D.1
OVERVIEW

WATCH ON YOUTUBE

The boot system load the CNC system software (flash RAM→DRAM), then starts it so that software can be executed.

The boot system provides the following maintenance functions for the CNC:

(1) Registering a file in flash ROM

· Reads a file from a memory card, in MS–DOS format conforming to JEIDA V4.1, into flash ROM.

(2) Checking a file (series and edition) in flash ROM

(3) Deleting a file from flash ROM

(4) Batch saving and restoration of files of parameters and programs backed up by battery (SRAM area), to and from a memory card

(5) Saving a file in flash ROM to a memory card

(6) Formatting of a memory card

(7) Deleting a file from a memory card

This manual describes the activation of the boot system, as well as the screen displays and operation for the functions listed above.

> **CAUTION**
> **A kind of memory card**
> 1 We recommend to use SRAM type memory card. When you use flash type memory card, it is impossible to use functions (4) to (7).
> 2 For the 60M1/05 and later versions of BOOT SYSTEM software, data can be saved to a flash memory card recommended by FANUC. Note, however, that the actually available memory is equal to the capacity of the flash memory card, minus 128 KB. The types of memory cards which can be used are detailed in the ordering list.
> Refer to the Order List for details of the usable memory card types.

D.1.1
Starting the Boot System

In ordinary system activation, the boot system automatically transfers files from flash ROM to DRAM in the background.

The user is not aware of this operation. However, the boot system must be operated manually, from menu screen, when maintenance is to be carried out or when the flash ROM does not contain a required file.

1 In system maintenance, for example, to replace a file in ROM

Operation : Turn the power on by simultaneously pressing the two soft keys at the right end.

◁ | | | | | ▷

Hold down the two keys until the boot system screen appears.

2 When the flash memory does not contain a file required to start the CNC

Immediately after the CNC is turned on, the boot system starts transferring files from flash ROM to DRAM. If, for some reason, a file required to start the CNC (NC basic) is not in flash ROM or has been destroyed, the boot system is automatically started.

D.1.2
System Files and User Files

The boot system organizes files in flash ROM into two main groups : system files and user files. These two file types have the following characteristics :

● **System files**   CNC and servo control software provided by FANUC

● **User files**   PMC sequence program (ladder), P–CODE macro program, and other user–created files

D.1.3
Boot Slot Configuration Screen

When OPT2 board or LCB (loader control board) is mounted on the CNC, we have to access to flash ROM or SRAM that mounted on additional board. So, the boot system displays BOOT SLOT CONFIGURATION screen that to select a access board.

● **Screen configuration**

```
(1)   BOOT SLOT CONFIGURATION      60M1–02

(2)   NO.  BOARD    F-ROM    SRAM
      0.    MAIN     4MB      1.0MB
      1.    OPT2     6MB      1.0MB
      2.    OPT3              128KB
      3.    LCB               512KB




(3)   *** MESSAGE ***
      SELECT SLOT AND HIT SELECT KEY.
      [ SELECT ][  YES  ][  NO  ][  UP  ][  DOWN  ]
```

(1) : Screen title.

(2) : Flash memory size and SRAM size of each board.

(3) : Message

● **Operation**   Press the **[UP]** or **[DOWN]** soft key to move the cursor, and select board to press the **[SELECT]** soft key.

Memory card slot
   The memory card slot on the loader control board (LCB) is provided specifically for the ladder edit card for the loader. When a memory card is to be used in the boot system, insert the card into the slot provided on the main board.

D.2
SCREEN
CONFIGURATION
AND OPERATING
PROCEDURE

● **MAIN MENU screen**

When the boot system is first started, the MAIN MENU screen is displayed. This screen is described below :

```
(1)   SYSTEM MONITOR MAIN MENU          60M1-01

(2)   1. SYSTEM DATA LOADING
(3)   2. SYSTEM DATA CHECK
(4)   3. SYSTEM DATA DELETE
(5)   4. SYSTEM DATA SAVE
(6)   5. SRAM DATA BACKUP
(7)   6. MEMORY CARD FILE DELETE
(8)   7. MEMORY CARD FORMAT


(9)   10.END

(10)  *** MESSAGE ***
      SELECT MENU AND HIT SELECT KEY.
      [ SELECT ][  YES  ][  NO  ][  UP  ][  DOWN  ]
```
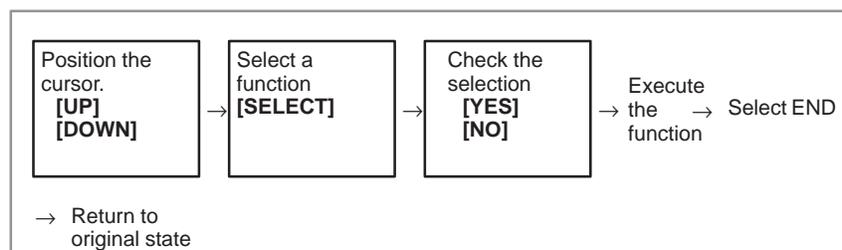
(1) : Screen title. The series and edition of the boot system appear at the right end.

(2) : Function for writing data to flash ROM.

(3) : Function for checing the edition of a file in ROM.

(4) : Function for deleting a file from flash ROM.

(5) : Function for making a backup copy of the data stored on the memory card.

(6) : Function for making a backup copy of the data in SRAM.

(7) : Function for deleting a file from a memory card.

(8) : Function for formatting a memory card.

(9) : Function for terminating the boot system and starting the CNC.

(10) : Condensed guidance or error message

● **Operating procedure**

Press the **[UP]** or **[DOWN]** soft key to select the desired function. After positioning the cursor to the desired function, press the **[SELECT]** soft key. Before executing a function, the system my request confirmation from the operator by having him/her press the **[YES]** or **[NO]** soft key.

● **Basic operation**

```
┌─────────────────────────────────────────────────────────────────────┐
│  ┌──────────────┐   ┌──────────────┐   ┌──────────────┐                │
│  │ Position the │   │ Select a     │   │ Check the    │   Execute      │
│  │ cursor.      │ → │ function     │ → │ selection    │ → the   → Select END │
│  │ [UP]         │   │ [SELECT]     │   │ [YES]        │   function     │
│  │ [DOWN]       │   │              │   │ [NO]         │                │
│  └──────────────┘   └──────────────┘   └──────────────┘                │
│                                                                        │
│  → Return to                                                           │
│    original state                                                      │
└─────────────────────────────────────────────────────────────────────┘
```

D.2.5
SRAM DATA BACKUP
Screen

● **Description**

This screen is used to collectively save and restore parameters, programs, and other data, retained after the CNC power in SRAM is turned off, to and from a memory card.

● **Screen configuration**

Select "4 SRAM DATA BACKUP" on the SYSTEM MONITOR MAIN MENU screen. The following screen is displayed.

```
(1)   SRAM DATA BACKUP
(2)   [BOARD:MAIN]
(3)    1. SRAM BACKUP (CNC  → MEMORY CARD)
       2. RESTORE SRAM (MEMORY CARD  → CNC)
(4)    END

(5)    SRAM SIZE  :  0.5MB (BASIC)
(6)    FILE NAME  :  SRAM0_5A. FDB




(7)   *** MESSAGE ***
      SELECT MENU AND HIT SELECT KEY.
      [ SELECT ] [  YES  ] [  NO  ] [  UP  ] [  DOWN  ]
```

(1): Screen title

(2): Names of accessing board

(3): Menu

(4): Returning to the previous menu

(5): Size of SRAM mounted on the CNC

(6): File name

(7): Message

● **Operating procedure**

[Backing up data]

1 Select "1. SRAM BACKUP." The following confirmation message is displayed. The backup file name may be displayed according to the SRAM capacity.

2 Press **[YES]** to start backup.

```
*** MESSAGE ***
BACKUP SRAM DATA OK ? HIT YES OR NO.
```

3 If a backup file is already on the memory card, you will be prompted to confirm whether to permit overwriting.

4 The name of the file being written to the memory card is displayed in the FILE NAME: field.

```
SRAM SIZE  : 0.5MB (BASIC)
FILE NAME  : SRAM0_5A.FDB  →  MEMORY CARD


*** MESSAGE ***
SRAM DATA WRITING TO MEMORY CARD.
```
Name of the file being saved

5 Upon terminating normally, the system displays the following message. Press the **[SELECT]** soft key.

```
*** MESSAGE ***
SRAM BACKUP COMPLETE. HIT SELECT KEY.
```

[Restoring the data]

1 Select "2. RESTORE SRAM." The system displays the following message. Press the **[YES]** key.

```
*** MESSAGE ***
RESTORE SRAM DATA OK ? HIT YES OR NO.
```

2 The system displays the following message during restoration.

```
*** MESSAGE ***
RESTORE SRAM DATA FROM MEMORY CARD.
```

3 Upon terminating normally, the system displays the following message. Press the **[SELECT]** soft key.

```
*** MESSAGE ***
RESTORE COMPLETE. HIT SELECT KEY.
```

● **Others**

1 Name of backup file

The name of the backup file written to the memory card by the SRAM backup function depends on the size of the SRAM installed in the CNC.

When the size of SRAM is 1MB or larger, backup files are created in units of 512 KB.

Number of files SRAM size	1	2	3	4	5
256KB	SRAM256A.FDB				
1.5MB	SRAM0_5A.FDB				
1.0MB	SRAM1_0A.FDB	SRAM1_0B.FDB			
1.5MB	SRAM1_5A.FDB	SRAM1_5B.FDB	SRAM1_5C.FDB		
2.5MB	SRAM2_5A.FDB	SRAM2_5B.FDB	SRAM2_5C.FDB	SRAM2_5D.FDB	SRAM2_5E.FDB

2 When the OPT2, OPT3, or LCB board is mounted in addition to the main board

The backup file for SRAM on the OPT2, OPT3, or LCB board will have the following extension:

Board	MAIN	OPT2	OPT3	LCB
Extension	FDB	OP2	OP3	LCB

> **CAUTION**
> If data such as parameters was restored from a memory card to SRAM in a system using an absolute pulse coder, set bit 4 (APZ) of parameter No. 1815 to 0, and set the reference point again.