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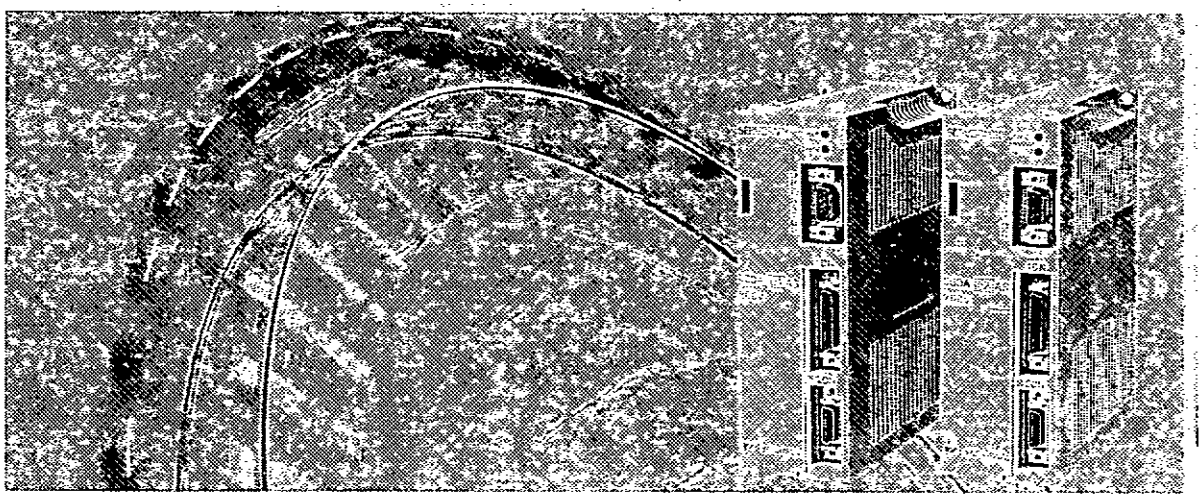
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YASKAWA

FOR AC SERVO DRIVES Σ SERIES
SOFTWARE FOR PERSONAL COMPUTER MONITORING

OPERATION MANUAL



YASKAWA SIE-S800-15.5B

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FOR SAFETY

● SAFE OPERATION

(1) To avoid accidents that may result in personal injury or physical damage, observe the instructions and operation procedure for safety in this manual. The instructions and operation procedures are indicated with the safety symbols shown below.

(2) No modification can be made without the expressed written consent of YASKAWA Electric Corp. YASKAWA takes no responsibility for injuries or damages caused by unauthorized modification.

(3) Do not change wiring when power is ON.
Make sure to turn OFF the power before connecting or disconnecting a connector.

⚠ **DANGER**	Describes misuse that may cause imminent danger of death or serious personal injury.
⚠ **WARNING**	Describes misuse that may cause possible death or serious personal injury.
⚠ **CAUTION**	Describes misuse that may cause either personal injury or damage to the equipment.

NOTE

This mark indicates prohibited entries and operations which will cause the equipment to either display an alarm or malfunction, without causing physical damage or serious hazards.

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OUTLINE OF THIS MANUAL

- This manual explains :
  - ·outline or functions and
  - ·how to operate

  the software for how to operate monitoring the Σ series SERVOPACK through a personal computer.
- Technical sheets on related equipment and modules are listed below. Refer to them when necessary.

Document No.	Document Name
TSE-S800-15.1	Σ series SGM/SGD for speed (torque) control
TSE-S800-15.2	Σ series SGM/SGD for position control
TSE-S800-15	Σ series SGM/SGDA User's Manual
TSEZ-S800-16	Σ series SGM/SGDB for position, speed and torque control

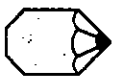
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HOW TO USE THIS MANUAL

● Icons

On the left margin, there are icons indicating what kind of information is described on the page.

<List of icons>

 CONVENIENT	Highlights convenient functions.
	Highlights program/operation examples.
 SUPPLEMENT	Highlights supplemental explanations.
	Explains technical or special terms which pop up in the text without any prior explanation.

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● Explanation of technical terms

Technical terms in shaded boxes are briefly explained in the footnote. An example is shown below :



● "Footnote"

The footnote is used to explain special and technical terms that may not be familiar to those who have limited experience with the SERVOPACK and other electronic equipment.

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NOTES ON SOFTWARE

(1) Use

- This software product is intended to be used on one particular computer (IBM PC). For other computers, compatible software must be purchased separately.
- Reproduction of this software is prohibited except for the purpose of creating a back-up copy.
- Store the original software disk with care.
- Reverse compilation and/or assembling of this software is strictly prohibited.
- The transfer, exchange, and/or lease of this software to a third party, is strictly prohibited.

(2) OS and Trademark

- MS-DOS is a registered trademark of Microsoft, USA.
- IBM DOS is a trademark of IBM.

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SECTION 1

SYSTEM OUTLINE

This section explains the outline and features of Σ series SERVOPACK personal computer monitoring software.

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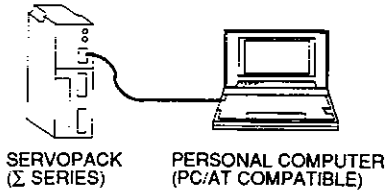
1 SYSTEM OUTLINE

This section explains the outline and features of and necessary preparation procedures for this system on an IBM personal computer.

1.1 OUTLINE AND FEATURES ···· 12 1.2 PREPARATION BEFORE USE ·· 13

1.1 OUTLINE AND FEATURES

(1) By connecting a PC/AT compatible personal computer and the Σ series SERVOPACK, user constants can be set up, operation can be executed, and status and alarms can be displayed.



(2) Install the provided "Σ series SERVOPACK personal computer monitoring software" on the (PC/AT compatible) personal computer.
By installing the software, the user can :

- Check the SERVOMOTOR's speed, torque and position following error through waveforms during operation.
- Check the SERVOPACK's system information, I/O signal status, and alarm contents thereby reducing setup time.
- Execute of jog operation, auto tuning and other adjustments.
- Load user constants in a single batch from a floppy disk to the SERVOPACK, and also store and manage multiple user constants on floppy disks.

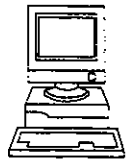
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1.2 PREPARATION BEFORE USE

(1) Prepare either of the following personal computers :

DESKTOP TYPE LAPTOP TYPE

IBM PC/AT or compatible (i486SX CPU or higher)





SUPPLEMENT

● If a mouse is to be used, use :
- Serial mouse (no particular manufacturer specified)
- IBM PS/2 compatible mouse

And, add the following statement to the AUTOEXEC. BAT file :
- LH MOUSE

(2) Prepare either of the following printers :

SERIAL PRINTER PAGE PRINTER

- ESC/P compatible printers
- LaserJet printer (HP)





(3) To run Σ series SERVOPACK personal computer monitoring software, operating system software is indispensable. Prepare either of the following components on the user side.

IBM DOS Ver. 3.30 or later made by IBM, or
MS-DOS Ver. 3.30 or later made by Microsoft

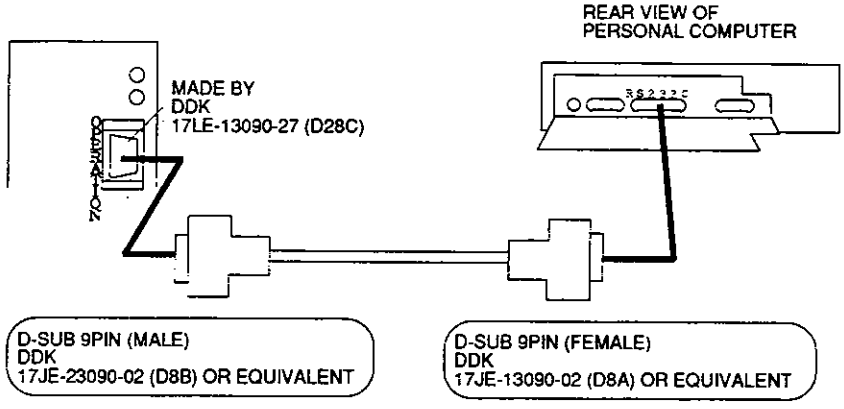


SUPPLEMENT

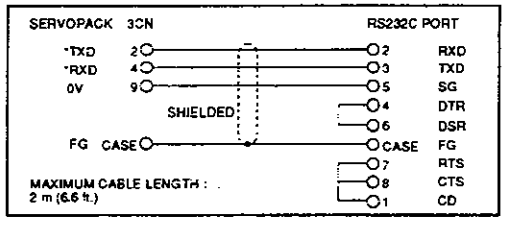
● The provided floppy disk does not contain MS-DOS or IBM DOS. Therefore, the user must have the operating system software pre-installed on the personal computer.

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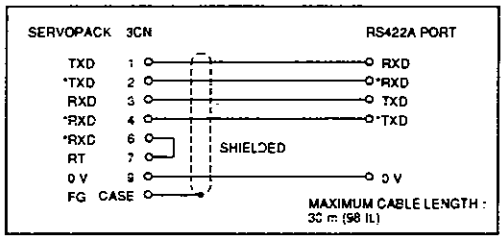
(4) Connect the personal computer and the SERVOPACK with a cable. The cable must be prepared by the user.



·To connect directly to a RS232C port :



·To connect to a RS422A port :
(For extending the cable, etc.)



(5) To run Σ series SERVOPACK personal computer monitoring software off from the hard disk, see item (6) on the following page, for instructions on installing the software to the hard disk of the personal computer. There are no restrictions on the system for running off from the hard disk. The user can run the software from either the hard disk or floppy disk.

Ex.

● To create directory "SGD" and install Σ series SERVOPACK personal computer monitoring software :

Activate MS-DOS and enter
「MD␣SGD ↵」

```
C : \> MD_SGD ↵
C : \>
```

TERMS

● _ : Indicates where the SPACE bar is to be depressed.

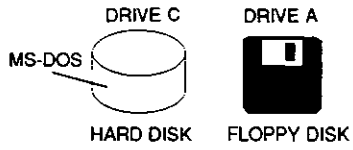
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(6) Installing the Σ series SERVOPACK personal computer monitoring software.

The following system configuration is used in the examples shown below :

《PC configuration》

Drive C : Hard disk
(MS-DOS already installed)
Drive A : Floppy disk



Start

Activate MS–DOS.

Insert the original floppy disk to drive A.

Copy the files contained in the floppy disk to the hard disk.*

To copy to the root directory :

C : \> COPY _ A : *. *_ C : ↵

To copy to subdirectory SGD created in Par. (5) :

C : \> COPY _ A : *. *_ C : \SGD ↵

Eject the floppy disk.

End

The above procedure completes installation of the communication software.

* If installation was successful, a message, "18 files have been copied", will appear on the bottom of the screen. Verify the number of files in the message.

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SUPPLEMENT

● Configuration of files to be installed

File Name	Outline
SVMON . EXE	SERVOPACK monitor program main module
SGDS . TBL	Table file for SGD-□□□S
SGDP . TBL	Table file for SGD-□□□P
SGDAS . TBL	Table file for SGDA-□□□S
SGDAP . TBL	Table file for SGDA-□□□P
SGDB . TBL	Table file for SGDB-□□AD
DR2 . TBL	Table file for DR2-□□□□
DR2F . TBL	Table file for DR2-□□□□-F
DRBA . TBL	Table file for CACR-DR□□BA
SERVO . TBL	Table file for SERVOPACK information
MOTOR . TBL	Table file for motor information
ATT . BGI	Graphic driver
CGA . BGI	Graphic driver
DOSVGA . BGI	Graphic driver
EGAVGA . BGI	Graphic driver
HERC . BGI	Graphic driver
IBM8514 . BGI	Graphic driver
PC3270 . BGI	Graphic driver

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SUPPLEMENT

●Σ series SERVOPACK personal computer monitoring software creates and uses files with the file extensions as shown in the table below. The user need not manipulate these files in the program.

File Name	Outline
*. PRM	SGXMT user constant file (can be read and updated for consistency.)
*. SGD	User constant file for SGD/SGDA (common to P and S)
*. SGB	User constant file for SGDB
*. DR2	User constant file for DR2
*. DRB	User constant file for CACR–DR□□BA
*. GRP	Trace data file (common to all components)

● When working with a floppy disk, make backup copies and store the original floppy disk in a safe place.

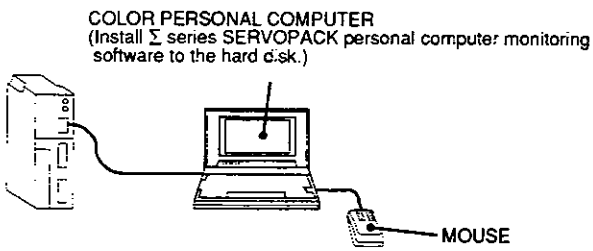
● If the software has been installed to the hard disk, store the original floppy disk for back-up in a safe place.

TERMS

● File extension : The file extension is added after the file name and is used for file management.

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(7) An optimum setting is shown below.



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SECTION 2

BASIC OPERATIONS

This section explains basic operations for running the Σ series SERVOPACK personal computer monitoring software as well as typical procedures for using the functions.

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1.5 ALLOCATION OF FUNCTION KEYS ····· 25

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1 BEFORE STARTING OPERATION

This section explains basic operations including use of the mouse, the keyboard, and the menu. Read this section thoroughly prior to starting operations.

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1.2 USING THE KEYBOARD ····· 21
1.3 APPLICABLE SERVOPACK ···· 22
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1.5 ALLOCATION OF FUNCTION KEYS ····· 25

1.1 USING THE MOUSE

(1) Mouse operations described in this manual do not include cancel mode. Depressing any button on the mouse has the same effect.

(2) There are three mouse operations :

Operation	Explanation
Click	Depress button and release immediately.
Double-click	Click button twice quickly.
Drag	While depressing button, move mouse and release at specified place.

(3) In the explanations in Sections 3 and 4, mouse operations are indicated with ( ). See description under the if the mouse is used.

Ex. ● : Click at [OK].

(4) Each of the three mouse operations have particular uses in the operation procedure described in Sections 3 and 4. Major uses are shown below.

Mouse Operation	Use
Click	·Selects menu item. ·Executes function. ·Changes windows. ·Closes window. ·Select a function. ·Sets switch to 1. ·Click ↑, ↓, ← or → to select the function.
Double-click	·Executes the selected function.
Drag	·Moves window. (Dragging the upper part of window will move window.)

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1.2 USING THE KEYBOARD

(1) There are three types of keyboard operations :

Operation	Explanation
[ALT] + [X] keys	Depress [X] key while depressing [ALT] key.
[↵] key	Depress the return key.
Enter " ×× [↵] ."	Enter as specified. Enter from keyboard regardless of whether mouse is used.

(2) In the explanations in Sections 3 and 4, keyboard operations are indicated with ( ). See description under the if the keyboard is used.

Ex.

● : Depress [↵] key.

(3) Use of major keys in the operation procedure described in Sections 3 and 4 are shown below.

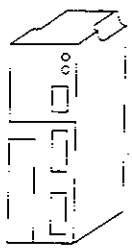
Key	Use
[ESC] key	·Closes window. ·Forces termination.
[TAB] key	·Selects function alternative.
[SPACE] bar	·Executes the selected function. ·Sets switch to 1.
[↑][↓][←][→] key	·Selects menu item. ·Use each key to select the function.
[↵] key	·Executes key-input. ·Executes function.

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1.3 APPLICABLE SERVOPACK

(1) Functions explained in the following sections may or may not be available with a particular type of SERVOPACK. See the list at the beginning of each section for the SERVOPACKs with which the function can be used.

Ex.

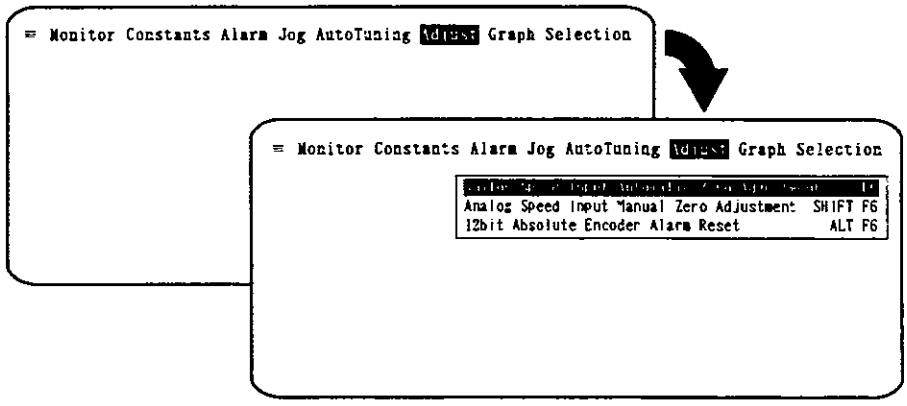


·SGDA-□□□S series
·SGDA-□□□P series
·SGDB-□□AD series
·DR2-□□□□ series
·DR2-□□□□-F series

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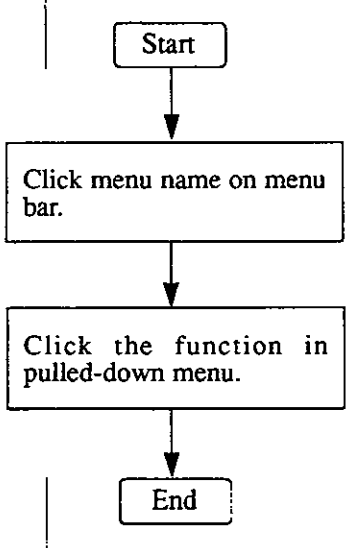
1.4 SELECTING FUNCTIONS

(1) Select a menu name from the menu bar on the upper part of the screen. The selected menu is pulled down to display a list of functions. Select one.



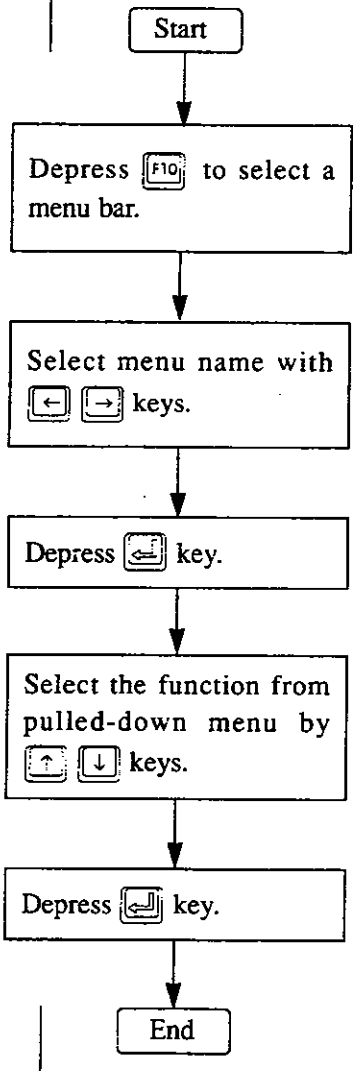
Procedure for selecting a function from the menu bar using the mouse or keyboard are explained below.

(2) With mouse



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(3) With keyboard



(4) In this manual, the above procedure is described as " select [XXX] - [XXX]".

Ex.

● Select [Alarm] – [Alarm].

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1.5 ALLOCATION OF FUNCTION KEYS

(1) Functions can be entered with the following function keys . Each function key name is displayed to the right of corresponding functions in the pulled-down menu. When you become familiar with the software, you may find the function keys to be very convenient.

Function Key	Function
F1	Monitor
F2	User constant
F3	Alarm
F4	Jog operation
F5	Auto tuning
F6	Speed reference offset auto adjustment
SHIFT + F6	Speed reference offset manual adjustment
ALT + F6	12-bit absolute encoder setup
F7	Data trace
SHIFT + F7	Waveform redisplay
F8	SERVOPACK selection
F9	Window change on monitor
F10	Cursor return to menu bar

TERMS

● Function keys : Function-assigned keys F1 to F10 at top of keyboard.

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SECTION 3

START TO END OF THE PROGRAM

This section explains procedures from activation to termination of the software.

1 START TO END OF THE PROGRAM
1.1 STARTING FROM HARD DISK ····· 28
1.2 STARTING FROM FLOPPY DISK ····· 31
1.3 END ····· 34

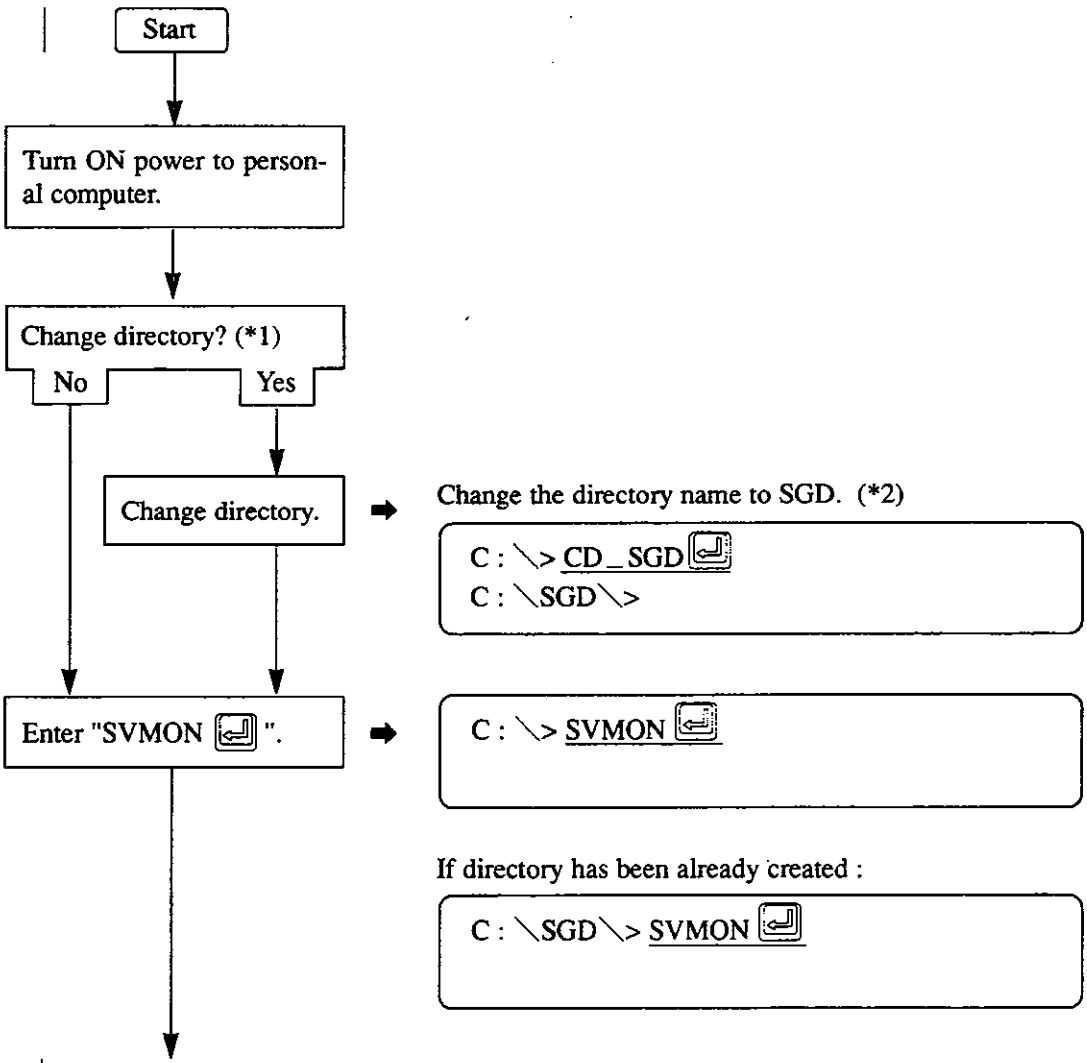
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1 START TO END OF THE PROGRAM

This section explains procedures from activation to termination on an IBM personal computer. For procedures of each function, see Section 4.

1.1 STARTING FROM HARD DISK ····· 28
1.2 STARTING FROM FLOPPY DISK ····· 31
1.3 END ····· 34

1.1 STARTING FROM HARD DISK

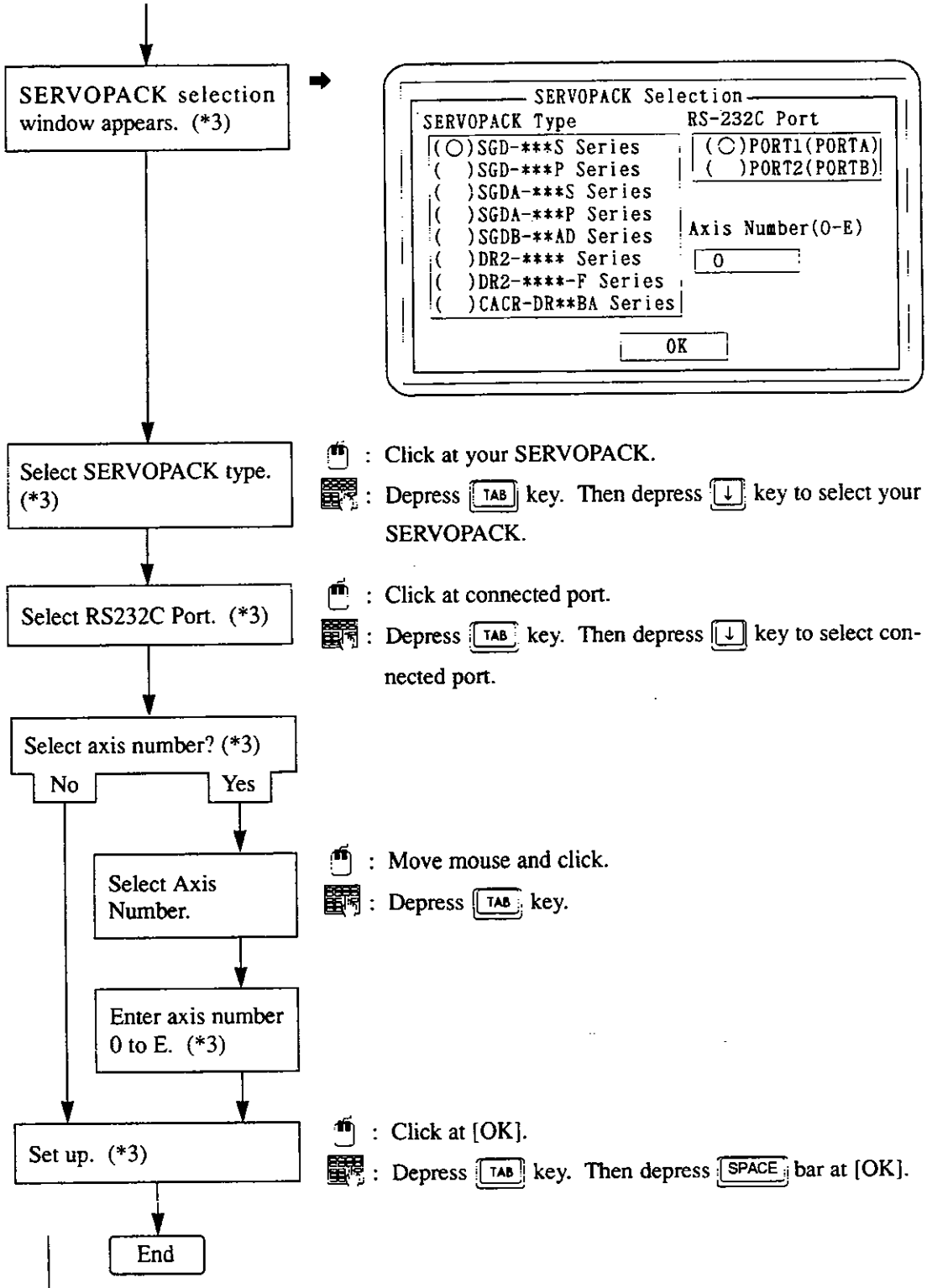


*1 The activated directory is the current directory .
*2 This directory name is the example created in Section 1. You can specify the directory name.

TERMS

● Current directory : Directory where you are operating at present.

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*3 If SERVOPACK type is selected for SVMON command option *1 as explained on the following page, the above SERVOPACK selection window does not appear.

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CONVENIENT

● SVMON command has options, "SVMON _ -____." Options are described in the ~~~ part. The options are enabled only when preceded with SVMON.

◇Option screen display
-HELP, -H or -?

◇Screen mode selection
-MONO : Modifies screen so that it will be clearer even on monochrome display.
-COLOR : Displays color screen for color display. (Default)

◇SERVOPACK selection (*1)
-SGDS : Selects SERVOPACK type SGD-□□□S.
-SGDP : Selects SERVOPACK type SGD-□□□P.
-SGDAS : Selects SERVOPACK type SGDA-□□□S.
-SGDAP : Selects SERVOPACK type SGDA-□□□P.
-SGDB : Selects SERVOPACK type SGDB-□□AD.
-DR2 : Selects SERVOPACK type DR2-□□□□.
-DR2F : Selects SERVOPACK type DR2-□□□□-F.
-DRBA : Selects SERVOPACK type CACR-DR□□BA.
SELECT : Selectable on other screens. (Default)

◇Axis number selection (*1)
-AXIS × : × enter value from 0 to E. (Default : 0)

◇RS232C port selection (*1)
-PORT × : × enter 1, 2, A, or B. (Default : 1 or A)

◇Printer selection (*1)
-ESCP : Selects ESC/P printer (Default)
-HP : Selects LaserJet printer

*1 Selectable on other screens when SERVOPACK selection is "SELECT".

Ex.

● To set up screen mode to MONO, SERVOPACK SGDA-□□□S, axis number 1, and RS232C port to PORT2, LaserJet printer HP, enter as follows :
SVMON_-MONO_-SGDAS_-AXIS1_-PORT2_-HP ↵

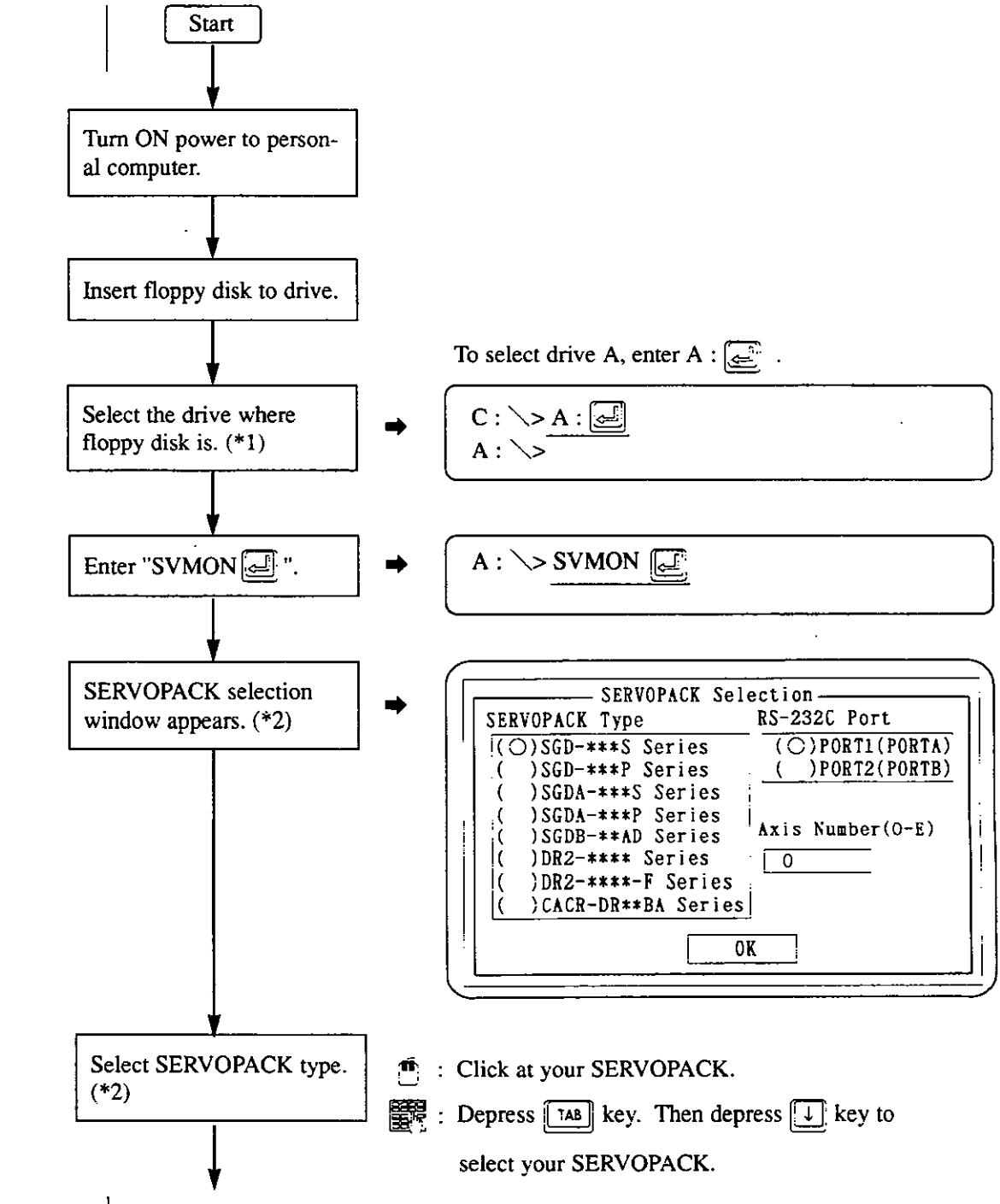
TERMS

● _ : Depress SPACE bar.

● Default : Value automatically used unless specified otherwise

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1.2 STARTING FROM FLOPPY DISK

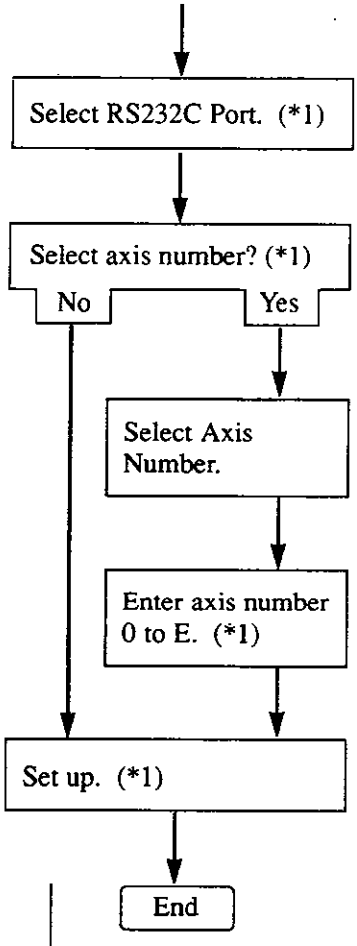


*1 The directory where you start the system is the current directory.

TERMS

● Current directory : Directory where you are operating at present.

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: Click at connected port.

: Depress TAB key. Depress ↓ key to focus connected port.

: Move mouse and click.

: Depress TAB key.

: Double-click at [OK].

: Depress TAB key. Then depress SPACE bar at [OK].

*1 If SERVOPACK type is selected for SVMON command option *1 explained on the next page, the above SERVOPACK selection window does not appear.

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CONVENIENT

● SVMON command has options "SVMON _ – ". Options are described in the part. The options are enabled only when preceded by SVMON.

◇ Option screen display
-HELP, -H or -?

◇ Screen mode selection
-MONO : Modifies screen so that it will be clearer even on monochrome display.
-COLOR : Displays color screen for color display. (Default)

◇ SERVOPACK selection (*1)
-SGDS : Selects SERVOPACK type SGD- □□□ S.
-SGDP : Selects SERVOPACK type SGD- □□□ P.
-SGDAS : Selects SERVOPACK type SGDA- □□□ S.
-SGDAP : Selects SERVOPACK type SGDA- □□□ P.
-SGDB : Selects SERVOPACK type SGDB- □□ AD.
-DR2 : Selects SERVOPACK type DR2- □□□□.
-DR2F : Selects SERVOPACK type DR2- □□□□ - F.
-DRBA : Selects SERVOPACK type CACR-DR □□ BA.
SELECT : Selectable on other screens. (Default)

◇ Axis number selection (*1)
-AXIS × : × stands for 0 to E. (Default : 0)

◇ RS232C port selection (*1)
-PORT × : × stands for 1, 2, A, or B. (Default : 1 or A)

◇ Printer selection (*1)
-ESCP : Select ESC/P printer (Default)
-HP : Select LaserJet printer

*1 Selectable on other screens when SERVOPACK selection is "SELECT."

Ex.

● To set up screen mode to MONO, SERVOPACK SGDAS, axis number 1, and RS232C port to PORT2, LaserJet printer HP, enter as follows :
SVMON_-MONO_-SGDAS_-AXIS1_-PORT2_-HP ↵

SUPPLEMENT

● When screen mode is set to -MONO, only the waveform display will become clearer on monochrome display.

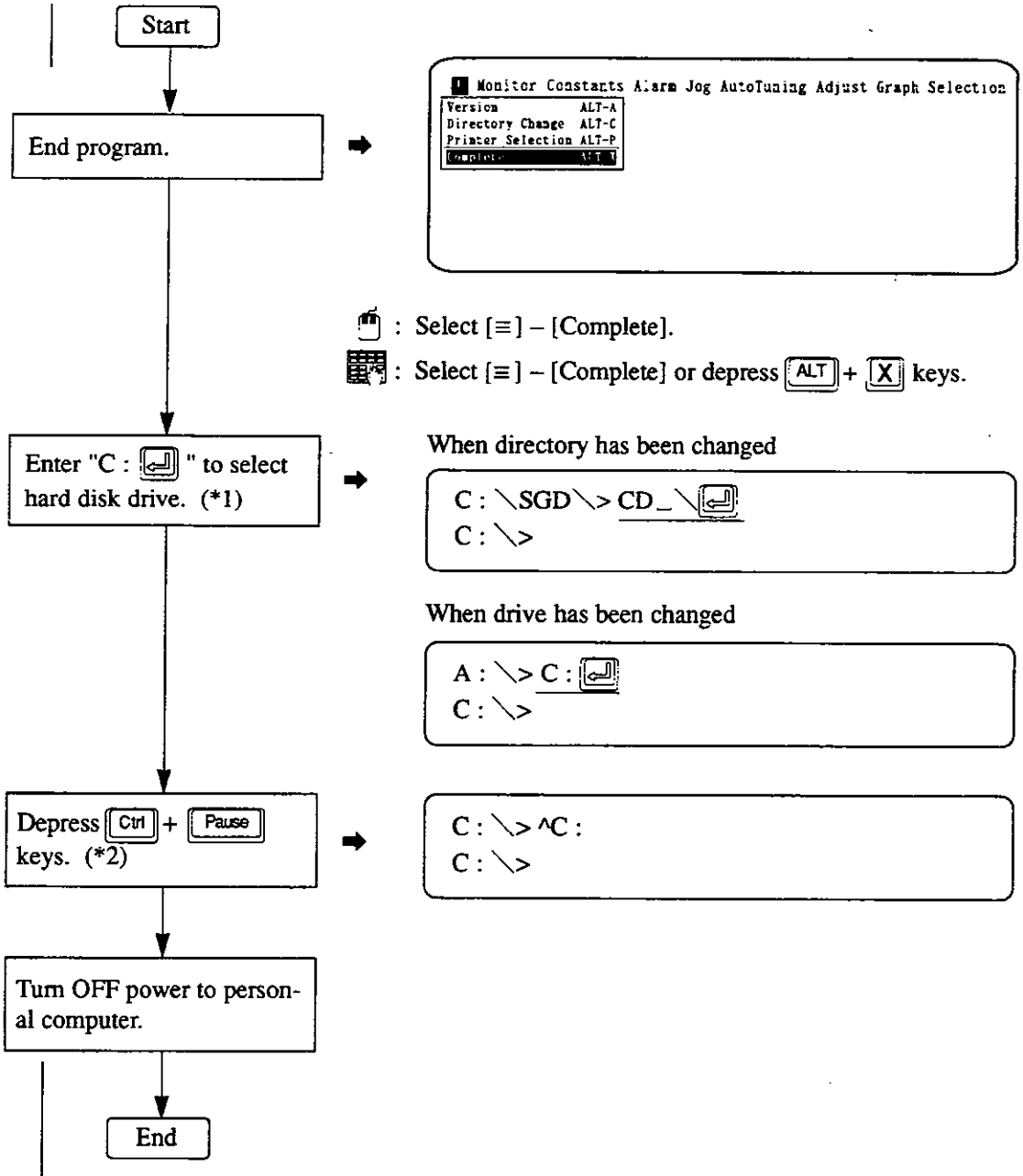
TERMS

● _ : Depress SPACE bar.

● Default : Value automatically used unless specified otherwise

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1.3 END



*1 This operation is necessary when the software is started with a floppy disk, or when the drive or directory has been changed to read or write files.

*2 To protect the drive, do not skip this step.

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SECTION 4

OPERATING EACH FUNCTION

This section explains detailed procedures for using each function.

FUNCTION TREE

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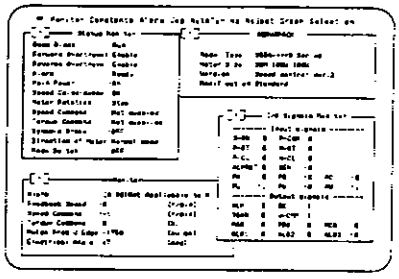
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Examples used in this section are for the SGDA-S series. Although the display may differ according to the type of SERVOPACK, operations are the same. Only active windows are shown in the diagrams depicting screen displays.

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Σ SERIES SERVOPACK PERSONAL COMPUTER PROGRAM OR SOFTWARE FUNCTION TREE

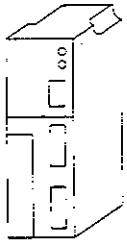


- System
  - Checking version (→ See Par. 1.1.)
  - Changing directry (→ See Par. 1.2.)
  - Selecting printer (→ See Par. 1.3.)
  - End
- Monitor (→ See Par. 2.)
  - Monitor
  - Status information
  - I/O signal monitor
  - SERVOPACK information
- User constant (→ See Par. 3.)
  - PC → Disk
  - PC ← Disk
  - PC → Drive
  - PC ← Drive
  - Print
  - Clear
  - Edit
- Alarm (→ See Par. 4.)
  - Alarm reset
  - Trace clear
- Jog operation (→ See Par. 5.)
- Auto tuning (→ See Par. 6.)
- Adjustment
  - Automatically adjusting speed reference offset (→ See Par. 7.1.)
  - Manually adjusting speed reference offset (→ See Par. 7.2.)
  - 12-bit absolute encoder alarm reset (→ See Par. 7.3.)
- Waveform display
  - Redisplaying waveform (→ See Par. 8.1.)
    - Trace buffer selection
    - Graph selection
    - Trigger condition selection
    - Sampling time selection
    - Pretrigger number selection
  - Redisplaying waveform (→ See Par. 8.2.)
    - Trace buffer selection
    - Graph selection
- SERVOPACK selection (→ See Par. 9.)
  - SERVOPACK selection
  - Axis number selection

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1 SYSTEM MONITOR

This section explains how to change directory information, etc.

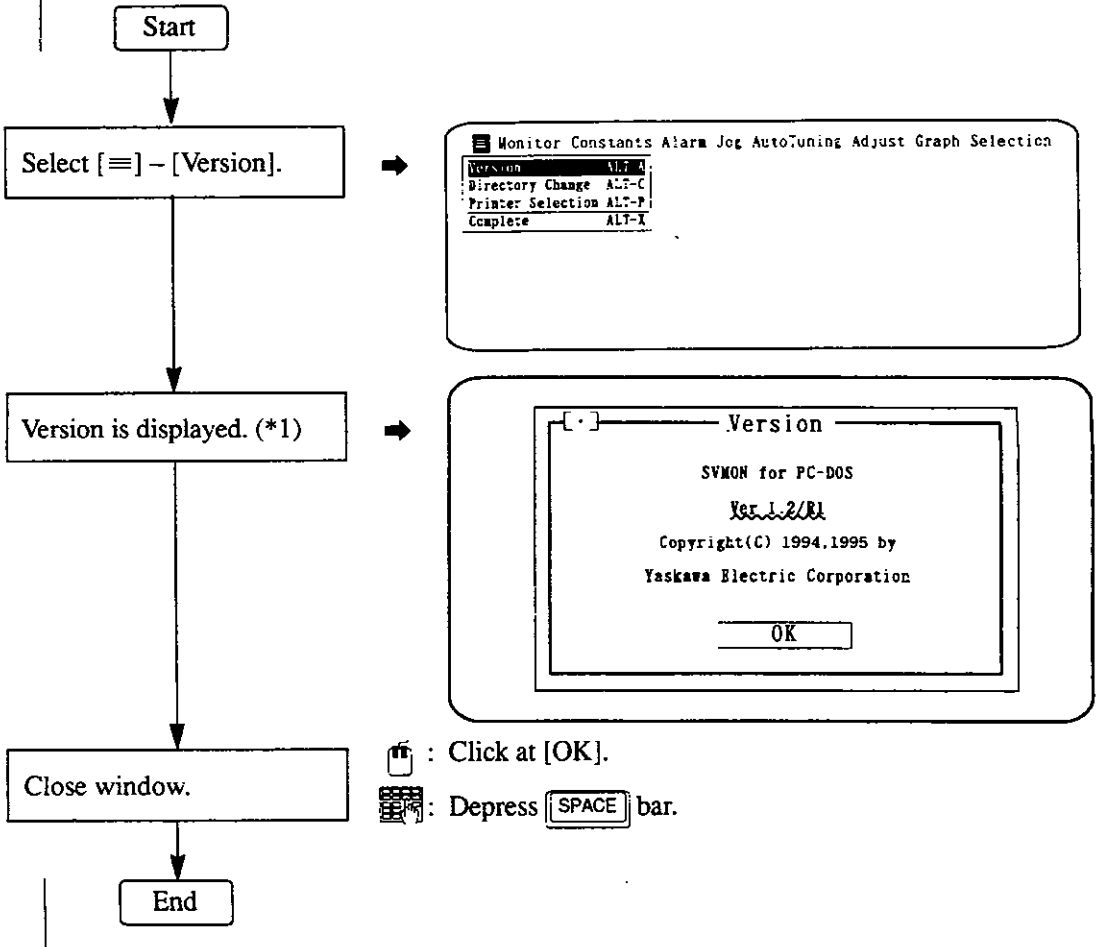


- ·SGD–□□□S series
- ·SGD–□□□P series
- ·SGDA–□□□S series
- ·SGDA–□□□P series
- ·SGDB–□□AD series
- ·DR2–□□□□ series
- ·DR2–□□□□–F series
- ·CACR–DR□□BA series

1.1 CHECKING VERSION ····· 37
1.2 CHANGING DIRECTORY ····· 38
1.3 SELECTING PRINTER ····· 40

1.1 CHECKING VERSION

(1) Display the version of Σ series SERVOPACK personal computer monitoring software.

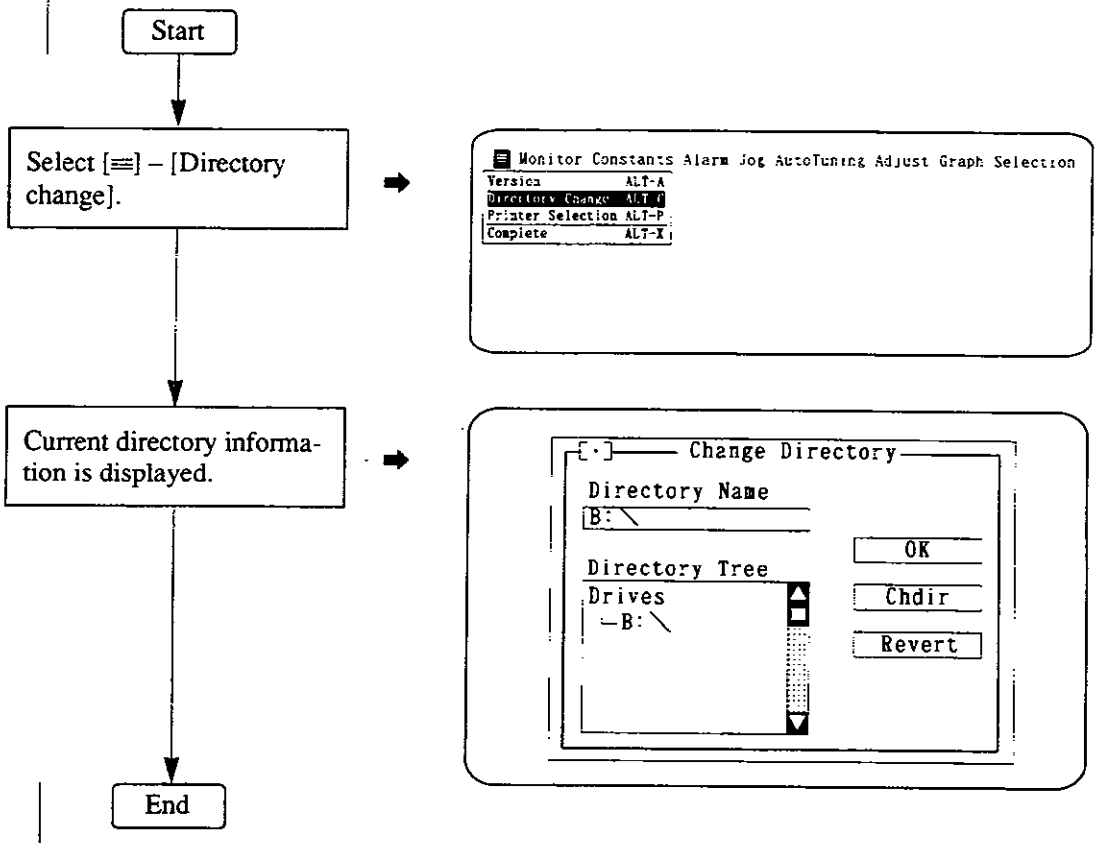


*1 The version number, as high lighted with underlining, ~~~~ is updated as the software version is upgraded.

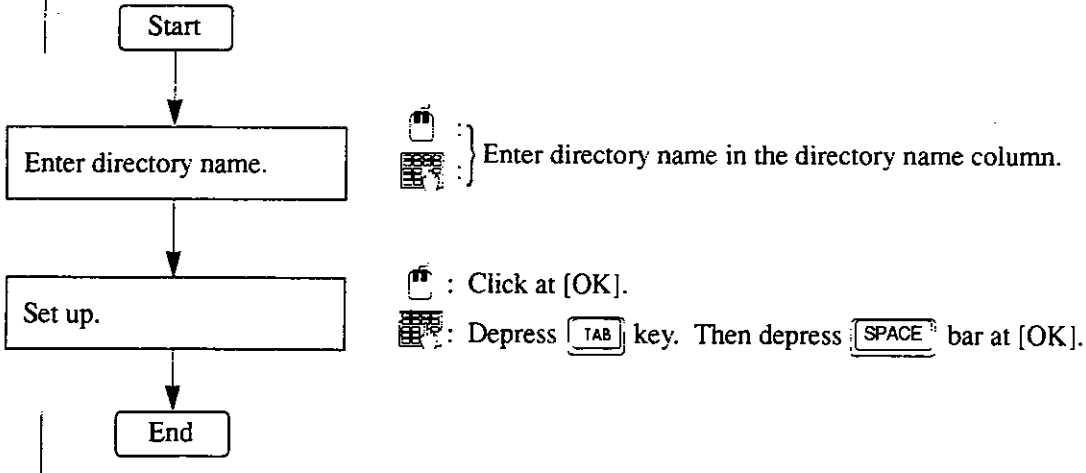
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1.2 CHANGING DIRECTORY

(1) Open window

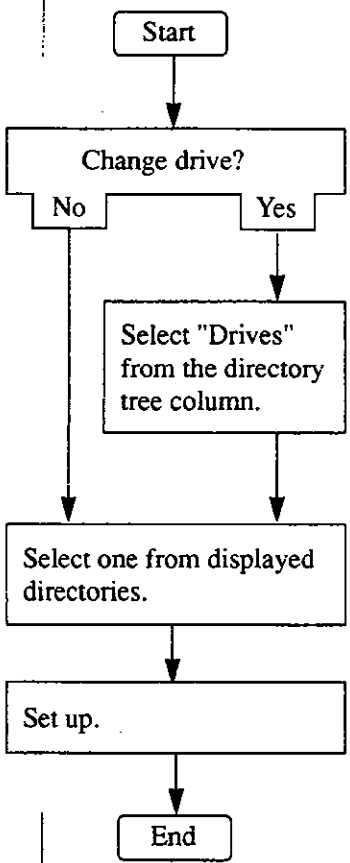


(2) Change directory (by entering directory name)



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(3) Change directory (by selecting from screen)



: Move mouse and double-click. To scroll directory tree screen, click ↑ or ↓ on right of tree display.

: Depress TAB key. Select by ↑ ↓ keys and depress SPACE bar.

: Move mouse and click.

: Select with ↑ or ↓ key and depress SPACE bar.

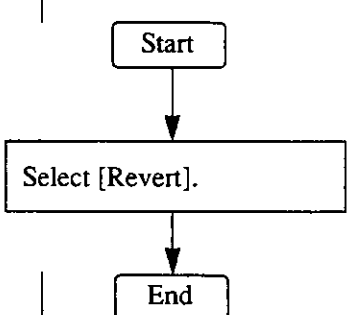
: Click at [OK].

: Depress TAB key. Then depress SPACE bar at [OK].

SUPPLEMENT

● Changed drive and directory names are displayed in the directory name column.

(4) Restore status before change

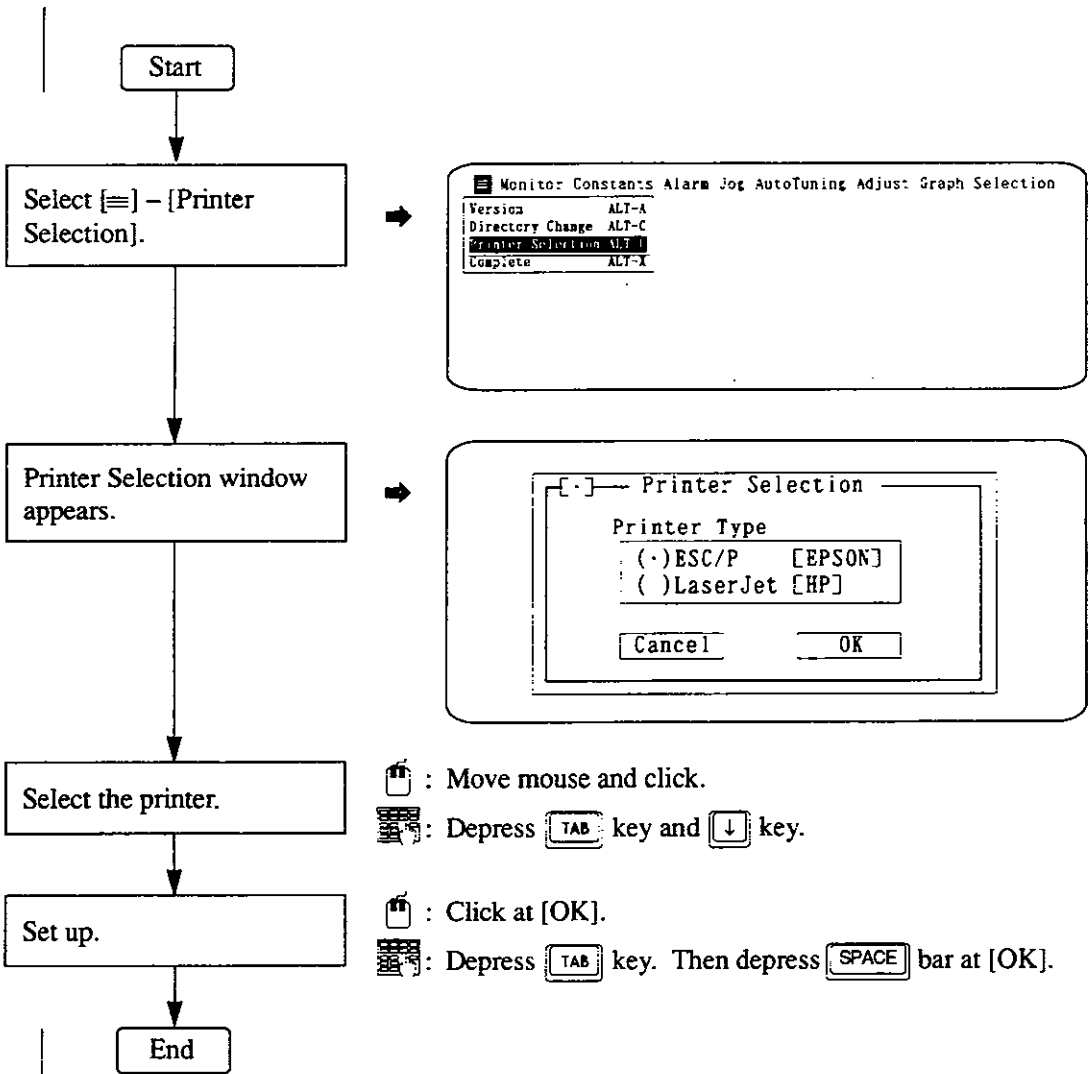


: Move mouse and click.

: Depress TAB key. Then depress SPACE bar.

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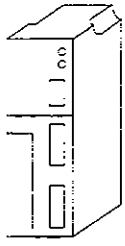
1.3 SELECTING PRINTER



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2 MONITORING FUNCTION

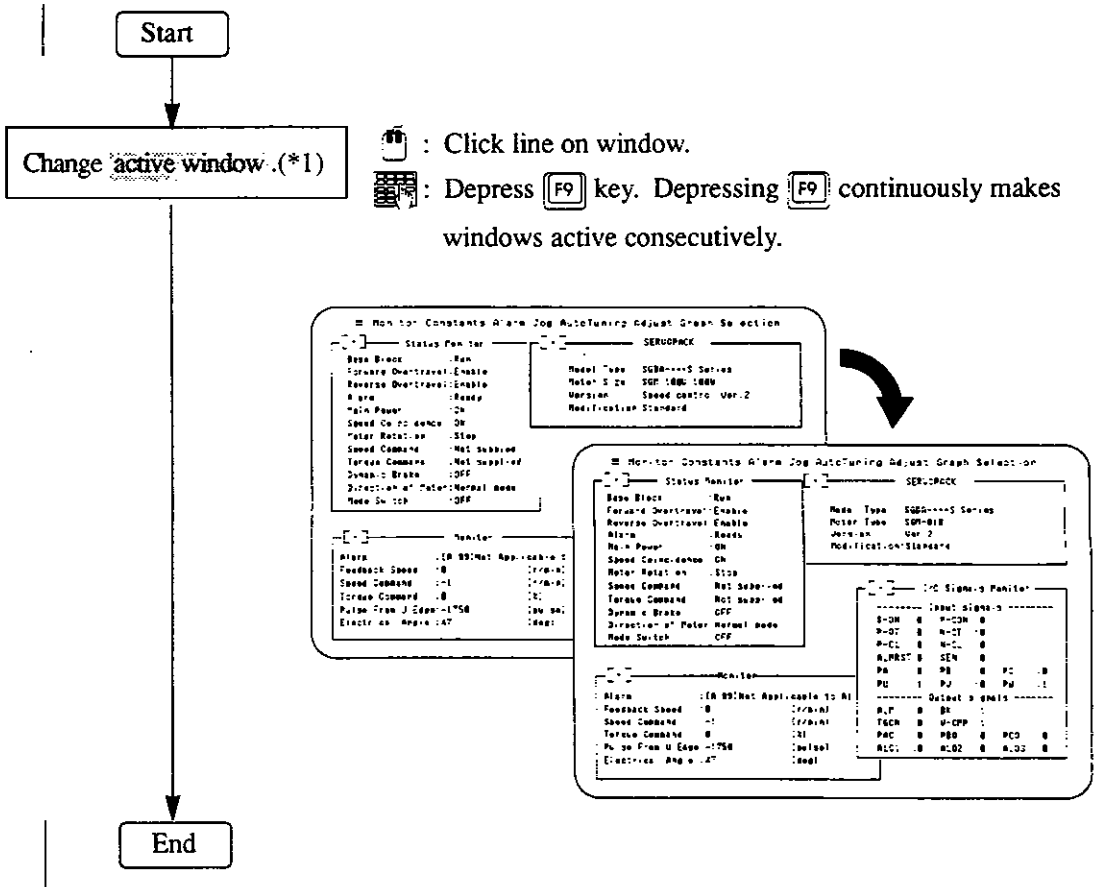
Status of SERVOPACK operation can be monitored on the screen.



- ·SGDA-□□□S series
- ·SGDA-□□□P series
- ·SGDB-□□AD series
- ·DR2-□□□□ series
- ·DR2-□□□□-F series
- ·CACR-DR□□BA series

2.1 CHANGING ACTIVE WINDOW ·· 41
2.2 CLOSING ACTIVE WINDOW ·· 42
2.3 DISPLAYING WINDOW ····· 43

2.1 CHANGING ACTIVE WINDOW



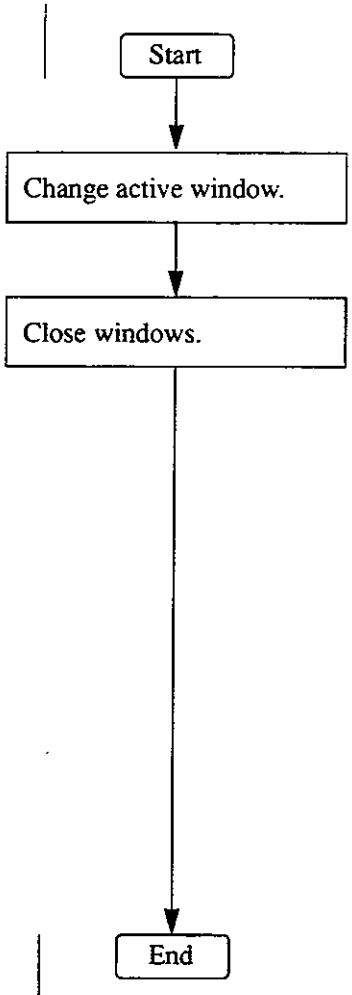
*1 Active window is boxed with a thicker line.

TERMS

● Active window : Window that is ready to operate.

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2.2 CLOSING ACTIVE WINDOW

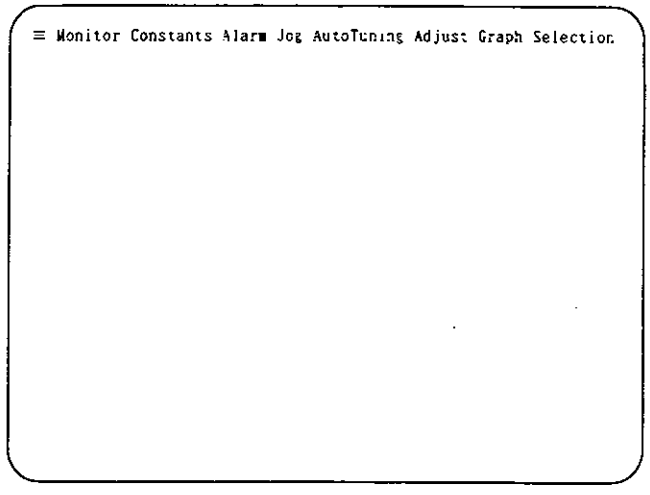


: Click line on window.

: Depress F9 key.

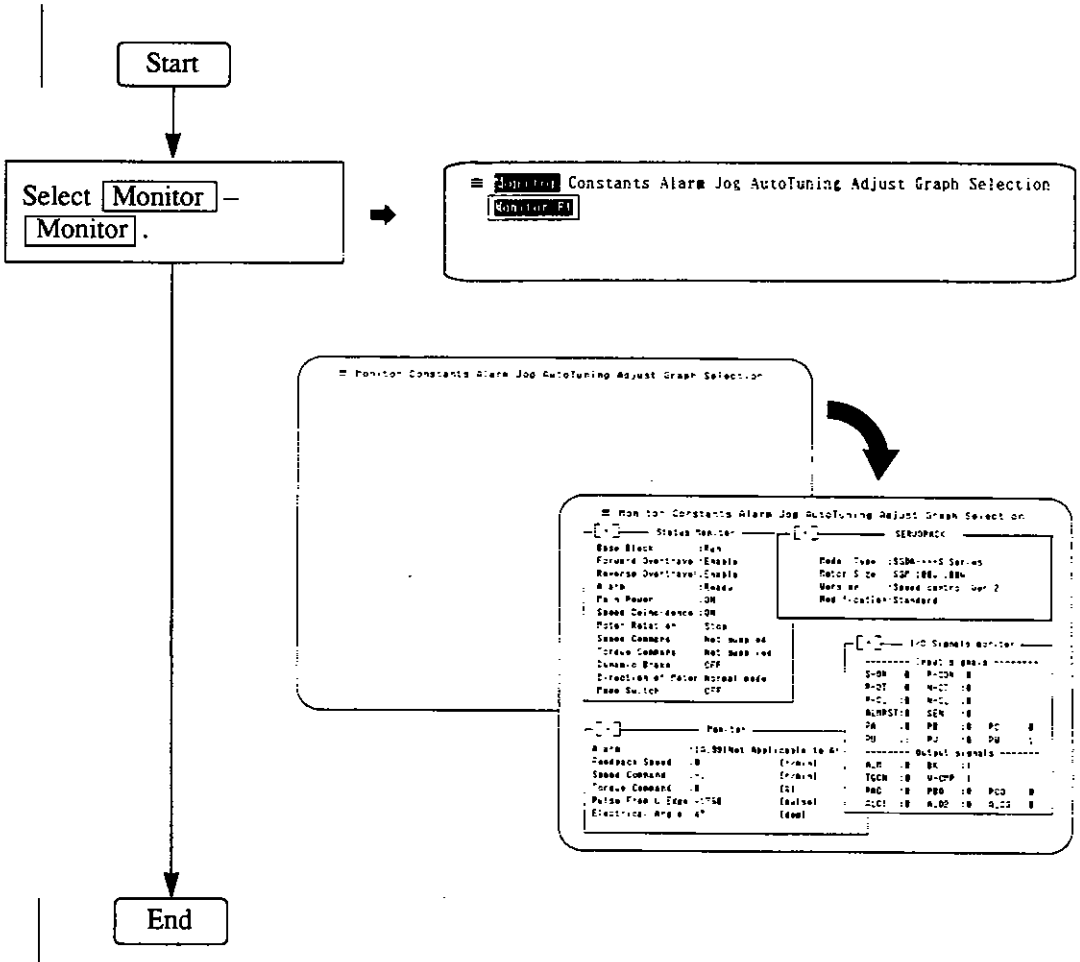
: Click [·] on upper left of window.

: Depress ESC key. Repeating the above procedures, closes windows consecutively.



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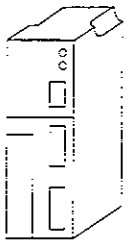
2.3 DISPLAYING WINDOW



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3 SETTING USER CONSTANT

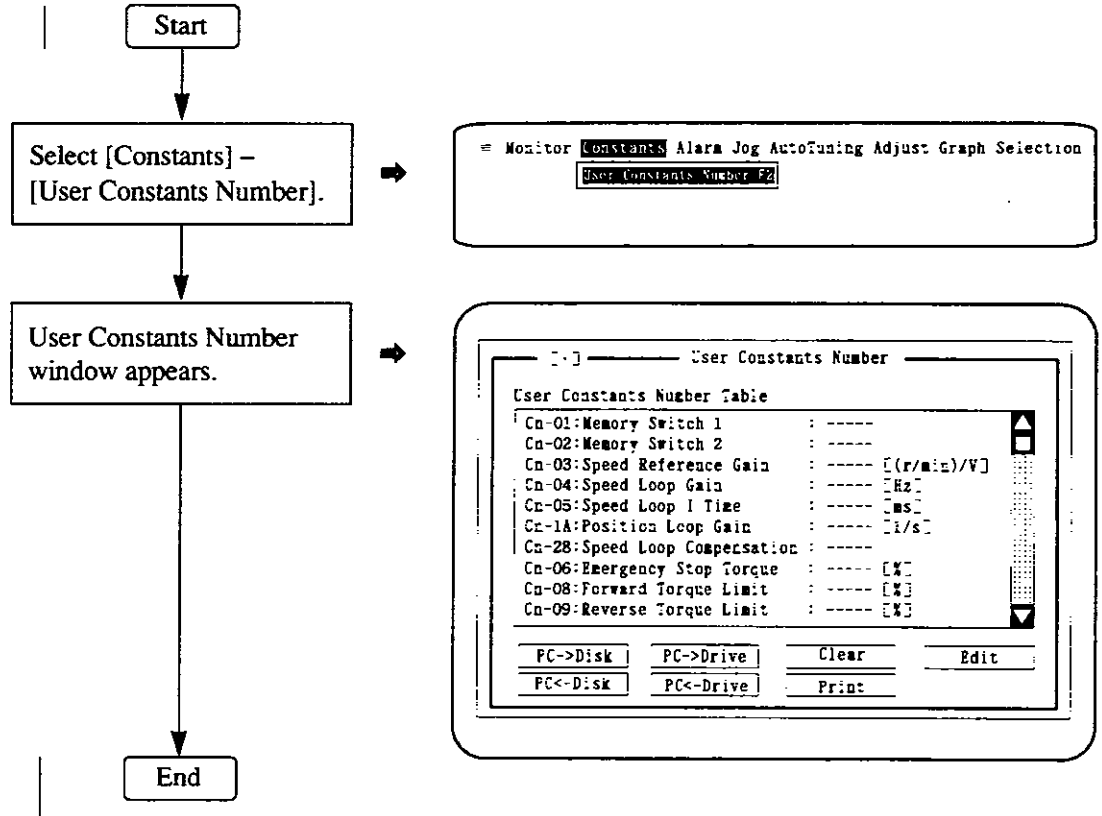
User constants can be edited and sent to a disk or the SERVOPACK.



- ·SGD-□□□S series
- ·SGD-□□□P series
- ·SGDA-□□□S series
- ·SGDA-□□□P series
- ·SGDB-□□AD series
- ·DR2-□□□□ series
- ·DR2-□□□□-F series
- ·CACR-DR□□BA series

3.1 OPENING WINDOW ····· 44
3.2 EDIT ····· 45
3.3 CLOSING WINDOW ····· 55

3.1 OPENING WINDOW



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3.2 EDIT

(1) Edit user constant (memory switch)

Start

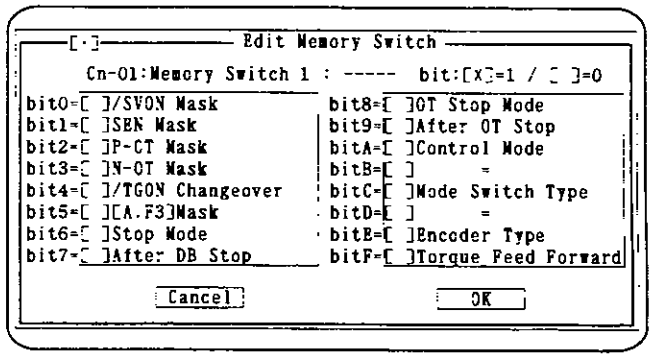
Select memory switch to be edited in User Constants Number Table.

: Move mouse and click.
: Depress TAB key. Then depress ↓ key.

Edit.

: Double-click.
: Depress SPACE bar.

Edit Memory Switch window appears.

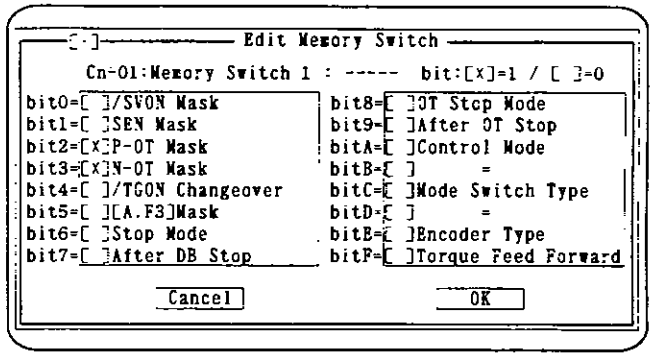


Select switch to be set 1.

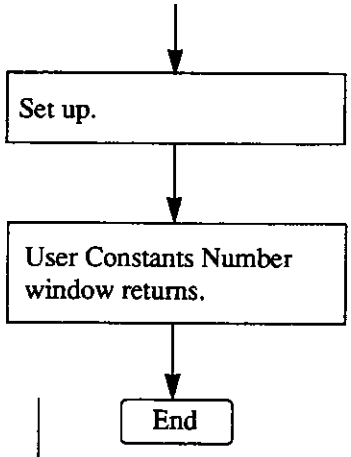
: Move mouse.
: Depress TAB key. Then depress ↓ key.

Set switch 1. (When set, × mark appears.)

: Click. Clicking twice clears mark.
: Depress SPACE bar. Depressing SPACE bar twice clears mark.



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: Click at [OK].

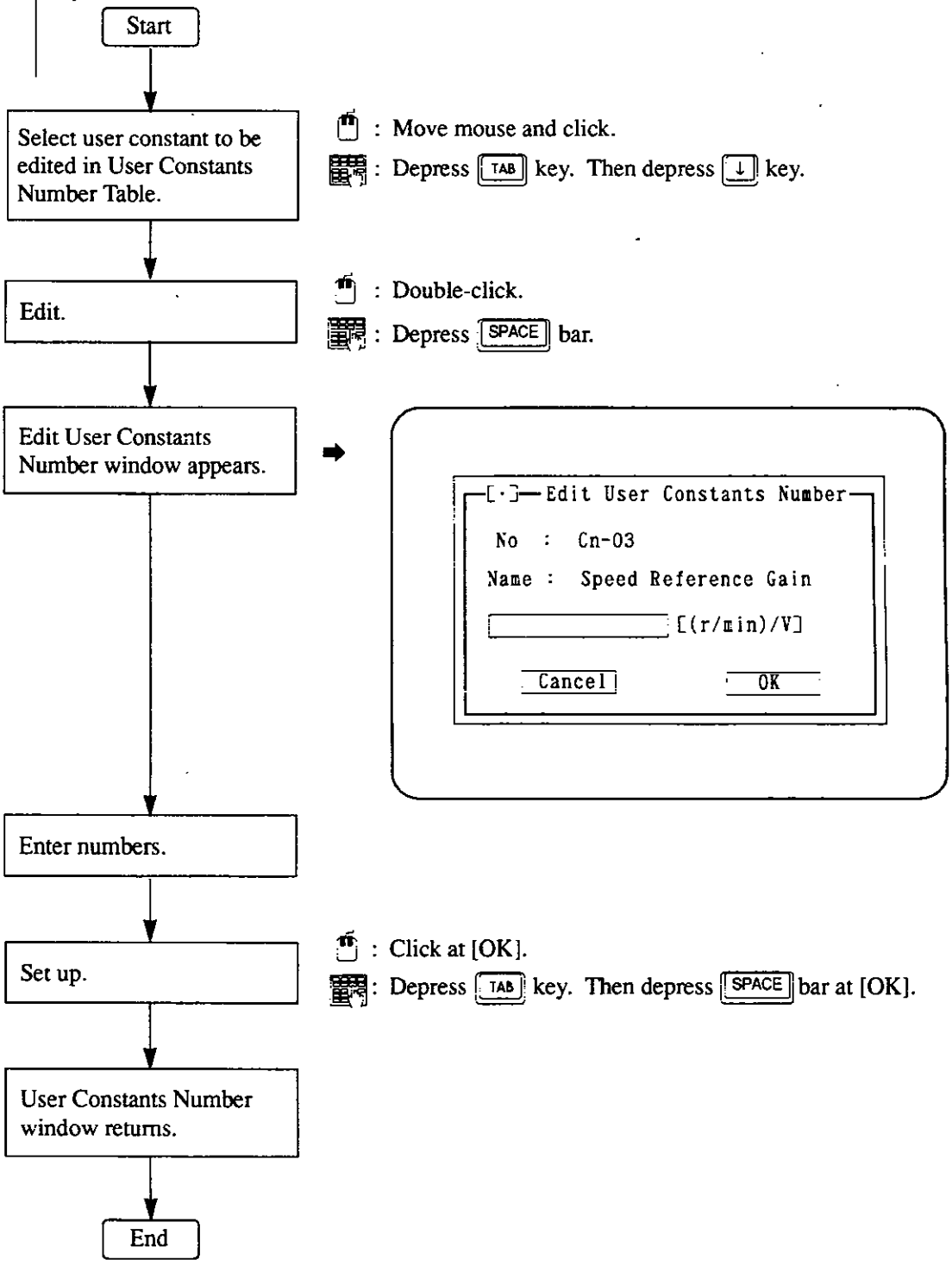
: Depress [TAB] key. Then depress [SPACE] bar at [OK].

NOTE

This user constant (memory switch) is enabled when the power supply is turned OFF and then turned ON again after editing.

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(2) Edit user constants

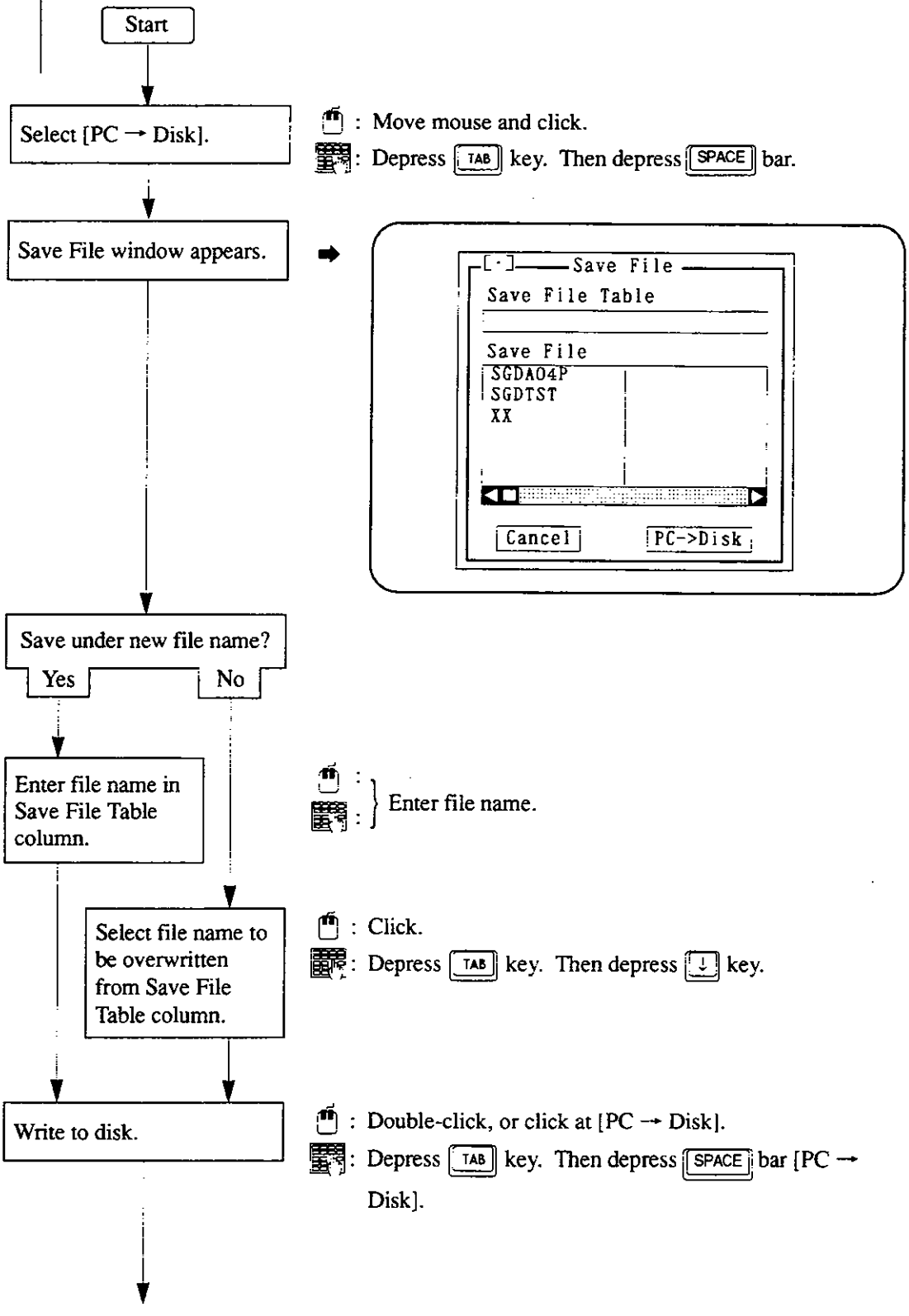


NOTE

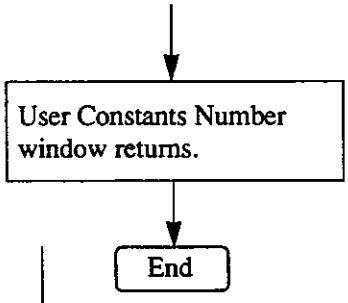
Some of user constants are not enabled unless the power supply is turned OFF and then turned ON again after editing. (Refer to each appropriate SERVOPACK manual for details.)

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(3) Save data from personal computer to disk



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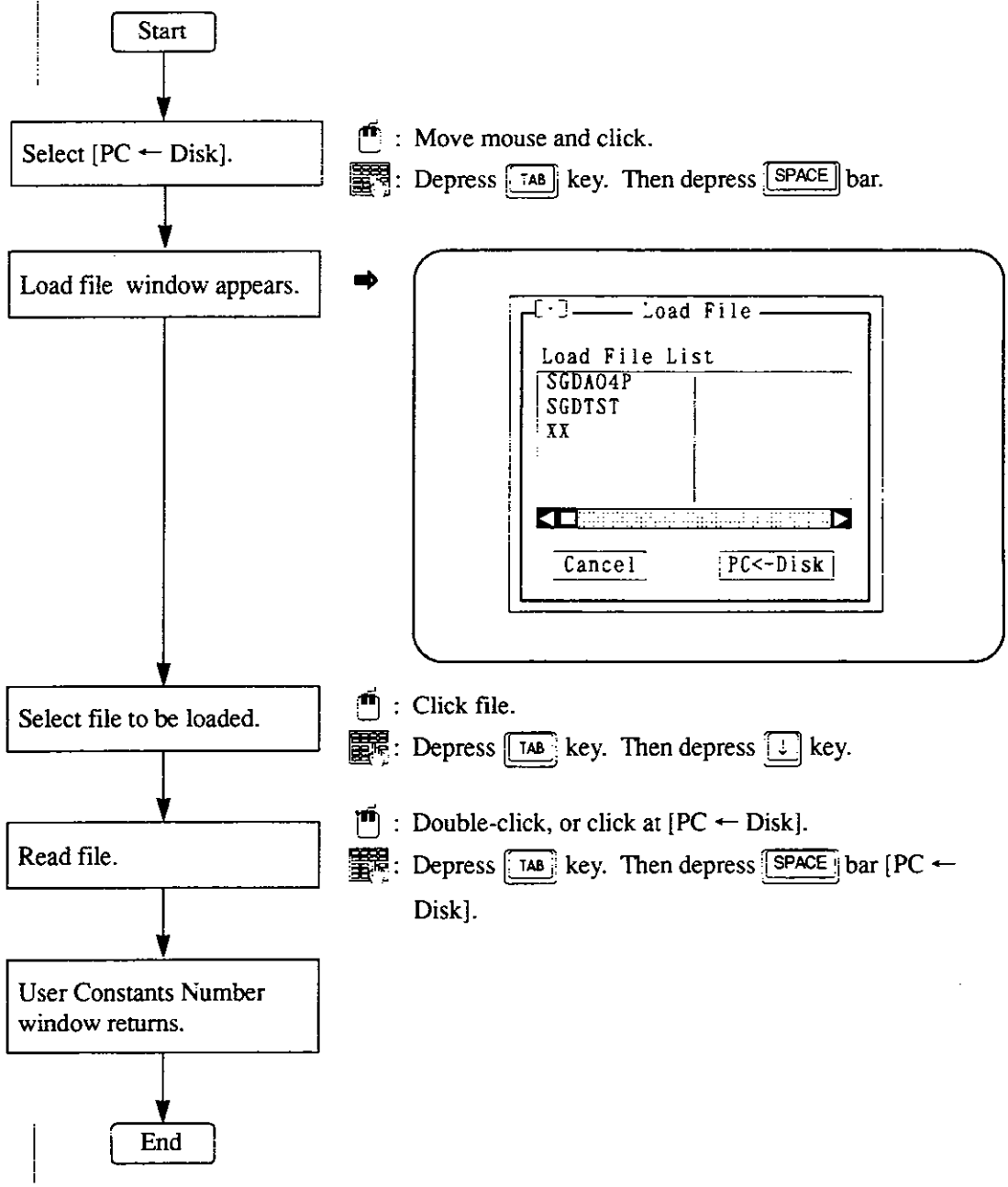


SUPPLEMENT

- To change directory and drive for saving to execute [≡] – [Directory Change]. (See Par. 4.1.2.)
- Up to 128 files with the same file extension can be saved in a single directory.
- When saving a file, do not specify the file extension as it is automatically added by the program.

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(4) Load data from disk to personal computer

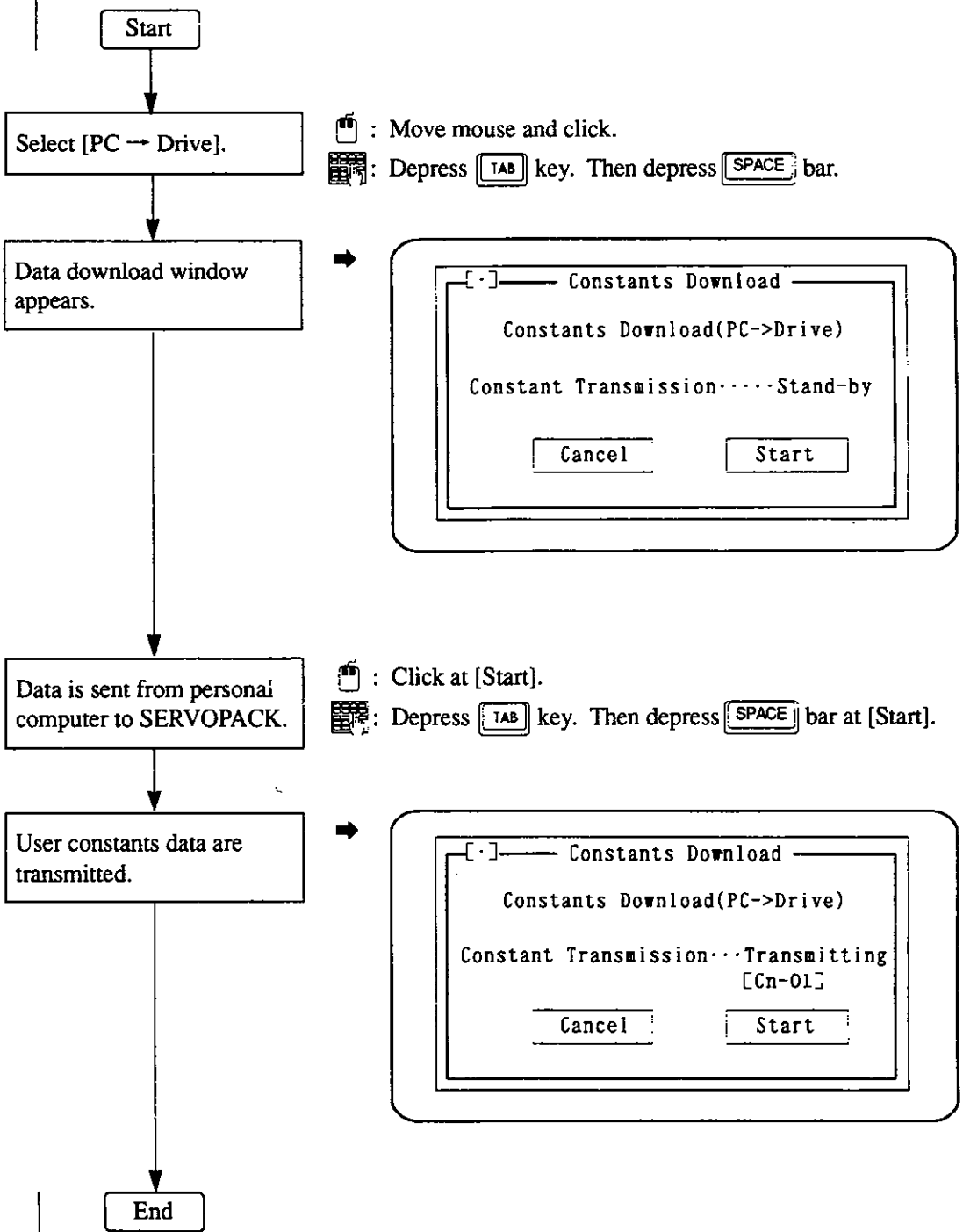


SUPPLEMENT

● To change directory and drive for loading to execute [≡] – [Directory Change]. (See Par. 4.1.2.)

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(5) Send data from personal computer to SERVOPACK

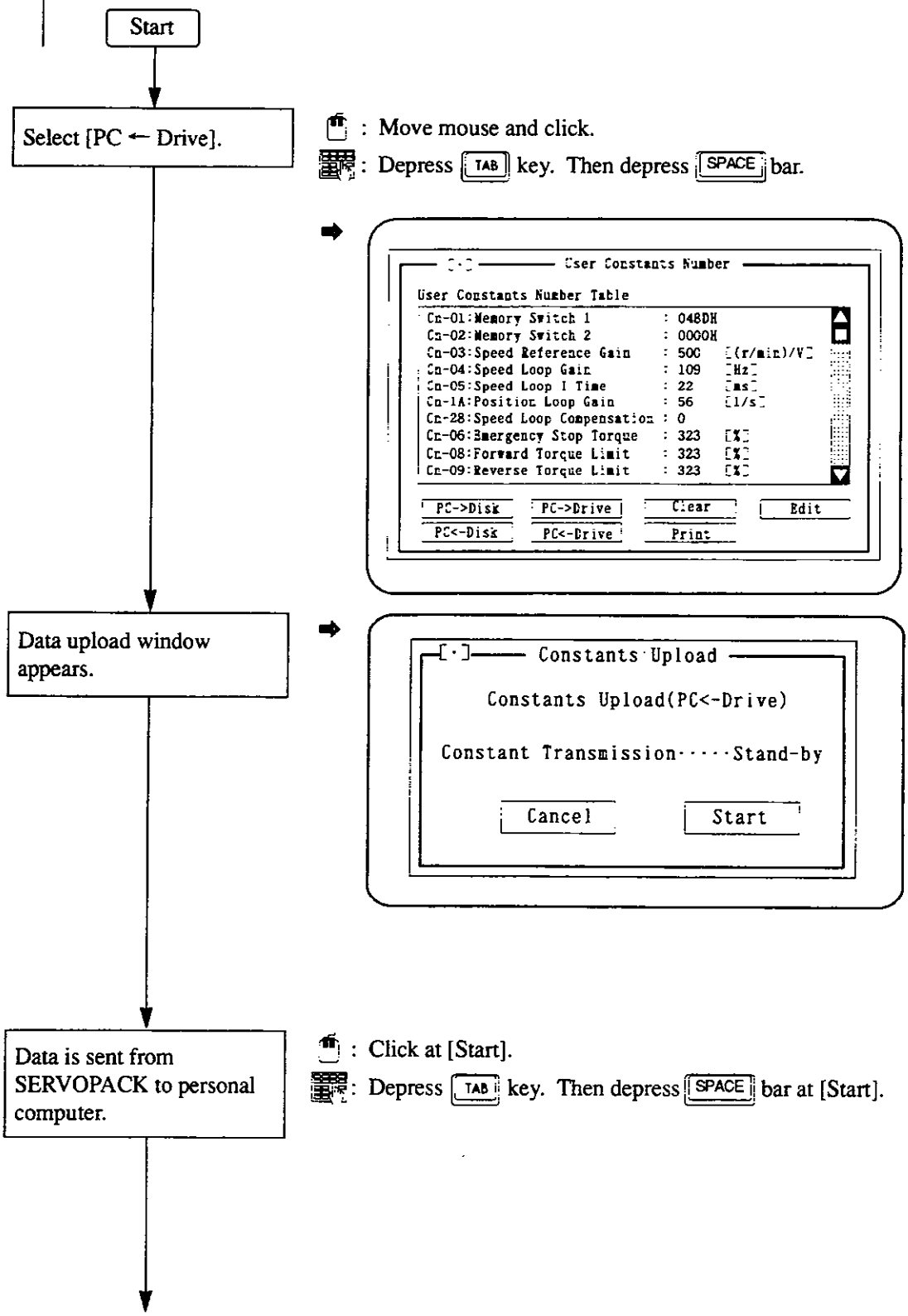


SUPPLEMENT

● Set user constants are transmitted. User constants not set up (indicated as -----) are not sent out.

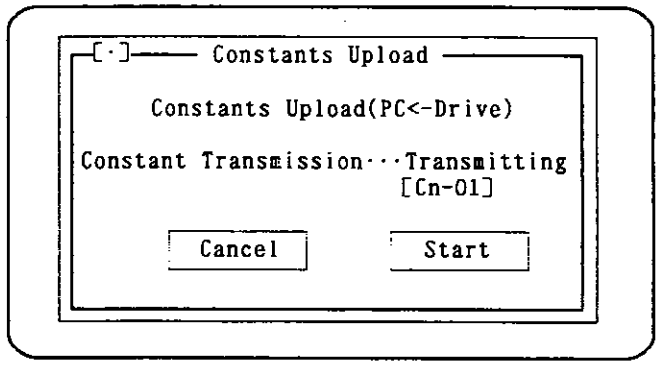
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(6) Send data from SERVOPACK to personal computer



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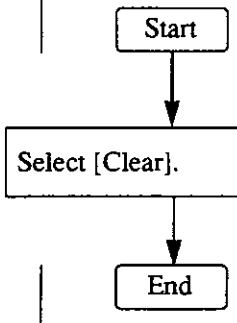
User constants data are transmitted.



End

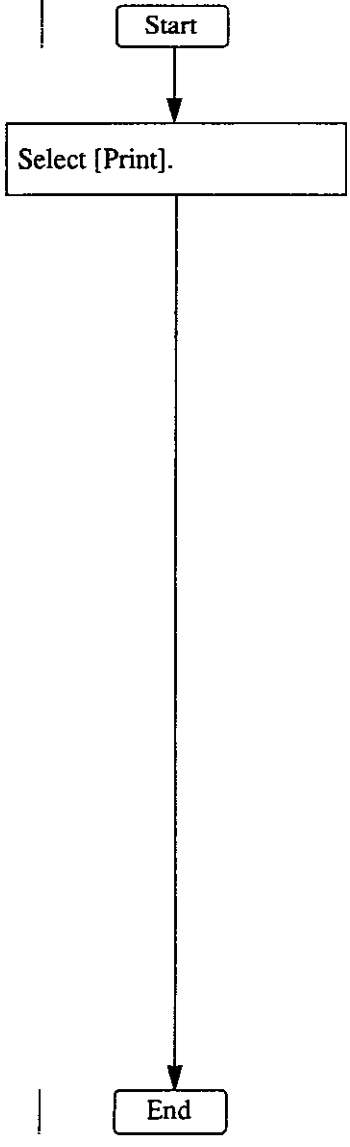
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(7) Clear displayed data



: Move mouse and click.
: Depress TAB key. Then depress SPACE bar.

(8) Print out user constant list



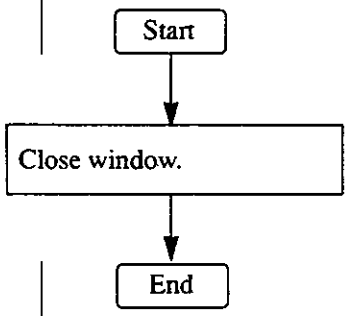
: Move mouse and click.
: Depress TAB key. Then depress SPACE bar.

```
SGDA-***S Series  User Constants Number     1994-11-25 14:42:36

Cn-01:Memory Switch 1            : 048DH
Cn-02:Memory Switch 2            : 0000H
Cn-03:Speed Reference Gain       : 500   [(r/min)/V]
Cn-04:Speed Loop Gain            : 109   [Hz]
Cn-05:Speed Loop I Time          : 22    [ms]
Cn-1A:Position Loop Gain         : 56    [1/s]
Cn-28:Speed Loop Compensation    : 0
Cn-06:Emergency Stop Torque      : 323   [%]
Cn-08:Forward Torque Limit       : 323   [%]
Cn-09:Reverse Torque Limit       : 323   [%]
Cn-13:Torque Reference Gain      : 30    [(1/10V)/Rated Torque)
Cn-14:Spd Lmt Torque Control     : 4500  [r/min]
Cn-17:Torque Filter Time         : 4     [100 μs]
Cn-18:Forward Current Limit      : 100   [%]
Cn-19:Reverse Current Limit      : 100   [%]
Cn-07:Soft Start Time (Accel)    : 0     [ms]
Cn-23:Soft Start Time (Decel)    : 0     [ms]
Cn-0B:Zero Speed Level           : 20    [r/min]
Cn-0F:Zero Clamp Level           : 10    [r/min]
Cn-22:V-CMP Output width         : 10    [r/min]
Cn-12:Delay Time (Brake->SVOff)  : 0     [10ms]
Cn-15:Brake Timing (Speed)       : 100   [r/min]
Cn-16:Brake Timing (Wait Time)   : 50    [10ms]
Cn-0A:PG Dividing Ratio          : 2048  [P/R]
Cn-11:Number of Encoder Pulse    : 2048  [P/R]
Cn-0C:Mode SW (Torque)           : 200   [%]
Cn-0D:Mode SW (Speed)            : 0     [r/min]
Cn-0E:Mode SW (Acceleration)     : 0     [10(r/min)/s]
Cn-10:JOG Speed                  : 500   [r/min]
Cn-1F:1st Speed                  : 100   [r/min]
Cn-20:2nd Speed                  : 200   [r/min]
Cn-21:3rd Speed                  : 300   [r/min]
Cn-29:Axis Number                : 0
```


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3.3 CLOSING WINDOW



: Click [·] upper left of window.

: Depress [ESC] key.

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4 MONITORING ALARMS

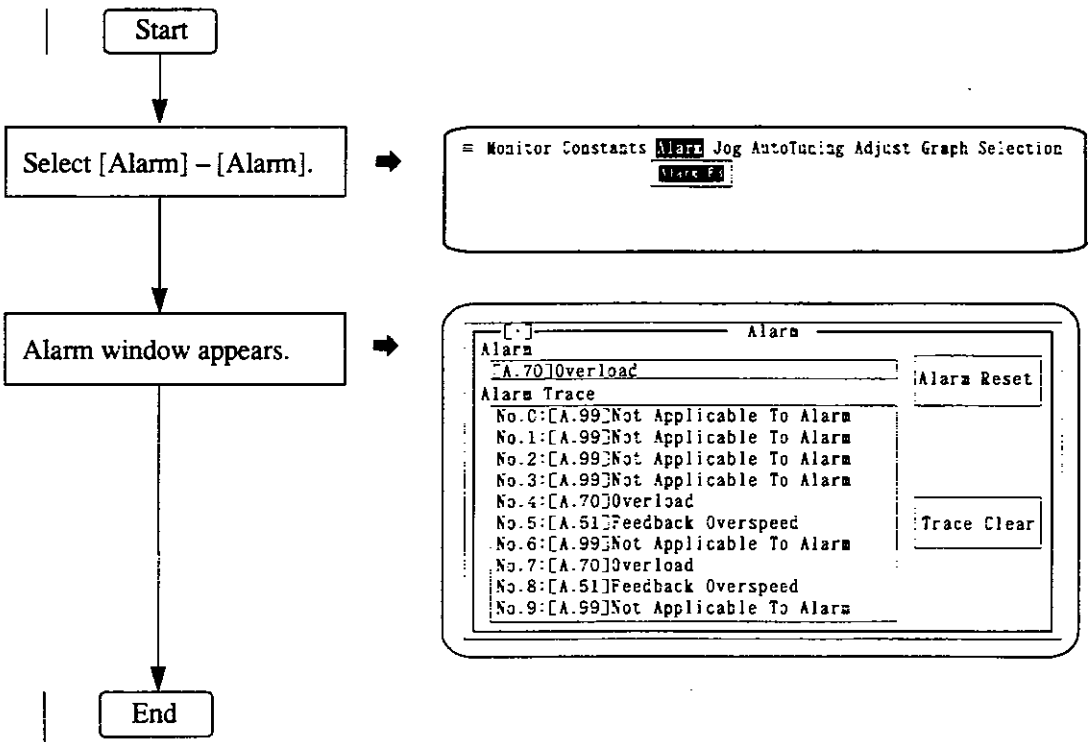
Information of historical and current alarms can be monitored.



- SGDA-□□□S series
- SGDA-□□□P series
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series

4.1 OPENING WINDOW ····· 56
4.2 CHECKING ALARM INFORMATION ····· 57
4.3 CLOSING WINDOW ····· 59

4.1 OPENING WINDOW



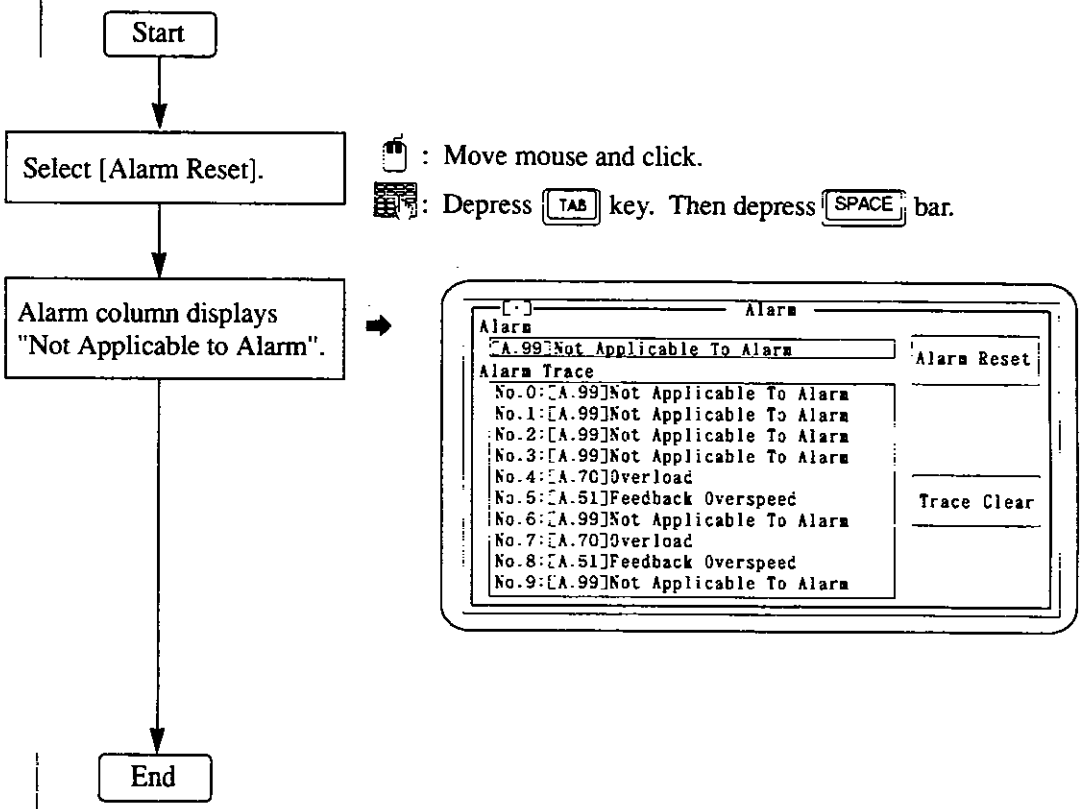
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4.2 CHECKING ALARM INFORMATION

(1) Alarm and alarm trace

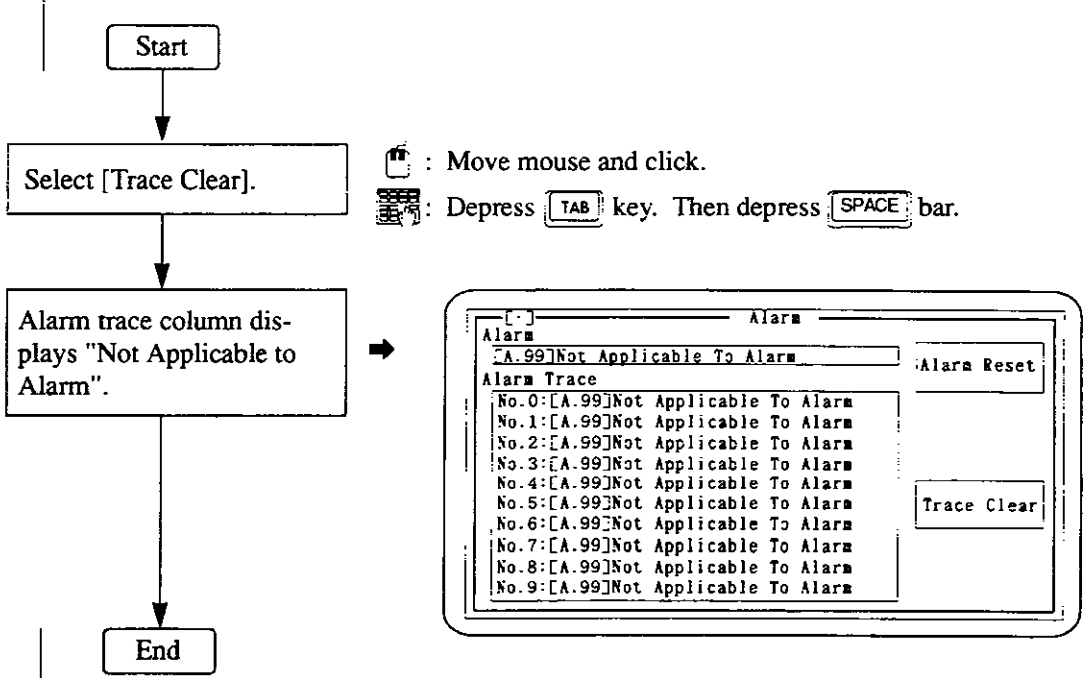
Alarm	Displays information of current alarms.
Alarm Trace	Displays information of the last ten alarms.

(2) Reset alarms



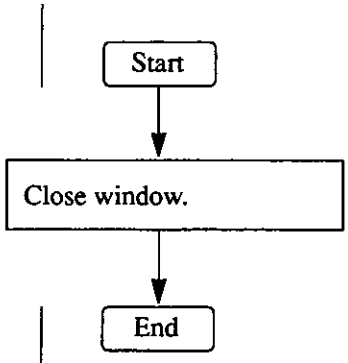
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(3) Clear trace data



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4.3 CLOSING WINDOW

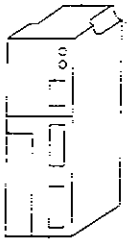


: Click [·] upper left of window.
: Depress [ESC] key.

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5 JOG OPERATION

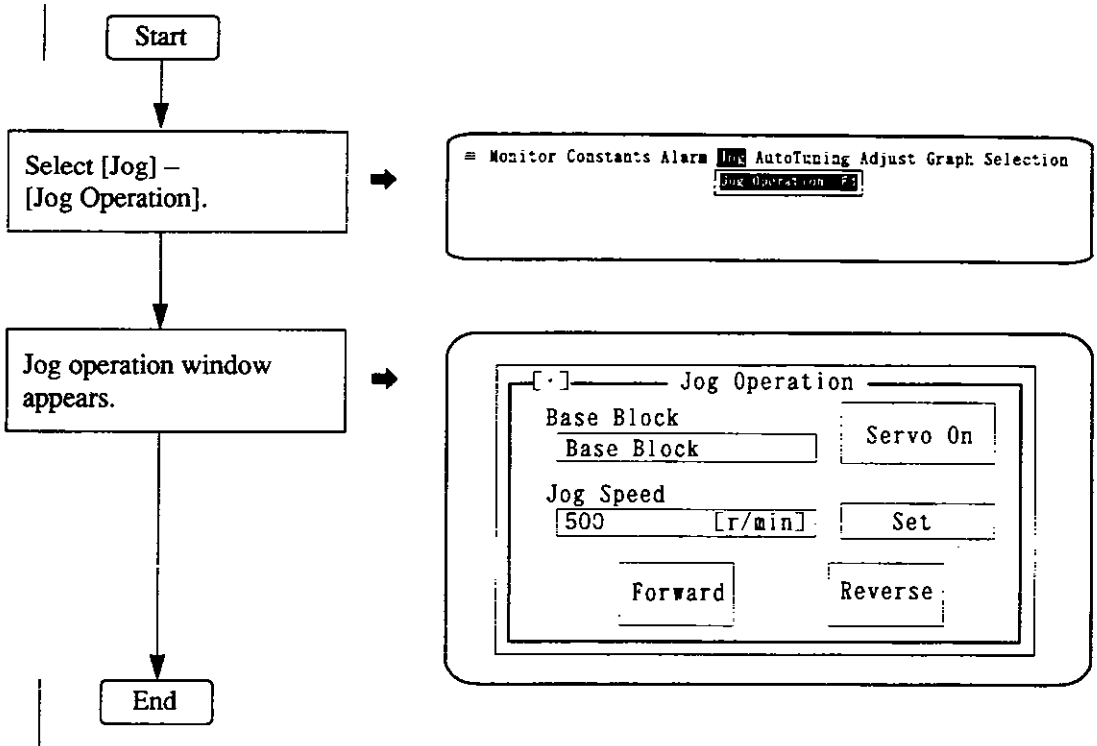
Motor rotation can be controlled by set-up jog speeds.



- SGDA-□□□S series
- SGDA-□□□P series
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series

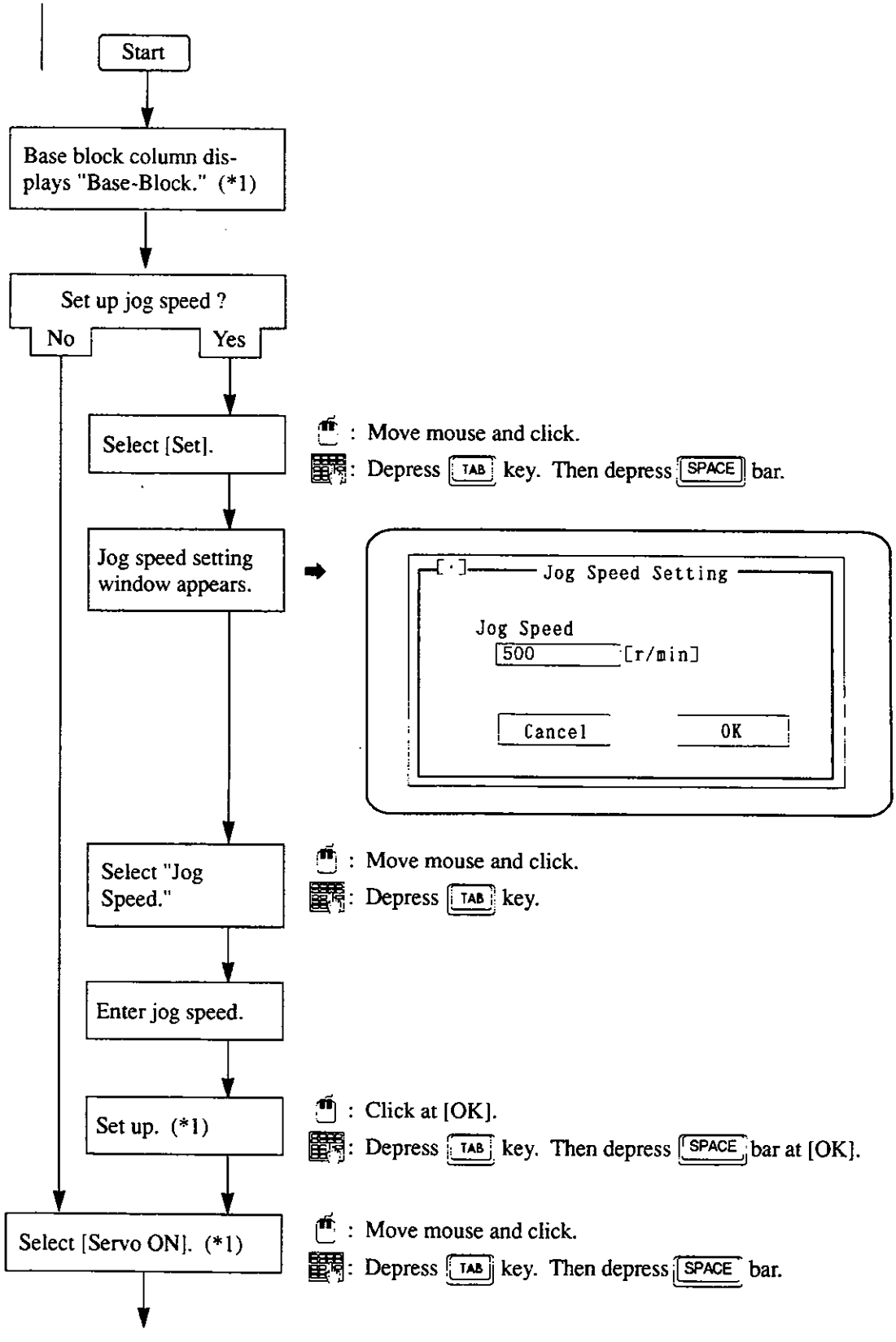
5.1 OPENING WINDOW ····· 60
5.2 PERFORMING JOG OPERATION ····· 61
5.3 CLOSING WINDOW ····· 63

5.1 OPENING WINDOW

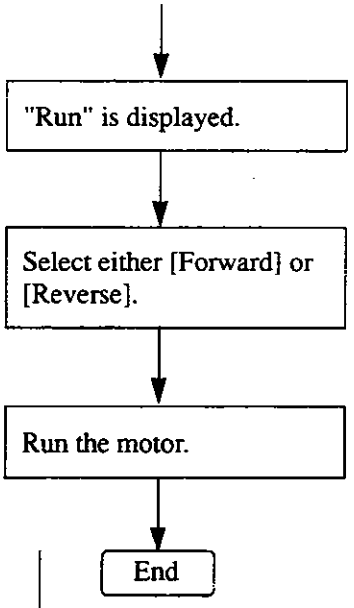


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5.2 PERFORMING JOG OPERATION



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: Move mouse
: Depress TAB key.

: While depressing mouse button, motor continues rotating. Releasing button stops motor.
: While depressing SPACE bar, motor continues rotating. Releasing SPACE bar stops motor.

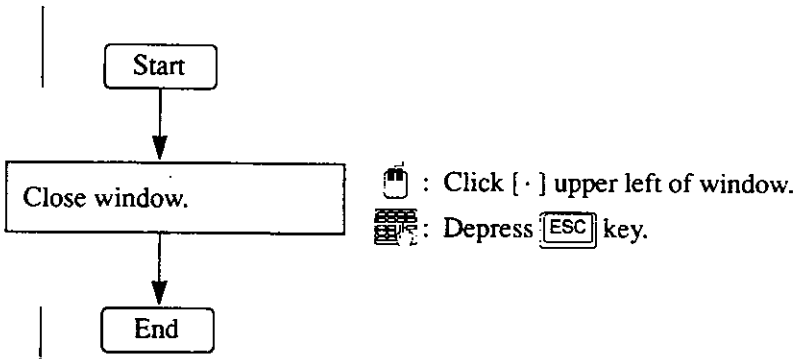
*1 When S-ON mask switch (user constant Cn-01) is set to 1, and servo ON is commanded externally, "Operating" continues to be displayed and the [Servo OFF] switch is disabled. (See the table below.)

	Cn-01 S-ON Mask ON?	Servo-ON Externally?		Servo ON-OFF Switch
①	×	×	→	Enabled
②	×	○	→	Disabled
③	○	×	→	Enabled
④	○	○	→	Disabled

- Under condition ①, by setting up jog speed while the base block column displays "Operating", it will enter the base block status.
- Under condition ③, by setting up jog speed while the base block column displays "Base Block", it will enter the operating status.

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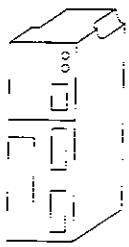
5.3 CLOSING WINDOW



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6 AUTO TUNING

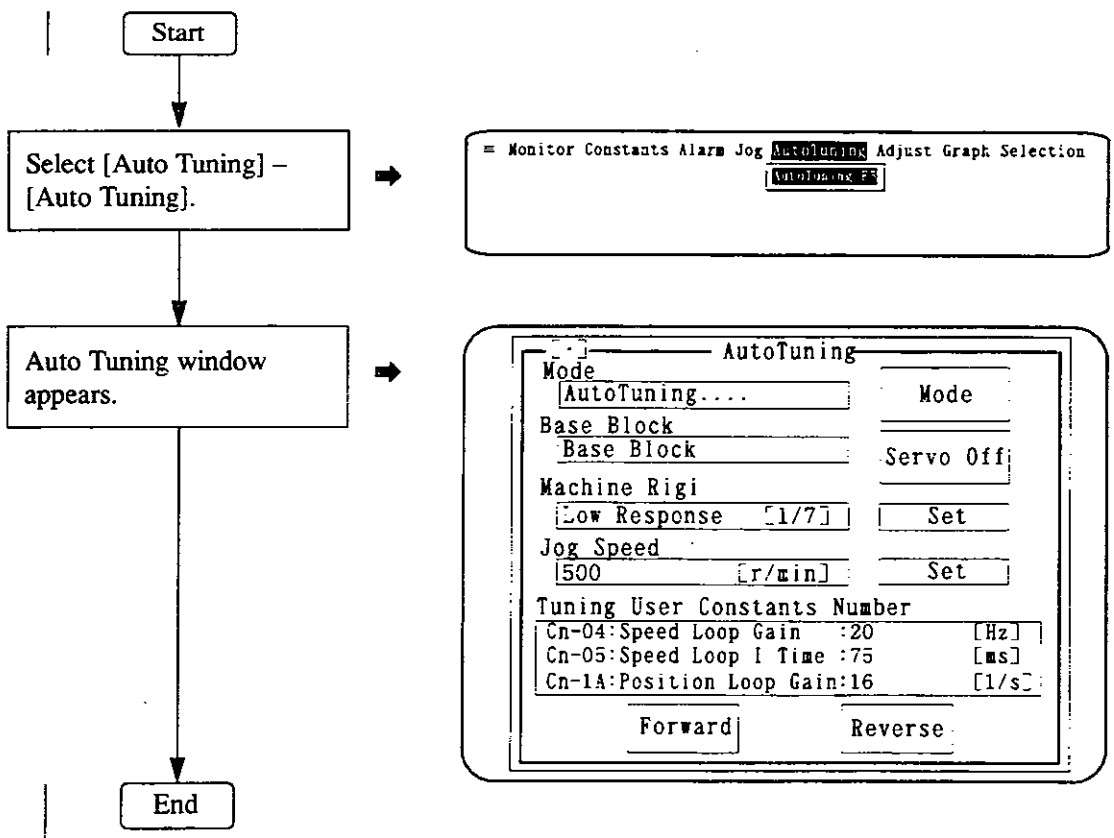
This function automatically adjusts servo system gain to correspond with the set machine rigidity.



- SGDA-□□□S series
- SGDA-□□□P series
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series

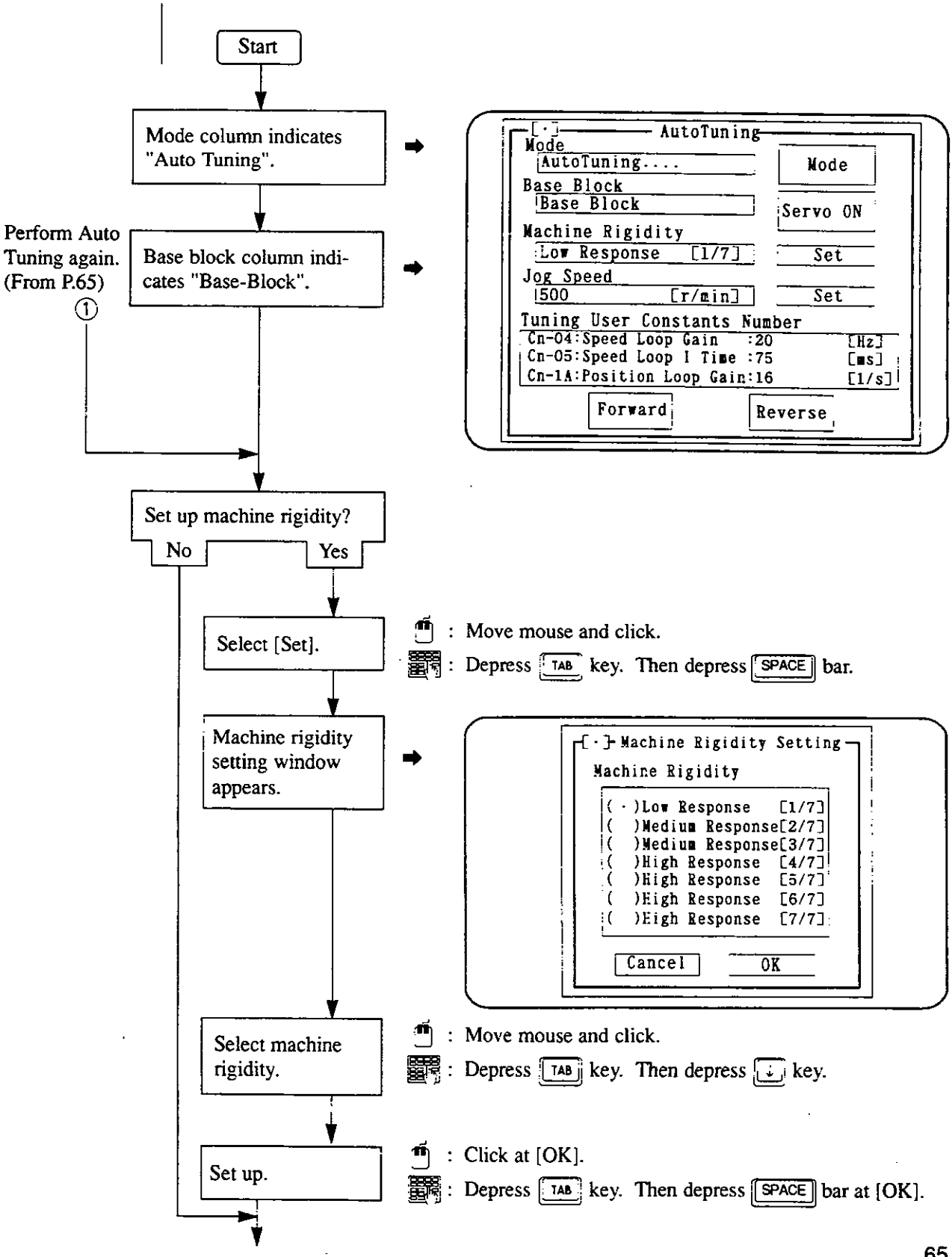
6.1 OPENING WINDOW ····· 64
6.2 PERFORMING AUTO TUNING ····· 65
6.3 CLOSING WINDOW ····· 69

6.1 OPENING WINDOW

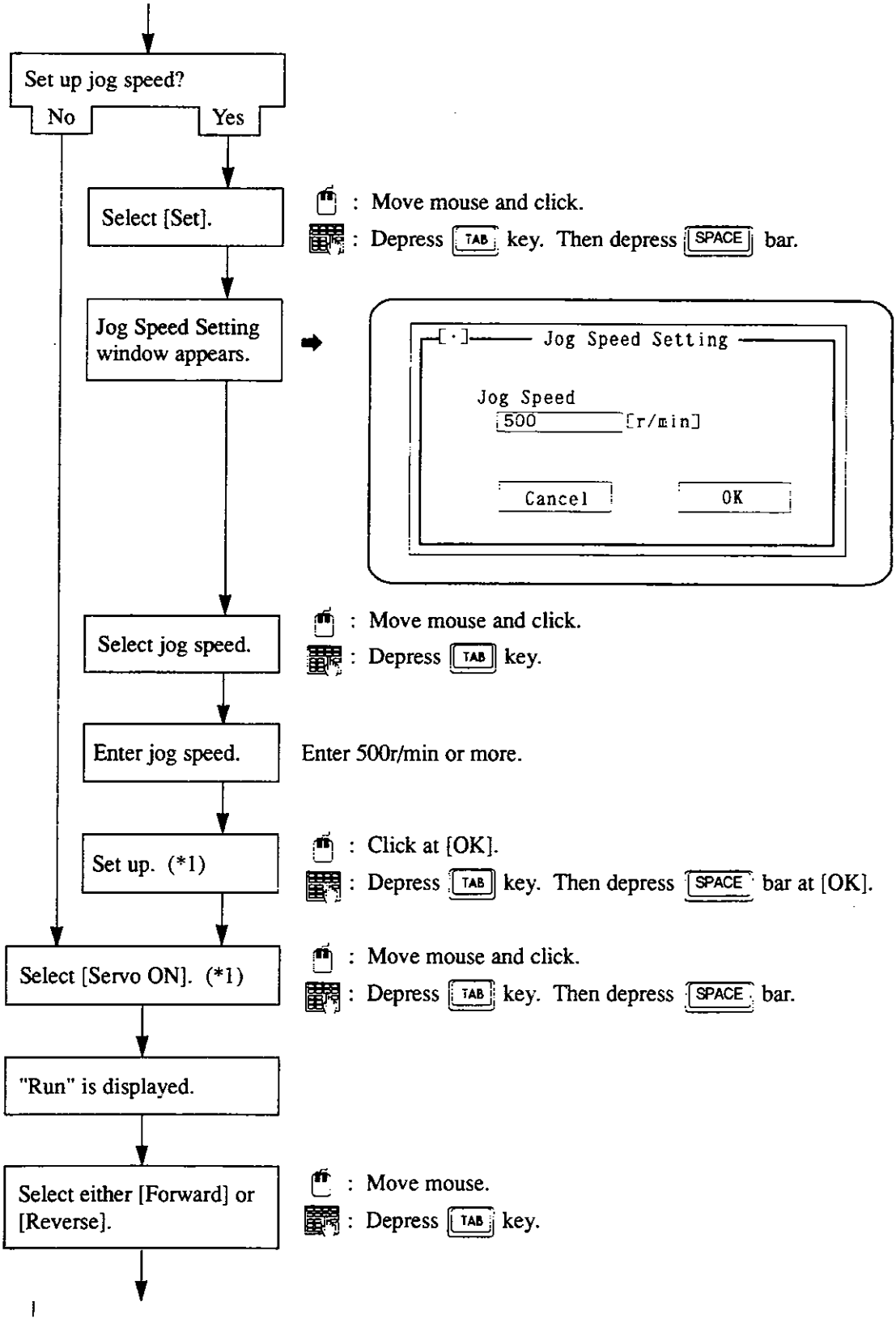


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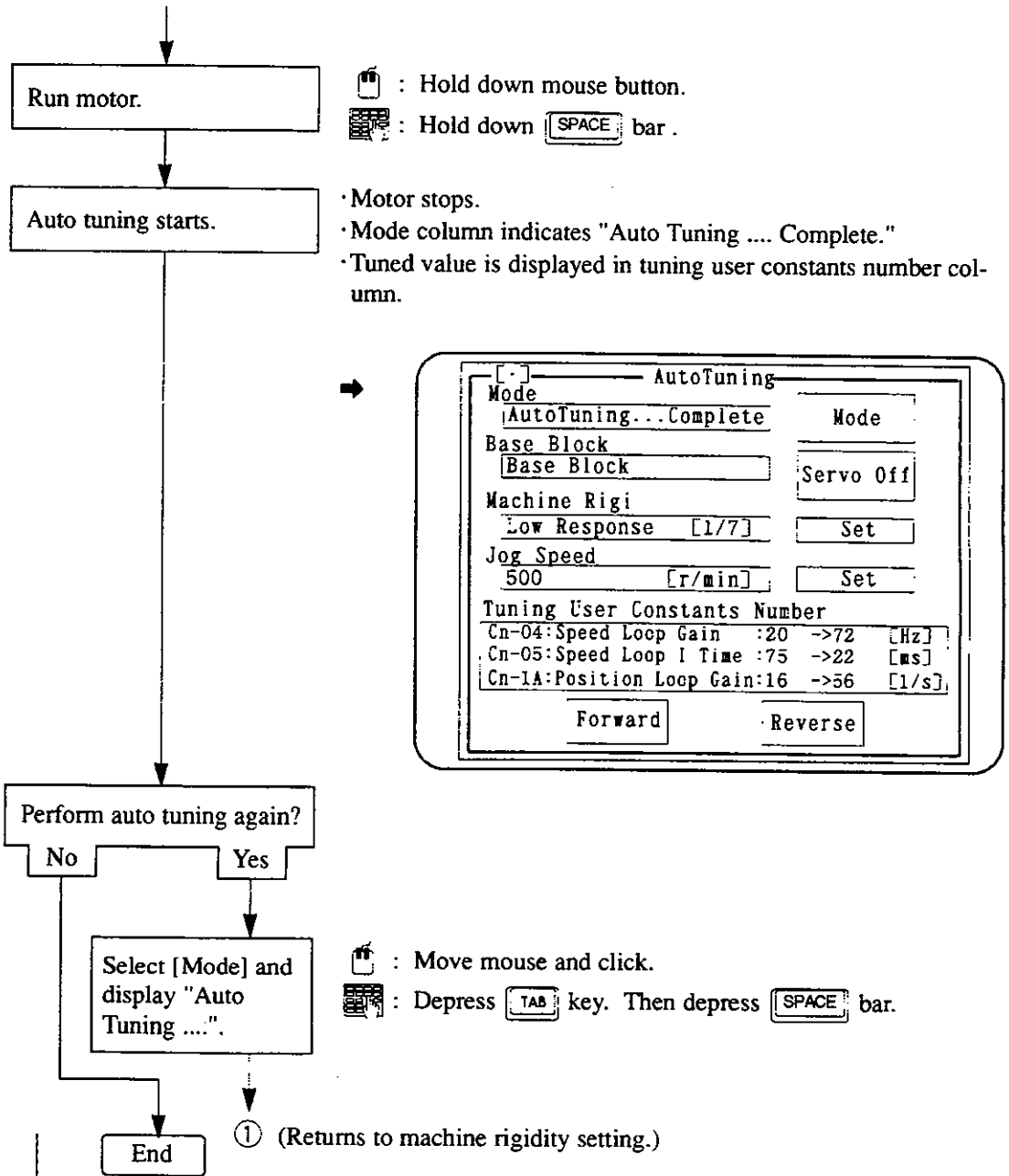
6.2 PERFORMING AUTO TUNING



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*1 When S-ON mask switch (user constant Cn-01) is set to 1, and servo-ON is commanded externally, "Operating" continues to be displayed and the [Servo OFF] switch is disabled. (See table below.)

	Cn-01 S-ON Mask ON	Servo-ON Externally?		Mode	Servo ON-OFF Switch
①	×	×	→	Auto Tuning	Enabled
				Auto Tuning .... Complete	Disabled
				Auto Tuning .... Cancel	
②	×	○	→	Auto Tuning	Disabled
				Auto Tuning .... Complete	
				Auto Tuning .... Cancel	
③	○	×	→	Auto Tuning	Enabled
				Auto Tuning .... Complete	Disabled
				Auto Tuning .... Cancel	
④	○	○	→	Auto Tuning	Disabled
				Auto Tuning .... Complete	
				Auto Tuning .... Cancel	

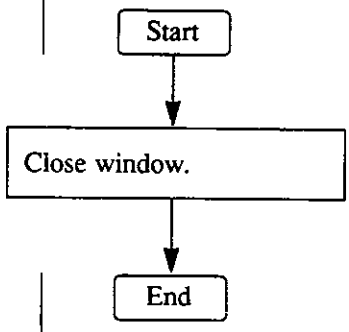
- Under condition ①, by setting up jog speed while the base block column displays "Operating", it will enter base block status.
- Under condition ③, by setting up jog speed while the base block column displays "Base-Block", it will enter operating status.

SUPPLEMENT

● When mode is changed during auto tuning, "Auto Tuning... Cancel" is displayed and auto tuning is canceled.

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6.3 CLOSING WINDOW



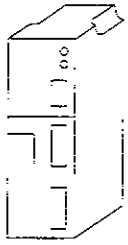
: Click [•] upper left of window.

: Depress [ESC] key.

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7 ADJUSTMENT

Speed reference can be adjusted automatically or manually and a 12-bit absolute encoder alarm can be reset.



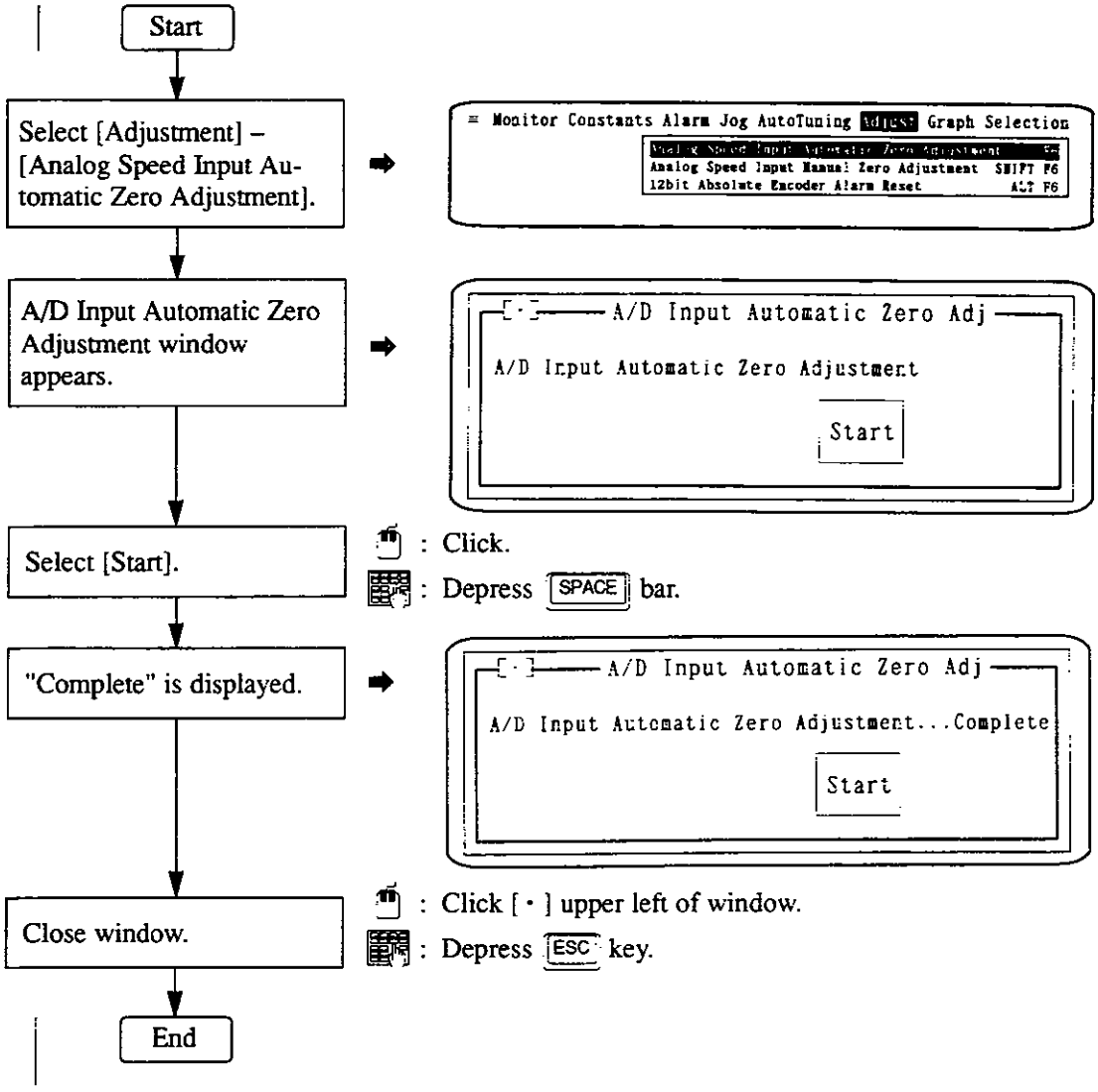
- SGDA-□□□S series
- SGDA-□□□P series (12-bit absolute encoder alarm reset only)
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series (12-bit absolute encoder alarm reset only)

7.1 AUTOMATICALLY ADJUSTING SPEED REFERENCE OFFSET ·· 70

7.2 MANUALLY ADJUSTING SPEED REFERENCE OFFSET ·· 71

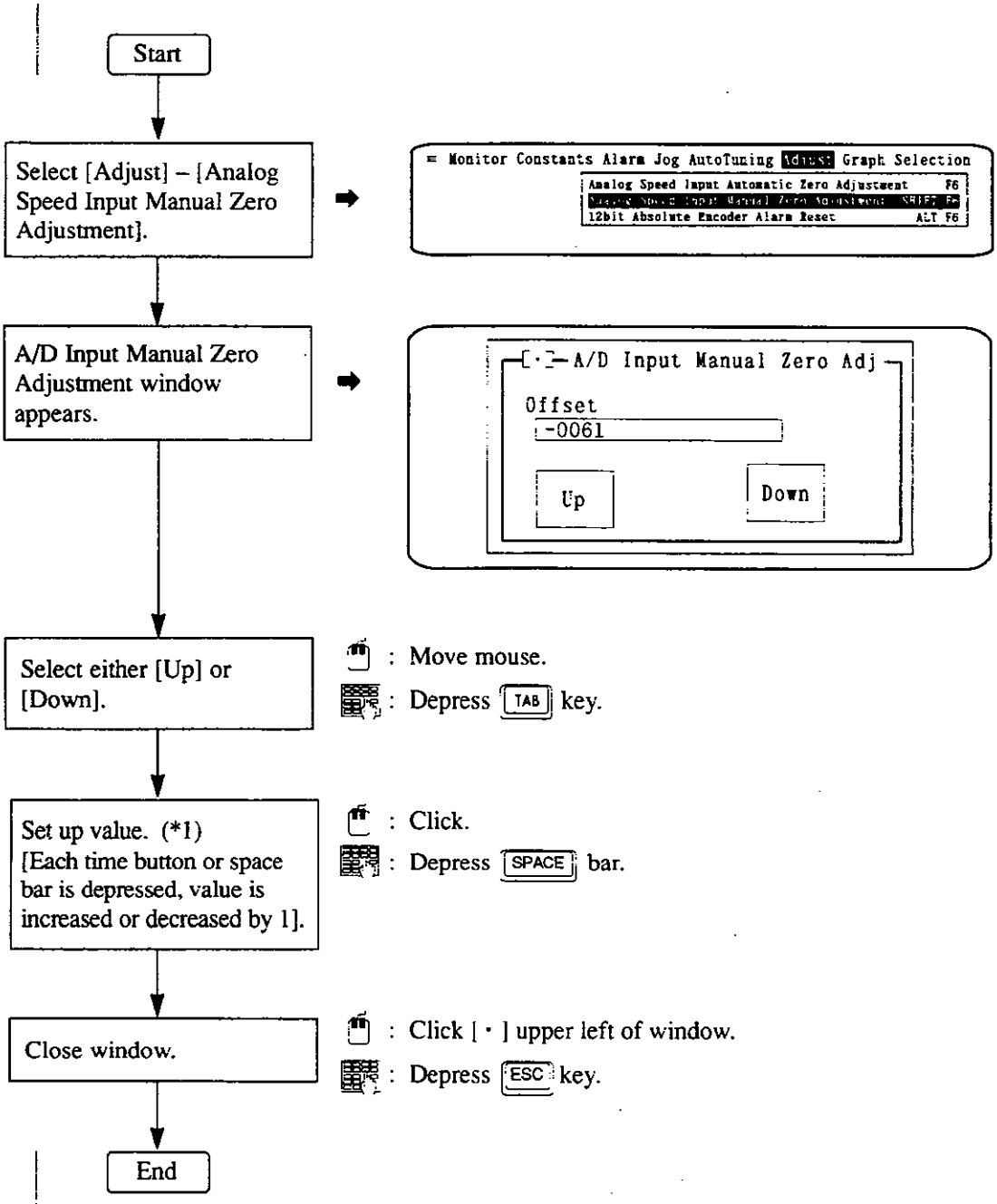
7.3 12-BIT ABSOLUTE ENCODER ALARM RESET ····· 72

7.1 AUTOMATICALLY ADJUSTING SPEED REFERENCE OFFSET



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7.2 MANUALLY ADJUSTING SPEED REFERENCE OFFSET



*1 While observing the motor or the machine, adjust so as to eliminate drift movement.

TERMS

● Drift : Gradual rotation of the motor from set position.

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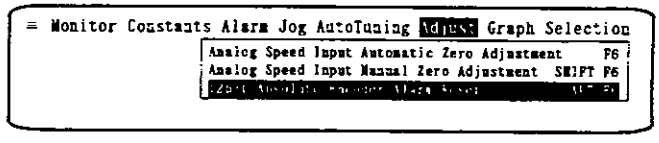
7.3 12-BIT ABSOLUTE ENCODER ALARM RESET

SUPPLEMENT

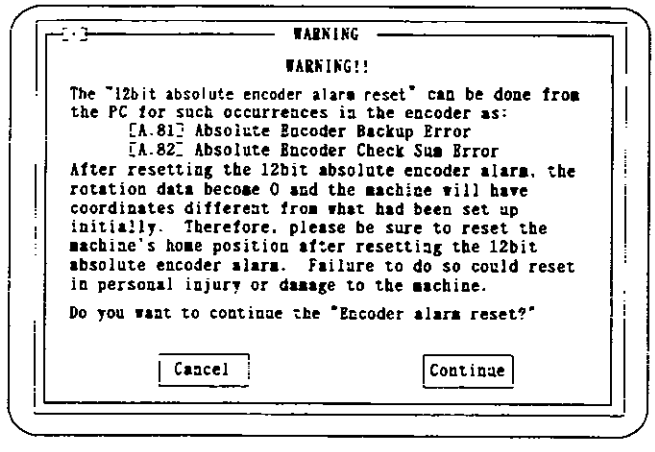
● This function is available only when a 12-bit absolute encoder is used.

Start

Select [Adjust] – [12-bit Absolute Encoder Alarm Reset].



Warning window appears.



Continue 12-bit absolute encoder alarm reset ?

No

Select [Cancel].

: Click at [Cancel].

: Depress [TAB] key. Then depress [SPACE] bar at [Cancel].

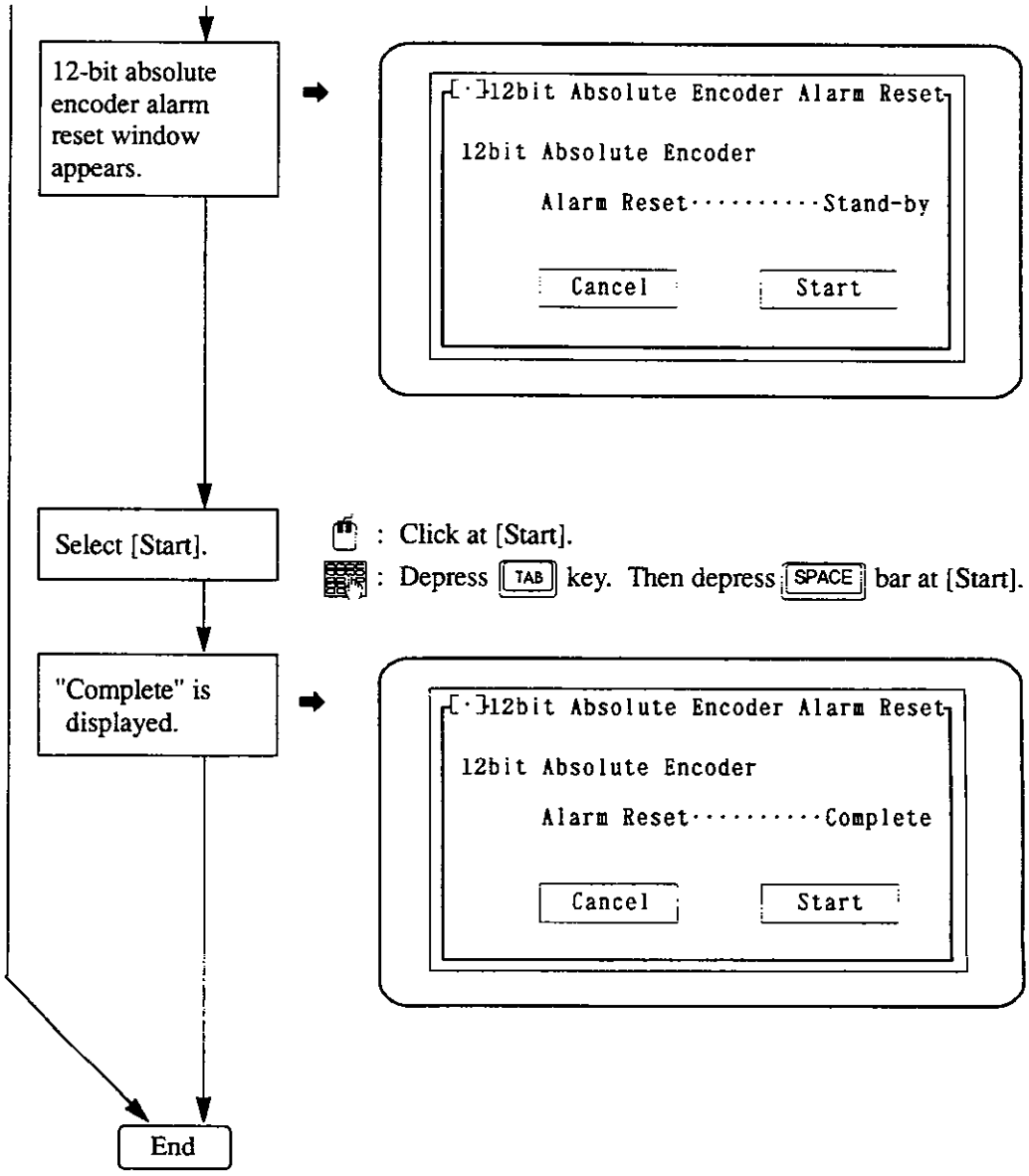
Yes

Select [Continue].

: Click at [Continue].

: Depress [TAB] key. Then depress [SPACE] bar at [Continue].

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⚠ WARNING

The "12-bit absolute encoder alarm reset" can be executed from the PC for such occurrences in the encoder as :

[A.81] Absolute Encoder Backup Error

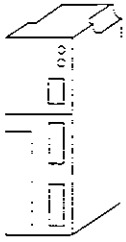
[A.82] Absolute Encoder Check Sum Error

After resetting the 12-bit absolute encoder alarm, the rotation data become 0 and the machine will have coordinates different from what had been set up initially. Therefore, be sure to reset the machine's home position after resetting the 12-bit absolute encoder alarm. Failure to do so could reset in personal injury or damage to the machine.

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8 DISPLAYING WAVEFORM

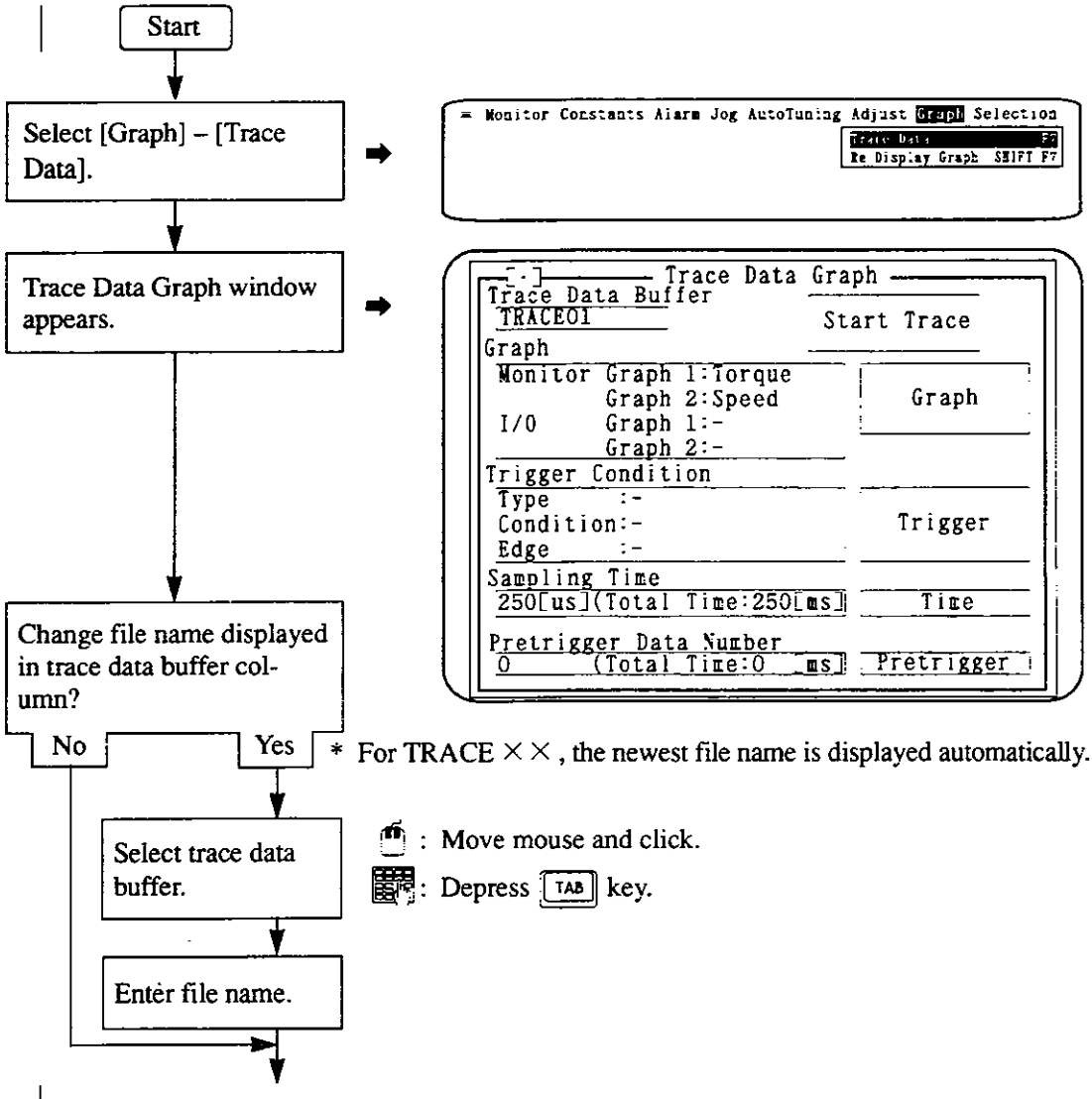
Waveforms can be displayed or existing files can be read to display waveforms.



- SGDA-□□□S series
- SGDA-□□□P series
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series

8.1 TRACING DATA ····· 74 8.2 REDISPLAYING WAVEFORM ·· 84

8.1 TRACING DATA



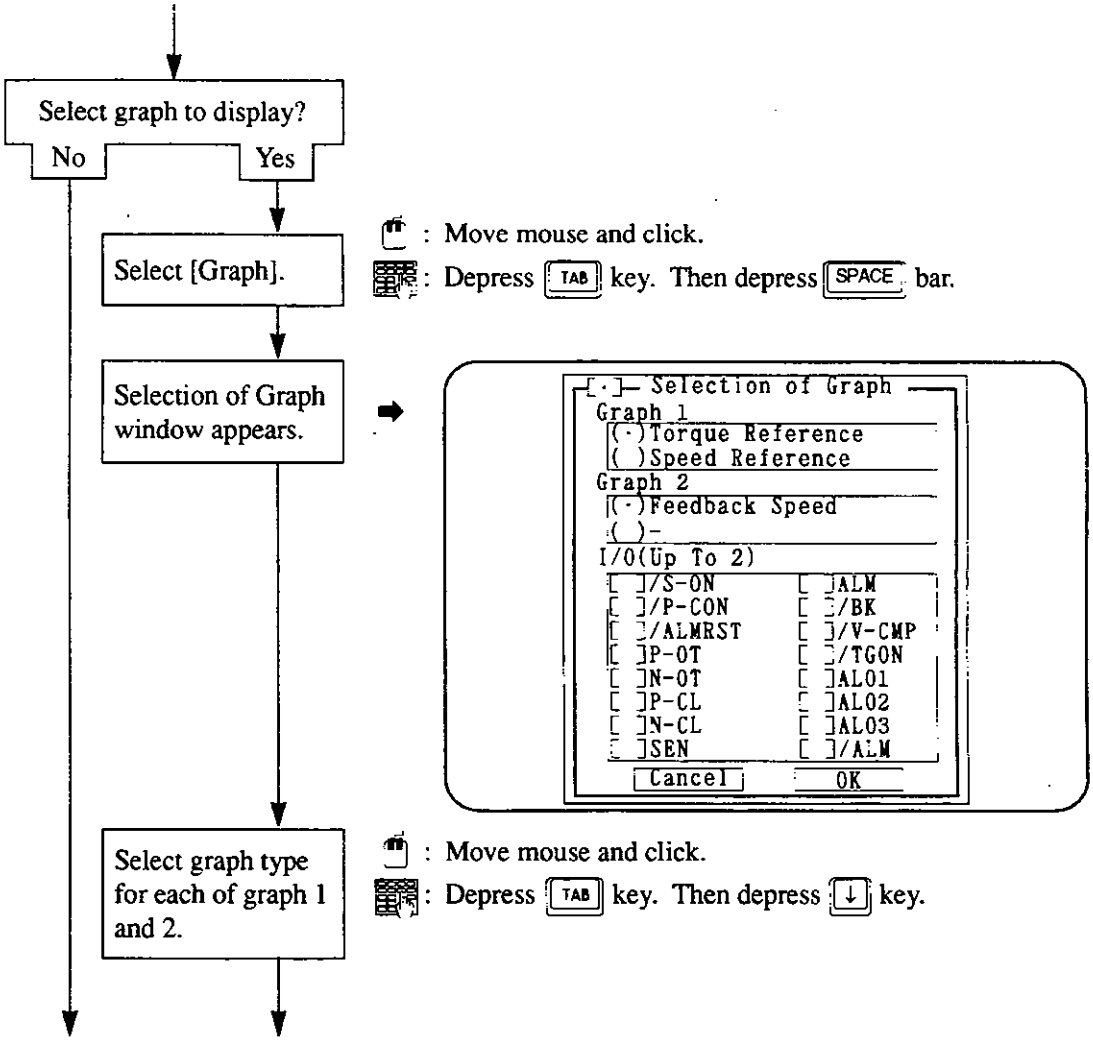
* For TRACE ××, the newest file name is displayed automatically.

: Move mouse and click.

: Depress TAB key.

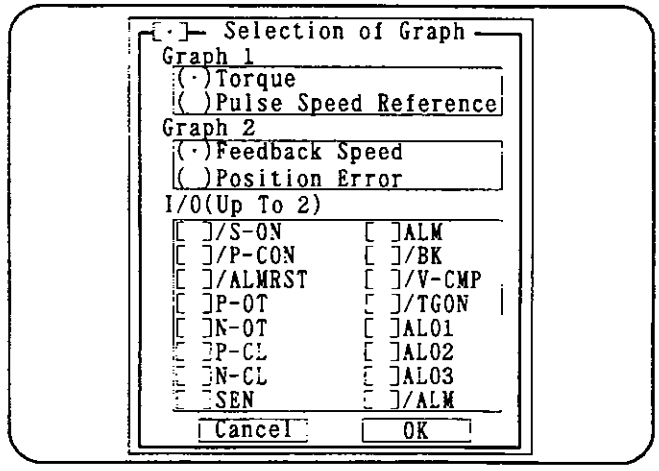
*1 Up to 128 files with the same file extension can be saved in a single directory.

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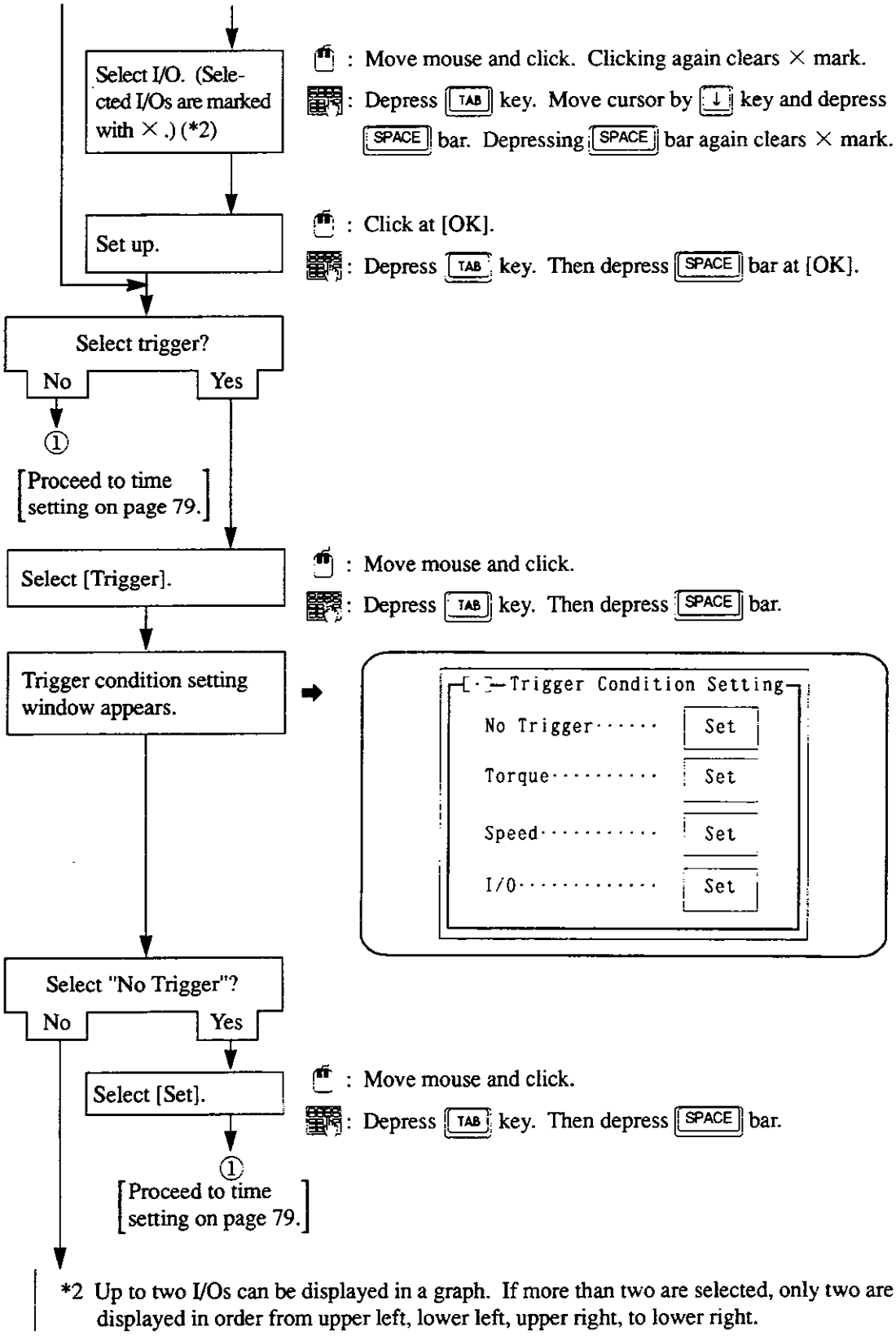


SUPPLEMENT

- The "Selection of Graph" window shown above is for speed control type. For position control type "Selection of Graph" window appears as shown on the right.

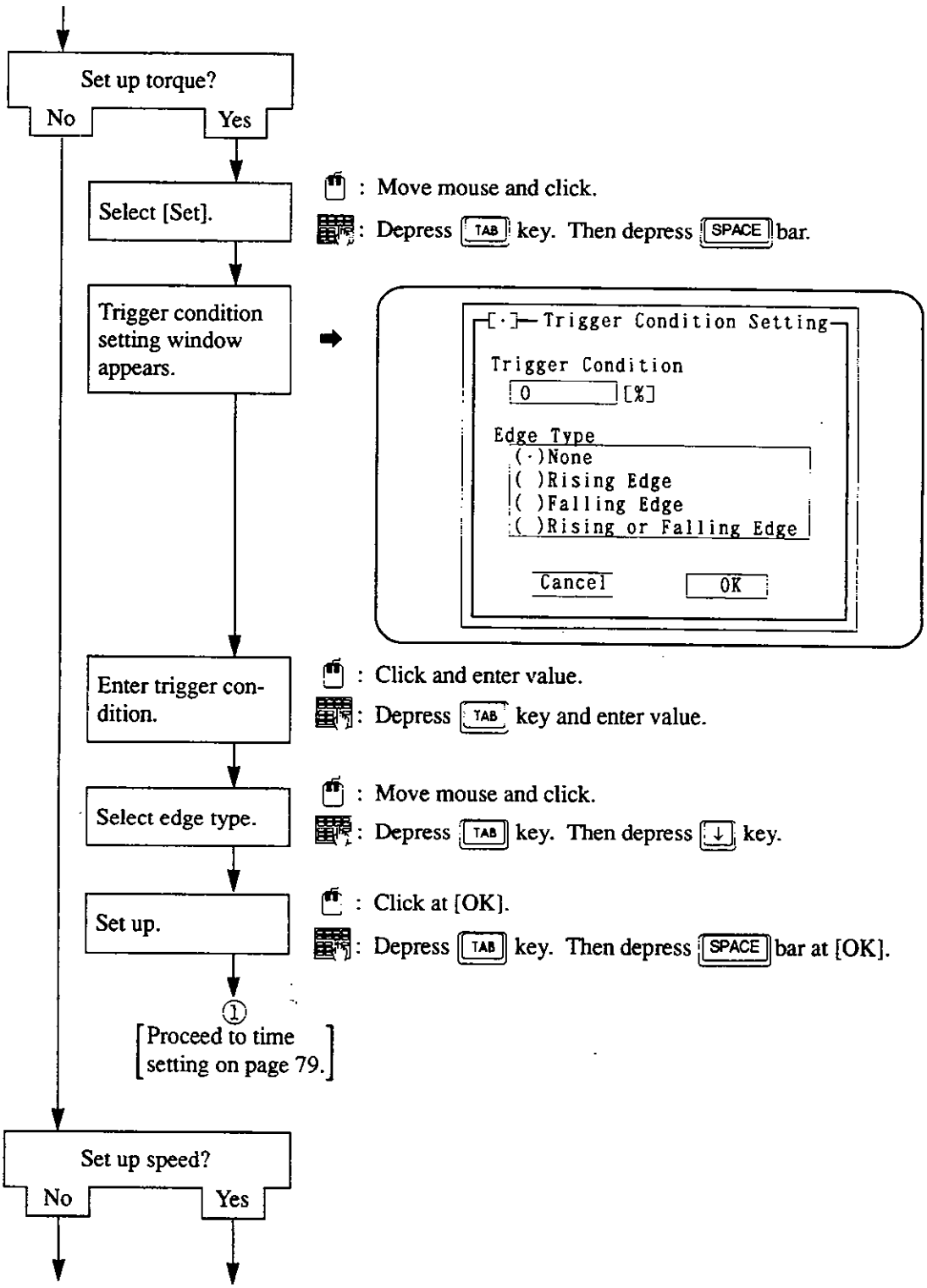


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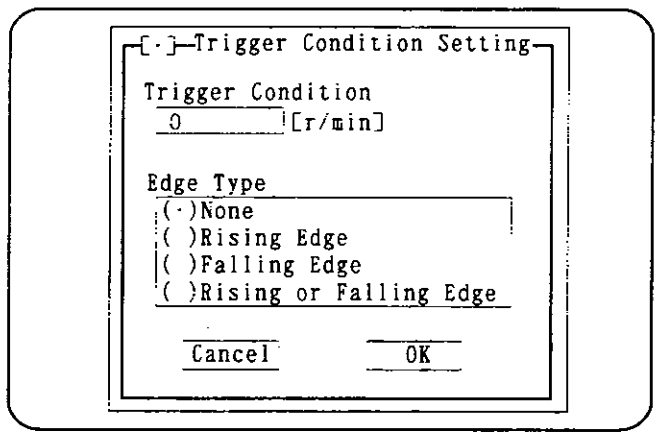
*2 Up to two I/Os can be displayed in a graph. If more than two are selected, only two are displayed in order from upper left, lower left, upper right, to lower right.

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Trigger condition setting window appears.



Enter trigger condition.

: Click and enter value.

: Depress TAB key and enter value.

Select edge type.

: Move mouse and click.

: Depress TAB key. Then depress ↓ key.

Set up.

: Click at [OK].

: Depress TAB key. Then depress SPACE bar at [OK].

①

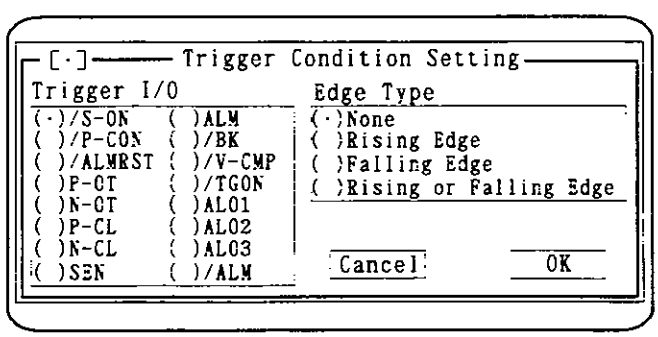
[Proceed to time setting on page 79.]

Set up I/O ?

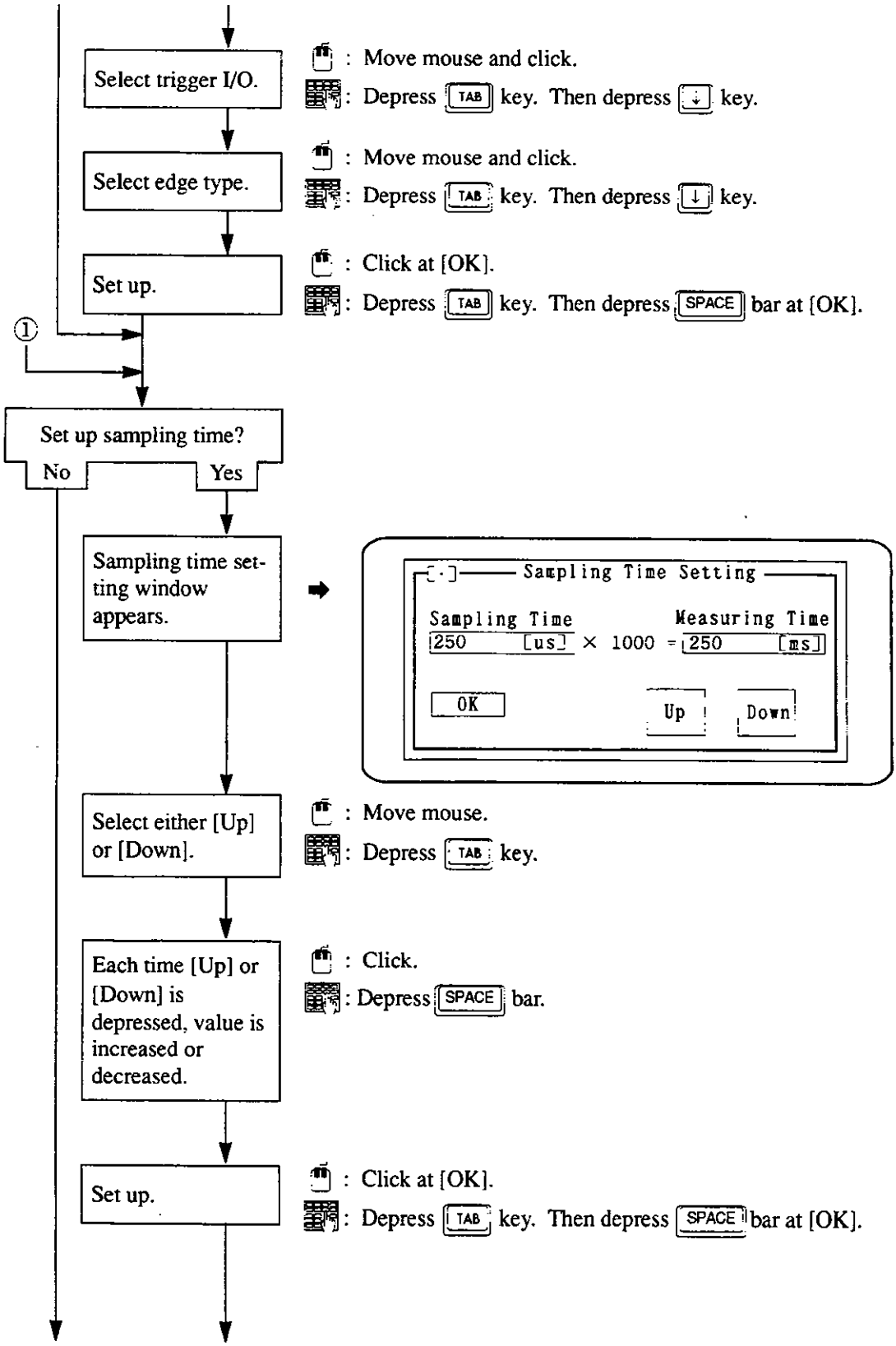
No

Yes

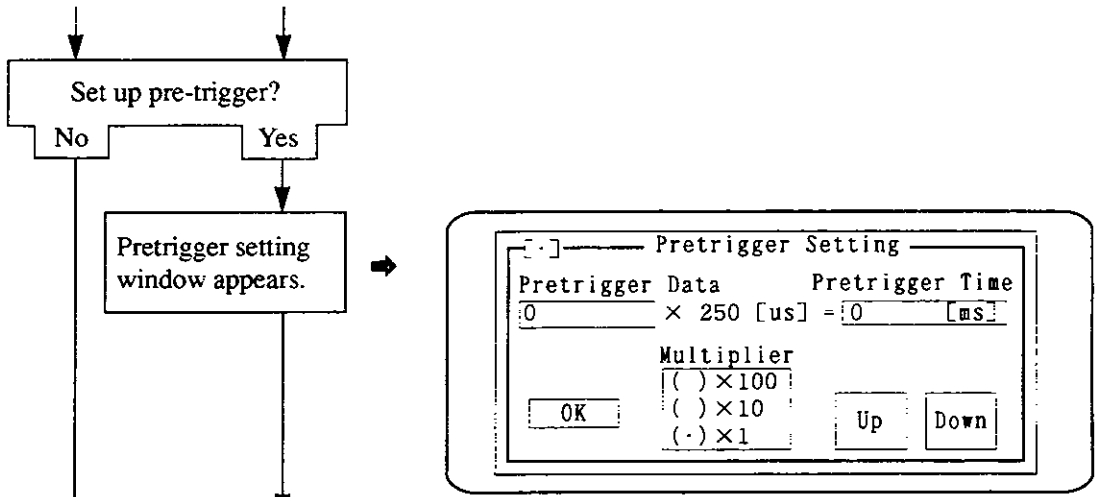
I/O trigger condition setting window appears.



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Select multiplier.

: Click.
: Depress TAB key. Then Depress ↓ key.

Select either [Up] or [Down].

: Move mouse.
: Depress TAB key.

Each time [Up] or [Down] is depressed, value is increased or decreased by specified multiplier.

: Click.
: Depress SPACE bar.

Ex.

● To set up pretrigger number to 128 :

With button multiplier 100, depress [Up] once.
With button multiplier 10, depress [Up] three times.
With button multiplier 1, depress [Down] twice.

Set up.

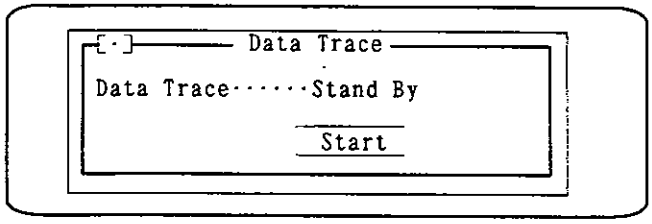
: Click at [OK].
: Depress TAB key. Then depress SPACE bar at [OK].

Select [Start Trace].

: Move mouse and click.
: Depress TAB key. Then depress SPACE bar.

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"Data Trace Stand By" is displayed.

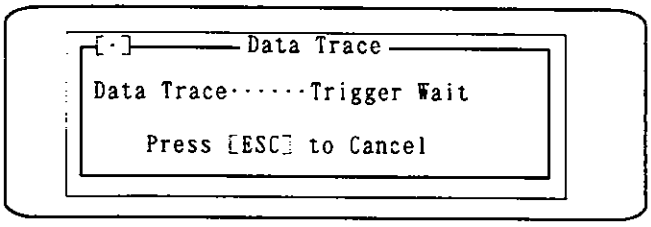


Select [Start].

: Click.

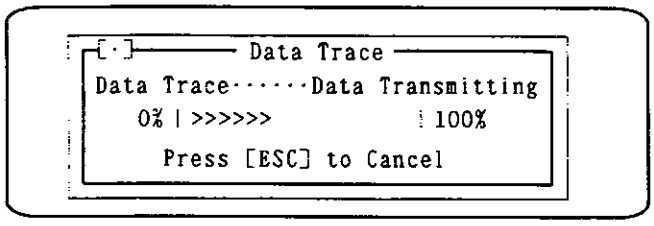
: Depress SPACE bar.

"Trigger Wait" is displayed.



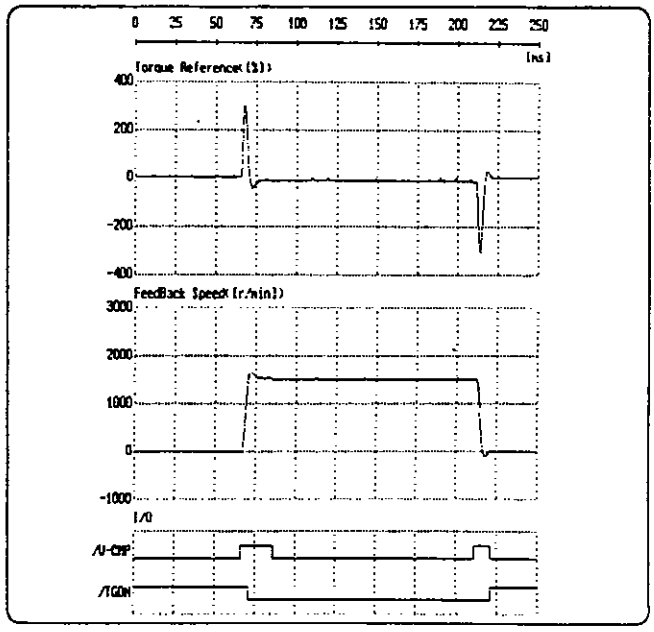
* If not triggered, the system will remain in wait status. To exit from this status, depress ESC key and set up triggers again.

Data are transferred.

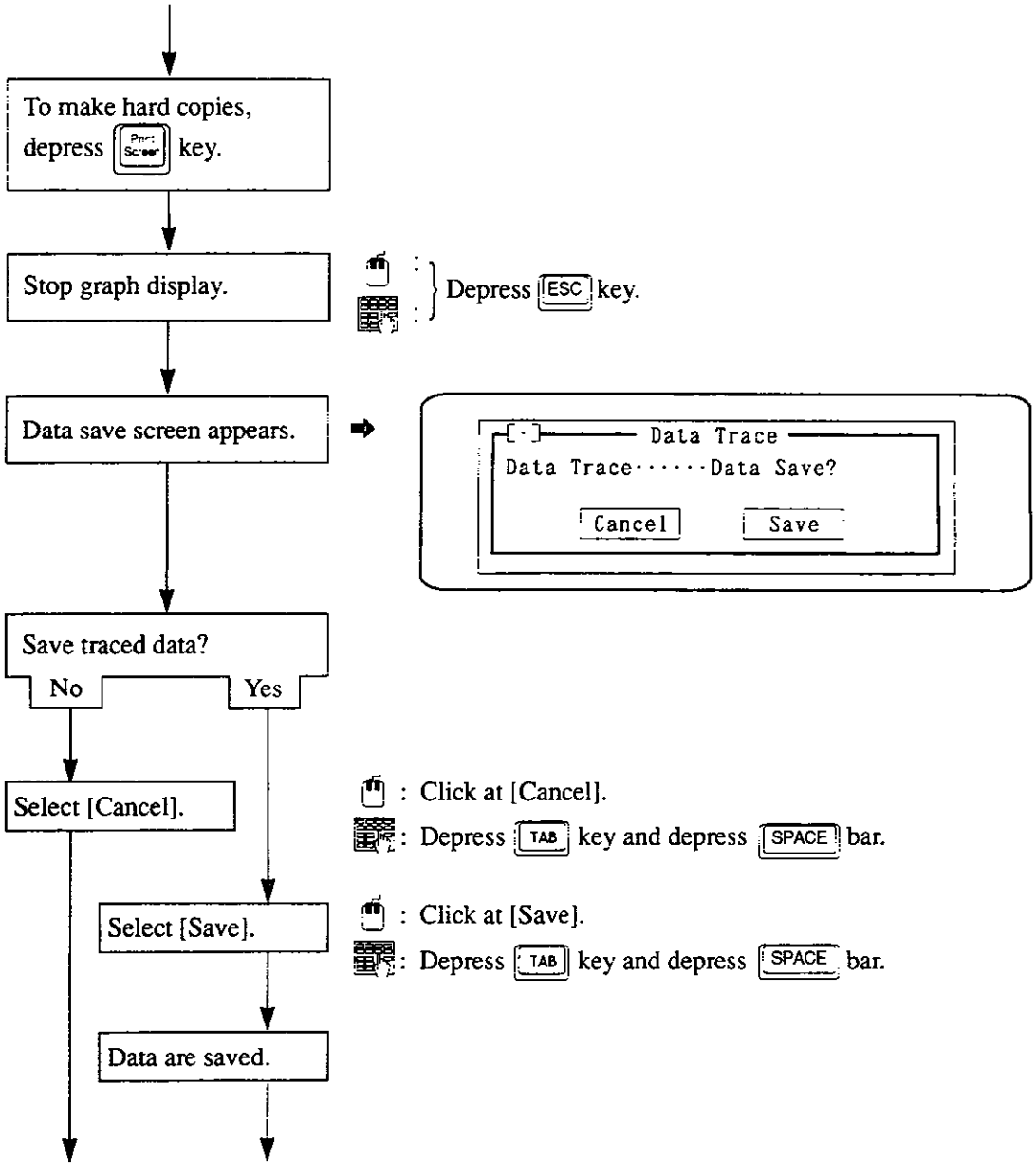


* To cancel during transmission, depress ESC key.

Graph is displayed.



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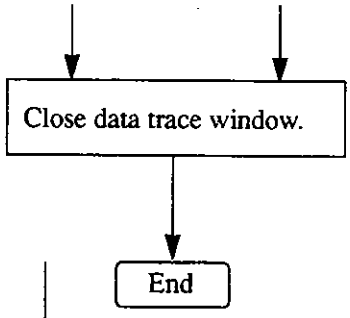


SUPPLEMENT

- Hard copies of a screen where waveforms are displayed can be printed by depressing the print screen key.
  The print-outs contain waveform, SERVOPACK type, motor type, print-out time, and gain-related user constants.

  This function can be used on the ESC/P compatible printers or laser printer (HP) (See Sect. 1.1.2.)

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: Click [▪] upper left of window.
: Depress ESC key.

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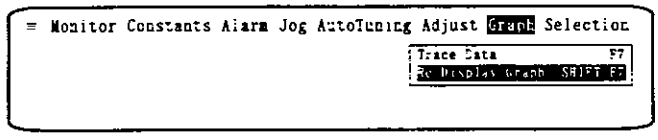
8.2 REDISPLAYING WAVEFORM

SUPPLEMENT

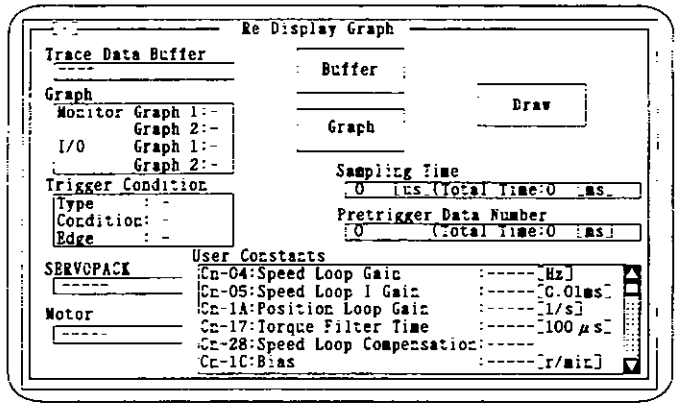
● The waveform redisplay function can be used with all types of SERVOPACKs. Graph files prepared on the SGDA, SGDB, or DR2 series can be selected.

Start

Select [Graph] – [Redisplay Graph].



Redisplay Graph window appears.

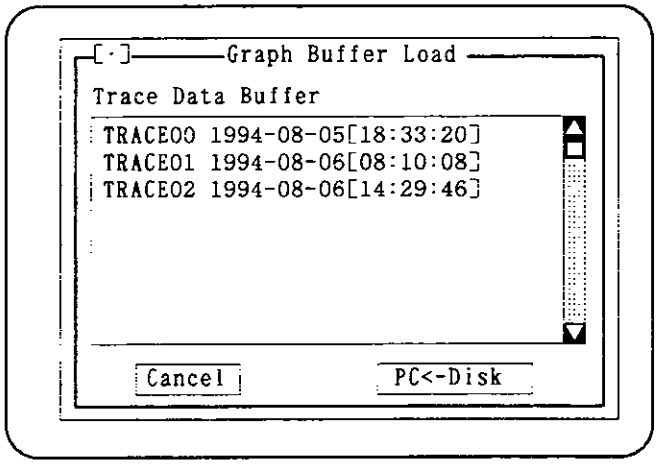


Select [Buffer].

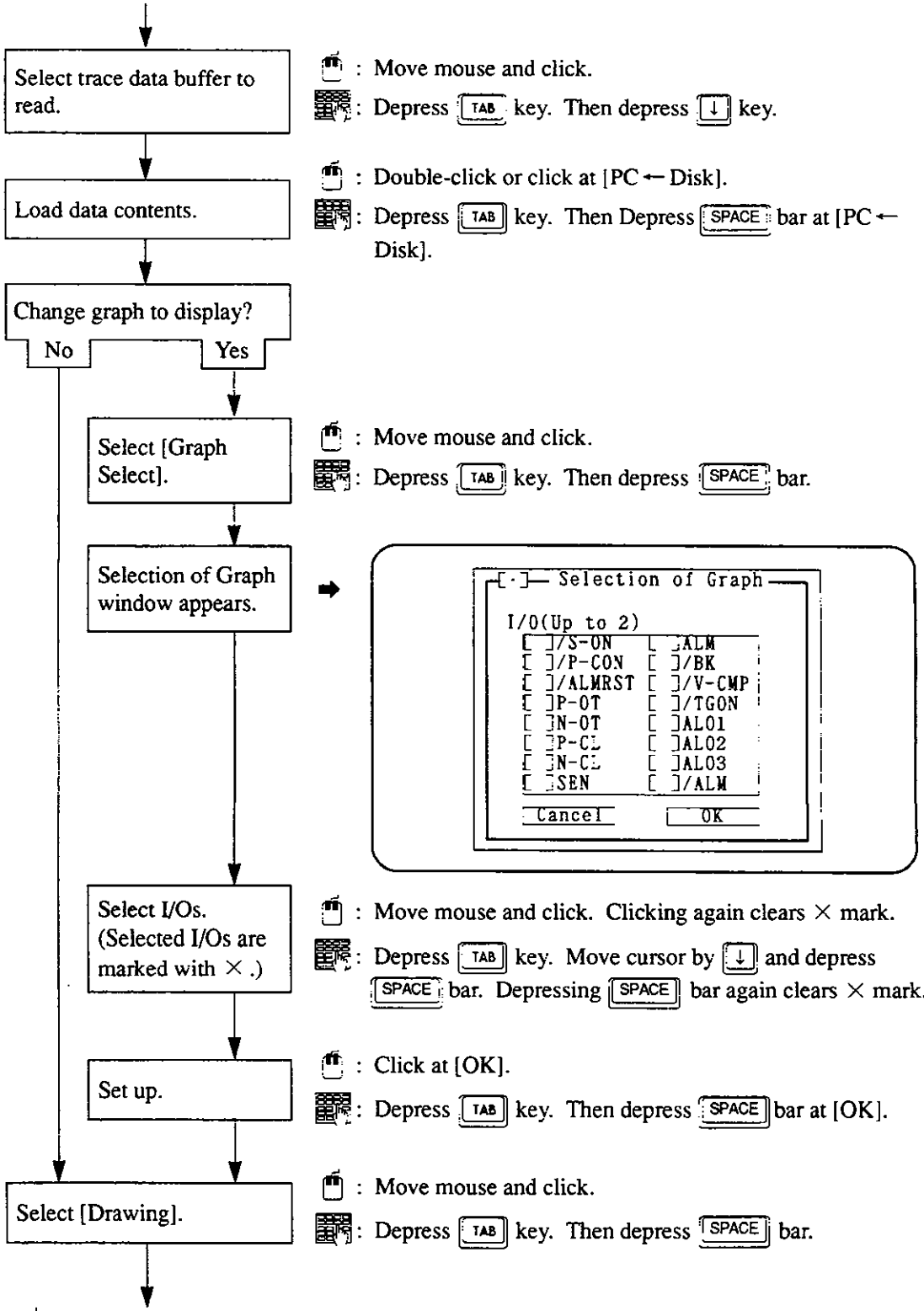
: Move mouse and click.

: Depress TAB key. Then depress SPACE bar.

Graph Buffer Load window appears.

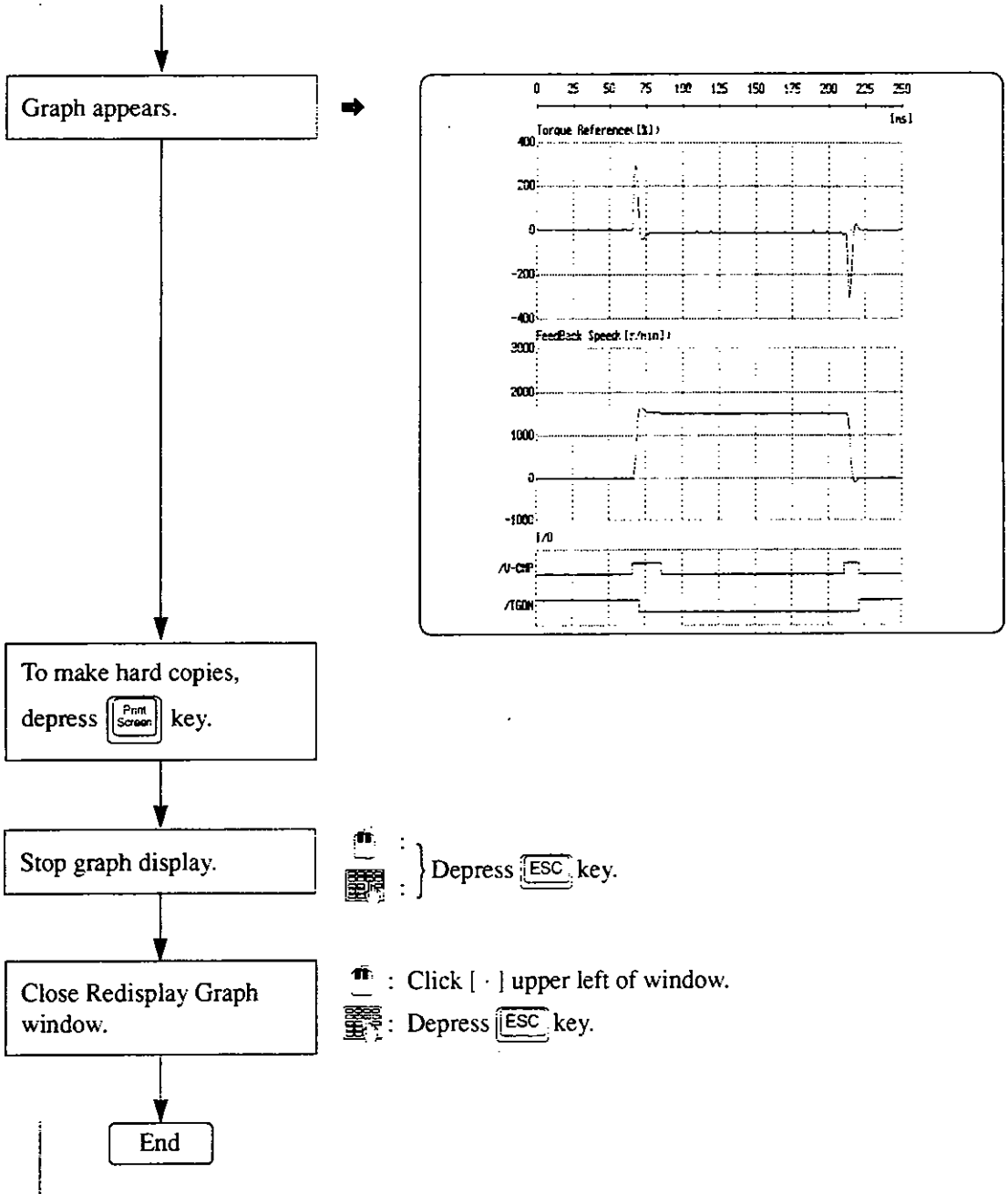


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*1 Up to two I/Os can be displayed in a graph. If more than two are selected, only two are displayed at a time in order from upper left, lower left, upper right, to lower right.

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SUPPLEMENT

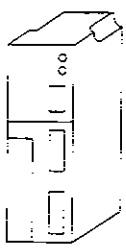
- Hard copies of a screen where waveforms are displayed can be printed by depressing the print screen key.
  The Print-outs contain waveform, SERVOPACK type, motor type, print-out time, and gain-related user constants.

  This function can be used on the ESC/P compatible printers or laser printer (HP) (See Par. 1.1.2.)

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9 SELECTING SERVOPACK

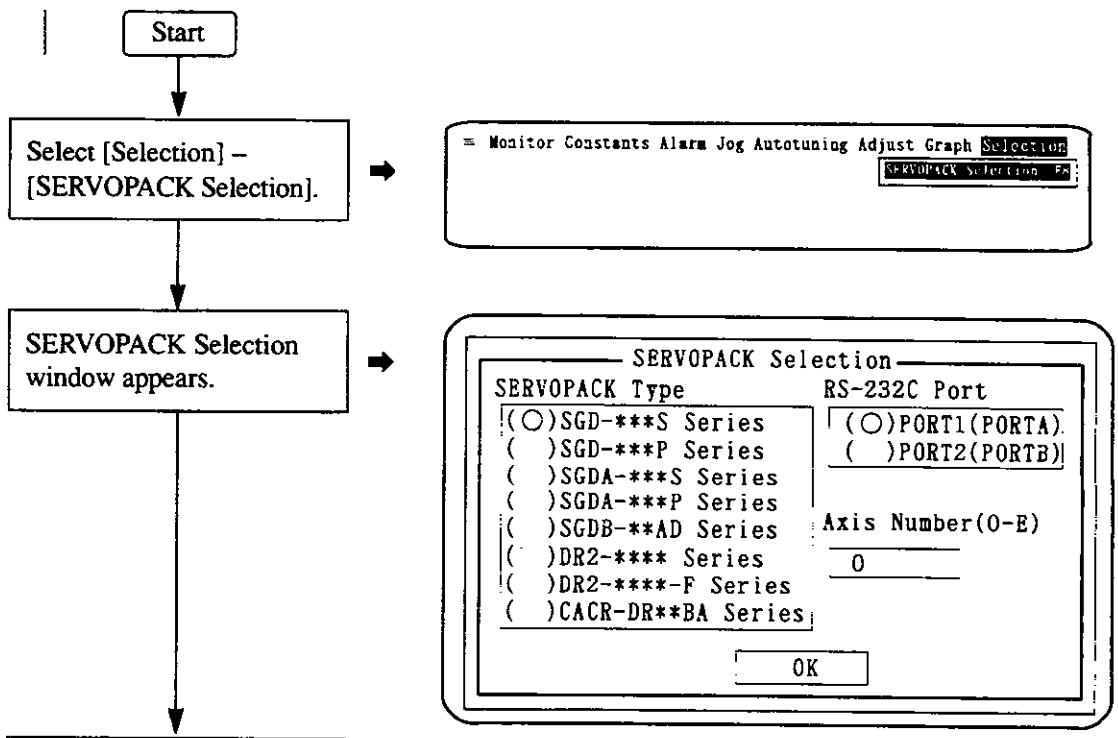
The servopack type specified at activation can be changed.



- SGD-□□□S series
- SGD-□□□P series
- SGDA-□□□S series
- SGDA-□□□P series
- SGDB-□□AD series
- DR2-□□□□ series
- DR2-□□□□-F series
- CACR-DR□□BA series

9.1 SELECTING SERVOPACK ···· 87

9.1 SELECTING SERVOPACK

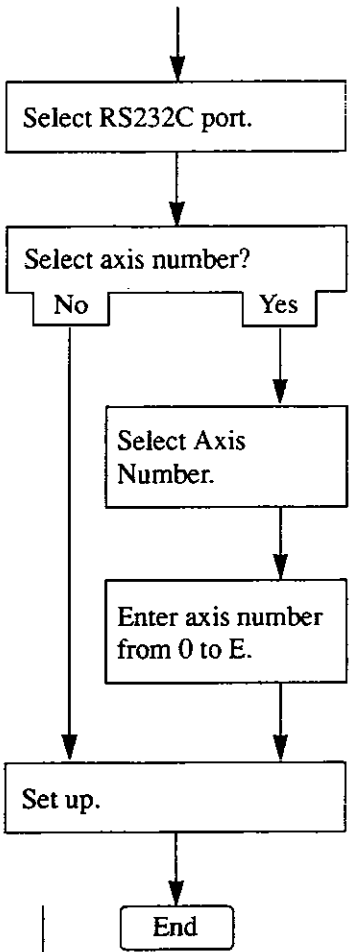


: Click at SERVOPACK to select.

: Depress TAB key. Then depress ↓ key.

*1 An error occurs if the selected SERVOPACK type does not match the SERVOPACK being used. If so, select again. However, it cannot distinguish between the SGD-□□□ S series and the SGD-□□□ P series. Therefore, the selected screen could be passed over.

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: Click at connected port.

: Depress [TAB] key. Then depress [↓] key to select connected

: Move mouse and click.

: Depress [TAB] key.

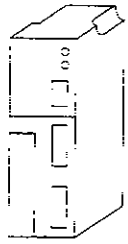
: Click at [OK].

: Depress [TAB] key. Then depress [SPACE] bar at [OK].

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10 OFF-LINE EDITING

This section explains the off-line editing function.



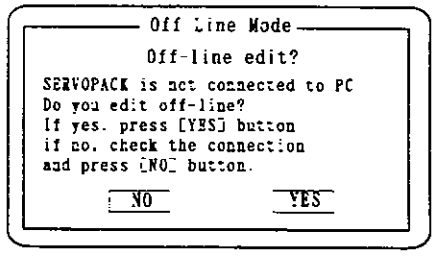
- ·SGD–□□□S series
- ·SGD–□□□P series
- ·SGDA–□□□S series
- ·SGDA–□□□P series
- ·SGDB–□□AD series
- ·DR2–□□□□ series
- ·DR2–□□□□–F series
- ·CACR–DR□□BA series

10.1 WHAT IS OFF-LINE EDITING? ····· 89
10.2 EDITING OFF-LINE ····· 90

10.1 WHAT IS OFF-LINE EDITING?

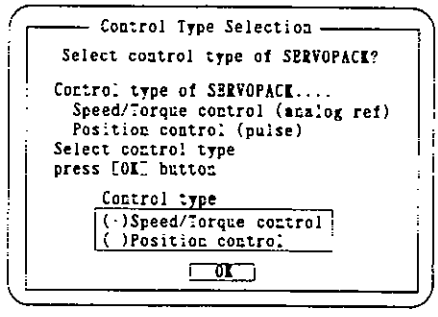
Off-line editing uses the functions of the Σ series SERVOPACK personal computer monitoring software while the machine is disconnected or not powered.

(1) When Σ series SERVOPACK personal computer monitoring software is activated, a message is displayed. Select [YES] or [No]. ➡



Offline editing to be performed.	Select [YES] .	: Move mouse and click. : Depress TAB key. Then depress SPACE bar.
Offline editing not to be performed.	Turn ON servo and select [NO].	

(2) If your SERVOPACK is DR2–□□□□ series, a window to select SERVOPACK control method appears. Select either "Speed/Torque control" or "Position control". ➡



Speed/torque control type	Select speed/ torque control.	: Move mouse and click to select control type. Then click at [OK]. : Depress TAB key. Select control type by ↓ key, then depress SPACE bar at [OK].
Position control type	Select position control.	

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10.2 EDITING OFF-LINE

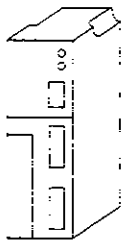
(1) The functions below can be edited off-line.

User constant setup	·See Par. 4.8. [Functions [PC → Disk] and [PC ← Disk] cannot be executed.]
Waveform redisplay	·See Par. 4.8.2. [Graph files prepared on SGDA, SGDB, or DR2 series can be selected.]
SERVOPACK selection	·See Par. 4.9.

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11 ERROR INFORMATION

This section explains how to respond to error information.



- ·SGD–□□□S series
- ·SGD–□□□P series
- ·SGDA–□□□S series
- ·SGDA–□□□P series
- ·SGDB–□□AD series
- ·DR2–□□□□series
- ·DR2–□□□□–F series
- ·CACR–DR□□BA series

11.1 RESPONDING TO ERROR INFORMATION ····· 91

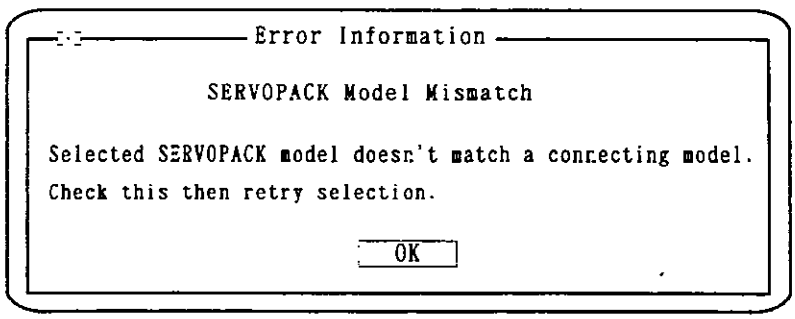
11.1 RESPONDING TO ERROR INFORMATION

Error information is displayed to notify the user of an input error of selection items or a communication error.
Error information appears in various situations. Read the information and take necessary action.
Two typical responses are explained below.

(1) When the user is requested to correct a selection item or data entry.

: Click.
: Depress SPACE bar.

Ex.



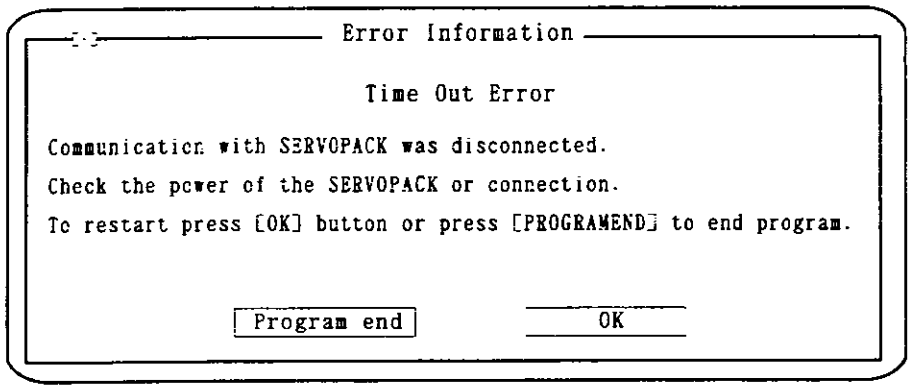
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(2) When the user is requested to forcibly terminate the program or verify conditions.

: Move mouse and click.

: Depress TAB key. Then depress SPACE bar.

Ex.



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