FR FAMILY
F^{2}MC FAMILY
32/16/8-BIT MICROCONTROLLER

Softune LINKAGE KIT ADDITIONAL MANUAL

(Memory Used Information List)

FUJITSU LIMITED

Output Specification of the Map List File Memory Used Information List (-mmi)

This outputs the memory used information of the Map List Files that are output by the Linker.

[Format]

```
-mmi
```

[Parameters]

None

[Explanation]

This outputs the memory used information list that indicates the usage conditions of the ROM or RAM areas specified by the options of the Map List Files that are output by the Linker as the default.

It indicates the information about usable area, used area and gap position and size in the area etc.

[Example]

flnk911s l0mp00 im_lnk -mmi -ra RAM1=0x1000/0x1FFF,RAM2=0x2000/0x23FF

-ro ROM1=0xBC000/0xBCFFF,ROM2=0xBD000/0xBFFFF -AL 2

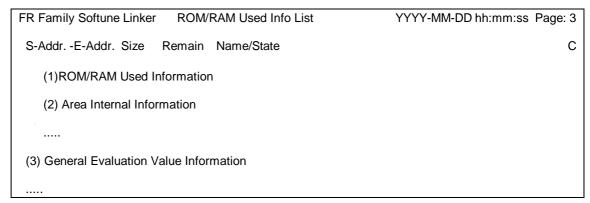**Note:** The following will not be output despite -mmi being specified.
    (1) The memory area is not specified. (-ra or -ro is not specified).
    (2) The Map List File output is not valid.

Memory Used Information List

The memory used information list displays the name of the area of the RAM specified area or the ROM specified area and the size of the free space or the remainder range and the header and end address of the specified area.

■ Memory Used Information List Field List Output Format

The following shows the memory used information list field list output format.

```
FR Family Softune Linker      ROM/RAM Used Info List            YYYY-MM-DD hh:mm:ss  Page: 3

 S-Addr. -E-Addr. Size    Remain   Name/State                                              C

    (1)ROM/RAM Used Information

    (2) Area Internal Information

      .....

  (3) General Evaluation Value Information

  .....
```

Page Header
   Linker name, list name, time and page number are shown in the page header.

(1) ROM/RAM Used Information Display Area

- Lines containing a # character at their head among those output to the ROM/RAM Used Information display area indicate the information specified by the –ro or –ra options.

- Lines that do not contain a # character at the head of the lines that were output, display the header address and end address of the sections in the valid area and the size of the area that is used including the gap area and the remainder or insufficient values for the sizes of the used areas.

- Areas specified by the –ro or –ra option, has have the names of their sections that could not be located and the size of the section.
  - S_Addr: Start Address (Hex)
  - E_Addr: End Address (Hex)
  - Size: Area Size (Hex)
  - Remain: Size of the area in the memory (Hex)

  The following shows the header symbols.
  +:   Free Area Size
  -:   Remainder Area Size
  Space: When free/remainder area is 0.
  - Name/State: Memory Area Name and Section Name

(2) Area Internal Information Area

   The area internal information area displays the free area of the valid area, the used area and the gap area in a map image. The information displayed in this area is information only of the located section with regard to the specified area.
  - S_Addr: Area Start Address (Hex)
  - E_Addr: Area End Address (Hex)
  - Size: Area Size (Hex)
  - Name/State: Area Type
       FREE: Free Area
       USED: Used Area
       GAP: Gap Area

(3) General Evaluation Value Information

General Evaluation Value Information shows the following types of information for the overall ROM and RAM areas.
1 Total value of the specified area (Total)
2 Total value of the used area (Used) (Note: Includes the Gap area.)
3 Total value of the free or remainder area (Remainder)

■ Example Display of the Memory Used Information List Field List

The following is an example of the Memory Used Information List Field list display.

```
FR Family Softune Linker    ROM/RAM Used Info List              1998-09-02 20:45:25  Page: 3

    S_Addr.  -E_Addr.   Size       Remain    Name/State                                    C
#  00001000-00001FFF  00001000  - - - - - - - -  RAM1   <-Memory Area Specified in the Option
   00001000-00001774  00000775  +0000088B              <-Memory Status of the Section Located

   00001000-00001136  00000137  - - - - - - - -  USED   RAM1 Area Information
   00001137-00001137  00000001  - - - - - - - -  GAP
   00001138-0000152B  000003F4  - - - - - - - -  USED
   0000152C-0000152F  00000004  - - - - - - - -  GAP
   00001530-00001774  00000245  - - - - - - - -  USED
   00001775-00001FFF  0000088B  - - - - - - - -  FREE

#  00002000-000023FF  00000400  - - - - - - - -  RAM2
   00002000-00003A1E  00001A1F  -0000161F              <-(*1)
   ** Not Locate  **  00000B28  - - - - - - - -  data01 <-Section Information Not Located (*2)
   ** Not Locate  **  00000EF6  - - - - - - - -  data02
                                                        RAM2 Area Information
   00002000-000023FF  00000400  - - - - - - - -  FREE

 RAM -- Total(00001400)  Used(00002194)  Remainder(-00000D94)     <-All RAM Area Information

#  000BC000-000BCFFF 00001000  - - - - - - - -  ROM1
   000BBF00-000BDFFF 00002100  -00001100              <-(*3)
                                                        ROM1 Area Information
   000BC000-000BCFFF 00001000  - - - - - - - -  USED

#  000BD000-000BFFFF 00003000  - - - - - - - -  ROM2
   000BD000-. . . . . . . .  00000000  +00003000
                                                        ROM2 Area Information
   000BD000-000BFFFF 00003000  - - - - - - - -  FREE

 ROM -- Total(00004000)  Used(00002100)  Remainder(+00001F00)     <-All ROM Area Information
```

(Note)
*1. Memory area information that has sections not located that were to be located in the memory area by the automatic locating option indicates the status with added section size. (When the numerical value expression exceeds 0xFFFFFFFF, the lower part of the 32 bit is displayed of that value.)
*2. When Mode 2 of the automatic location option is specified, this displays the memory area specified last for the section not located (for either the ROM area or the RAM area).
*3. Sections specified by the user location are included in the memory area which include the section header address.