paper width*	8 inch 11 inch	This sets the width of the paper on which printing will be conducted.
4	Paper length*	8 inch 11 inch 16 inch Continuous	This sets the length of the paper on which printing will be conducted.

* This is only valid when "Continuous" is specified from "Paper layout".

Point

- A screen hard copy can only be made target printer when using an ESC/P printer.

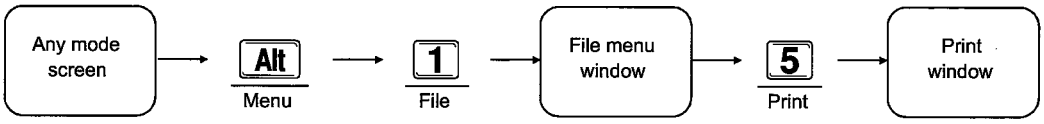
  Therefore, the settings in setup will be ignored.

Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

15.6 Print

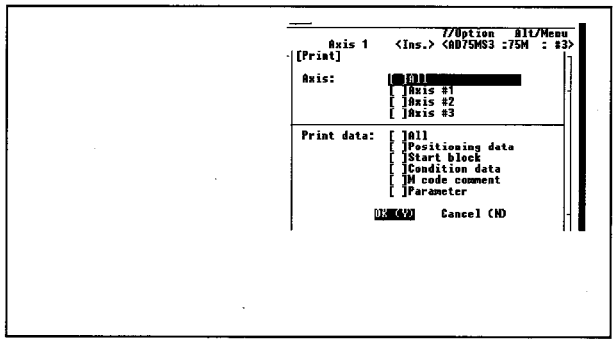
This prints the contents of the peripheral equipment memory.

Basic operation



Print window and operation

Print window



- Move cursor : ↑, ↓, Tab
- Confirm/clear selected item : SP
- Execute print : Y
- Select print item : Ctrl + D

Explanation

- The [Tab] key is used to move the cursor between setting items. The set item is confirmed/canceled using the [SP] key. When "All" items are selected then an "*" is added to the displayed items.
- The Positioning data, Start block, Condition data, and Parameter print items can be set extended by entering the [Ctrl]+[D] keys.
- When the [Y] key is entered the following dialog box is displayed.

  Are you sure?
  Yes (Y) No (N)

  Press [Y] key to retry.
  When the [N] key is entered the display is returned to the original screen.
- Printing can be stopped by entering the [ESC] key during printing. During an error the following dialog box is displayed.

  Printr error
  OK (Y)
- **Print form**

  (1) Positioning data

  [AD75] Positioning data Axis 1 Page1 Tue Feb 21. 15:04:42 1995

No.	Patt.	Method	Acc.	Des.	Address	Arc Address	Speed	Dwell	M code
1	****	********	**	**	*********	**********	******	*****	***
2	****	********	**	**	*********	**********	******	*****	***

  This prints the same parameter related information as is displayed on the screen.
- When there is an interrupt the following dialog box is displayed.

  Print abort
  OK (Y)

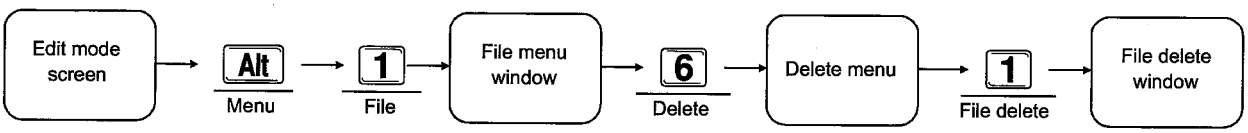
Points

- Much time is required to print all items. (Approximately 1 hour)
- An interrupt error may occur during printing when the paper runs out during printing.

15.7 Delete

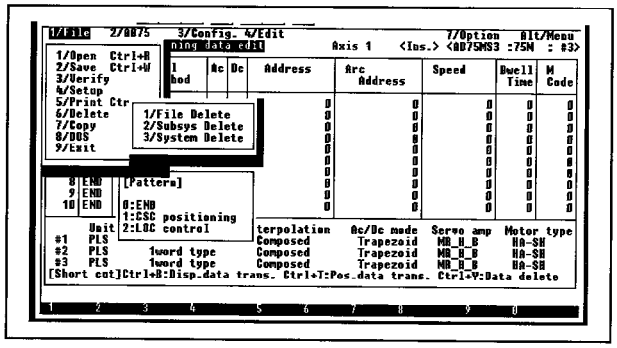
This deletes the specified file.

Basic operation



File delete window and operation

File delete window



- Move cursor : ↑, ↓, Tab
- Move cursor to designated area : SP
- Designate file name : [Drive : file name] + Enter
- Confirm/clear axis designation : SP
- Execute delete : Y

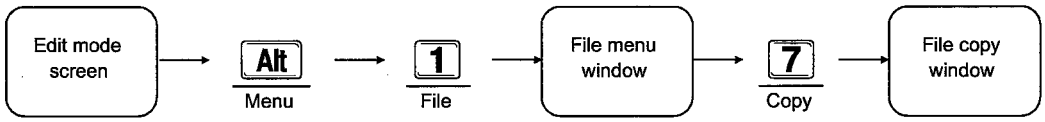
Explanation

- The specified drive, system name, and sub-system name file can be deleted by selecting 1/file delete.
- The sub-system name of the specified drive and system name can be deleted by selecting 2/sub-system name delete. However, when a file exists in the specified sub-system name deletion can be conducted in batch.
- The specified drive system name can be deleted by selecting 3/system name delete. However, when a file exists in the specified system name the system name cannot be deleted.

15.8 Copy

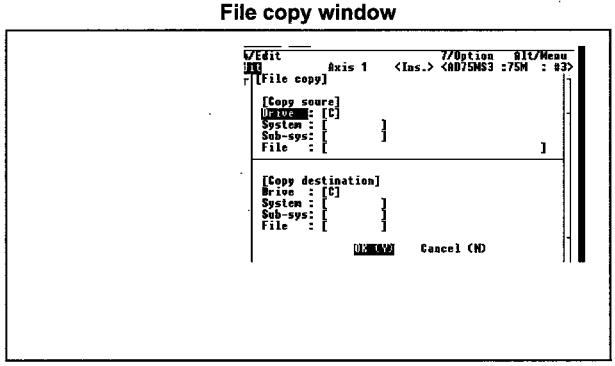
Files can be copied using file name units.

Basic operation



File copy window and operation

File copy window



- Move cursor : ↑, ↓, Tab
- Move cursor to designated area : SP
- Execute copy : Y

Explanation

- This specifies the drive, system name, sub-system name of the data copy source. The items can be selected by moving the cursor to the drive, system name, sub-system name, and file name position and then pressing the [SP] key.
- The cursor is moved to the copy destination file name specification column by entering the [Tab] key.
- Specify the drive, system name, sub-system name, and file name to be used for the data copy destination. The items can be specified by moving the cursor to the drive, system name, sub-system name, and file name positions and entering the [SP] key.
- When the same file already exists during the HD/FD and the [Y] key is entered, the following dialog box is displayed.

Do you want to overwrite?
Yes (Y) No (N)

When the [Y] key is entered the existing file is overwritten.

- When an error occurs because of a mistaken copy specification to the HD/FD, etc., the following dialog box is displayed and processing stops.

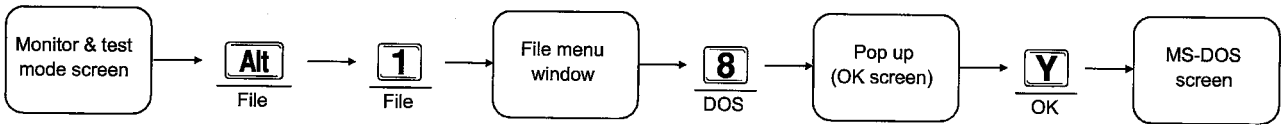
Retry?
Yes (Y) No (N)

Press [Y] key to retry.

15.9 DOS Mode (Not possible with SW□RX-AD75P)

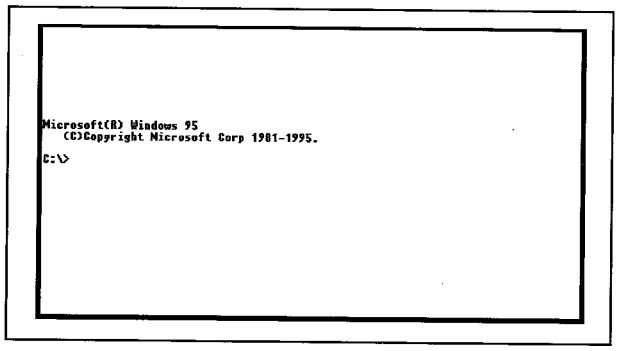
This makes is possible to execute DOS commands by returning to the MS-DOS prompt state (command entry wait) without ending the AD75P function.

Basic operation



MS-DOS screen and operation

MS-DOS screen



• OK : Y

Explanation

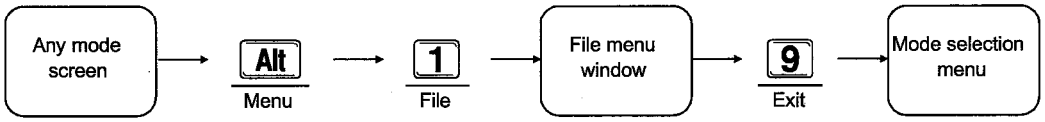
- The screen can be switched to the DOS screen by entering the [Y] key.
- You can return from the DOS screen to the AD75P function mode by entering "EXIT."
- **DOS ↔ AD75P function mode**
  When switching from the current screen being edited to the DOS screen, the contents of the screen being edited are temporarily stored. When returning to the edit screen by entering "EXIT" you are returned to the screen that was displayed before the switch was made.
- DOS commands can be executed. FDs can be formatted and directories can be created.
- When other applications are running or when the system is reset, then it may not be possible to return to the AD75P function. If it is not possible to return then the data that was being edited may be destroyed.

Model Name	AD75P[ ]	AD75P[ ]-S3	AD75M[ ]
Application			O

15.10 Exit

This exits the mode and returns the display to the mode selection menu.

Basic operation



Explanation

This exits the selected mode and returns the screen to the mode selection menu.

16 AD75 MENU

16.1 AD75 Menu Restrictions on Any Mode

The AD75 menu restrictions on any mode are shown below.

Mode \ AD75 menu		Upload	Download	Verify	OS	F-ROM request	Servo ON	All axis Servo OFF instruction
Edit	Positioning data edit Start block edit Parameters edit	○	○	○	○	○	–	–
	M code comment edit	–	–	–	–	–	–	–
	Condition data edit	○	○	○	○	○		
Monitor		–	–	–	–	–	–	–
Test		–	–	–	○	–	○	○
Servo start-up		–	–	–	–	–	○	○
Servo		–	–	–	–	–	○	○
Trace		–	–	–	–	–	–	–
Environment		–	–	–	–	–	–	–

○: Setting possible, –: Setting not possible

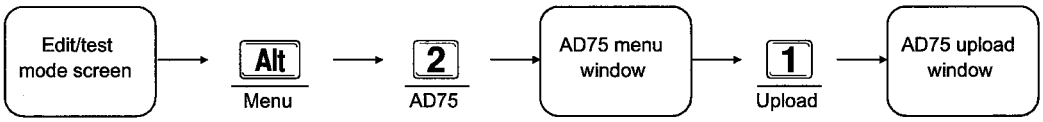
Remark

1) The items for which setting is not possible in any mode are not displayed in the AD75 menu.

16.2 AD75 Upload

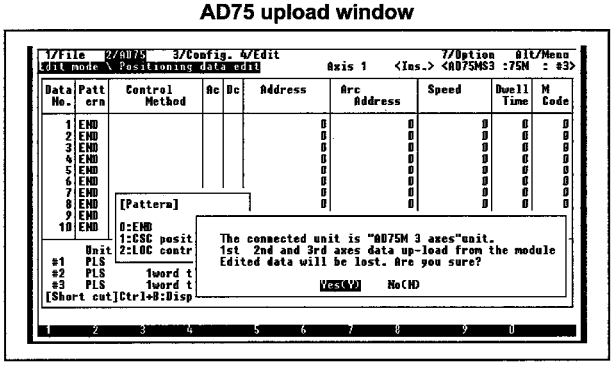
This Uploads the settings data from the AD75 main module.

Basic operation



AD75 upload window and operation

AD75 upload window



Explanation

When AD75 upload is selected from the AD75 menu the following dialog box is displayed.

<Example>: For the 3 axis unit

The connected unit is "AD75M 3 axes" unit.
1st 2nd and 3rd axes data up-load from the module
Edited data will be lost. Are you sure?
Yes (Y) No (N)

When the [Y] key is entered the peripheral equipment edited information becomes invalid and the AD75 main module data is upload. When the [N] key is entered uploading is stopped.

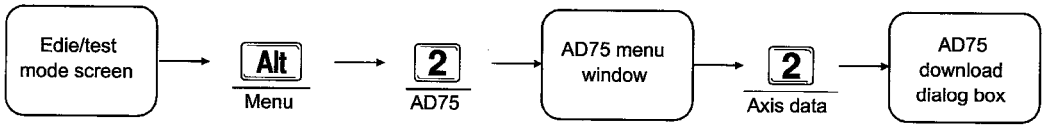
- The main module data read is conducted by matching the connected module type.
- When a communication error occurs during a upload from the AD75, the following dialog box is displayed and communication is ended.

In up-load process
Receive time out
Retry?
Yes (Y) No (N)

16.3 AD75 Download

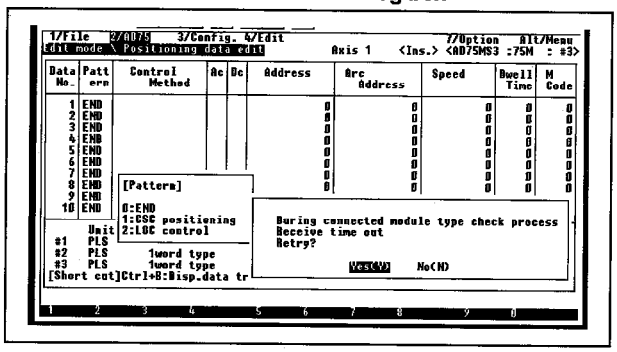
The information in the peripheral equipment internal memory is batch downloaded to the AD75. Please conduct downloading to the AD75 after checking the items (Refer to Item 22.3) and confirming that there are no errors.

Basic operation



AD75 download dialog box and operation

AD75 download dialog box



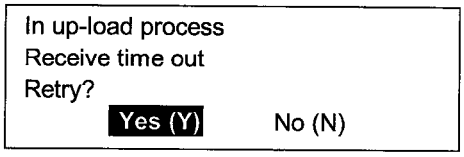
• Execute download : Y

Explanation

- The positioning data, start information, conditions data, and all parameters for all axis are downloaded to the AD75 main module.
- When the [Y] key is pressed the information in the internal peripheral equipment memory is downloaded to the AD75 main module. In addition, when the flash ROM automatic write setting is set to "Write," downloading is automatically done to the flash ROM after downloading to the AD75 main module.

  For information regarding the flash ROM automatic download setting, refer to Item 17.4.
- When a communication error occurs during the download to the AD75 main module, the following dialog box is displayed and communication is ended.

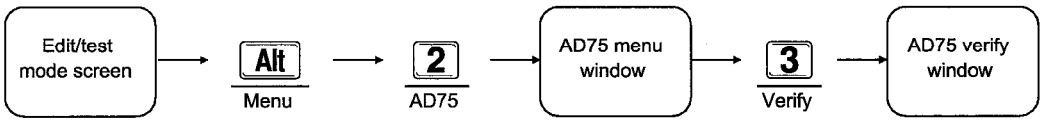
  At this time data will only be partially transmitted.



16.4 AD75 Verify

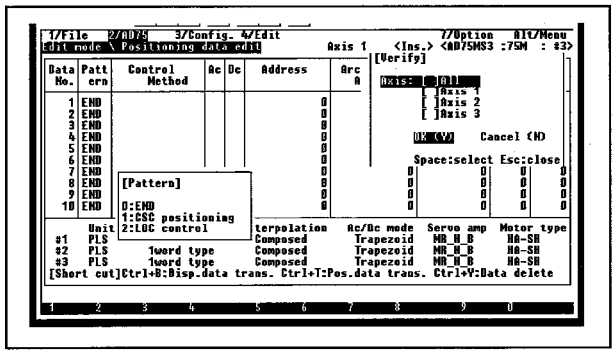
This verify the current peripheral equipment internal memory contents and the setting data in the AD75.

Basic operation



AD75 verify window and operation

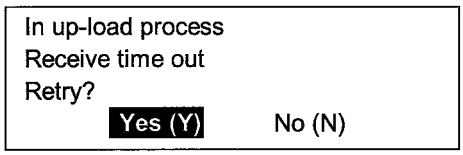
AD75 verify window



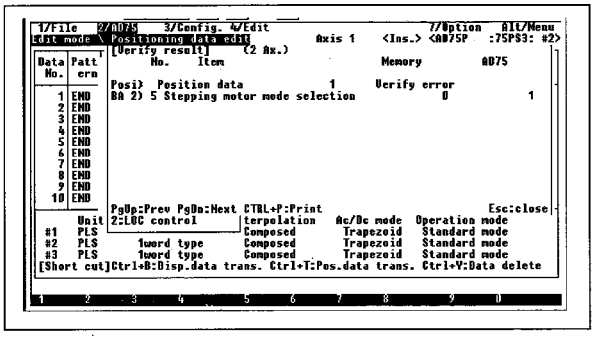
- Move cursor : ↑, ↓
- Confirm/clear axis designation : SP
- Execute verify : Y

Explanation

- The [SP] key is used to confirm/clear the axis specification. When "All" is selected a "*" is added to the displayed items.
- When the [Y] key is pressed the peripheral equipment internal memory contents are compared with the AD75 main module settings data.
- When a communication error occurs during a verification to the AD75 main module, the following dialog box is displayed and communication is ended.



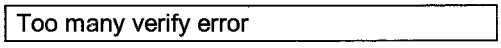
- When the verification results do not match, an unmatching contents list screen like that shown below is displayed using axis units.



(1) The data verification order and display form are as follows.

Verification order	Display form
[1] Positioning data	Posi
[2] Start block	Str
[3] Conditions data	Cond
[4] OPR basic parameter	OPRB
[5] OPR extended parameter	OPRE
[6] Basic parameter #1	BA1
[7] Basic parameter #2	BA2
[8] Extended parameter #1	EX1
[9] Extended parameter #2	EX2
[10] M code comment	M C

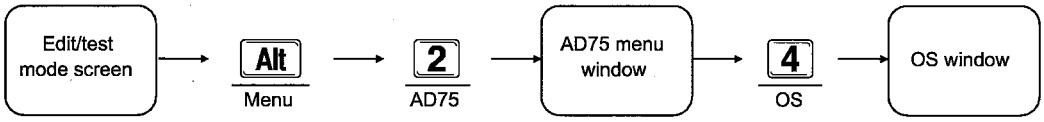
(2) Up to 10 items can be displayed in the screen and it is possible to switch to the next item by entering the [Page Up] or [Page Down] keys. Entering the [ESC] key closes the screen and continues verification of 2 axes and 3 axes. During verification, if too many verification errors are detected the following dialog box is displayed and verification is stopped.



16.5 OS

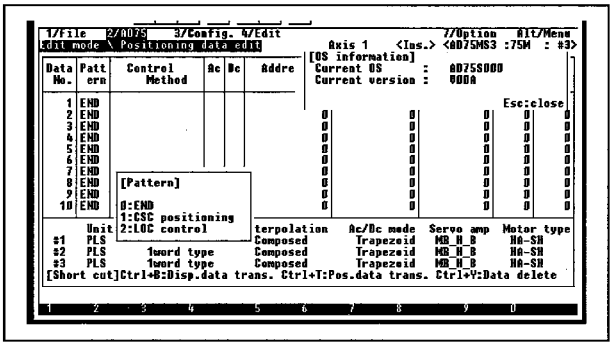
This displays the OS information.

Basic operation



OS window and operation

OS window



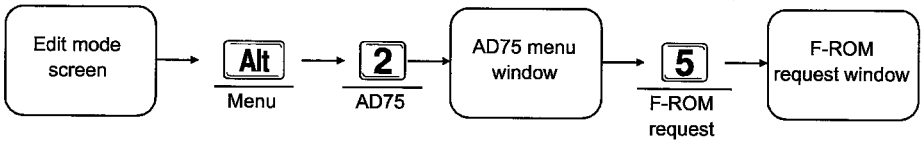
Explanation

- This displays the OS name and OS version installed in the AD75 main module.

16.6 F-ROM Request

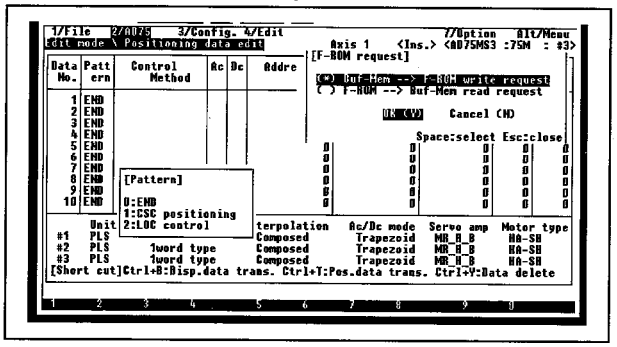
This conducts reading and writing between the AD75 main module buffer memory and the F-ROM.

Basic operation



F-ROM request window and operation

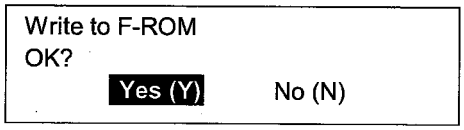
F-ROM request window



- Move cursor : ↑, ↓
- Confirm/clear selection setting : SP
- Execute : Y

Explanation

- Move the cursor with the item to be selected and then confirm the selected item by entering the [SP] key.
- Entering the [Y] key will display the following dialog box.



When the [Y] key is entered writing/reading to the F-ROM is executed.

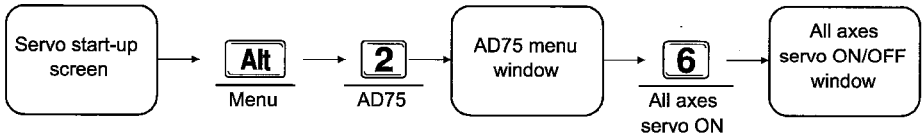
Model Name	AD75P[ ]	AD75P[ ]-S3	AD75M[ ]
Application			O

16.7 Servo ON/OFF Instruction

This places the servo amplifier connected to the AD75M from the peripheral equipment into the servo ON/OFF state.

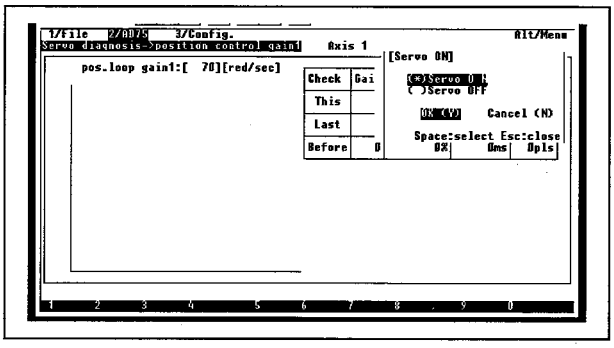
- Servo ON: Servo operation possible state (Positioning control possible)
- Servo OFF: Free RUN state

Basic operation



Servo ON window and operation

Servo ON window



- Move cursor : ↓, ↑, →, ←
- Select item : SP

Explanation

- Select using the [SP] key after moving the cursor to the Servo ON/Servo OFF using the cursor key.
- When OK (Y) is selected the execute selection window is displayed.
  - When Yes (Y) is selected the all axis Servo ON/OFF request is issued to the AD75M.
  - When No (N) is selected the display returns directly to the original screen.
- The Servo ON request is valid in the following cases.
  - When the servo ready signal for all of the axis that are connected are in the off state.
  - When all of the connected axis are either in the "Servo unconnected" or "Servo OFF".
- The Servo OFF request is valid in the following cases.
  - When the servo ready signal of the connected 1-axis is in the on state.
  - When all of the connected axis are in one of the following states.
    Stand-by
    Stop
    Step stand-by
    Step stop
    Servo unconnected
    Servo OFF
- When an error occurs during the Servo ON/OFF request issue an error box is displayed. After the error contents are corrected reissue the Servo ON/OFF request.
- Use the servo status signal to confirm whether or not the Servo ON/OFF request is received on the servo amplifier side after it is issued.

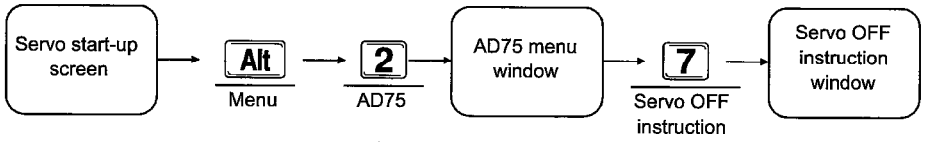
Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

16.8 Servo OFF

This sets the servo amplifier connected to the AD75M from the peripheral equipment to the Servo ON/OFF state for each axis.

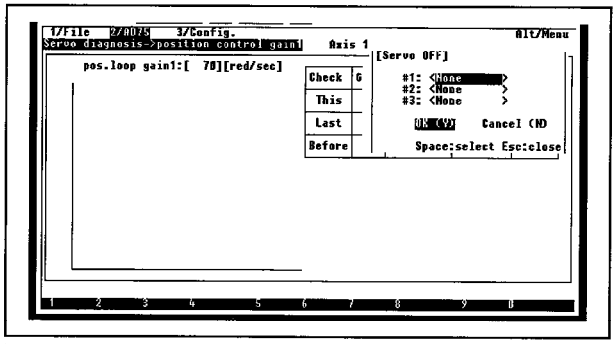
- Servo ON: Servo operation possible state (Positioning control possible)
- Servo OFF: Free run state

Basic operation



Servo OFF window and operation

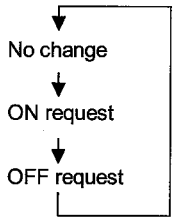
Servo OFF window



- Move cursor : ↓, ↑, →, ←
- Select item : SP

Explanation

- Use the cursor key to select the axis for which Servo ON/OFF will be conducted and then make the selection using the [SP] key.
- The setting information will change as shown below each time the [SP] key is pushed. Select the item for which the request will be conducted.



- When OK (Y) is selected the execute selection window is displayed.
  - When Yes (Y) is selected the Servo ON/OFF request is issued to the AD75M.
  - When the No (N) is selected the display immediately returns to the original screen.
- The Servo ON request is valid in the following cases.
  - When the servo ready signal is in the on state servo off.
  - When an axis status other than "Error generation inside" or "Step error generation inside".
- The Servo OFF request is valid in the following cases.
  - When the axis for which Servo OFF will be conducted is in the Servo ON state.
  - When the axis for which Servo OFF will be conducted is in one of the following states.
    Stand-by
    Stop
    Step stand-by
    Step stop
- When an error occurs during Servo ON/OFF request issue, an error box is displayed. After correcting the error contents reissue the Servo ON/OFF request.
- After the Servo ON/OFF request is issued use the servo status signal to check whether or not the request is received at the servo amplifier side.

17 CONFIG. MENU

17.1 Config. Menu Restrictions on Any Mode

The config. menu restrictions on any mode are shown below.

Mode \ Config. Menu		Axis switch	Aux. menu disable (display)	Symbol change	F-ROM auto write	Test reconfirm	Start block change	Start block access
Edit	Positioning data edit	O	O	O	O	–	–	O
	Start block edit	O	O	–	O	–	O	O
	Parameters edit M code comment edit	O	–	–	O	–	–	O
	Conditions data edit	O	O	–	O	–	–	O
Servo parameter edit		O	O	–	O	–	–	O
Monitor	Operation monitor	–	–	–	–	–	–	–
	Positioning data monitor	O	–	O	–	–	–	–
	Start block monitor	O	–	–	–	–	–	–
Test	Operation test monitor	–	–	–	–	O	–	–
	Positioning data test & monitor	O	O	–	–	O	–	–
	Start block test & monitor	O	O	–	–	O	O	–
Servo start-up		–	–	–	–	–	–	–
Servo		O	–	–	–	–	–	–
Trace		–	–	–	–	–	–	–
Environment		–	–	–	–	–	–	–

O: Setting possible, –: Setting not possible

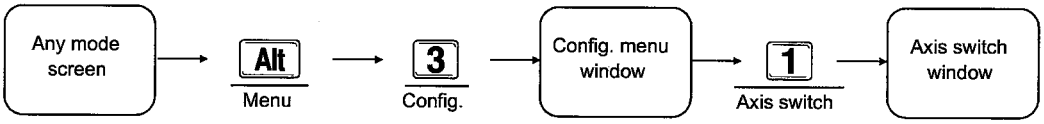
Remark

1) The items that cannot be set in any mode are not displayed in the config. menu.

17.2 Axis Switch

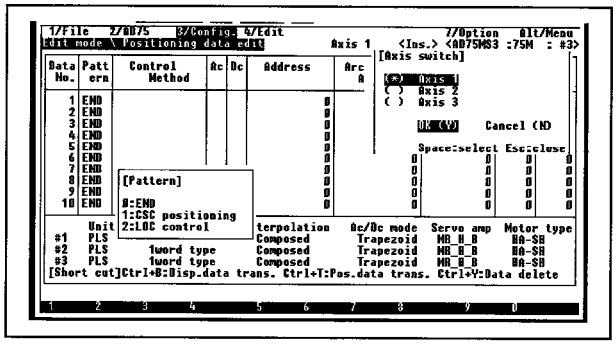
This switches the axis in the display screen.

Basic operation



Axis switch window and operation

Axis switch window



- Move cursor : ↑, ↓
- Confirm/clear axis designation : SP
- Execute switch : Y

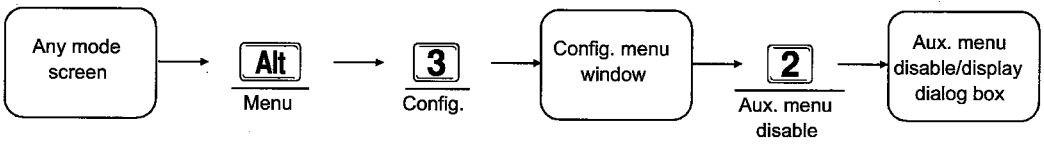
Explanation

- Align the cursor with the item to be set and then push the [SP] key to confirm/clear the specified axis.
- The screen switches to the specified axis when the [Y] key is entered.
- The axis can be switched to either the 1 axis, 2 axes, or 3 axes.

17.3 Aux. Menu Disable (Display)

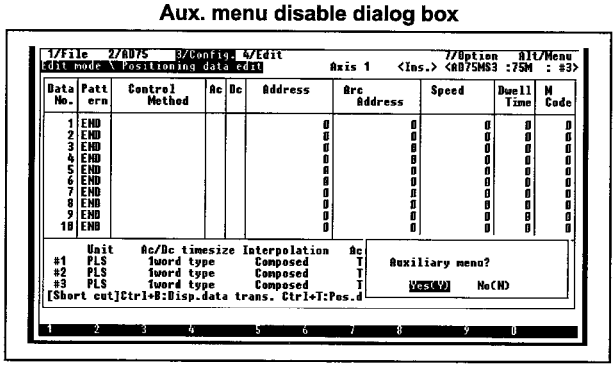
This disable/displays the aux. menu.

Basic operation



Aux. menu disable dialog box and operation

Aux. menu disable dialog box



Explanation

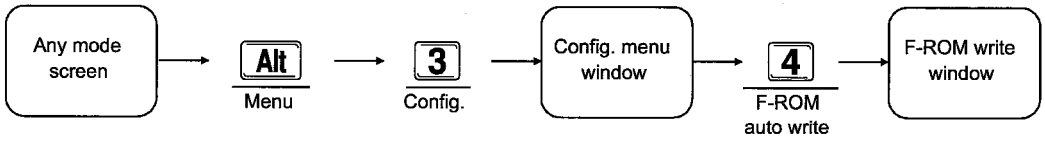
- This disables or displays the auxiliary menu displayed by being linked to cursor movement to positioning data edit, start block edit, condition data edit, positioning test, and start test.
- Entering the [Y] key displays the auxiliary menu.

  Entering the [N] key disables the auxiliary menu.
- When the current auxiliary menu is displayed the auxiliary menu disables message is displayed.
- When the current auxiliary menu is disables, the auxiliary menu display message is displayed.

17.4 F-ROM Auto Write

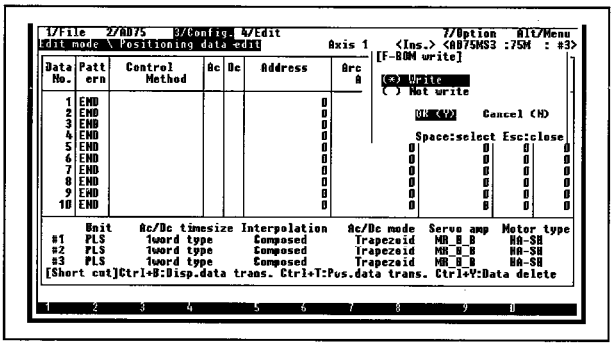
This sets whether or not the F-ROM is written to when the AD75 is written to. (The default setting is for the F-ROM to be written to.)

Basic operation



F-ROM write window and operation

F-ROM write window



- Move cursor : ↑, ↓
- Confirm/clear selected item : SP
- Execute : Y

Explanation

- This sets whether or not a write to F-ROM is automatically executed when the [Alt] menu "2/AD75" "Write" is executed.
  - Write:
    The edited data is written to the buffer memory and the F-ROM.
  - Not write:
    The edited data is written to buffer memory.
- Align the cursor with the item to be selected and then use the [SP] key to confirm/clear the selected item. Items next to which an * is displayed are selected.
- Entering the [Y] key executes the settings.

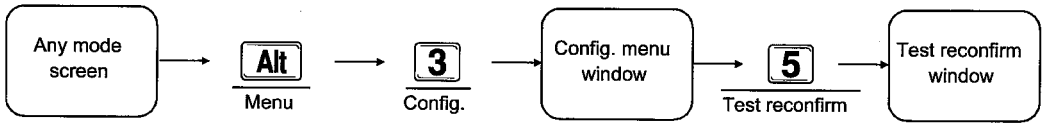
Points

- The following edited data is displayed.
  - Positioning data
  - Start block data
  - Positioning parameter
  - M code comment
  - Condition data
  - Servo parameter
- When setting the edited data using the AD75P and conducting the write positioning control in the AD75, then writing to the F-ROM is required. If the F-ROM is not written to then the edited data written from the AD75P will be erased when the PC power supply is turned off.
- The F-ROM can be written to up to 100,000 times. It cannot be written to more than 100,000 times.

17.5 Test Reconfirm

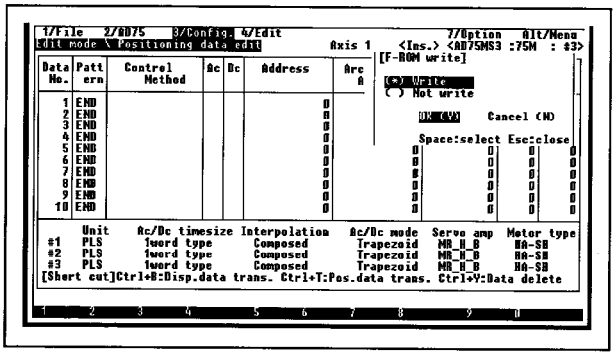
This sets whether or not the execution confirmation dialog box is displayed when the AD75 main module test is started up in the test mode and Servo diagnosis mode.

Basic operation



Test reconfirm window and operation

Test reconfirm window



- Move cursor : ↑, ↓
- Confirm/clear selected item : SP
- Execute : Y

Explanation

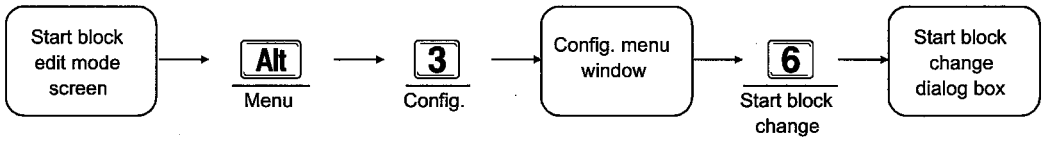
- Align the cursor to the items to be set and then enter the [SP] key to confirm the selected items.
  - Reconfirm:
    The execution confirmation dialog box is displayed.
  - Not reconfirm:
    The execution confirmation dialog box is not displayed.
- Enter the [Y] key to execute the settings.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application		O	O

17.6 Start Block Change

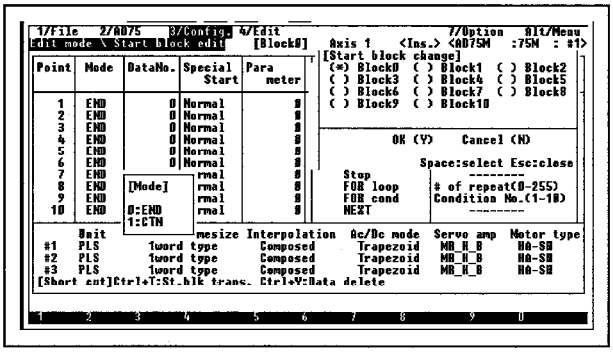
This switches the No. as the start block to be edited during start block editing.

Basic operation



Start block change dialog box and operation

Start block change dialog box



- Move cursor : ↑, ↓, →, ←
- Select/clear item : SP

Explanation

- Use the cursor key to move the cursor to the start block No. to be edited and then select it using the [SP] key.
- Use the [Tab] key to move the cursor to the "OK (Y)" position.
  - When the [Y] key is entered the screen is switched to the selected block No.
  - When the [N] key is entered the block No. is not switched.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application		O	O

17.7 Start Block Access

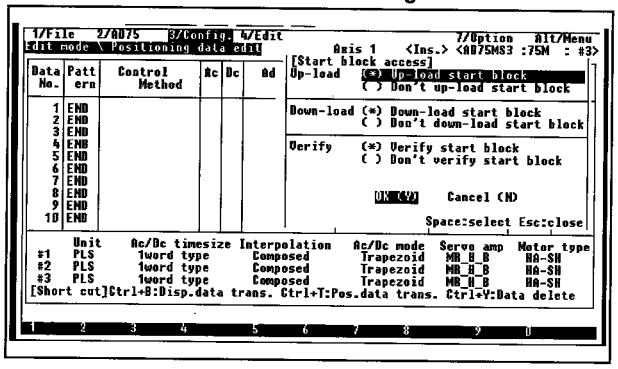
This sets whether or not start blocks 1 to 10 are subjected to the AD75 upload, AD75 download, and AD75 verify.

Basic operation

Start block edit mode screen → Alt (Menu) → 3 (Config.) → Config. menu window → 7 (Start block access) → Start block access dialog box

Start block access dialog box and operation

Start block access dialog box



- Move cursor : ↓, ↑
- Select/clear item : SP
- Moving between items : Tab

Explanation

- Use the cursor keys to move the cursor to "Setting item" position and then make a selection using the [SP] key.
- Entering the [Y] key will AD75 upload, download, or verify the selected contents.

  Entering the [N] key will AD75 upload, download, or verify the previous setting.

18 EDIT MENU

18.1 Edit Menu Restrictions on Any Mode

The edit menu restrictions on any mode are as shown below.

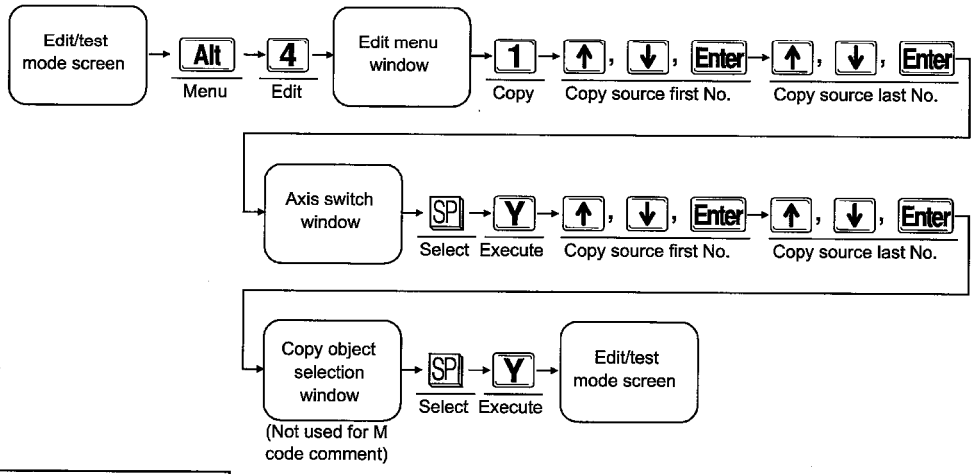
Mode \ Config. menu		Copy	Jump	Axis copy	Block copy
Edit	Positioning data edit Start block edit	○	○	○	—
	Parameter edit	—	—	○	○
	M code comment edit	○	—	○	—
	Conditions data edit	—	—	○	○
	Servo parameter edit	—	—	○	—
Monitor		—	—	—	—
Test	Operation test & monitor	—	—	—	—
	Positioning data test & monitor Start block test & monitor	—	○	—	—
Servo start-up		—	—	—	—
Servo		—	—	—	—
Trace		—	—	—	—
Environment		—	—	—	—

○: Setting possible, —: Setting not possible

18.2 Copy

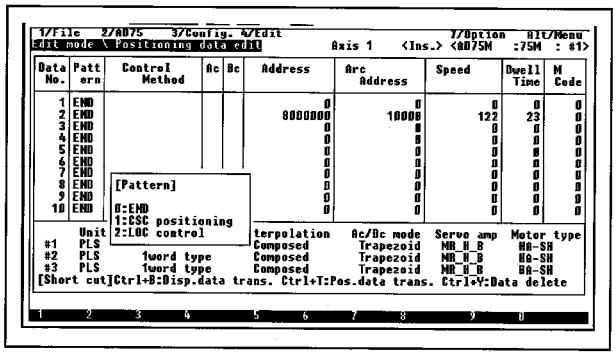
This copies the positioning data, start block, and M code comment to any position.

Basic operation



Edit/test mode screen in operation

Edit/test screen



- Move cursor : ↑, ↓
- Confirm/clear setting item : SP
- Designate copy range : Enter
- Switch between insert/overwrite : INS

á Execute : Y

Explanation

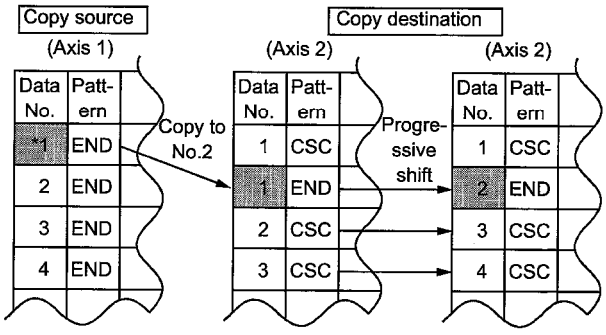
- Use the [Enter] key to set the start No. and end No. to be copied. An "*" will be added to the left of the range specified data, point, and M code No.
- Set the copy destination axis using the [SP] key in the axis switch window.
- An "*" will be added to the displayed items when the "All" item is selected in the selection window to be copied. In addition, there is no selection window to be copied when copying M code comment editing.
- The following copy functions are displayed in the insert/overwrite state.

  <Insert>

  Items will be sent in order when and * is inserted, so there is a chance that the overall data No. will be offset. Be careful of setting redundant data Nos.

  <Example>

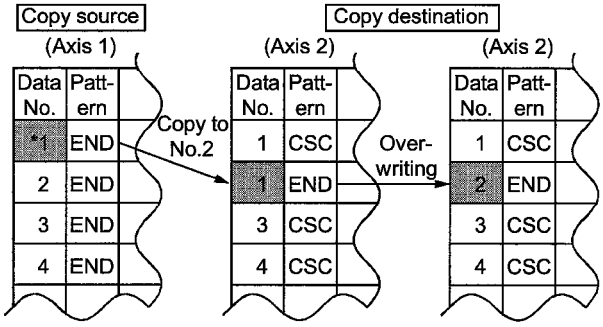
  When inserting the axis 1 data No. 1 in the axis 2 data No. 2.



<Overwrite>

<Example>

The data No. 1 is overwritten to the copy destination data No. 2.



The [Ins] key becomes valid during copy function execution, so switching between the insert/overwrite function is possible by entering the [Ins] key.

- When there is insufficient space in the copy destination the following dialog box is displayed.

Invalid copy destination area Do you still want to copy? Yes (Y) No (N)

When the [Y] key is entered the copy source data will be given priority to copy over the copy destination data.

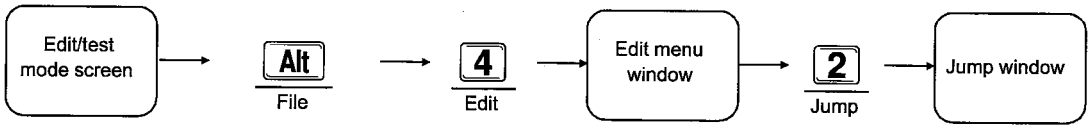
<Note>

When the copy destination area is 0, the copying will not be conducted even if forced copy is executed.

18.3 Jump

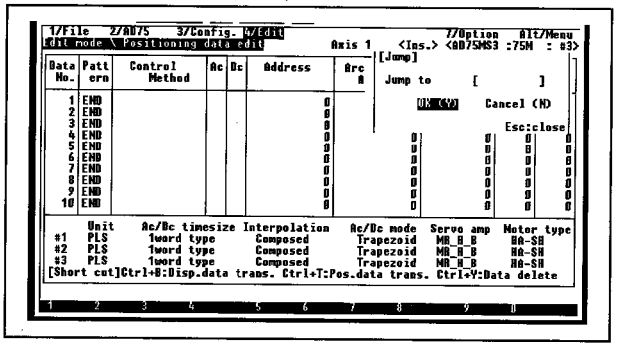
The cursor is moved to the designated No.

Basic operation



Jump window and operation

Jump window



• Jump : Y

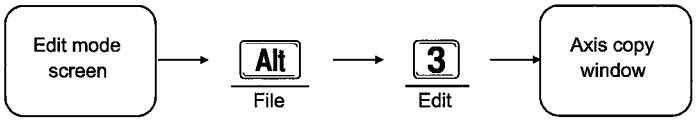
Explanation

- This sets the jump destination data No. The jump destination data No. setting range is shown below.
  - Positioning data: 1 to 600
  - Start block: 1 to 50
- Entering the [Y] key will display the cursor and the set data No. position.

18.4 Axis Copy

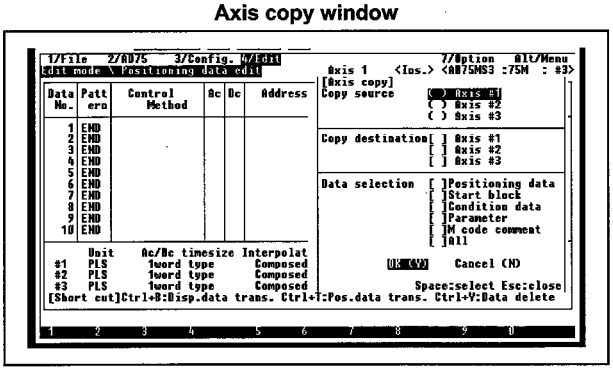
This copies the positioning data, start block data, condition data, parameters, and M code comment to a different axis.

Basic operation



Axis copy window and operation

Axis copy window



- Move cursor : ↓, ↑
- Select/clear item : SP

Explanation

- When the [Tab] key is pushed the cursor (reverse display) will move as shown below.

  Copy source axis specification column
  ↓
  Copy destination axis specification column
  ↓
  Data selection column

- **Copy source**
  - Only 1 axis can be set for the copy source axis.
  - When an axis is reverse displayed the copy source axis setting (* displayed) can be set by pushing the [SP] key.

- **Copy destination**
  - Multiple axis can be set as the copy destination axis.
  - When an axis is reverse displayed the copy destination axis setting (* displayed) can be set by pushing the [SP] key. Pushing the [SP] key again makes it possible to cancel the copy destination axis setting.

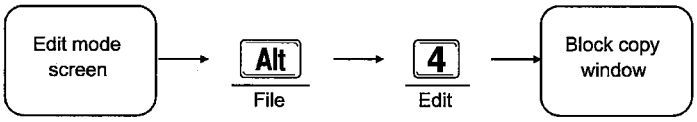
- **Data selection**
  - This sets the data that will be copied.
  - Multiple settings for the data to be copied can be done.
  - When the data is reverse displayed the data to be copied can be set (* displayed) by pushing the [SP] key. The setting can be canceled by pushing the [SP] key again.
  - When the machine selection is AD75M ☐, the parameter settings and servo parameters can also be copied.

- When the copy source and copy destination axis are the same then processing is not conducted.

18.5 Block Copy

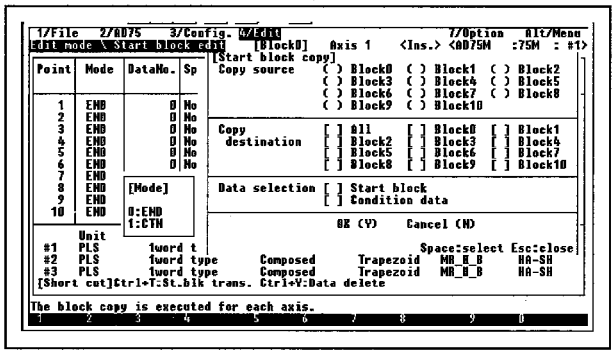
This is used to copy the set start block and conditions data to another block.

Basic operation



Block copy window and operation

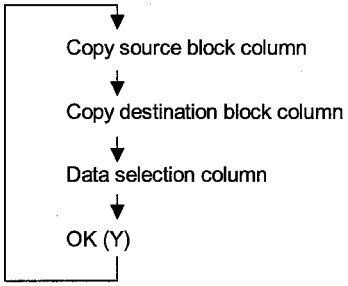
Block copy window



- Move cursor : ↓, ↑, →, ←
- Select/clear item : SP

Explanation

- When the [Tab] key is pushed the cursor moves as shown below.



- **Copy source**
  - Only one block can be set as the copy source block.
  - When the cursor displayed in the block that block can be set as the copy source block (* displayed) by pushing the [SP] key.
- **Copy destination**
  - Multiple copy destination blocks can be set.
  - For the block in which the cursor is displayed the copy destination block can be set (* displayed) by pushing the [SP] key. The copy destination axis setting can be canceled by pushing the [SP] key again.
- **Data selection**
  - This sets the data to be copied.
  - It is possible to set multiple data to be copied.
  - Data in which the cursor is displayed can be set as the data to be copied (* displayed) by pushing the [SP] key. The setting can be canceled by again pushing the [SP] key.
- When the copy source and copy destination blocks are the same the processing is conducted.

19 MONITOR MENU

19.1 Monitor Menu Restrictions on Any Mode

The monitor menu restrictions on any mode are shown below.

Mode \ Monitor menu		Error history	Warning history	Start history	Start with error	X device	Y device	External I/O	Status info.	Address monitor	Speed monitor
Edit		—	—	—	—	—	—	—	—	—	—
Monitor	Operation monitor	○	○	○	○	○	○	○	○	○	○
	Positioning data monitor Start block monitor	—	—	—	—	—	—	—	—	—	—
Test	Operation test & monitor	○	○	○	○	○	○	○	○	○	○
	Positioning data test & monitor Start block test & monitor	—	—	—	—	—	—	—	—	—	—
Servo start-up		—	—	—	—	—	—	—	—	—	—
Servo		—	—	—	—	—	—	—	—	—	—
Trace		—	—	—	—	—	—	—	—	—	—
Environment		—	—	—	—	—	—	—	—	—	—

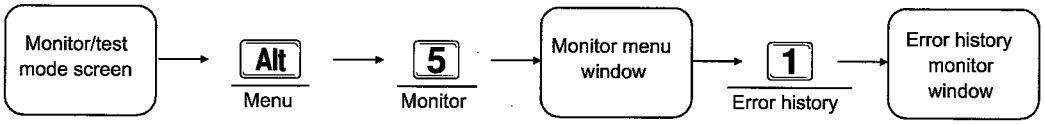
(Continued)

Mode \ Monitor menu		Axis data	OPR	Special start	JOG & man-pls op.	V/P control	M code comment	Servo monitor	Torque control data	Servo parameter
Edit		—	—	—	—	—	—	—	—	—
Monitor	Operation monitor	○	○	○	○	○	○	○	○	○
	Positioning data monitor Start block monitor	—	—	—	—	—	—	—	—	—
Test	Operation test & monitor	○	○	○	○	○	○	○	○	○
	Positioning data test & monitor Start block test & monitor	—	—	—	—	—	—	—	—	—
Servo start-up		—	—	—	—	—	—	—	—	—
Servo		—	—	—	—	—	—	—	—	—
Trace		—	—	—	—	—	—	—	—	—
Environment		—	—	—	—	—	—	—	—	—

19.2 Error History Monitor

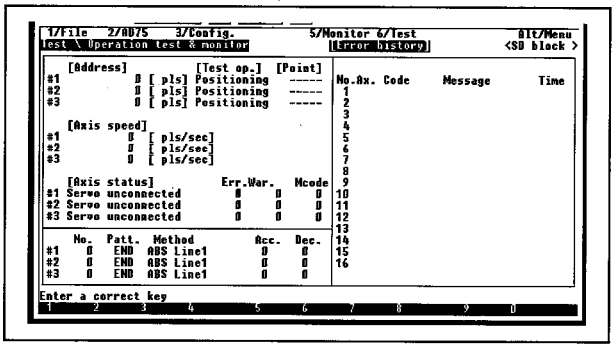
This displays 16 error occurrence axis, error No., error contents, and occurrence time.

Basic operation



Error history monitor window and operation

Error history monitor window

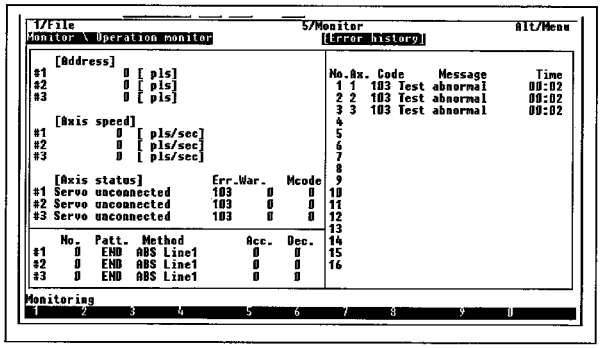


- Switch screen display : Ctrl + F1
- Stop monitoring (Monitor mode only) : ESC

Explanation

- The error occurrence axis when an error occurs when the power supply is turned on, error No., contents, and occurrence time for a maximum of 16 errors are displayed from the most recent error. The newest data is displayed in order from the bottom.
- When more than 16 errors occur the oldest data is deleted.
- **Special display**

  The screen changes to the following special screen display when the [Ctrl]+[F1] keys are pushed.



This screen displays the error occurrence time in up to 100 msec. In addition, the error contents are not displayed. To return to the original screen push the [Ctrl]+[F1] keys again.

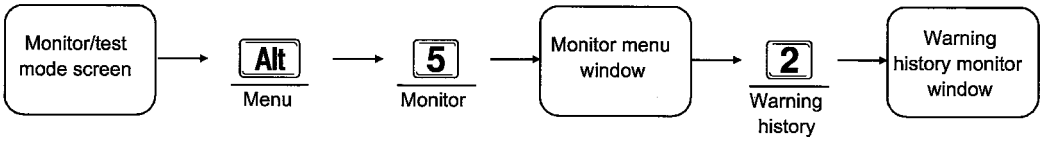
- Processing message display for the error (Only during the monitor mode).

  Monitoring is stopped by pressing the [ESC] key. Use the [↑] and [↓] keys to move to the top of the error code for which you want a message to be displayed and then press the [Enter] key to display the processing message for the error code for the guide message portion on the bottom of the screen.

19.3 Warning History Monitor

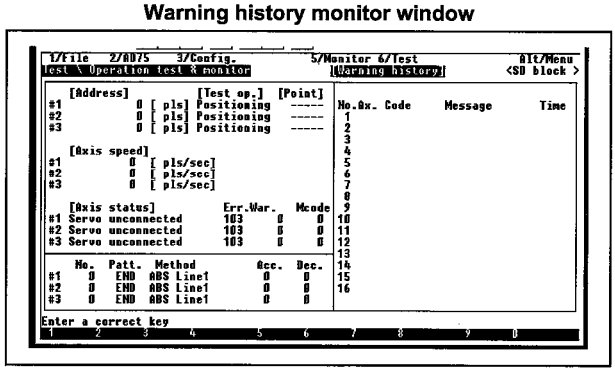
This displays 16 warning occurrence axis, warning No., contents, and occurrence time.

Basic operation



Warning history monitor window and operation

Warning history monitor window

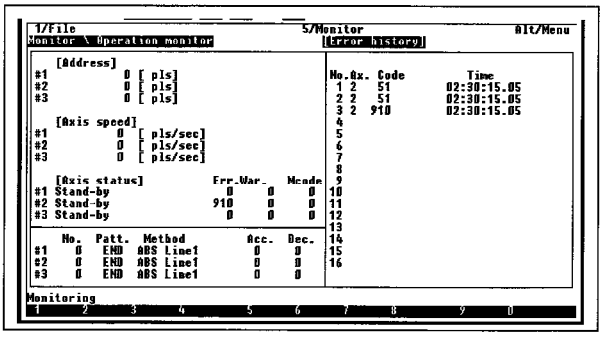


- Switch screen display : Ctrl + F1
- Stop monitoring (Monitor mode only) : ESC

Explanation

- This displays a maximum of 16 of the newest warning occurrence axis, warning No., contents, and warning time when a warning occurs when the power supply is turned on.
- When more than 16 warnings occur the oldest data is erased.
- **Special display**

  The screen changes to the following special screen display when the [Ctrl]+[F1] keys are pushed.



This screen displays the one occurrence time in 100 ms units. In addition, the warning contents are not displayed. Push the [Ctrl]+[F1] keys to return to the original screen.

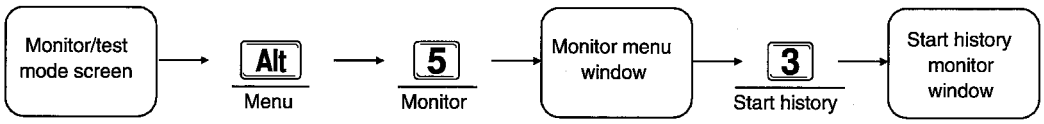
- Processing comment display for warnings (only during monitor mode)

  Entering the [ESC] key will stop monitoring. Use the [↑] and [↓] keys to move the cursor above the warning No. for which the message will be displayed and then enter the [Enter] key to display a processing message for the warning when the guide message section at the bottom of the screen.

19.4 Start History Monitor

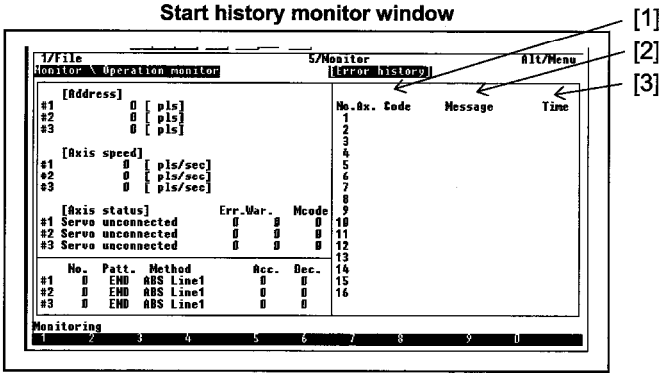
This displays up to 16 start histories including the started axis, start mode, start time, and error res.

Basic operation



start history monitor window and operation

Start history monitor window



Explanation

[1] Code

This displays whether start will occur from the PC CPU, external start, or peripheral equipment.

[2] Message

This displays the positioning No. where start is begun for the JOG operation, manual pulser operation, positioning operation, and operation control command simultaneous start, etc. When restarting when the system is stopped the word "Re" will be displayed next to the positioning No.

[3] Time

The time is displayed in hour: minute: second in up to 100 ms.

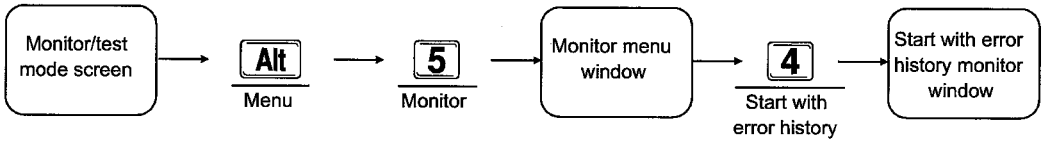
[4] Res.

This displays the error code when an error occurs. OK is displayed during normal end.

19.5 Start With Error History Monitor

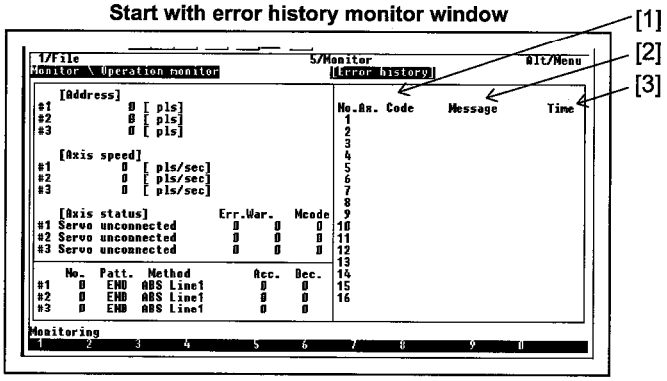
This displays up to 16 start histories form the time an error has occurred.

Basic operation



Start with error history monitor window and operation

Start with error history monitor window



Explanation

- When an error occurs in the start history all of the start history contents are copied to the Start with error history. This displays a maximum of 16 start histories from the time an error occurred.

  [1] Code

  This displays whether start will occur from the PC CPU, external start, or peripheral equipment.

  [2] Message

  This displays the positioning No. where start is begun for the JOG operation, manual pulser operation, positioning operation, and operation control command simultaneous start, etc. When restarting when the system is stopped the word "Re" will be displayed next to the positioning No.

  [3] Time

  The time is displayed in hour: minute: second in up to 100 ms.

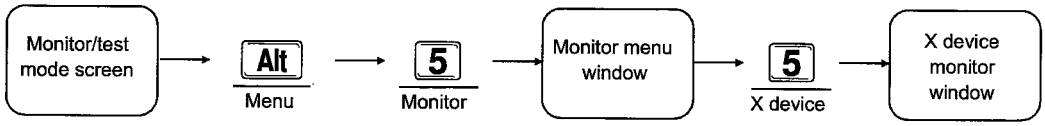
  [4] Res.

  This displays the error code when an error occurs. OK is displayed during normal end.

19.6 X Device Monitor

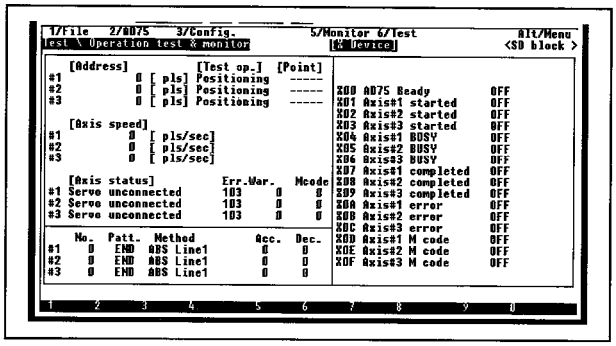
This displays the X device signal.

Basic operation



X device monitor window and operation

X device monitor window



Explanation

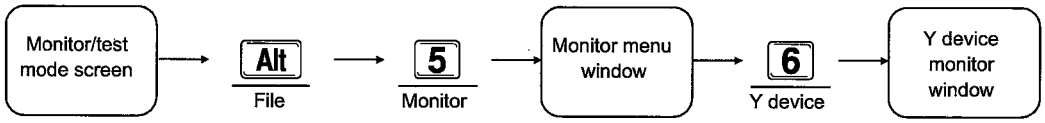
- This displays whether the X device signals (input signals) are on or off with OFF and ON. The details of which states are displayed are shown below.

Device	Axis No.	State	
		OFF	ON
X00	—	AD75 not ready	AD75 ready
X01	Axis #1	Start completed OFF	Start completed ON
X02	Axis #2		
X03	Axis #3		
X04	Axis #1	NOT BUSY	BUSY
X05	Axis #2		
X06	Axis #3		
X07	Axis #1	Positioning not completed.	Positioning completed.
X08	Axis #2		
X09	Axis #3		
X0A	Axis #1	No error occurrence	Error occurrence
X0B	Axis #2		
X0C	Axis #3		
X0D	Axis #1	M code OFF	M code ON
X0E	Axis #2		
X0F	Axis #3		

19.7 Y Device Monitor

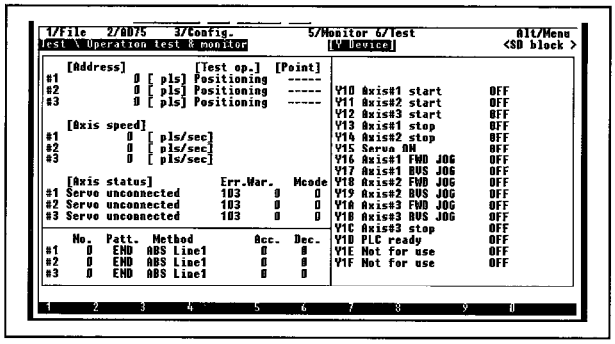
This displays the Y device signal.

Basic operation



Y device monitor window and operation

Y device monitor window



Explanation

- This displays whether the Y device signals (output signals) are in the on or off sate with OFF, ON. The details of which state is displayed are given below.

Device	Axis No.	State	
		OFF	ON
Y10 Y11 Y12	Axis #1 Axis #2 Axis #3	No positioning start request	Positioning start request
Y13 Y14	Axis #1 Axis #2	No axis stop request	Axis stop request
Y15	—	—	—
Y16	Axis #1	FWD JOG start OFF	FWD JOG start ON
Y17	Axis #1	RVS JOG start OFF	RVS JOG start ON
Y18	Axis #2	FWD JOG start OFF	FWD JOG start ON
Y19	Axis #2	RVS JOG start OFF	RVS JOG start ON
Y1A	Axis #3	FWD JOG start OFF	FWD JOG start ON
Y1B	Axis #3	RVS JOG start OFF	RVS JOG start ON
Y1C	Axis #3	No axis stop request	Axis stop request
Y1D	—	PC ready OFF	PC ready ON
Y1E		—	—
Y1F			

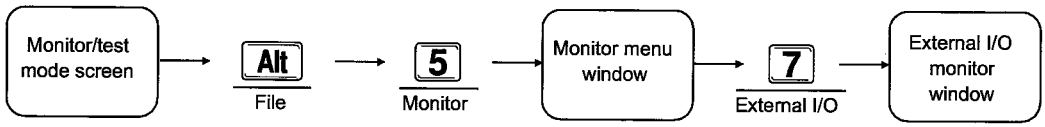
- For the AD75M□, all axes are displayed in the Servo ON state in Y15.

  OFF: All axes Servo OFF (free RUN state)
  ON: All axes Servo ON

19.8 External I/O Monitor

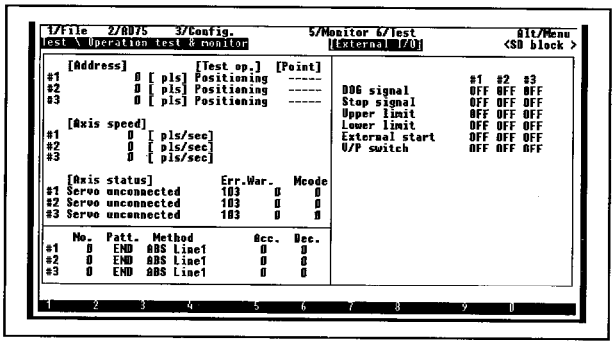
This displays the on and off states for the External I/O.

Basic operation



External I/O monitor window and operation

External I/O monitor window



Explanation

- This displays whether the external I/O is on or off for each axis with OFF and ON.

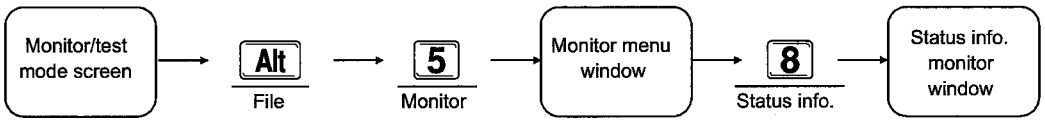
  The External I/O below with an * are not displayed in the AD75M□.

  Drive module ready * .... • This displays the drive module ready on/off state.
  Zero point signal *..... • This displays the 0 point signal on/off state.
  In-position signal * ..... • This displays the in position on/off state.
  DOG signal ..... • This displays the near-point signal on/off state.
  Stop signal..... • This displays the stop signal on/off state.
  Upper limit..... • This displays the upper limit on/off state.
  Lower limit..... • This displays the lower limit on/off state.
  External start..... • This displays the external start on/off state.
  V/P switch signal..... • This displays the speed position switch signal on/off state.
  Deviat. count. CLR * ..... • This displays the deviation counter clear on/off state.

19.9 Status Info. Monitor

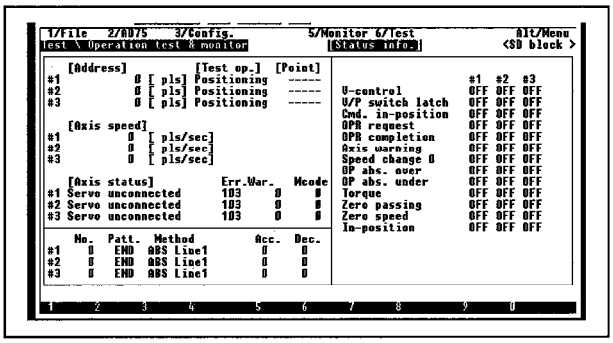
This displays the Status info. ON and OFF status.

Basic operation



Status Info. monitor window and operation

Status info. monitor window



Explanation

- This shows whether the status signal is on/off for each axis using OFF and ON.

- **V-control**
  This is on during V-control and off during P-control. In addition, it is off when the power supply is turned on, during JOG operation, and during manual pulser operation.

- **V/P switch latch**
  This is on when switching from the V-control to P-control during V/P control execution.

- **Cmd. in-position**
  This is on when the absolute value of the difference between the command position and the feed current position is less than the "Cmd. In-position range" set by the parameter.

- **OPR request**
  This is on when the origin address confirmation is required when the power supply is turned on or during positioning control.

- **OPR completion**
  This is on when the OPR completes normally.

- **Axis warning**
  This is on when an axis warning occurs during operation.

- **Speed change 0**
  This is on when there is a speed change request when the speed change value is 0. This is off when speed change value is anything other than 0.

- **OP abs. over**
  This is on when there is an overflow in the OP absolute position.

- **OP abs. under**
  This is on when there is an underflow in the OP absolute position.

- **Torque**
  This is on during torque control

- **Zero passing**
  This is on when the encoder's zero point (Z phase) is passed through even once.

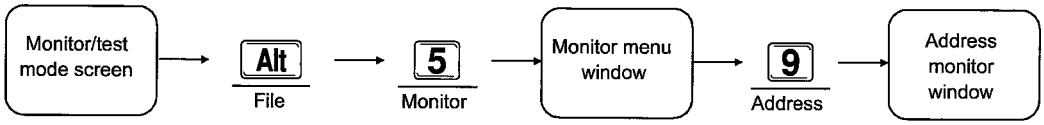
- **In-position**
  This is on when the servo amplifier is in imposition.

- **Zero speed**
  This is on when the servo amplifier is zero speed.

19.10 Address Monitor

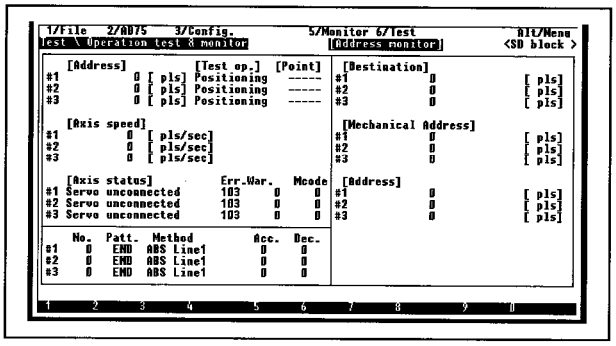
This monitors the Destination, Mechanical Address, and Address for each axis.

Basic operation



Address monitor window and operation

Address monitor window



Explanation

- **Destination**

  During position control the destination is displayed based on the specified positioning address and movement amount and when positioning is completed the value becomes 0. 0 is displayed Speed control and OPR. For speed position control a 0 is displayed during start and when switching to position control the movement amount is displayed as the target value. 0 is displayed when JOG operation, manual pulser operation, or OPR operation is started.

- **Mechanical Address**

  The fixed positions (machine coordinates) determined by the machine are displayed as the current position which is the origin. When OPR is completed the OPR address is displayed.

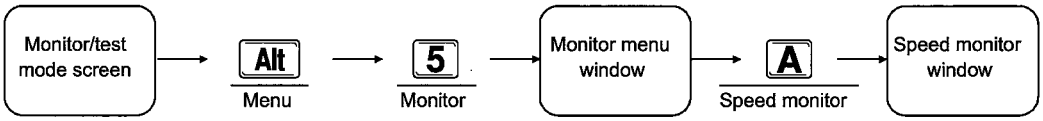
- **Address**

  This displays the actual moved Address (feed current value-deviation counter accumulated pulse).

19.11 Speed Monitor

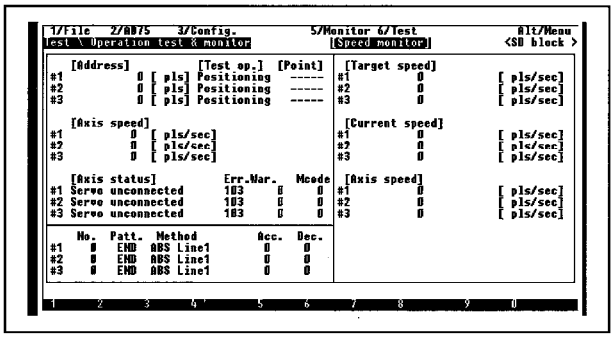
This monitors the Target speed, Count speed, and Axis speed for each axis.

Basic operation



Speed monitor window and operation

Speed monitor window



Explanation

- **Target speed**
  This displays the actual target speed for the positioning data taking into account the current speed, overwrite, and speed limit value in an operation and when the movement is completed 0 is displayed. During interpolation the combined speed or long axis speed target speed is displayed in the basic axis and 0 is displayed for interpolated axis. During JOG operation the target speed taking into account the JOG speed limit value in the JOG speed is displayed and when operation stops 0 is displayed. 0 is displayed for manual pulser operation.

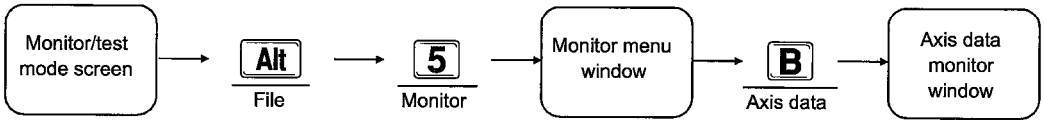
- **Current speed**
  A command speed specified by the positioning data is only displayed during positioning operation, and when the speed is changed the changed speed is displayed. 0 is displayed when positioning operation ends. During interpolation the combined speed or long axis speed is displayed in the first axis and 0 is displayed in other interpolation axis. 0 is displayed during JOG operation and manual pulser operation.

- **Axis speed**
  The actual speed that is generated for all operations is displayed, and when the axis stops 0 is displayed. For interpolation the speed for the combined or long axis speed is displayed in the first axis and 0 is displayed in other interpolation axis.

19.12 Axis Data Monitor

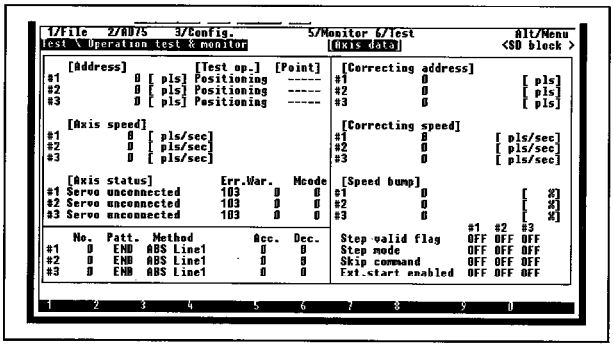
This monitors the four flags of Correcting address, Correcting speed, Speed bump, and axis data for each axis.

Basic operation



Axis data monitor window and operation

Axis data monitor window



(In test mode only)

- Move cursor : ↑, ↓, ←, →
- Switch setting status : SP
- Data : [Numeric value] → Enter

Explanation

- The respective flag data are displayed as 0 for OFF and 1 for ON.
- **Correcting address**
  This displays the current value changed using the positioning No.9003.
- **Correcting speed**
  This displays the numerical value changed for each time the speed is changed during positioning operation or a JOG operation. Change is also possible during the test operation.
- **Speed bump**
  This displays the speed bump for the positioning operation speed (current speed). Change is also possible during test operation.
- **Step valid flag**
  This displays whether or not the step operation is conducted during the positioning operation.
  ON: Step operation is not conducted
  OFF: Step operation is conducted
- **Step mode**
  This displays with which positioning unit step operation is conducted.
  OFF: Reduction unit step
  ON: Data No. unit step
- **Skip command**
  When the skip command is turned on during positioning operation automatic reduction is conducted and the next positioning is performed.
  OFF: Skip request reception complete (set by the OS)
  ON: Skip request (set by the PC program)
- **Ext. start enabled**
  This makes the external control signal valid.
  OFF: Signal not valid
  ON: Signal valid
- **Edit method in test mode editing**
  The axis control data can be edited during test mode editing. The "OFF" setting is highlighted when switching between "OFF" and "ON" using the SP key. In addition, even if the status on the peripheral equipment side is displayed in reverse the display may not be changed from the appearance of data that is again displayed in reverse on the AD75 main module side. The valid range in which numerical values can be changed is shown below.

Item	Valid range	Unit	Valid range	Unit
Correcting address	-214748364.8 to 214748364.7	μm	-21474.83648 to 21474.83647	inch
	0 to 359.99999	degree	-2147483648 to 2147483647	PLS
Correcting speed	0 to 6000000.00	mm/min	0 to 600000.000	inch/min
	0 to 600000.000	degree/min	0 to 1000000	PLS/sec
Speed bump	1 to 300	%		

When the "Start key" is pushed the selection cursor will disappear and test operation will begin.

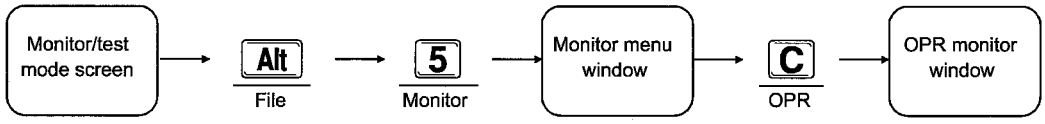
Point

- **Precautions regarding step validity flag setting during test mode editing**
  When the system is stopped after starting an axis set with "Step automatic reduction operation" or "Step data No. unit operation" in "6/test" → "2/test operation conditions" in the [Alt] menu, restarting is not possible if the step validity flag setting is changed to off. In addition, in the same way if "Normal operation" is set then restart cannot be done if the "Step valid flag" is set to on.

19.13 OPR Monitor

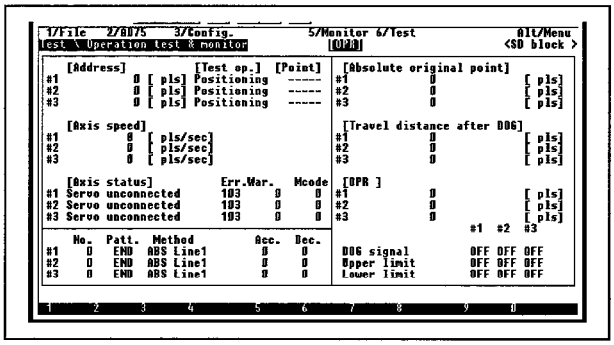
This monitors the four signals related to Original point, Travel distance after DOG, and OPR.

Basic operation



OPR monitor window and operation

OPR monitor window



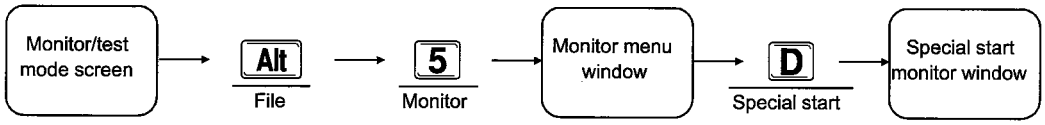
Explanation

- **Absolute original point**
  Positioning to the origin position can be done using the Absolute original point value. The origin address is displayed when OPR is completed.
- **Travel distance after DOG**
  0 is displayed during OPR start. After OPR complete, the movement amount from the near-point dog on to the OPR complete is displayed.
- The signal on/off data is shown as OFF and ON. (For AD75M□-□, the zero point signal is not displayed.)

19.14 Special Start Monitor

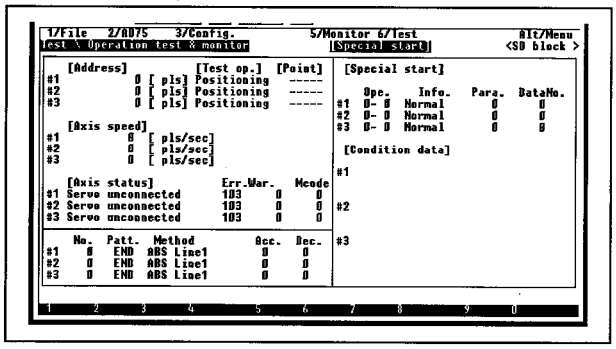
This displays the Special start information and the Condition data during conditions start.

Basic operation



Special start monitor window and operation

Special start monitor window



Explanation

- **Special start**

  The special start information display item details are shown below.

State	Operation (operation mode)	Information (special start data)	Data No.	Parameter
Normal	Operation (Operation mode)	–	Positioning data No. (Indirect specification No.)	–
Condition		Condition		Condition data No.
Wait		Wait		
Simultaneous		Simultaneous		
Stop		Stop		–
FOR loop		FORL		Condition data
FOR cond		FORJ		Condition data No.
NEXT		NEXT		–

  When the information is "FOR" the parameter displays the count using the decrement method. When the positioning data No. is indirectly specified the indirect No. is displayed.

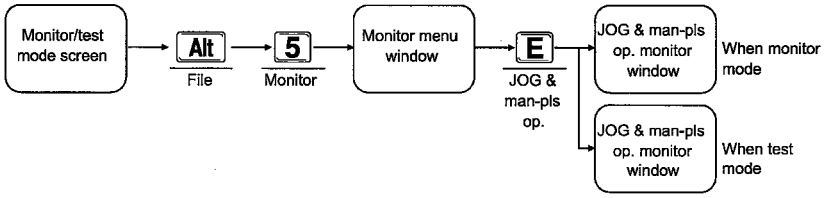
- **Condition data**

  When the axis is started by the condition data the condition data specified by the parameter is displayed.
  (Parameters)
  Condition No.: (1 ≦ condition data No. ≦ 10)
  # of repeat: (1 ≦ repeat count ≦ 255)

19.15 JOG & Man-Pls Op. Monitor

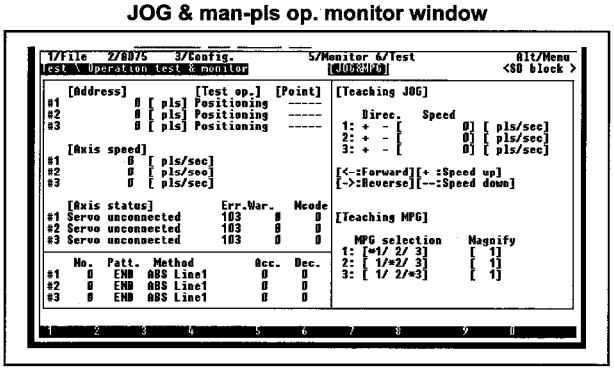
This monitors the JOG & man-pls op. Nable/enable and Magnify, etc.

Basic operation



JOG & man-pls op. monitor window and operation

JOG & man-pls op. monitor window

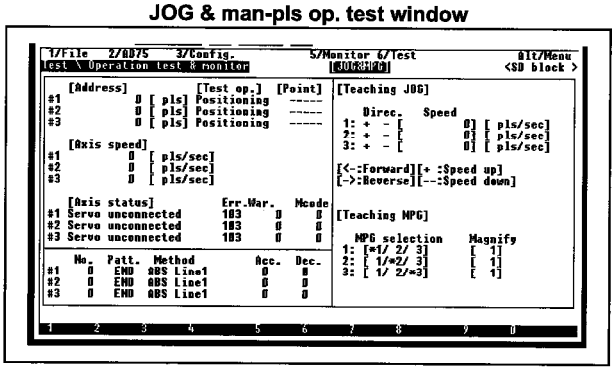


Explanation

- **Direc.**
  This displays the JOG operation direction. The details for the Y device bit are shown below.
  *+ -: Forward JOG start
  +*-: Reverse JOG start
- **Speed**
  This displays the JOG speed during JOG operation and when there is a change displays the speed after the change.
- **Magnify**
  This displays the magnify for pulse for the number of input pulses from the manual pulser.
- **Enable**
  This displays the manual pulser approval flag.

JOG & man-pls op. test window and operation

JOG & man-pls op. test window



- Move cursor : ↑, ↓, ←, →, Tab
- Start JOG operation : ←, →
- Fine adjustment of numeric value : +, -
- Data : [Numeric value] → Enter
- Designate axis : SP

Explanation

- The JOG & man-pls op. can be edited and the test mode can be edited.
- In addition to directly entering a numerical value, the JOG speed can be fine adjusted by pressing the [+] and [-] keys. For information regarding the adjustment width setting, refer to Item 20.2.
- To begin JOG start first select the axis to start using the [←] (forward) and [→] (reverse) keys. JOG will only operate when the [←] and [→] keys are entered, and during operation the direction is shown by a reverse display of the "+" or "-" and an "*" is displayed next to the selected axis. The operation results are displayed in the feed "Address" portion for each axis. In addition, when the [+] and [-] keys are entered for axis for which the JOG speed is 0, a setting error will occur and the axis start cannot be performed.
- Entering the [Tab] key makes it possible to switch between "JOG op." and "Man-pls op."
- Set the manual pulser operation "Magnify" by entering the numerical value. To set an axis to be approved for manual pulser operation enter the [SP] key before the number of the axis to be approved. When approved an "*" is displayed, and when not approved nothing is displayed. All axes enter the not approved state when the "Man-pls op." is selected or ended, and will enter the "Disable" state when there is a changed axis for "Man-pls op." multiplier, or "Man-pls op.", "MPG selection". The valid range for the numbers that can be edited is shown below.

Item	Model name	Setting range	Unit
JOG speed	AD75P □	0.01 to 6000000.00	mm/min
	AD75M □	0.001 to 600000.000	inch/min
	AD75P □-S3 (Basic mode)	0.001 to 600000.000	degree/min
		1 to 1000000	pulse/s
	AD75P □-S3 (Stepping motor mode)	0.01 to 375000.00	mm/min
		0.001 to 37500.000	inch/min
		0.001 to 37500.000	degree/min
		1 to 62500	pulse/s
Magnify	—	1 to 100	

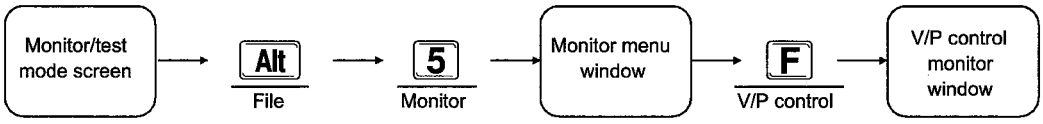
The "Man-pls op.", "Magnify" is fixed at PLS regardless of the selected unit system.

When the "Start key" is entered the selection cursor will disappear and the test operation will begin.

19.16 V/P Control Monitor

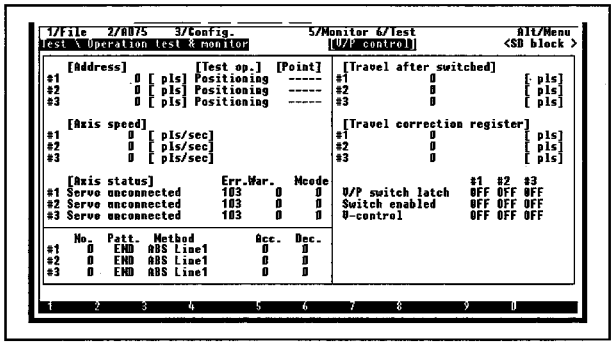
This monitors the movement amount change V/P control Travel after switched/correction register and the V/P switch enabled, etc.

Basic operation



V/P control monitor window and operation

V/P control monitor window



Explanation

- **Travel after switched (velocity/position switch control change value)**
  This displays the change move amount and position control movement amount change during velocity control during V/P switch control. When the velocity and position switch control signal is on the contents of the V/P switch control movement amount are displayed.

- **Travel correction register (velocity/position switch control position control movement amount)**
  This displays the movement amount when switching from velocity control to position control when the velocity an position switch signal turns on during on velocity and position switch control until positioning is completed. When switching to position control the position control movement amount is displayed.

- **V/P switch latch**
  When V/P control is executing this is turned on when switching from velocity control to position control.
  OFF: Velocity control in progress
  ON: Position control in progress

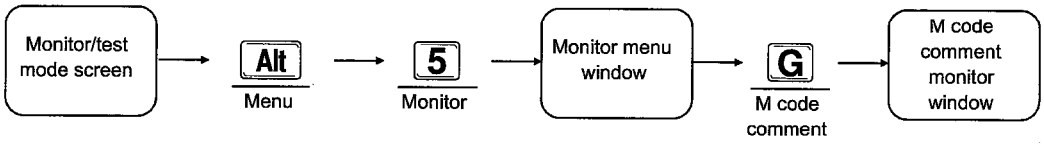
- **V/P switch enable**
  This is the allowance flag for whether or not a switch is made from velocity control to position control while V/P control is executing.
  OFF: No switch from velocity control to position control even though the V/P control switch control signal is on.
  ON: Switches from velocity control to position control when the V/P control switch control signal turns on.

- **V-control**
  This is on during V- control and off during positioning control. It is also off during when the power is turned on, during JOG operation, and during manual pulser operation.
  OFF: Off
  ON: On

19.17 M Code Comment Monitor

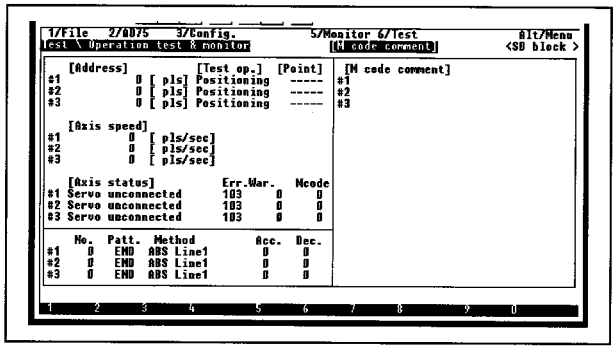
This displays the M code comment and indirect comment.

Basic operation



M code comment monitor window and operation

M code comment monitor window



Explanation

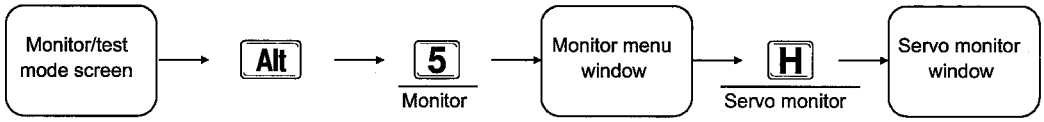
- This displays the M code comment and indirect comment added to the operation data No. of each axis.
- Comments can be displayed with up to 32 half-width characters (16 full-width characters).

Model Name	AD75P⬚	AD75P⬚-S3	AD75M⬚
Application			O

19.18 Servo Monitor

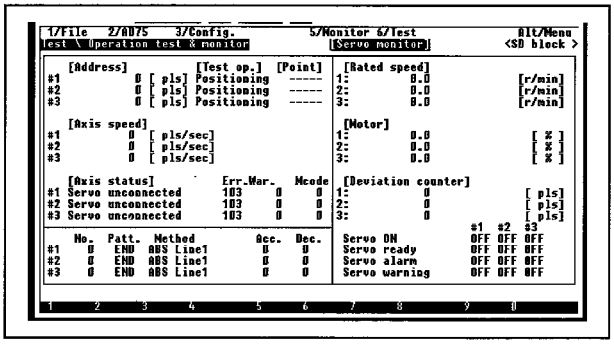
This monitors the Rated speed, Motor, Deviation counter, and Servo status for the servo motor connected to the AD75M⬚.

Basic operation



Servo monitor window and operation

Servo monitor window



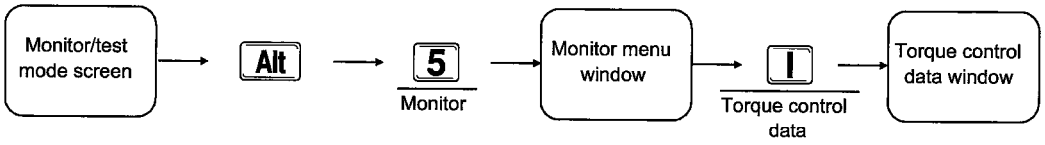
Explanation

- **Rated speed**
  This displays the motor RPM.
- **Motor**
  This displays the motor current value.
- **Deviation counter**
  This displays the actual current value difference between the feed current value and the servo amplifier.
- **Servo ON**
  This displays the servo ON/OFF status.
  - OFF: Off
  - ON: On
- **Servo ready**
  This displays the servo ready ON/OFF status.
  - OFF: Off
  - ON: On
- **Servo alarm**
  This displays on when a servo alarm is in progress.
  - OFF: Off
  - ON: On
- **Servo warning**
  This displays on when a servo warning is in progress.
  - OFF: Off
  - ON: On

19.19 Torque Control Data Monitor

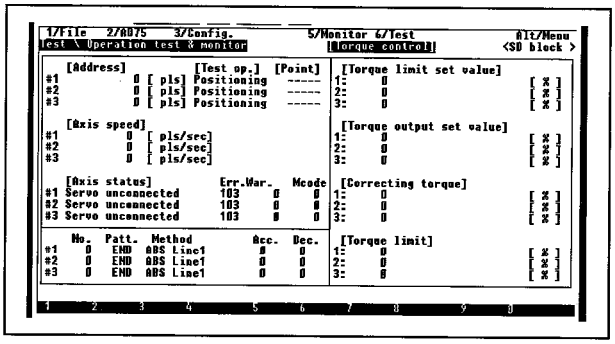
This monitors the Torque limit set value, Torque output set value, Correcting torque, and Torque limit for the servo motor connected to the AD75M□.

Basic operation



Torque control data monitor window and operation

Torque control data monitor window



Explanation

- **Torque limit set value**
  This displays the value set using the torque limit set value of the extended parameter #1.
- **Torque output set value**
  This displays the value set using the axis control data torque output set value.
- **Correcting torque**
  This displays the value set using the axis control data correcting torque.
- **Torque limit**
  This displays the torque output set value or correcting torque. The torque output setting value is stored during positioning start, JOG start, and manual pulser operation. This is changed when a torque change value other than 0 is stored in the torque change value during operation.

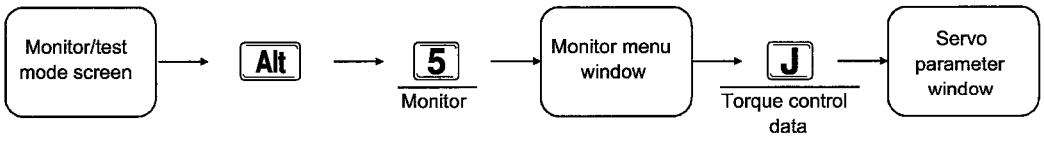
- When the Torque control data window is displayed by the test mode the "Torque output set value" and "Correcting torque" can be edited. Move the cursor to the item to be edited using the [↓] and [↑] keys and then change value.

Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

19.20 Servo Parameter Monitor

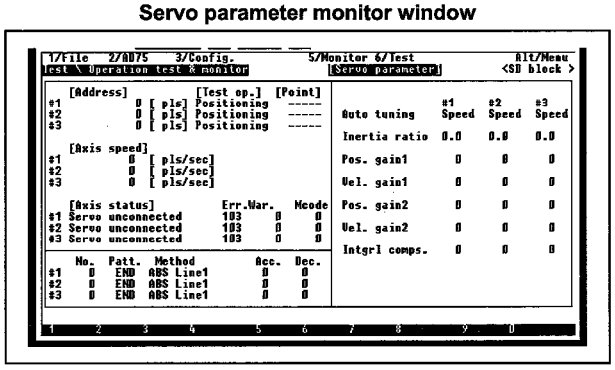
This monitors the Auto tuning, Inertia ratio, Pos./vel gain, and Integrl comps. value for the servo amplifier connected to the AD75M□. When auto tuning is valid the value changed during auto tuning can be monitored.

Basic operation



Servo parameter monitor window and operation

Servo parameter monitor window



Explanation

- This displays the value changed during auto tuning during setting by the AD75P.
- The value set using the auto tuning valid value and auto tuning is not reflected in the AD75P servo parameter. When auto tuning is valid please monitor the value set with auto tuning and change the servo parameter value.
- Entering the [Ctrl]+[F2] keys displays the servo parameter error list small screen.

20 TEST MENU

20.1 Test Menu Restrictions on Any Mode

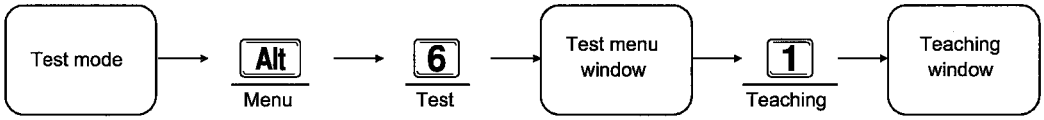
The test menu restrictions on any mode are displayed below.

Mode \ Test menu	Teaching	Test condition	Address change	OPR	Operation test & monitor	Positioning data test & monitor	Start block test & monitor
Edit	—	—	—	—	—	—	—
Monitor	—	—	—	—	—	—	—
Test	○	○	○	○	○	○	○
Servo start-up	—	—	—	—	—	—	—
Servo	—	—	—	—	—	—	—
Torque Trace	—	—	—	—	—	—	—
Environment	—	—	—	—	—	—	—

20.2 Teaching

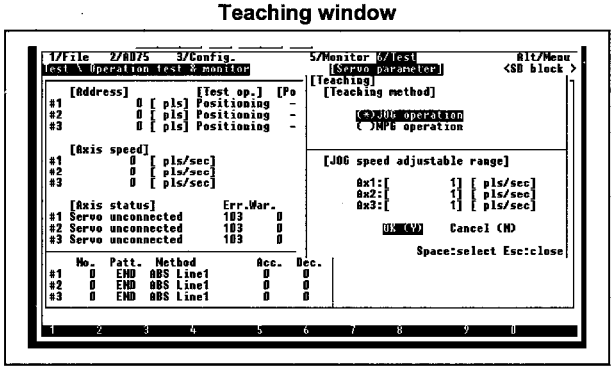
This sets the teaching method performed in the "Positioning data test & monitor screen".

Basic operation



Teaching window and operation

Teaching window



- Move cursor : ↑, ↓, Tab
- Set/clear teaching method : SP
- Data : [Numeric value] → Enter
- Execute : Y

Explanation

- **Teaching method**

  Align the cursor with the item to be selected and then enter the [SP] key to set the teaching method. This setting will change the display to the editing screen in the "Positioning data test & monitor screen".

- **JOG speed adjustable range**

  This sets the up and down width used to adjust the speed for JOG speed. When "1000" is set here the JOG speed will be increased or decreased in units of "1000" each time the "UP/DOWN" key is entered.

20.3 Test Condition

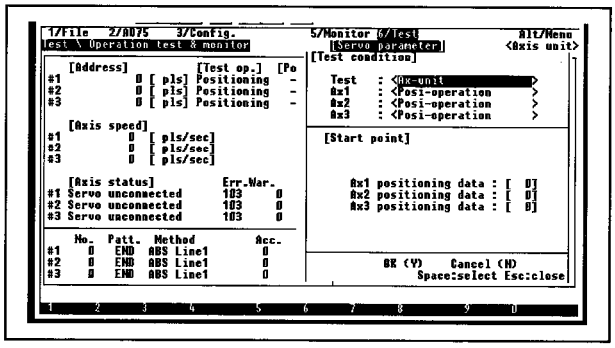
This sets the start axis and operation method for each axis to be conducted during Test operation.

Basic operation

Monitor/test mode screen → Alt (File) → 6 (Monitor) → Monitor menu window → Z (Test condition) → Test condition window

Test condition window and operation

Test condition window



- Move cursor : ↑, ↓, ←, →, Tab
- Select setting item : SP
- Set start axis : SP
- Data : [Numeric value] → Enter
- Execute : Y

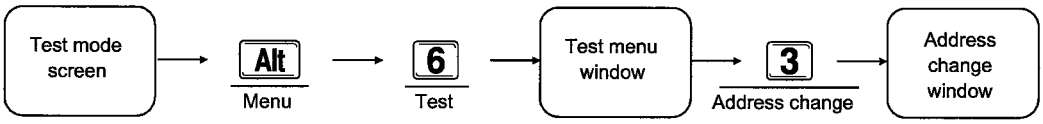
Explanation

Refer to the explanation given in Item 8.2.

20.4 Address Change

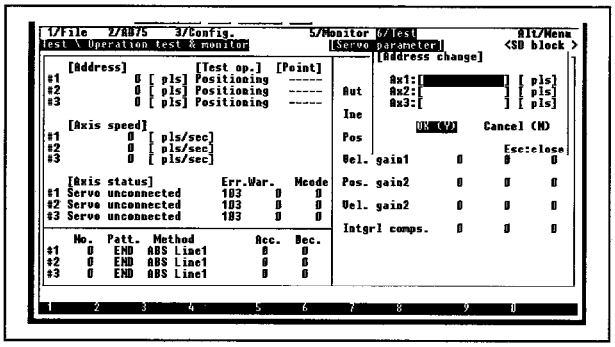
This changes the Address.

Basic operation



Address change window and operation

Address change window



- Move cursor : ↑, ↓
- Data : [Numeric value] → Enter
- Execute : Y

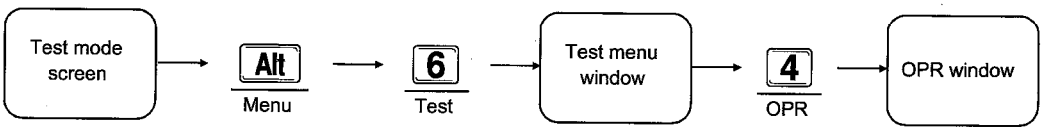
Explanation

- This displays the address until a number is entered.
- When a number is set and the [Y] key is entered only the value that is set as the address for the axis to be changed is changed. In this case, test operation will be conducted from the beginning even for a stopped axis, so retry can no longer be performed for a stopped axis.

20.5 OPR

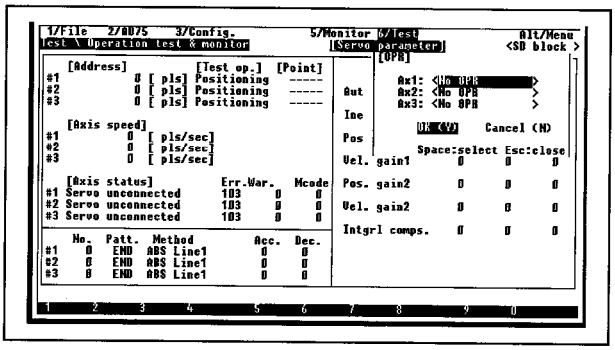
This conducts OPR.

Basic operation



OPR window and operation

OPR window



- Move cursor : ↑, ↓
- Select setting item : SP
- Execute : Y

Explanation

- Align the cursor with the axis for which OPR setting is to be conducted and then press the [SP] key to switch and set the screen as shown below.

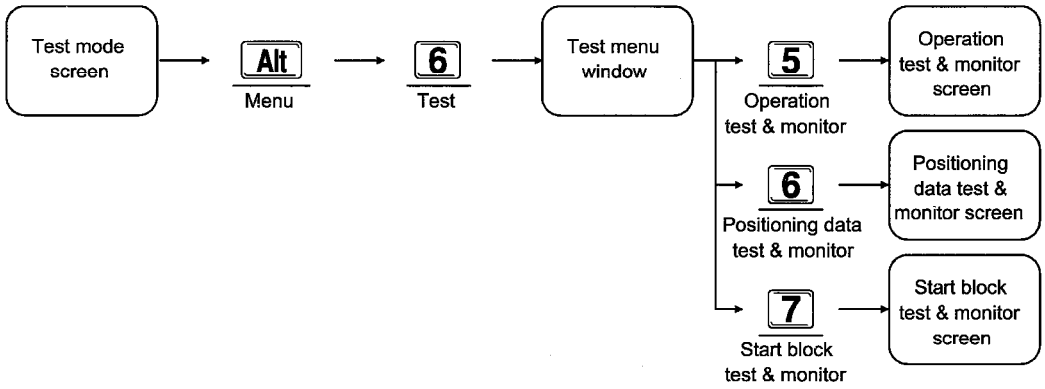
<Sub-system OPR> ⟶ <Sub-system OPR>
↘ ↙
<High speed OPR>

- Entering the [Y] key conducts OPR using the set OPR method. In this case, even if there is a stopped axis, the start operation will be conducted from the beginning, so it will no longer be possible to conduct retry for the stopped axis.
- Entering the [F10] (All stop) key will interrupt the OPR.

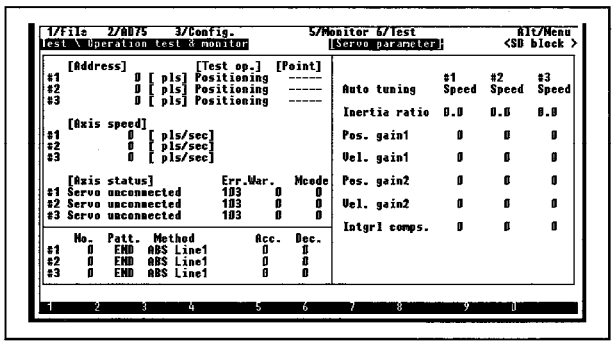
20.6 Operation Test & Monitor/Positioning Data Test & Monitor/Start Block Test & Monitor

This makes it possible to switch to the Operation/Positioning data/Start block test & monitor screens without ending the test mode.

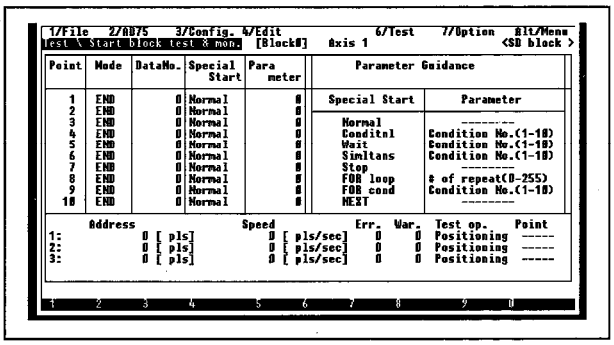
Basic operation



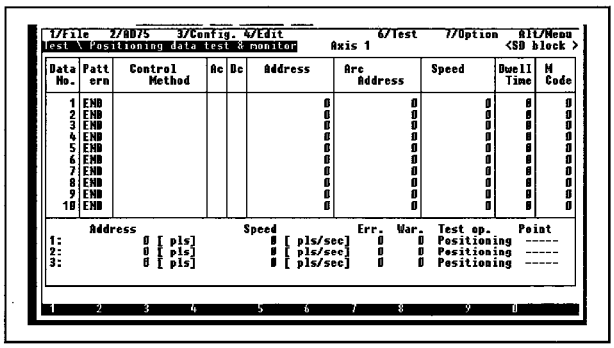
Operation test & monitor screen



Start block test & monitor screen



Positioning data test & monitor screen



Explanation

- The screen can be switched to each test & monitor screen by pressing the [5], [6], or [7] key.

21 SERVO MENU

21.1 File Menu Restrictions on Any Mode

The servo menu restrictions on any mode are shown below.

Mode \ Servo menu	Initial check	Model name check	U/L limit check	RPM check
Edit	—	—	—	—
Monitor	—	—	—	—
Test	—	—	—	—
Servo start-up	O	O	O	O
Servo	—	—	—	—
Trace	—	—	—	—
Environment	—	—	—	—

O: Setting possible, —: Setting not possible

Remark

1) The items that cannot be set in any mode are not displayed in the servo menu.

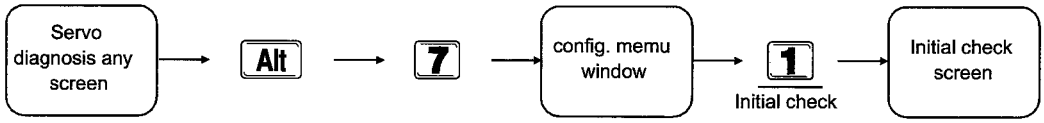
Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

21.2 Initial Check

This displays the error and warning information that is stored in the error history and warning history buffer memories of the AD75P□-S3/AD75M□ main modules. In addition, the selected error and warning detailed information (cause of occurrence, countermeasure) can be displayed.
When the error/warning information is displayed, please remove the displayed error warning. The displayed error or warning can be reset by entering the [F7] key.

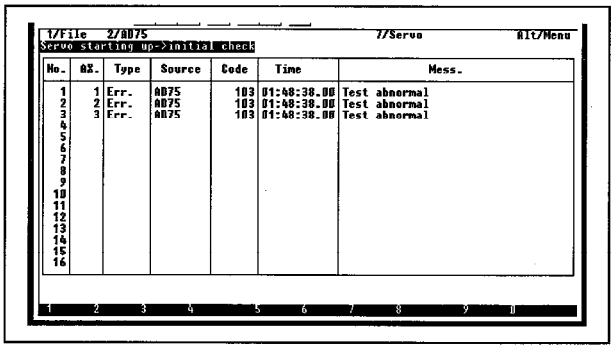
(1) Initial check screen display

Basic operation



Initial check screen and operation

Initial check screen



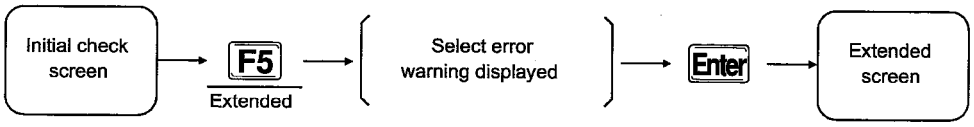
- Display next screen (RPM check screen) : F4
- M code ON signal turn off : F6
- Error clear of all axes servo amplifier : F7
- Exit servo start-up : F8

Explanation

- **Ax.**
  This shows the axis No. for which the error or warning is occurring.
- **Type**
  This shows the type of the code being displayed.
  - Err: Error
  - Warn: Warning
- **Source**
  This displays the error or warning detection source.
  - Servo amp: Servo amplifier
  - AD75: AD75 main module
- **Code**
  This displays the error or warning code. The error or warning details displayed when [F5] is pushed can be confirmed.
- **Time**
  This displays the error or warning occurrence time.
- **Mess.**
  This displays the message for the displayed error or warning.
- You can switch to a screen other than the servo startup screen by pressing the [Alt] menu option.

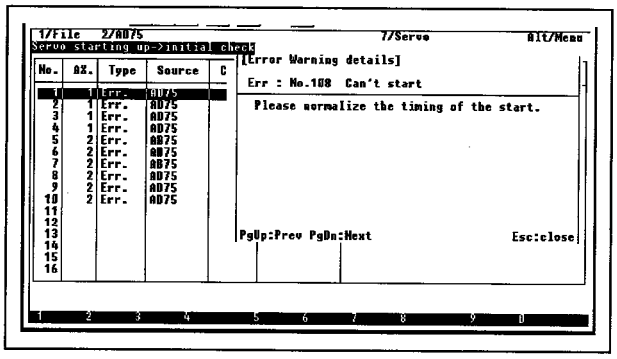
(2) Extended screen display

Basic operation



Extended screen and operation

Extended screen



- Move cursor : ↓, ↑
- Display initial check screen : F5

Explanation

- This displays the cause and countermeasures of the error or warning selected in the initial check screen. Check the error or warning cause and countermeasures and then take appropriate measures.

Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

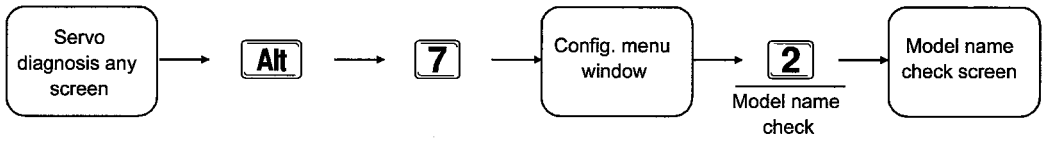
21.3 Model Name Check

The contents of the servo parameter transmitted from the AD75M□ to the servo amplifier when the PC power supply is turned on are read from the servo amplifier and displayed. In addition, the servo parameter stored in the peripheral equipment are also displayed.

Whether or not communication with the servo amplifier is normal can be checked by reading the servo parameters from the servo amplifier and comparing them with the peripheral equipment servo parameters.

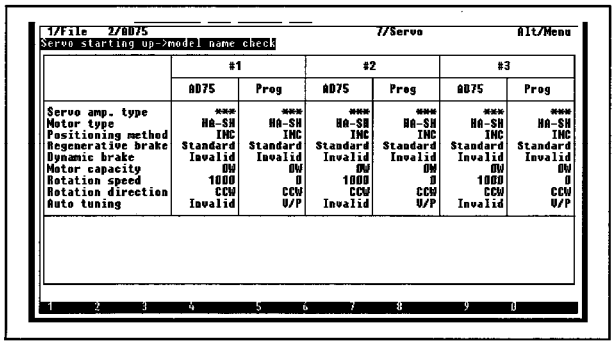
The displayed servo parameter items cannot be changed in the model name check screen. To change the servo parameters use the "Edit mode".

Basic operation



Model name check screen and operation

Model name check screen



- Display next screen (RPM check screen) : F4
- M code ON signal turn off : F6
- Error clear of all axes servo amplifier : F7
- Exit servo start-up : F8

Explanation

- The following main modules and peripheral equipment are displayed.
  - AD75:
    Servo parameter data read from the servo amplifier
  - Prog.:
    Servo parameter stored in the peripheral equipment
- Auto tuning display

  MR-H-B ····· Displays the auto tuning setting contents
  MR-J2-B ····· Displays the servo amplifier current value
  MR-J-B
- When the servo parameters are to be reread from the servo amplifier enter the [F5] key.
- Refer to the following manuals for information regarding the items of the displayed servo parameter.

  A1SD75M1/M2/M3 and AD75M1/M2/M3 Users Manuals (Detailed Edition)

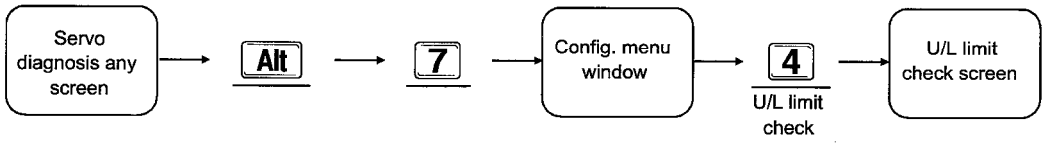
Model Name	AD75P□	AD75P□-S3	AD75M□
Application			O

21.4 U/L Limit Check

The U/L limit check conducts forward and reverse JOG and checks whether the upper limit switch/lower limit switch connected to the AD75M□ are actually operating.
The servo amplifier forward limit switch/reverse limit switch cannot be checked using the U/L limit check.
The upper and lower limit check can be executed when the following conditions are reached.

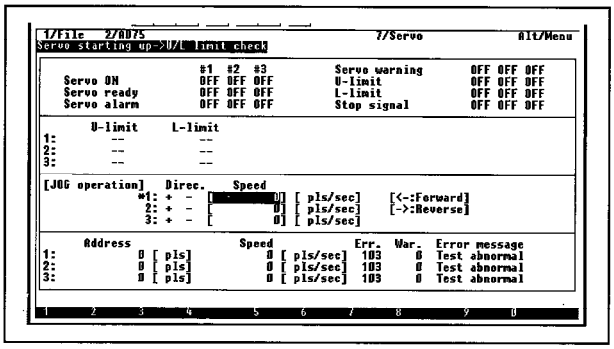
- Servo ON signal : ON
- Servo ready signal : ON
- Upper limit signal : ON
- Lower limit signal : ON
- Test mode in progress : ON
- Servo alarm in progress signal : OFF
- Stop signal : OFF
- JOG speed : When other than 0

Basic operation



U/L limit check screen and operation

U/L limit check screen



- Select JOG operation axis : ↓, ↑
- JOG operation : →, ←

Explanation

- The JOG speed default is set to "0". Please conduct the JOG operation after setting the JOG speed for the axis for which JOG operation will be conducted.
- The servo motor will stop when the U-limit/L-limit of the AD75M□ that is conducting the JOG operation is "OFF". After the U/L limit check is completed turn "ON" the AD75M□ U-limit/L-limit using the JOG operation.

[1] Status display
- OFF: Off is displayed.
- ON: On is displayed.

[2] When JOG operation is conducted and the AD75M□ U-limit/L-limit changes from on to off, "OK" is displayed.

[3] An "*" is displayed on the left side of selected axis. The JOG speed can be set when an * is displayed. After entering the JOG speed press the [Enter] key to confirm the JOG speed. After confirming the JOG speed the +/- keys can be used to make fine adjustments to the JOG speed.

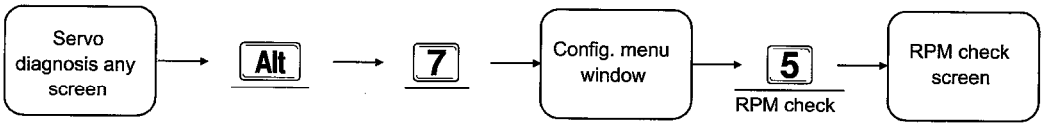
- +: Increases the speed
- −: Decreases the speed

21.5 RPM Check

The RPM check conducts forward and reverse JOG and checks whether or not the servo motor RPM during the highest command speed is below the motor RPM set by the servo parameter.
The upper and lower limit check can be executed when the following conditions are reached.

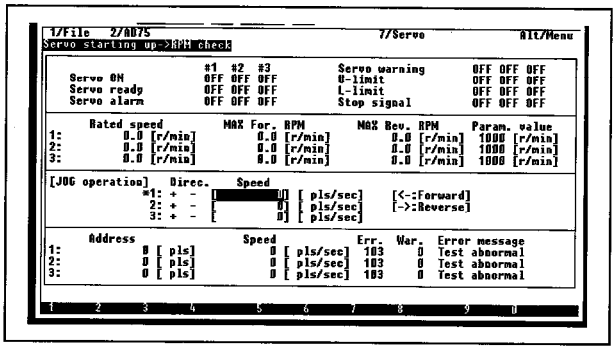
- Servo ON signal : ON
- Servo ready signal : ON
- Upper limit signal : ON
- Lower limit signal : ON
- Test mode in progress : ON
- Servo alarm in progress signal : OFF
- Stop signal : OFF
- JOG speed : When other than 0

Basic operation



RPM check screen and operation

RPM check screen



- Select JOG operation axis : ↓, ↑
- JOG operation : →, ←

Explanation

- The JOG speed default is set to "0". After setting the JOG speed for the axis for which JOG operation will be conducted please conduct JOG operation.
- When the RPM during forward/reverse JOG execution exceeds the RPM set by the servo parameter then the display is reverse displayed.

[1] Status display
- OFF: Off is displayed
- ON: On is displayed

[2] RPM display
- RPM:
  This displays the average value during RPM check.
- MAX For. RPM:
  This displays the maximum value when forward JOG is conducted.
- MAX Rev. RPM:
  This displays the maximum value when reverse JOG is conducted.
- Param. value:
  This displays the RPM of the motor selected using the servo parameter.

[3] An "*" is displayed on the left side of selected axis. The JOG speed can be set when an * is displayed. After entering the JOG speed press the [Enter] key to confirm the JOG speed. After confirming the JOG speed the +/- keys can be used to make fine adjustments to the JOG speed.

- +: Increases the speed
- −: Decreases the speed

MEMO

22 OPTION MENU

22.1 Option Menu Restrictions on Any Mode

The option menu restrictions on any mode are shown below.

Mode \ Option menu		Initialization	Data check	DOS 71 → 75 conv.	Start block init.	Srv param. init.	Srv amp select	
Edit	Positioning data edit Start block edit	○	○	○	○	○	–	
	Parameter edit	○	–	○	○	○	–	
	M code comment edit	○	○	–	–	○	–	
	Condition data edit	○	–	–	○	○	–	
Servo parameter edit		○	–	–	–	○	△*1	
Monitor		–	–	–	–	–	–	
Test	Operation test & monitor	–	–	–	–	–	–	
	Positioning data test & monitor Start block test & monitor	–	○	–				
Servo start-up		–	–	–	–	–	–	
Servo		–	–	–	–	–	–	
Trace		–	–	–	–	–	–	
Environment		–	–	–	–	–	–	

	Srv amp register	Srv amp delete	Trace condition	Trace interval
	—	—	—	—
	—	—	—	—
	—	—	—	—
	—	—	—	—
	△*1	△*1	—	—
	—	—	—	—
	—	—	—	—
	—	—	—	—
	—	—	—	—
	—	—	—	
	—	—	○	△*2
	—	—	—	—

○: Setting possible, △: Setting possible for some functions, —: Setting not possible

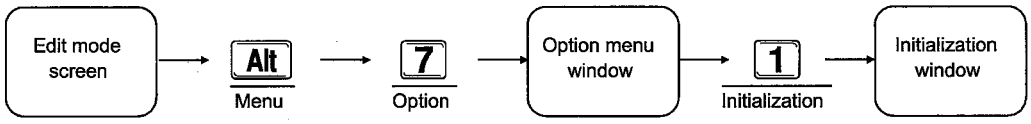
Remarks

1) *1: This can only be set during the servo basic parameter setting.
2) *2: This can be set except torque trace.
3) The items for which setting is not possible in any modes are not displayed in the option menu.

22.2 Initialization

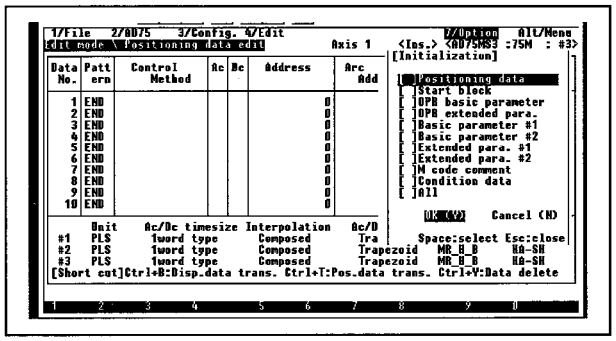
This initializes the Positioning data, Start block, Parameters, Comment, and Condition data.

Basic operation



Initialization window and operation

Initialization window



- Move cursor : ↑, ↓
- Confirm / clear setting item : SP
- Execute : Y

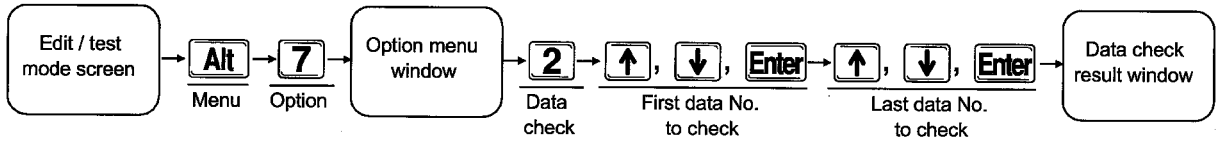
Explanation

- When the "All" item is selected an "*" is added to the displayed items.
- The specified data is initialized when the [Y] key is entered.

22.3 Data Check

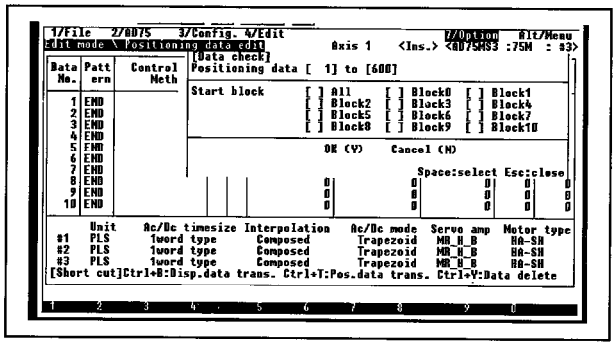
This checks the Positioning data items.

Basic operation



Data check result window and operation

Data check result window



• Execute : 2

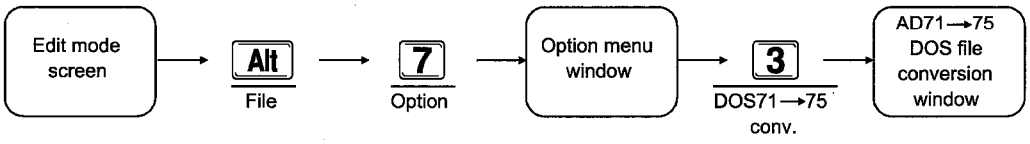
Explanation

- Use the [↑] and [↓] keys to move the cursor and use the [Enter] key to confirm the start No. and end No. to be error checked. An "*" is added to the left of the data No./point that was range specified.
- When conducting a parameter check please set the positioning data start and end to 1.
- The error check results display varies depending on the positioning data, start block, and M code comment, etc.
- The message for the error check results display varies depending on the positioning data, start block, and M code comment, etc.

22.4 AD71→AD75 (For MS-DOS Format)

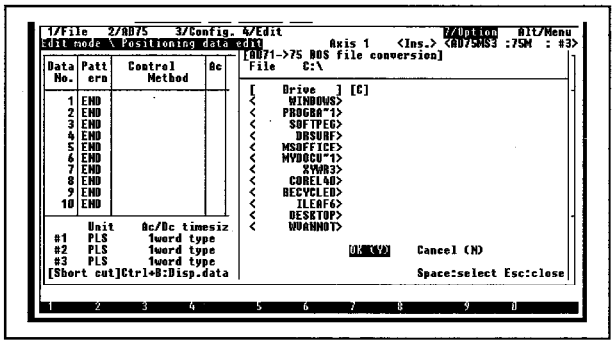
This converts the AD71 data so that it can be moved to the AD75.

Basic operation



AD71→75 DOS file conversion window and operation

AD71→75 DOS file conversion window



- Move cursor : ↑, ↓
- Drive designation : SP
- Directory designation : SP
- Execute : Y

Explanation

- This conducts a conversion so that the AD71 data can be moved to the AD75 with the minimum of changes. Please use DOS format for the FDD in which the AD71 data to be affected by this function is stored.

- **Drive designation**
  Entering the [SP] key to switch the drive from A through Z. Each time the drive is switched the current directory name and file name list is displayed.

- **Directory designation**
  When the [SP] key is entered at the file directory name<.....>a file name list under that directory is displayed.

- Conversions conducted when the [Y] key is entered.

- The specifications when the AD71 data is converted to AD75 data are shown below.

AD71 set item	Conversion specification
Positioning pattern	The pattern is developed as is.
Positioning method	For absolute the control format ABS straight line 1 is used and for incremental the control format INC straight line 1 is used.
Positioning direction	The forward and reverse address code is developed. (Only valid for INC).
Positioning speed	The specified speed is developed unchanged.
Positioning address	The code is converted and developed by the positioning direction setting.
Dwell time	The dwell time is developed unchanged.
M code & comment	Only the M code is developed.

Other conversions

- The acceleration and deceleration times are allotted a default of 0.
- The Arc address is displayed as 0.
- The M code comment is ignored.

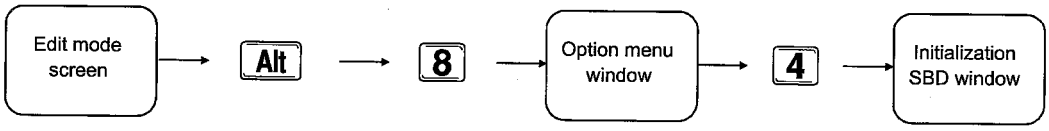
Point

- When this function is executed the peripheral equipment memory contents.

22.5 Start Block Init.

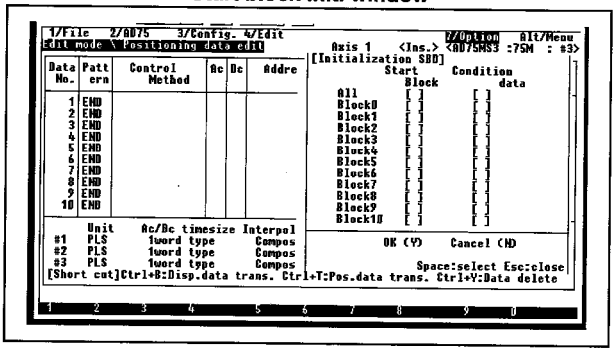
This initializes the set start block data and condition data.

Basic operation



Start block init. window and operation

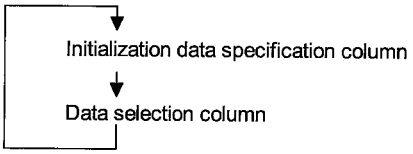
Start block init. window



- Move cursor : ↓, ↑, →, ←
- Select / clear item : SP

Explanation

- When the [Tab] key is pushed the cursor (reverse display) moves as shown below.



- **Data selection**
  - This sets the data that to be initialized.
  - Multiple settings of data to be initialized is possible.
  - When the [SP] key is entered when data is displayed by the cursor the data that is to be initialized can be set (* display). The setting can be cleared by pressing the [SP] key again.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application			O

22.6 Srv Param. Init.

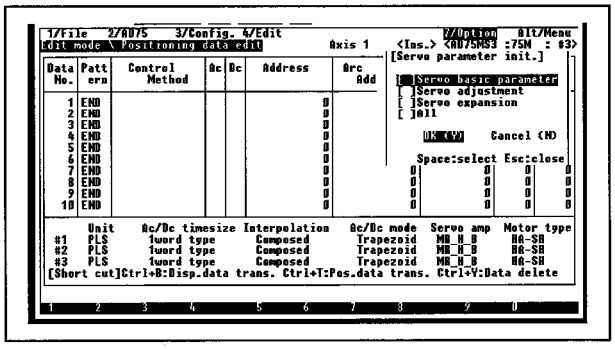
This initializes the set Servo basic parameter, Servo extension parameter, and Servo adjustment parameter.

Basic operation

Edit mode screen → Alt → 8 → Option menu window → 5 → Servo parameter init. window

Srv param. init. window and operation

Srv param. init. window



- Move cursor : ↓, ↑, →, ←
- Select / clear item : SP

Explanation

- **Data selection**
  - This sets the data to be initialized.
  - Multiple settings of the data to be initialized is possible.
  - The data to be initialized can be set (* display) by pressing the [SP] key when the data is displayed in reversed. To clear the setting push the [SP] key again.

Model Name	AD75P ⬚	AD75P ⬚-S3	AD75M ⬚
Application		O	O

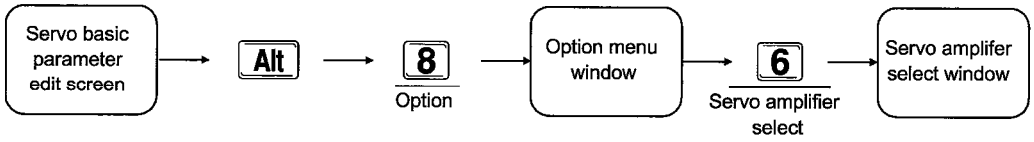
22.7 Srv Amp Select

This sets the servo basic parameter items 1 to 7. When the servo series, Amp type, Motor type, and Capacity combination are selected the following items can be set using the data registered in the AD75P.

- Motor type
- Speed
- Feedback pulse

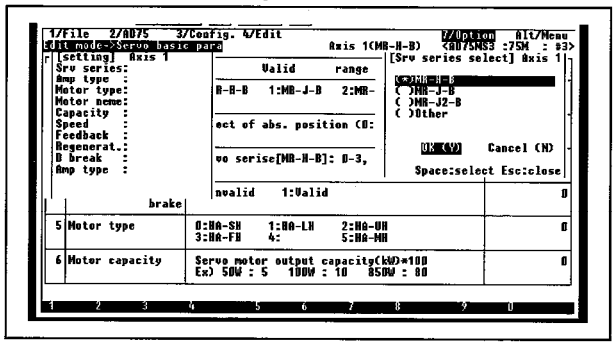
In addition, the Regenerat., D break, and Amp type can be selected from the selection window.

Basic operation



Srv amp select window and operation

Srv amp select window



- Move cursor : ↓, ↑, →, ←
- Select / clear item : SP

Explanation

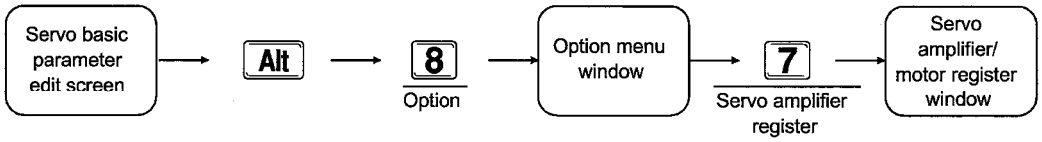
- When servo amplifier selection is selected the "Setting" and "Srv series select" windows are displayed.
- When the displayed servo series is selected the "Srv motor selection" window is displayed. Select the amp type, motor type, and capacity to be used from the displayed combinations.
- When the servo motor is selected the "Regenerative break", "Dynamic break, and Amplifer type" selection windows are displayed in order. Please select the regenerat., dynamic break, and amplifier type to be selected.
- When dynamic break and amplifier type are selected the execution selection window is displayed.
  - Selecting yes will set the set data in the servo basic parameter.
  - Selecting No (N) will not set the set data in the servo basic parameter.

Model Name	AD75P [ ]	AD75P [ ]-S3	AD75M [ ]
Application		O	O

22.8 Srv Amp Register

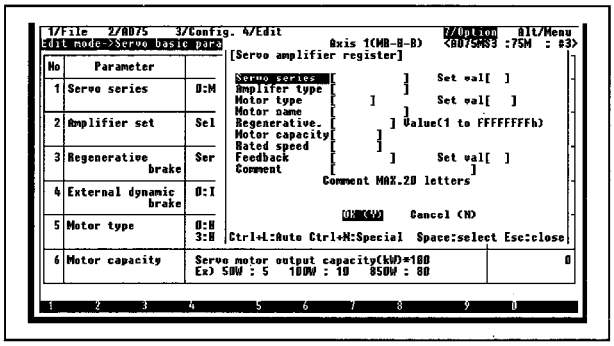
The servo basic parameter items 1 to 7 are used for user registration. The Servo series, Amplifier type, Motor type, Motor name, Regenerative., Motor capacity, Rated speed, and the Feedback pulse that are not registered in the AD75P can be registered can be registered in the AD75P.

Basic operation



Srv amp register window and operation

Srv amp register window



- Move cursor : ↓, ↑, →, ←
- Select item : SP

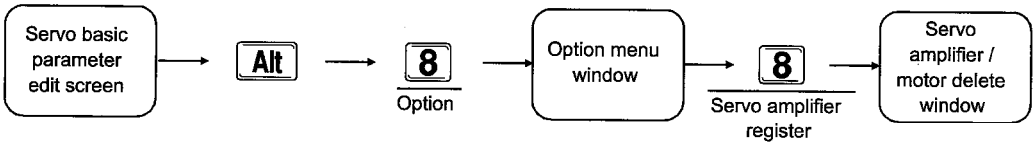
Explanation

- Select the setting items in the cursor key and then enter the [SP] key to set the selected item.
- In the Srv amp register window all the displayed items must be set. If all items are not set and then error message will be displayed.
- It is possible to register the motors that can be combined with the registered amplifier type.
- Only a combination to a new amplifier or a combination to an existing amplifier can be added to the registered motor.
- Auto (Ctrl+L) and Special (Ctrl+N) can be set when the servo amplifier is MR-J2-B.

22.9 Srv Amp Delete

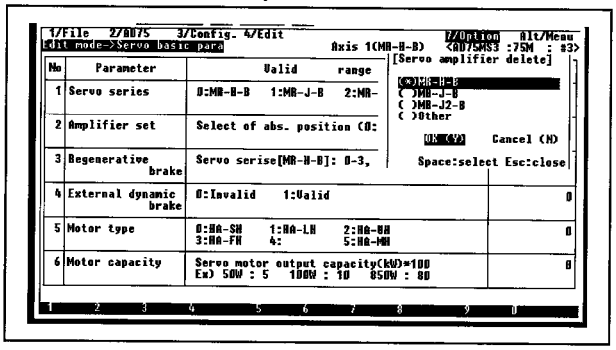
The Servo series Amplifier type, Motor type, Motor name, Regenerative., Motor capacity, Rated speed, and Feedback pulse data registered in the AD75P can be deleted from the AD75P.

Basic operation



Srv amp delete window and operation

Srv amp delete window



- Move cursor : ↓, ↑
- Select item : SP

Explanation

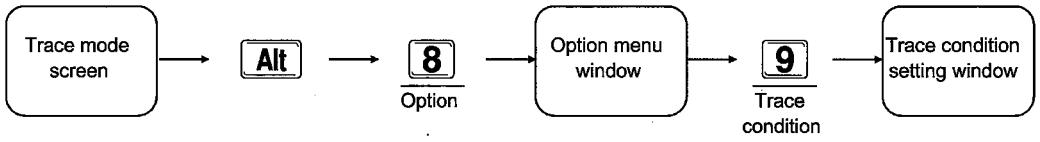
- When the cursor key is used to move the cursor to the series to be deleted and then the [SP] is pushed the selected series Srv amp delete window is displayed.
- Select a combination of "Amp", "Motor", and "Capacity" to be deleted using the cursor key in the Srv amp delete window. When the [Y] key is entered the execute selection window is displayed.
  - When yes (Y) is selected the data at the cursor position is deleted and the screen is returned to the Srv amp delete window.
  - When no (N) is selected the deletion is not conducted and the screen is returned to the Srv amp delete window.

Model Name	AD75P □	AD75P □-S3	AD75M □
Application		O	O

22.10 Trace Condition

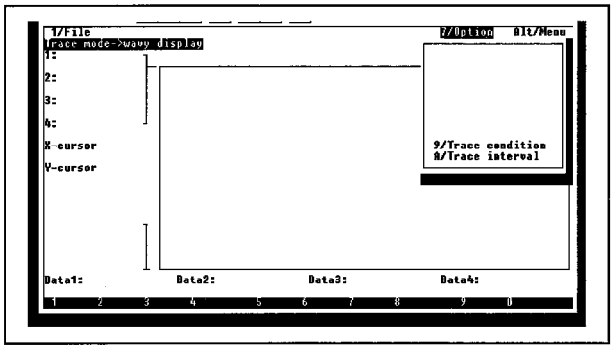
This sets the trace conditions for when tracing is conducted by the trace mode.

Basic operation



Trace condition setting window and operation

Trace conditions setting window



- Move cursor : ↓, ↑, →, ←
- Selet item : SP

Explanation

- **Trace stop condition**

  The conditions where tracing will be stopped by the AD75M are selected using the [SP] key.
  - Buffer full:
    Tracing is stopped when the buffer used for the trace data is full.
  - Trace number of points:
    Tracing is stopped when the specified number of points is reached. The setting range is 1 to 8192.
  - Error step:
    Tracing is stopped when an error occurs.
  - Endless:
    Tracing is stopped when there is a "Trace stop request" from the AD75P.

  Even when buffer full, trace number of points, and error step are set tracing can be stopped when a trace stop request is sent from the AD75P.

- **Ax No.**

  The axis No. for which tracing will be conducted is selected using the [SP] key.

- After selecting the item to be set using the cursor key use the [SP] to select the numerical settings.

- **Trace**

  This sets the time for which the AD75M conducts one trace. The setting range is 1 to 256.
  The trace time for one cycle is as follows.
  [Trace time for one cycle] = 3.555 x [Trace interval] (ms)

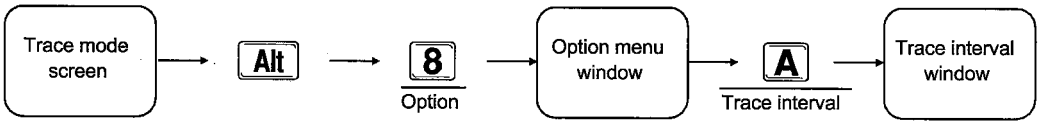
- **Trigger**

  The conditions under which the AD75M begins tracing are set using the [SP] key.
  - Start reception:
    Tracing is started when the start end signal is turned on.
  - PC trigger ON:
    Tracing is begun when "1: ON" is written to the PC CPU memory area 5050.
  - Unconditional:
    Tracing is begun by a command from the peripheral equipment.

22.11 Trace Interval

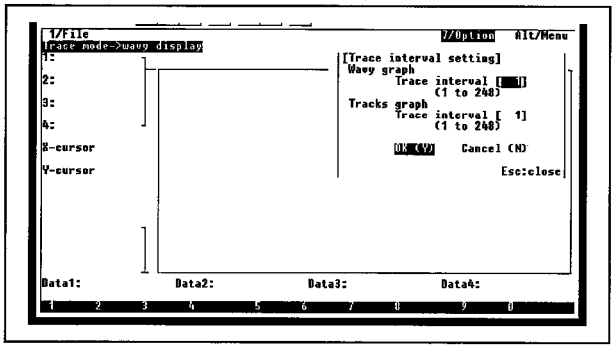
This sets the conditions for when a graph is displayed. When the trace interval is set the display time can be shortened by thinning and displaying the corrected data.

Basic operation



Trace interval setting window and operation

Trace interval setting window



• Move cursor : ↓, ↑

Explanation

- The interval at which draw is conducted can be set in the range from 1 to 248. If set in the range from 1 to 248, the graph display time can be shortened.

23 ERROR MESSAGE LIST

This section explains the causes of error messages displayed when AD75P functions are operated by peripheral equipment and the related countermeasures.
For information regarding the communication errors displayed in dialog boxes, please refer to the sections in this document covering Monitor Mode and Test Mode.
The errors that occur during file access are displayed in the message display area of dialog boxes related to errors that occur during communication.
Error messages are listed in the order of Japanese phonic system, alphabet, and then numbers.

In this chapter the error messages are displayed for the following items.

23.1 Startup Error Messages

Error Message	Cause	Corrective Action
Can't find message_file	Peripheral equipment cannot be started up because the message file does not exist.	Prepare the following peripheral equipment startup information file. • D75_MESS.2ND • D75EMESS.DAT • D75WMESS.DAT • D75_SRV2.DAT
VM error [5258]: not enough disk space for swapping-reqwired bytes:xxx	Insufficient vacant space in the hard disk.	Prepare 3MB or more of vacant space in the hard disk during startup.
DOS/16M error [17]: System software is neither VCPI or DPMI	The EMS manager combined with the config.sys does not support the VCPI or the DPMI.	Change the EMS manager that supports the VCPI or DPMI.
		Delete the EMS manager from the config.sys.
VM error [5251]: insufficient physical memory	Insufficient vacant space in the main memory or extension memory.	Make the vacant storage space in the main memory 400 kB or more and in the extension memory 2MB or more.

23.2 Edit Mode Error Messages

Error Message	Cause	Corrective Action
Parameter range error	Incorrect input range during parameter setting.	Confirm the valid setting range and then reset.

23.3 Monitor Mode Error Messages

Error Message	Cause	Corrective Action
No error history	—	—
No warning history	—	—

23.4 Error Messages for Common Functions

Error Message	Cause	Corrective Action
Print item not specified	Print item setting too short.	Set print item.
Print axis not specified	Print axis not set.	Set print axis.
Invalid file extension	The extension of the storage file is not corrent.	Set the extension "D75"
This FD is not CP/M format	The FD in use has not been formatted for CP/M.	Use a CP/M format FD.
Copy destination file not specified	Copy destination file name is not specified.	Specify copy destination file name.
Copy failed	File copy is not possible due to insufficient memory.	Secure memory by removing unnecessary drivers.
Copy source file not specified	Copy source file name is not specified.	Specify the copy source file name.
Too many verification errors	There are too many verification errors.	Verification is not possible.
Objective axis not specified	No axis designation made for function that requires axis designation.	Designate an axis and retry.
Communication error	When reading, writing or verifying, communication with the AD75 is interrupted. (Except for time out)	Check communications circuit.
Invalid directory name	Specified directory name does not exist.	Confirm directory name.
File can't open	Failed to open specified file.	Check the specified file.
Can't create file	Specified file can not be created.	Check file name and directory.
File not found	When reading, writing, verifying, deleting or copying, specified file is not found.	Make sure file is there.
File can't read	Read error when reading or verifying FD file.	Check condition of FD.
File version not correct	Because file version is not correct, it is impossible to read / verify the file.	Read a current version file.
Failed F-ROM writing	Writing to F-ROM has failed.	Confirm whether the CPU is running.
Out of paper	No paper in the printer.	Supply paper.

23.5 Error Messages Relating to FD Access

Error Message	Cause	Corrective Action
Write forbid	FD is set to write protect.	Cnacel write protection of FD.
Disk full	Write error due to insufficient FD storage capacity.	Use a new FD.
Drive not ready	Specified drive is not ready.	Confirm the drive name.
File can't read	File reading error has occurred when reading from FD.	Check condition of FD.
Command invalid Seek error Specified sector not found Disk access error Invalid disk change Invalid media Request header length invalid Invaild module number CRC error	Something is wrong with the FD, it is impossible to access it normally.	Change the FD or format the FD once again.

23.6 Error Messages Received from the AD75

The error messages received from the AD75, their detection timing, processing after fetection, and action to be taken by the user, are described below.

23.6.1 AD75 detected errors

The error contents and countermeasures when an error occurs are shown below.

No.	Error	Detection Timing	Error Processing	Corrective Action
000	Normal status	—	—	—
001 003 004 005	<Critical errors> Fault Zero assignment Overflow Underflow	H/W error	System stop.	Check for influence of noise. If noise is not the problem: H/W error.
51	Position command range over	PC READY during OFF→ON	The AD75 preparation complete flag (X0) does not turn OFF.	Correct the parameter position data to within the range specified by Item 4.23.
		During positioning start	Does not start.	Correct the positioning address data to within the range specified by Item 4.23.
52	Speed command range over	PC READY during OFF→ON	The AD75 preparation complete flag (X0) does not turn OFF.	Correct the parameter speed data to within the range specified by Item 4.23.
		During positioning start	Does not start.	Correct the positioning data command speed to within the range specified by Item 4.23.
100	<Common> Peripheral device stop during operation	When "Stop" key of peripheral device is pressed during operation	Deceleration stop or rapid stop.	Clear the error by axis error reset.
101	PC READY OFF during operation	When PC READY is OFF during operation	Deceleration stop or rapid stop.	Clear the error by axis error reset.
102	Drive module READY signal OFF	When drive module READY signal is OFF during operation	Immediate stop.	Clear the error by axis error reset.
103	Test mode error during operation	During test mode	Deceleration stop.	Investigate the cause, turn off the power to the AD75 its peripheral devices, and turn on the power supply again.
104	H/W stroke limit +	When operation is started	No operation on starting.	Clear the error and start JOG operation or manual pulse operation away from the limit switch.
		During operation	Deceleration stop.	
105	H/W stroke limit -	When operation is started	No operation on starting.	Clear the error and start JOG operation or manual pulse operation away from the limit switch.
		During operation	Deceleration stop.	
106	Stop signal ON at start	When operation is started	No operation on starting.	Clear the error by axis error reset.
107	PC READY OFF to ON during BUSY	PC READY signal Leading edge of Y1D	X0 ON Next start not executed.	Switch Y1D OFF and ON again.
201	Start on the home position	When OPR is started	OPR is not carried out.	• Make OPR retry function valid. Move present position using JOG operation or manual pulse operation before OPR.
203	Dog detection timing error	During deceleration from the OPR speed	Deceleration stop.	• Correct OPR speed.

No.	Error	Detection Timing	Error Processing	Corrective Action
206	Count type travel value error	When count type OPR is started	OPR is not carried out.	• Caluculate the travel distance from the speed limit value, OPR speed and deceleration time. Set the travel value after the near-zero point dog so that the distance is greater than the deceleration distance. • Reduce OPR speed. • Adjust the near-zero point dog position so that the travel value after the near-zero point dog is long.
207	OPR request ON	When high-speed OPR is started		Carry out OPR.
208	Out of creep speed range	When OPR is started		Set the speed within the creep speed or the OPR speed.
209	OPR restart disabled	When restart is requested after OPR stop	Restart is not carried out.	Start OPR again.
300	<JOG> Out of JOG speed range	When JOG operation is started	JOG operation does not start when the setting is 0 or out of range.	Set the set value within the setting range (excluding 0).
500	<Positioning operation> Condition data No. incorrect	When the special start data is analyzed	Operation is ended.	Correct the special start data.
501	Error before simultaneous start			
502	Positioning data No. incorrect	When the special start data is analyzed	Positioning data is not carried out.	Correct the positioning data.
503	No commanded speed	When the first positioning data is analyzed at the start	No operation on starting.	
504	Linear travel value out of range	When the special start data is analyzed		Review the positioning address.
506	Excessive arc error	When the locus for circular interpolation control is calulated by designation of a center point	Circular interpolation control by designation of a center point is not carried out.	• Correct the center point address and end point address. • Correct the value of circular interpolation error allowable range.
507	Start outside storke limit +	When opration is started	No operation on starting.	Set the feed present value within the software stroke limit using JOG operation or manual pulse operation.
508	Start outside stroke limit +			
509	Travel outside stroke limit +			• For positioning operation, set the positioning address within the software stroke limit setting range. • For JOG operation and manual pulse operation, carry out operation within the software stroke limit.
510	Travel outside stroke limit -			
511	Travel outside stroke limit +	During operation	Immediate stop at the data one previous to the data outside the stroke limit.	Correct the positioning data.
512	Travel outside stroke limit -			
514	Out of present value change range	When the present value change is analyzed	Present value is not changed.	Set the present value within the setting range.
515	Present value change disabled			Do not designate present value change for the next positioning data in continuous locus control.

No.	Error	Detection Timing	Error Processing	Corrective Action
516	Continuous locus control disabled	When the positioning data is analyzed	No operation on starting.	• Do not designate fixed-pitch feed for the next positioning data in continuous locus control. • Do not carry out fixed-pitch feed, speed control, or speed/position switching control in continuous locus control.
518	Out of operation pattern range	When the positioning data in analyzed	No operation on starting. Deceleration stop during operation.	Correct the operation pattern.
519	Other axis BUSY interpolation		No operation on starting. Stop during operation.	Correct the control type.
520	Unit group discrepancy	When the positioning data is analyzed	No operation on starting. Deceleration stop during operation.	Correct the positioning data. Change the parameter.
521	Interpolation writing command incorrect			Corrent the control type.
522	Commanded speed setting error			Correct the commanded speed.
524	Control type setting error			
525	Auxiliary point setting error		No operation on starting. Immediate stop during operation.	Correct the arc address.
526	End point setting error			Correct the positioning address.
527	Center point setting error			Corrent the arc address.
530	Out of sddress range		No operation on starting. Deceleartion stop during operation.	Correct the positioning address.
532	Simultaneous start disabled	When simultaneous start is started	Operation exits.	Correct the special start data and positioning data.
533	Condition data error	When special start data is analyzed		Correct the special start data.
534	Special start command error			
536	M code signal ON signal ON start	When positioning is started	No operation on starting.	After turning OFF the M code ON signal, start operation.
537	PC READY OFF start			Start after PC READY ON.
538	Ready complete ON start			Start operation after confirming AD75 READY is OFF.
543	Out of start No. range			Correct the positioning start No.
544	Out of radius range	When positioning data is analyzed	No operation on starting. Immediate stop during operation.	Correct the positioning data.
900	<Error history> (Basic parameter 1) Out of unit setting range	When the power supply is turned on or PC READY is switched from OFF to ON	AD75 READY complete flag(X0) is not turned ON.	Set the value within the setting range.
901	1 rotation pulse No. setting error			
902	Travel value per revolution setting error			
903	Unit magnification setting error			

No.	Error	Detection Timing	Error Processing	Corrective Action
910	<Error history> (Basic parameter 2) Out of speed limit value range	When the power supply is turned on or PC READY is switched from OFF to ON	AD75 READY complete flag(X09) is not turned ON when the power supply is turned on or PC READY is switched from OFF to ON. No operatoin on starting.	Set the value within the setting range.
911	Out of acceleration time range			
912	Out of deceleration time range			
913	Out of bias speed range			
921	<Error history> (Extended parameter 1) S/W upper stroke limit	When PC READY is switched from OFF to ON	AD75 READY complete(X0) is not turned OFF.	Set the value within the setting range.
922	S/W lower stroke limit			
923	S/W stroke limit selection			
924	S/W stroke limit valid			
925	Torque limit set value incorrect			
926	Command in-position range			
927	M code ON timing error			
928	Speed switching mode error			
929	Interpolation speed setting method			
930	Present value change request error			
931	Manual pulse selection error			
933	(Reservation)	—	—	—
934	(Reservation)			
935	(Reservation)			
936	(Reservation)			
937	(Reservation)			
938	Backlash compensation error 2	When PC READY is switched from OFF to ON	AD75 READY complete(X0) is not turned ON.	Set the value within the setting range.

No.	Error	Detection Timing	Error Processing	Corrective Action
950	<Error history> (Extended parameter 2) Acceleration time 1 setting error	When the positioning data is analyzed	No operation on starting. Deceleration stop during operation.	Set the value within the setting range.
951	Acceleration time 2 setting error			
952	Acceleration time 3 setting error			
953	Deceleration time 1 setting error			
954	Deceleration time 2 setting error			
955	Deceleration time 3 setting error			
956	JOG speed limit value error			
957	JOG acceleration selection setting error			
958	JOG deceleration selection setting error			
959	Acceleration/decelerotion setting error			
960	S-curve ratio setting error			
962	Rapid stop deceleration time incorrect			
963	Stop group #1 selection error			
964	Stop group #2 selection error			
965	Stop group #3 selection error			
966	Out of allowable error range for circular interpolation			
967	External start selection error			
980	<Error history> (OPR basic parameter) OPR method setting error	PC READY OFF to ON	AD75 READY is not ON.	Set the value within the setting range.
981	OPR direction error			
982	Home position address setting error			
983	OPR speed error			
984	Creep speed error			
985	OPR retry error			
991	<Error history> (OPR extended parameter) OPR torque control limit	PC READY OFF to ON	AD75 READY complete(X0) is not ON.	Set the value within the setting range.
992	Near-zero point dog travel value error			
993	Home position acceleration selection error			
994	Home position deceleration selection error			
999	F-ROM sum check error	Write to F-ROM	AD75 READY complete(X0) is not ON.	Retry the F-ROM writing of user data. Replace the module if the same error occurs again.

23.6.2 Errors detected by the servo amplifier

(1) Error codes when the MR-H-B is used

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2010	Insufficient voltage The power supply voltage (R, S, T) is below the set level (160V).	1. The power supply voltage is less than AC160V.	Measure the input voltage (R, S, T) with a voltmeter.	Revise the power supply capacity.
		2. The power momentarily stopped for more than 15 msec.	A momentary power outage did not occur. Measure the input voltage with an oscilloscope.	
		3. The power supply voltage dropped during start, etc., because of insufficient power supply capacity.	Measure the input voltage (R, S, T) with a voltmeter.	Revise the power supply capacity.
2012	Memory error 1 ROM, RAM	Printed circuit board H-C10 defect.	Replace the printed circuit board H-C10.	Replace the module.
2013	Clock error	Printed circuit board H-C10 defect.	Replace the printed circuit board H-C10.	Replace the module.
2014	Watchdog	Printed circuit board H-C10 defect.	Replace the printed circuit board H-C10.	Replace the module.
2015	Memory error 2 EEPROM	Printed circuit board H-C10 defect.	Replace the printed circuit board H-C10.	Replace the module.
2016	Detector error 1	1. The detector connector is loose.	Visual check (Is the connector loose are starting to come loose?)	Connect correctly.
		2. Motor detector internal damage.	Try replacing the servo motor.	Replace the servo motor.
		3. Defective detector cable. (Broken wire or short circuit.)	Inspect the cable. (Try replacing the cable.)	Repair or replace the cable (Be careful not to apply an external force to the cable.)
2017	Circuit board error	Printed circuit board H-PO□ defect.	Replace the printed circuit board H-POa.	Replace the module.
2019	Memory error 3 F-ROM	Printed circuit board H-PO□ defect.	Replace the printed circuit board H-C10.	Replace the module.
2020	Detector error 2	1. The detector connector is loose.	Visual check (Is the connector loose are starting to come loose?)	Connect correctly.
		2. Defective detector cable. (Broken wire or short circuit.)	Inspect the cable. (Try replacing the cable.)	Repair or replace the cable (Be careful not to apply an external force to the cable.)
2024	Output ground	UVW ground	Inspect to determine whether the servo motor or cable are grounded.	1. Repair the cable ground.
2025	Absolute position disappearance	1. Voltage drop in the super capacitor in the detector (Set up start up).	Turn on the power supply with the alarm occurring for 2 to 3 minutes and then try turning the power supply from off to on.	2. Replace the motor. Turn the power supply on for 2 or 3 minutes and then turn the power supply from off to on after super capacitor has charged and discharged. Conduct origin initial set.
		2. Battery voltage drop.	Try measuring the voltage at both battery terminals after turning the power supply off.	
		3. Battery cable defect or battery defect.	When an error occurs after the above measures are taken.	Replace the battery.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2030	Regeneration error	1. Parameter setting mistake.	Check the parameter.	Set correctly.
		2. Regeneration resistance not connected.	Check the connection.	Connect correctly.
		3. Regeneration maximum load over (1) The regeneration resistance maximum load capacity is exceeded due to very frequent transport. (2) The regeneration resistance maximum load capacity is exceeded due to continuous regeneration transport.	1. Revise the regeneration brake torque and the regeneration frequency. 2. Check the monitor mode rotation load ratio.	1. Lower the positioning frequency. 2. Add a regeneration option. 3. Increase the motor capacity. 4. Lighten the load.
		4. The regeneration power transistor is damaged (short circuited).	Use a tester to check the regeneration power transistor resistance value.	Replace the module.
		5. Regeneration resistance defect.	Check the resistance value of the regeneration resistance.	Replace the regeneration resistance.
2031	Acceleration The motor RPM are outside the allowable RPM speed.	1. The command speed exceeds the allowable rotation speed.	1. Check the speed command (Pulse series frequency). 2. Check if the motor RPM determined by the AD75 setting speed exceeds the motor rated RPM.	Correctly set the speed.
		2. The constant during acceleration is too small and an over shoot occurs.	1. Try making the constant during acceleration and deceleration larger. 2. Try lowering the speed.	Revise the constant during acceleration and deceleration.
		3. The servo system is unstable causing an over shoot.	1. Try adjusting the servo gain. 2. Check the load inertial moment ratio. 3. Try making the constant during acceleration and deceleration larger. 4. Try lowering the speed.	1. Reset the servo gain to the appropriate value. 2. When the servo gain cannot be set: ① Make the load inertial moment smaller. ② Revise the constant during acceleration and deceleration.
		4. Parameter setting mistake.	Check the parameter.	Set correctly.
		5. Detector error	1. Try replacing the cable. 2. Try replacing the motor.	Replace the cable. Replace the motor.
2032	Overcurrent A current above the allowable value is flowing in the servo amplifier bus.	1. The servo amp lifier output U, V, and W phases are mutually short circuited.	Use a tester to check if the U, V, and W connection lines are short circuited.	Repair the wiring.
		2. The servo amp lifier transistor is damaged.	Use a tester to measure the resistance value between the transistor module terminals.	Replace the transistor module or module.
		3. The servo amp lifier output U, V, and W phases are short circuited.	1. Use a tester to check between the terminal block U, V, and W phases and the case. 2. Use a tester and megger to check between the motor U, V, and W phases and the core.	Repair the ground. Replace the module or motor.
		4. Noise is mixed into the over current detector circuit.	Check if the peripheral equipment relays and valves are not working.	Take countermeasures for noise.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2033	Overvoltage The converter bus voltage exceeds 400V.	1. Regeneration resistance connection mistake.	Check the connect between the terminal block C-P.	Connect correctly.
		2. The regeneration power transistor is damaged.	Use a tester to check the regeneration power transistor resistance value.	Replace the module.
		3. The regeneration resistance in the servo amplifier is disconnected.	Use a tester to measure between the terminal block C-P. (Measure approximately 3 minutes after the charge light turns off.)	Replace the module.
		4. The power supply voltage is high.	Use a voltmeter to measure the input voltage (R, S, T).	Revise the power supply capacity.
2034	CRC error Command cable error	The bus cable (MR-HBUS) is loose.	Check if the cable connector is loose.	Connect the connector.
		The bus cable (MR-HBUS) is defective.	Check if the cable wire is broken, etc.	Replace the cable.
		Noise is mixed into the SSC net cable (MR-HBUS).	The peripheral equipment relays and valves, etc., are operating.	Take countermeasures for noise.
		The end terminal connector is loose.	Check if the end terminal connector is loose.	Connect the end terminal connector.
2035	Command frequency error	1. The command pulse frequency is too high.	Is there an error in the input pulse?	Replace the command module.
		2. Noise is mixed into the command pulse.	Are the peripheral equipment relays and valves, etc., operating?	Take countermeasures for noise.
2036	Transmission error Command cable error	The SSC net cable (MR-HBUS) is loose.	Check if the cable connector is loose.	Connect the connector.
		The SSC net cable (MR-HBUS) is defective.	Check if the cable wire is broken, etc.	Replace the cable.
		The printed circuit board H-C10 is defective.	Try replacing the printed circuit board H-C10.	Replace the module.
		The end terminal connector is loose.	Check if the end terminal connector is loose.	Connect the end terminal connector.
2037	Parameter error	1. The parameter data is damaged.	1. Check if fuzz, etc., is stuck to the card. 2. Try resetting the parameter.	1. Remove the fuzz from the card and reset. 2. Replace the card and reset.
		2. Parameter data erroneous setting.		
2045	Main circuit element overheating	1. Amplifier error.	—	Replace the module.
		(Rated output over) 2. ON/OFF is repeated with the power in an overload state.	Try turning the power supply on and off to see if the motor is operating.	Revise the operation method.
		3. Cooling error.	1. Check if the servo amplifier fan is stopped. 2. Check if the air flow is obstructed. 3. Check if the panel temperature is too high (0 to +55°C). 4. Check the monitor mode and effective load ratio.	Improve the cooling.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2046	Motor overheated	1. The motor is overloaded.	1. Check the monitor mode and effective load ratio. 2. Measure the motor input current. 3. Measure the motor temperature increase.	1. Lighten the load. 2. Increase the capacity.
		2. The temperature surrounding the motor exceeds the usage value of 40°C.	4. Try reducing the load. • Check the motor surrounding temperature (0 to +40°C). • There is an over, etc., close by causing the motor to overheat.	Use in a surrounding temperature of 0 to +40°C.
		3. The detector internal thermo protector is defective.	Try replacing the motor.	Replace the motor.
		4. Cooling fan error.	Is the motor cooling fan turning?	Replace the motor.
2050	Overload 1 An overload current of approximately 200% continues to flow.	1. The servo amplifier is being used while the continuous output current is exceeded.	Refer to error code 2046-1.	
		2. Hunting is being caused by an unstable servo system.	Refer to error code 2031-3.	
		3. A collision with the machine.	1. Check if it is colliding with the machine. 2. Check if the stroke end LS is moving correctly.	1. Revise the operation pattern. 2. Replace the LS.
		4. Motor wiring connection mistake. The servo amplifier terminal U, V, and W do not match the motor terminal U, V, and W.	Check the U, V, and W connections.	Connect correctly.
		5. Detector defective.	1. Try replacing the cable. 2. Try replacing the motor.	1. Replace the cable. 2. Replace the motor.
2051	Overload 2 The maximum current flows for several seconds.	1. A collision with the machine.	Refer to error code 2050-2.	
		2. Motor wiring connection mistake. The servo amplifier terminal U, V, and W do not match the motor terminal U, V, and W.	Refer to error code 2050-4.	
		3. Hunting is being caused by an unstable servo system.	Refer to error code 2031-3.	
		4. Voltage drop in the bus in the servo amplifier.	Is the charging light turned on?	Replace the module.
		5. Detector defective	Refer to error code 2050-5.	

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2052	Excessive error The error count residual pulse count exceeds 80k pulses.	1. The constant during acceleration and deceleration is to short.	Try making the constant during acceleration and deceleration larger.	Make the constant during acceleration and deceleration longer.
		2. Starting is not possible because of insufficient torque.		
		3. The servo gain (Pr13) setting is too low.	Try increasing the Pr13 set value.	Set the appropriate value.
		4. The bus voltage in the module is too low.	Refer to error code 2051-3.	
		5. An external forced rotated the motor once.	1. Is the value changed during the motor stop that checks the monitor mode residual pulse accumulated regeneration load ratio value? 2. Check the torque limit value. Has the servo torque been set to a small setting by an external force?	1. Torque limit value change 2. Lighten the load 3. Increase the capacity
		6. A collision with the machine.	Check if there was a collision with the machine.	Revise the operation pattern.
		7. Detector defective.	Refer to error code 2050-5.	
2086	RS-232C communication error.	This occurs when a parity, frame, or over running error occurs 5 times in a row.	Check if the cable connector wire is broken.	Replace the cable.

(2) Error codes when MR-J-B is used

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2010	Insufficient voltage The power supply voltage (R, S, T) has fallen below the set level (160V).	1. The power supply voltage is below AC160V.	Measure the input voltage (R, S, T) with a voltmeter.	Revise the power supply capacity.
		2. There was a momentary power outage of 15 msec or more.	A momentary power outage did not occur. Measure the input voltage with an oscilloscope.	
		3. The power supply voltage dropped during start up, etc., due to insufficient power supply capacity.	Measure the input voltage (R, S, T) with a voltmeter.	Revise the power supply capacity.
2012	Memory error 1 ROM, RAM	Printed circuit board J-C21 is defective.	Replace the module.	Replace the module.
2013	Clock error	Printed circuit board J-C21 is defective.	Replace the module.	Replace the module.
2015	Memory error 2 EEPROM	Printed circuit board J-C21 is defective.	Replace the module.	Replace the module.
2016	Detector error 1	1. The detector connector is loose.	Visual check (Is the connector loose are starting to come loose?)	Connect correctly.
		2. The motor detector has suffered internal damage.	Try replacing the motor.	Replace the motor.
		3. The detector cable is defective. (The wire is broken or short circuited.)	Inspect the cable. (Try replacing the cable.)	Take countermeasures for noise.
2017	Circuit board error	Printed circuit board J-P4a is defective.	Replace the module.	Replace the module.
2020	Detector error 2	1. Occurrence of excessive noise.	Inspect whether the MC, etc., operates at the alarm occurrence timing.	Take countermeasures for noise.
		2. The detector cable is defective. (The wire is broken or short circuited.)	Inspect the cable. (Try replacing the cable.)	Repair or replace the cable. (Be careful not to apply an external force to the cable.)
2025	Absolute position disappeared	1. Voltage drop in the super capacitor in the detector. (Set up start up.)	Turn on the power supply with the alarm occurring for 2 to 3 minutes and then try turning the power supply from off to on.	Turn the power supply on for 2 or 3 minutes and then turn the power from off to on after super capacitor has charged and discharged. Conduct origin initial set.
		2. Battery voltage drop.	Try measuring the voltage at both battery terminals after turning the power supply off.	
		3. Battery cable defective or battery defective.	When an error occurs after the above measures are taken.	Replace the battery.
2030	Regeneration error	1. Parameter setting mistake.	Check the parameter *PEG setting.	Set correctly.
		2. Regeneration resistance not connected.	Check the connection.	Connect correctly.
		3. Regeneration maximum load over (1) The regeneration resistance maximum load capacity is exceeded due to very frequent transport. (2) The regeneration resistance maximum load capacity is exceeded due to continuous regeneration transport.	1. Revise the regeneration brake torque and the regeneration frequency. 2. Check the monitor mode rotation load ratio.	1. Lower the positioning frequency. 2. Add a regeneration option. 3. Increase the motor capacity. 4. Lighten the load.
		4. The regeneration power transistor is damaged (short circuited).	Use a tester to check the regeneration power transistor resistance value.	Replace the module.
		5. Regeneration resistance defect.	Check the resistance value of the regeneration resistance.	Replace the regeneration resistance.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2031	Acceleration The motor RPM are outside the allowable RPM speed.	1. The command speed exceeds the allowable rotation speed.	1. Check the speed command (pulse series frequency). 2. Check if the motor RPM determined by the AD75 setting speed exceeds the motor rated RPM.	Correctly set the speed (600kpps or lower).
		2. The constant during acceleration is too small and an over shoot occurs.	1. Try making the constant during acceleration and deceleration larger. 2. Try lowering the speed.	Revise the constant during acceleration and deceleration.
		3. The servo system is unstable causing an over shoot.	1. Try adjusting the servo gain. 2. Check the load inertial moment ratio. 3. Try making the constant during acceleration and deceleration larger. 4. Try reducing the speed.	1. Reset the servo gain to the appropriate value. 2. When the servo gain cannot be set: 1 Make the load inertial moment smaller. 2 Revise the constant during acceleration and deceleration.
		4. Parameter setting mistake.	Check parameter *MTY and *MTR.	Set correctly.
		5. Detector error	1. Try replacing the cable. 2. Try replacing the motor.	Replace the cable. Replace the motor.
2032	Overcurrent A current above the allowable value is flowing in the servo amplifier bus.	1. The servo amplifier output U, V, and W phases are mutually short circuited.	Use a tester to check if the U, V, and W connection lines are short circuited.	Repair the wiring.
		2. The servo amplifier transistor is damaged.	Use a tester to measure the resistance value between the transistor module terminals.	Replace the transistor module or module.
		3. The servo amplifier output U, V, and W phases are short circuited.	1. Use a tester to check between the terminal block U, V, and W phases and the case. 2. Use a tester and megger to check between the motor U, V, and W phases and the core.	Repair the ground. Replace the module or motor.
		4. Noise is mixed into the over current detector circuit.	Check if the peripheral equipment relays and valves are not working.	Take countermeasures for noise.
2033	Overvoltage The converter bus voltage exceeds 400V.	1. Regeneration resistance connection mistake.	Check the connect between the terminal block C-P.	Connect correctly.
		2. The regeneration power transistor is damaged.	Use a tester to check the regeneration power transistor resistance value.	Replace the module.
		3. The regeneration resistance in the servo amplifier is disconnected.	Use a tester to measure between the terminal block C-P. (Measure approximately 3 minutes after the charge light turns off.)	Replace the module.
		4. The power supply voltage is high.	Use a voltmeter to measure the input voltage (R, S, T).	Revise the power supply capacity.
2034	CRC error Command cable error.	The SSC net cable (MR-HBUS) is loose.	Check if the cable connector is loose.	Connect the connector.
		The SSC net cable (MR-HBUS) is defective.	Check if the cable wire is broken, etc.	Replace the cable.
		Noise is mixed into the SSC net cable (MR-HBUS).	The peripheral equipment relays and valves, etc., are operating.	Take countermeasures for noise.
		The end terminal connector is loose.	Check if the end terminal connector is loose.	Connect the end terminal connector.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2035	Command frequency error	1. The command pulse frequency is too high.	Is there an error in the input pulse?	Replace the command module.
		2. Noise is mixed into the command pulse.	Are the peripheral equipment pulleys and valves, etc., operating?	Take countermeasures for noise.
2036	Transmission error Command cable error	The bus cable(MR-HBUS) is loose.	Check if the cable connector is loose.	Connect the connector.
		The bus cable (MR-HBUS) is defective.	Check if the cable wire is broken, etc.	Replace the cable.
		The printed circuit board is defective.	Replace the module.	Replace the module.
		The end terminal connector is loose.	Check if the end terminal connector is loose.	Connect the end terminal connector.
2037	Parameter error	1. The parameter data is damaged.	1. Check if fuzz, etc., is stuck to the card. 2. Try resetting the parameter.	1. Remove the fuzz from the card and reset. 2. Replace the card and reset.
		2. Parameter data erroneous setting.		
2042	Feedback error	An error has occurred in the motor detector signal.	Try replacing the motor.	Replace the motor.
2045	Main circuit element overheating	1. Amplifier error. (Rated output over)	—	Replace the module.
		2. On/off is repeated with the power supply in an overload state.	Try turning the power on and off to see if the motor is operating	Revise the operation method.
		3. Cooling error.	1. Check if the servo amplifier fan is stopped. (MR-H150B or more) 2. Check if the air flow is obstructed. 3. Check if the panel temperature is too high (0 to +55°C). 4. Check the monitor mode and effective load ratio.	Improve the cooling.
2046	Motor overheated	1. The motor is overloaded.	1. Check the monitor mode and effective load ratio. 2. Measure the motor input current. 3. Measure the motor temperature increase. 4. Try reducing the load.	1. Lighten the load. 2. Increase the capacity.
		2. The temperature surrounding the motor exceeds the usage value of 40°C.	• Check the motor surrounding temperature (0 to +40°C). • There is an over, etc., close by causing the motor to overheat.	Use in a surrounding temperature of 0 to +40°C.
		3. The detector internal thermo protector is defective.	Try replacing the motor.	Replace the motor.
		4. Cooling fan error.	Is the motor cooling fan turning?	Replace the motor.

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2050	Overload 1 An overload current of approximately 200% continues to flow.	1. The servo amplifier is being used while the continuous output current is exceeded.	Refer to error code 2046-1.	
		2. Hunting is being caused by an unstable servo system.	Refer to error code 2031-3.	
		3. A collision with the machine.	1. Check there was a collision with the machine. 2. Check if the stroke end LS is moving correctly.	1. Revise the operation pattern. 2. Replace the LS.
		4. Motor wiring connection mistake The servo amplifier terminal U, V, and W do not match the motor terminal U, V, and W.	Check the U, V, and W connections.	Connect correctly.
		5. Detector defective	1. Try replacing the cable. 2. Try replacing the motor.	1. Replace the cable. 2. Replace the motor.
2051	Overload 2 The maximum current flows for several seconds.	1. A collision with the machine.	Refer to error code 2050-2.	
		2. Motor wiring connection mistake The servo amplifier terminal U, V, and W do not match the motor terminal U, V, and W.	Refer to error code 2050-4.	
		3. Hunting is being caused by an unstable servo system.	Refer to error code 2031-3.	
		4. Voltage drop in the bus in the servo amplifier.	Is the charging light turned on?	Replace the module.
		5. Detector defective	Refer to error code 2050-5.	
2052	Excessive error The error count residual pulse count exceeds 80k pulses.	1. The constant during acceleration and deceleration is too short.	Try making the constant during acceleration and deceleration larger.	Make the constant during acceleration and deceleration longer.
		2. Starting is not possible because of insufficient torque.		
		3. The servo gain (PG1) setting is too low.	Try increasing the parameter PG1 set value.	Set the appropriate value.
		4. The bus voltage in the module is too low.	Refer to error code 2051-3.	
		5. An external forced rotated the motor once.	1. Is the value changed during the monitor stop that checks the monitor mode residual pulse accumulated regeneration load ratio value? 2. Check the torque limit value. Has the servo torque been set to a small setting by an external force?	1. Torque limit value change 2. Lighten the load 3. Increase the capacity
		6. A collosion with the machine.	Check if there was a collision with the machine.	Revise the operation pattern.
		7. Detector defective	Refer to error code 2050-5.	
2086	Watchdog	Printed circuit board J-C21 is defective.	Replace the module.	Replace the module.

(3) Error codes when MR-J-B is used.

No.	Name	Description	Cause of the Occurrence	Corrective Action
2010	Insufficient voltage	The power supply voltage is under 160V.	1. Power supply voltage drop.	Revise the power supply.
			2. There was a momentary power outage of 15 ms or more.	
			3. The power voltage dropped due to insufficient power supply capacity during start up, etc.	
			4. Turned on within 5s after the power supply was turned off.	
			5. Damage to a component in the servo amplifier. <Inspection method> An error code (2010) occurs even when all the connectors are removed and the power supply is turned on.	
2011	Circuit board error 1	Printed circuit board error	Damage to a component in the servo amplifier. <Inspection method> An error code (2011 to 2013 or 2015) occurs even when all the connectors are removed and the power supply is turned on.	Replace the servo amplifier.
2012	Memory error 1	RAM, ROM memory error		
2013	Clock error	Printed circuit board error		
2015	Memory error 2	EEPROM error		
2016	Detector error 1	There was a detector and servo amplifier communication error.	1. The detector connector is loose.	Connect correctly.
			2. The detector is damaged.	Replace the servo motor.
			3. The detector cable is defective.	Repair or replace the cable.
			4. The servo amplifier and servo motor combinations are different.	Make the correct combination.
2017	Circuit board error 2	CPU or component error.	Damage to a component in the servo amplifier. <Inspection method> An error code (2017, 2018) occurs even when all the connectors are removed and the power supply is turned on.	Replace the servo amplifier.
2018	Circuit board error 3			
2020	Detector error 2	There was a detector and servo amplifier communication error.	1. The detector connector is loose.	Connect correctly.
			2. Detector cable error (The wire is broken or short circuited.)	Repair or replace the cable.
2024	Output ground	The U, V, and W are grounded.	The servo amplifier output U, V, and W phases are grounded.	Repair the wiring.
2025	Absolute position disappears	There is an error in the absolute position data.	1. Voltage drop in the super capacitor in the detector.	After leaving the power supply on for 2 or 3 minutes after the alarm occurs, turn the power supply off once and then turn it on again. Conduct OPR again.
			2. Battery voltage drop.	Replace the battery and conduct OPR again.
			3. Battery cable defect or battery defect.	

No.	Name	Description	Cause of the Occurrence	Corrective Action
2030	Regeneration error	The internal regeneration resistor or the regeneration option allowable regeneration power was exceeded.	1. Parameter No.0 setting mistake.	Set correctly.
			2. The internal regeneration resistor or the regeneration option is not connected.	Connect correctly.
			3. The regeneration option allowable regeneration power was exceeded by the high-frequency operation or the continuous regeneration operation. <Inspection method> Use the status display to check the regeneration load ratio.	1. Lower the positioning frequency. 2. Change to a regeneration option with a large capacity. 3. Make the load smaller.
			4. The power supply voltage is above 260V.	Revise the power supply.
		Regeneration transistor error.	5. The regeneration transistor is damaged. <Inspection method> ① The regeneration option is error overheating. ② The alarm occurs even when the internal regeneration option is disconnected.	Replace the servo amplifier.
			6. The internal regeneration resistor or the regeneration option is defective.	Replace the servo amplifier or the regeneration option.
2031	Overspeed	The RPM momentarily exceeds the allowable speed.	1. The over shoot is large because the constant during acceleration and deceleration is small.	Make the constant during acceleration and deceleration larger.
			2. Over shooting because the servo system is unstable.	1. Reset the servo gain to the appropriate value. 2. When the servo gain cannot be set, do as follows. ① Make the load inertial moment smaller. ② Revise the constant during acceleration and deceleration.
			3. The detector is damaged.	Replace the servo motor.
2032	Overcurrent	A current larger than the servo amplifier allowable current flowed.	1. The servo amplifier output U, V, and W phases are short circuited.	Repair the wiring.
			2. Servo amplifier transistor (IPM) damage <Inspection method> The error code (2032) occurs in the servo amplifier even when the U, V, and W are disconnected and the power supply is turned on.	Replace the servo amplifier.
			3. The servo amplifier output U, V, and W phases are grounded.	Repair the wiring.
			4. The over current detection circuit malfunctions because of outside noise.	Take noise countermeasures.
2033	Overvoltage	The converter bus voltage is higher than 400V.	1. The internal regeneration resistor or regeneration option lead wire is broken or loose.	1. Replace the lead wire. 2. Connect correctly.
			2. The regeneration transistor is damaged.	Replace the servo amplifier.
			3. The internal regeneration transistor or regeneration option wire is broken.	1. For an internal regeneration resistor: Replace the servo amplifier. 2. For a regeneration option: Replace the regeneration option.

No.	Name	Description	Cause of the Occurrence	Corrective Action
2034	CRC error	Bus cable error	1. The bus cable connector is loose.	Connect correctly.
			2. Bus cable defect. (The wire is broken or short circuited.)	Repair or replace the cable.
			3. Noise is mixed into the bus cable.	Take noise countermeasures.
			4. The end terminal connector is loose.	Connect the end terminal connector.
2035	Command pulse error	The input command pulse exceeded 600kpulse/s.	1. The command pulse frequency exceeded 600kpulse/s.	The command pulse frequency is 2.5Mpps or less.
			2. Noise is mixed into the command pulse.	Take noise countermeasures.
			3. The command module is damaged.	Replace the command module.
2036	Transfer error	Bus cable error	1. The bus cable connector is loose.	Connect correctly.
			2. Bus cable defect. (The wire is broken or short circuited.)	Repair or replace the cable.
			3. The end terminal connector is loose.	Connect the end terminal connector.
		Printed circuit board error	A component in the servo amplifier is damaged.	Replace the servo amplifier.
2037	Parameter error	This is a parameter setting value error.	1. The parameter setting value is over written by the servo amplifier damage.	Replace the servo amplifier.
			2. A regeneration option that is not combined with the servo amplifier used is selected.	Reset the regeneration resistance correctly.
2046	Motor heating	The servo motor temperature rose and the thermo protector operated.	1. The temperature surrounding the servo motor exceeded 40°C.	Change the environment so that the surrounding temperature is 0 to 40°C.
			2. The servo motor is overloaded.	1. Make the load smaller. 2. Revise the operation pattern. 3. Use a servo motor with a large output.
			3. The thermo protector in the detector is damaged.	Replace the servo motor.
2050	Over load 1	The servo amplifier over load protection characteristics were exceeded. Load ratio 300%: 4s or more Load ratio 200%: 0.3s or more During servo motor lock: 0.3s or more	1. Used while the servo amplifier continuous output current is exceeded.	1. Make the load smaller. 2. Revise the operation pattern. 3. Use a servo motor with a large output.
			2. Hunting is caused by an unstable servo system.	1. Conduct auto tuning by repeating acceleration and deceleration. 2. Change the auto tuning response setting. 3. Turn the auto tuning off and manually adjust the gain.
			3. Collided with the machine.	1. Revise the operation pattern. 2. Limit switch setting.
			4. Servo motor connection mistake The servo amplifier output terminal U, V, and W and the servo motor input terminal U, V, and W do not match.	Connect correctly.
			5. Detector damage <Inspection method> The return pulse accumulation changes proportionally to the rotation axis angle when the servo motor axis is turned slowly in the servo off state. The detector is damaged if the display jumps forward or backwards during this operation.	Replace the servo motor.

No.	Name	Description	Cause of the Occurrence	Corrective Action
2051	Over load 2	The maximum output current flows for several seconds because of a collision with the machine, etc.	1. Collided with the machine.	1. Revise the operation pattern. 2. Limit switch installation.
			2. Servo motor connection mistake. The servo amplifier output terminal U, V, and W and the servo motor output terminal U, V, and W do not match.	Connect correctly.
			3. Hunting is caused by an unstable servo motor system.	1. Conduct auto tuning by repeating acceleration and deceleration. 2. Change the auto tuning response setting. 3. Turn the auto tuning off and manually adjust the gain.
			4. Detector damage <Inspection method> The return pulse accumulation changes proportionally to the rotation axis angle when the servo motor axis is turned slowly in the servo off state. The detector is damaged if the display jumps forward or backwards during this operation.	Replace the servo motor.
2052	Excessive error	The error counter residual pulse exceeds the error excessive alarm level (Initial value: 80kpulse).	1. The constant during acceleration and deceleration is too small.	Make the constant during acceleration and declaration larger.
			2. Starting is not possible because of insufficient torque from a drop in power supply voltage.	1. Revise the power supply setting capacity. 2. Use a servo motor with a large output.
			3. The position control gain 1 value is small.	Make the set value larger and adjust so that it does not operate properly.
			4. The servo motor axis was rotated by an external force.	1. When the torque is limited, make the limit value larger. 2. Make the load smaller. 3. Use a servo motor with a large output.
			5. Collided with the machine.	1. Revise the output pattern. 2. Limit switch installation.
			6. The detector is damaged.	Replace the servo motor.
			7. Servo motor connection mistake. The servo amplifier output terminal U, V, and W and the servo motor input terminal U, V, and W do not match.	Connect correctly.
2088	Watchdog	CPU, component error	Damaged component in the servo amplifier. <Inspection method> The alarm (2136) occurs in the servo amp even when all connectors are disconnected and the power is turned on.	Replace the servo amplifier.
208E	RS-232C communication error	A communication defect occurred between the servo amplifier and the personal computer.	1. The communication connector is loose.	Connect correctly.
			2. Communication cable defect. (The wire is broken or short circuited.)	Repair or replace the cable.
			3. The personal computer is damaged.	Replace the personal computer.

23.7 Warning List

23.7.1 Warnings detected by the AD75

The warning contents and countermeasures when a warning occurs are shown below.

Error code	Error name	Detection Timing	Warning Processing	Corrective Action
000	Normal status	—	—	—
100	<Common> Start during operation	When the start request is ON	Operation continues.	Correct the start request ON timing.
101	BUSY present value change	When present value change is requested (Test mode)	Present value change request is not acknowledged.	Do not change the present value while the axis is in operation.
102	Error ccunter clear request	When error counter clear is requested	Error counter clear request is not acknowledged.	Do not clear the error counter while the axis is in operation.
104	Restart disabled	When restart command is requested	Operation continues.	Correct the start request ON timing.
105	Target axis incorrect	When write/read is requested	Warning for reference axis	Set the correct set value and request write/read again.
106	Positioning data No. incorrect		Warning for target axis	
107	Write pattern incorrect			
108	F-ROM write incorrect	When write/read is requested	Warning for axis 1	No process
109	Write during BUSY	When write is requested	Warning for target axis	Carry out write/read request when the axis is not BUSY.
111	PC READY is ON	When F-ROM is written	Warning for axis 1	None (Respond to the request when Y1D is OFF.)
112	Overwrite value incorrect	During analysis	• 100 when the set value is 0. • Controlled at 300 when the setting value is 301 or more.	Set the set value within the setting range.
113	Out of torque change value range	During operation	Torque change is not carried out.	
115	Incorrect write/read data count	During write/read	Warning for the affected axis.	Make a rewrite/reread request of the correct set value.
300	<JOG> Speed change during deceleration	When JOG operation speed is changed	Speed change is not carried out	Do not carry out JOG speed change during deceleration caused by the JOG start signal going OFF.
301	JOG speed limit value	When JOG operation speed is changed	• JOG operation is carried out at the JOG speed limit value when the speed exceeds the JOG speed limit value. • The "Speed limit in progress flag" is turned ON when the speed is controlled by JOG speed control.	Set the set value within the setting range.
401	<Manual pulse operation> Out of manual pulse input magnification range	When manual pulse operation input magnification is changed	Clamped at 100 when the input magnification is 101 or higher. Clamped at 1 when the value is 0.	Set the manual pulse operation 1 pulse input magnification within the setting range.
402	Manual pulse operation selection setting 0	When operation is started	No operation on starting.	• Manual pulse operation enable flag OFF • Set the set value to 1 to 3. • PC READY OFF to ON.
500	<Positioning operation> Deceleration/stop speed change	When speed is changed	Speed change is not carried out.	Do not change the speed during a deceleration stop caused by a stop command or automatic deceleration in positioning control.
501	Speed limit value exceeded	When speed is changed	Clamp at the "Speed limit value."	Set the changed speed within the range from 0 to the speed limit value.

Error code	Error name	Detection Timing	Warning Processing	Corrective Action
502	Remaining distribution speed low	During positioning control remaining distribution mode	Warning for target axis	No processing
503	M code ON signal ON	When positioning data is executed	When execution of positioning data is carried out	Correct the M code OFF signal ON/OFF timing.
505	Operation exit not set	When 50th point is updated	Operation exits.	Set the operation end at the 50th point.
506	FOR to NEXT nesting	During FOR command analysis	Operation continues.	Eliminate FOR to NEXT nesting
508	Speed-position switching signal ON during acceleration	When speed/position switching signal is ON	Operation continues.	Do not turn on the speed/position switching signal during acceleration.
509	Insufficient remaining distance	When speed is changed	Nearest value is used for the change. (Except operation pattern 11)	Nearest value is used for the change to the speed change value.
512	External start function incorrect	When external start signal is ON	Nothing happens when the external start signal comes ON.	Set the parameter within the setting range.
513	Insufficient travel value	During positioning operation	Immediate stop after reaching the positioning address	Correct the positioning data and parameter.
	Travel value change register out of range during speed/positioning control	When speed/position switching signal is ON	Positioning control is carried out without using the change register.	Set the travel value within the setting range.
514	Out of commanded speed range	During analysis	Commanded speed is clamped at the speed limit value.	Set the commanded speed within the setting range.
900	<System control data> Incorrect time data setting	During time data setting.		Reset to normal time data.

23.7.2 Warnings detected by the servo amplifier

(1) Warning codes when using the MR-H-B

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2092	Battery wire break warning	1. Detector cable break 2. Battery voltage low	Check the cable conductance.	Repair or replace the cable.
2096	Origin set mistake	1. The command input is being entered even after the residual pulse is cleared. 2. A residual pulse greater than the setting value remains.	• Check if the servo motor RPM is 0. • Check if the residual pulse monitor display is within the imposition range.	Check the controller sequence.
2102	Battery warning	Battery voltage low.	Measure the battery voltage. (Check if it is 3.2+/-0.2V or more.)	Charge, replace, or install the battery.
2140	Over regeneration warning	More than 85% of the regeneration resistance maximum load capacity.	Refer to error code 2030.	
2141	Over load warning	Load of more than 85% of the over load alarm level.	Refer to error code 2050, 2051	
2143 (*A)	Absolute position counter warning	There is an error in the absolute position detector pulse.	Refer to the servo amplifier manual.	
2145	ABS timeout warning	Absolute position data transmission defect.	Check the CN1B-9 pin and CN1B-6 pin connections.	Connect correctly.
2146	Servo emergency stop	An emergency stop signal entered the servo amplifier.	Check the emergency stop signal in the servo amplifier.	Turn off the emergency stop signal.
2147	PC emergency stop	An emergency stop signal entered the AD75.	Check the emergency stop signal in the AD75.	
2149	Main circuit off warning	The servo on (SON) signal turned on in the main circuit power off state.	Check the servo amplifier charging light (LED).	Turn on the main circuit connector or the main circuit power.

(2) Warning code when using the MR-J-B

No.	Name and Description	Cause of Occurrence	Check Point	Corrective Action
2092	Battery wire break warning	1. Detector cable break 2. Battery voltage low	Check the cable conductance.	Repair or replace the cable.
2096	Origin set mistake	1. The command input is being entered even after the residual pulse is cleared. 2. A residual pulse greater than the setting value remains.	• Check if the servo motor RPM is 0. • Check if the residual pulse monitor display is within the imposition range.	Check the controller sequence.
2147	PC emergency stop	An emergency stop signal entered the motion controller.	Check the motion controller emergency stop signal.	Turn off the emergency stop signal.
2145	Parameter warning	The parameter set during operation exceeds the parameter setting range. The set parameter is ignored.	Correctly enter the set value.	Reset.

(3) Warning code when using the MR-J2-B

No.	Name	Description	Cause of Occurrence	Corrective Action
2146	Battery wire break warning	The absolute position detection system battery voltage dropped.	1. The battery cable wire is broken.	Repair the cable or replace the battery.
			2. The battery voltage is below 2.8V.	Replace the battery.
2150	Origin set mistake warning	OPR could not be executed.	1. A command pulse entered after the residual pulse was cleared.	Make it so that a command pulse does not enter after the clear.
			2. A residual pulse with a value outside the imposition range set value remains.	
2224	Over regeneration warning	There is a possibility that the regeneration power could exceed the internal regeneration resistor or regeneration option allowable regeneration power.	Reached 85% or more of the internal regeneration resistor or regeneration option allowable regeneration power. <Inspection method> Check the regeneration load ratio from the status display.	1. Reduce the positioning frequency. 2. Change to a regeneration option with a large capacity. 3. Reduce the load.
2225	Over load warning	There is a possibility that over load alarms 1 and 2 will go off.	The load is 85% or more of the over load alarm 1 and 2 occurrence level. <Cause and inspection method> Refer to 50 and 51.	Refer to error codes 2080 and 2081.
2228	Parameter warning	The parameter is outside the setting range.	The parameter from AD75 set a value that is outside the setting range.	Set the correct parameter.
2230	Servo emergency stop	Released between the EM1-SG.	External emergency stop is valided. (EM-SG is disconnection)	Check for safety and then cancel the emergency stop.

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