



# Memory Stick Information for Developers

Memory Stick ►► Physical Format

### **7.5. User Block**

User block is in user area and can be used by user. The logical format described in Section 8 is defined in it. However, the information block and logical/physical translation table block are not treated as user block, though they are in user area.

## 7.7. Logical/Physical Translation Table Block

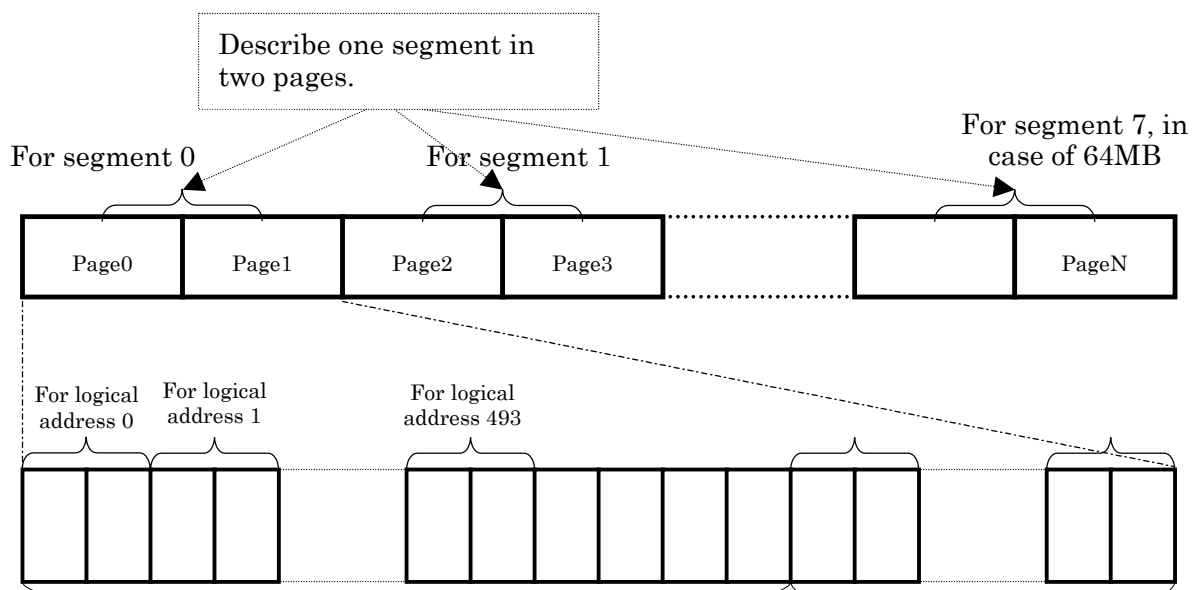
### 7.7.1. Overview

Any one block in the last segment of user area shall be allocated for logical/physical translation table. However, it is not written when delivered from factory. A block shall be determined to be a table block, if the translation table bit of ExtraDataArea management flag is 0(:table block).

In case the appliance cannot have logical/physical translation table for reasons such as insufficient memory, the table can be written in the Memory Stick. The written contents will be nullified when the Memory Stick power supply is turned off. If logical/physical translation table block is found at the time of booting, the data in the block shall be erased or the update status in overwrite flag in ExtraDataArea shall be set to 0(:unused). See section 7.10 Example of Sector Data Updating for updating of contents.

In the ExtraDataArea of the logical/physical translation block, the translation table bit of management flag shall always be set to 0(:table block), and update status of overwrite flag always set to 0(:updating).

### 7.7.2. Structure



Physical block No. corresponding to logical address is given for every word. Physical block No. is to be allocated even if corresponding logical address is not used.

\* Only in the top segment, 2-word dummy (0xFFFF) for boot block is placed after the word for logical address 493.

Accordingly, the list of physical block No. becomes 496 word fixed.

Physical block No. of alternate blocks

Physical block No. are forward-justified and the rest is filled with 0xFFFF.

Fig. 7.7.1 Logical/Physical Translation Table Block

- ◆ See Section 7.12.1 Procedure Example of Table Generation, for procedures on generating logical/physical translation table.
- ◆ All word data are given in big-endian method.
- ◆ Since logical address is not set in the system reserve block and initial defect block, the physical block No. corresponding to it does not exist in the logical/physical translation table.
- ◆ Appliances using the logical/physical translation table, shall erase the logical/physical translation table block if it is found upon booting process, and shall create a new one.

### 7.9. Example of Boot Block Retrieval

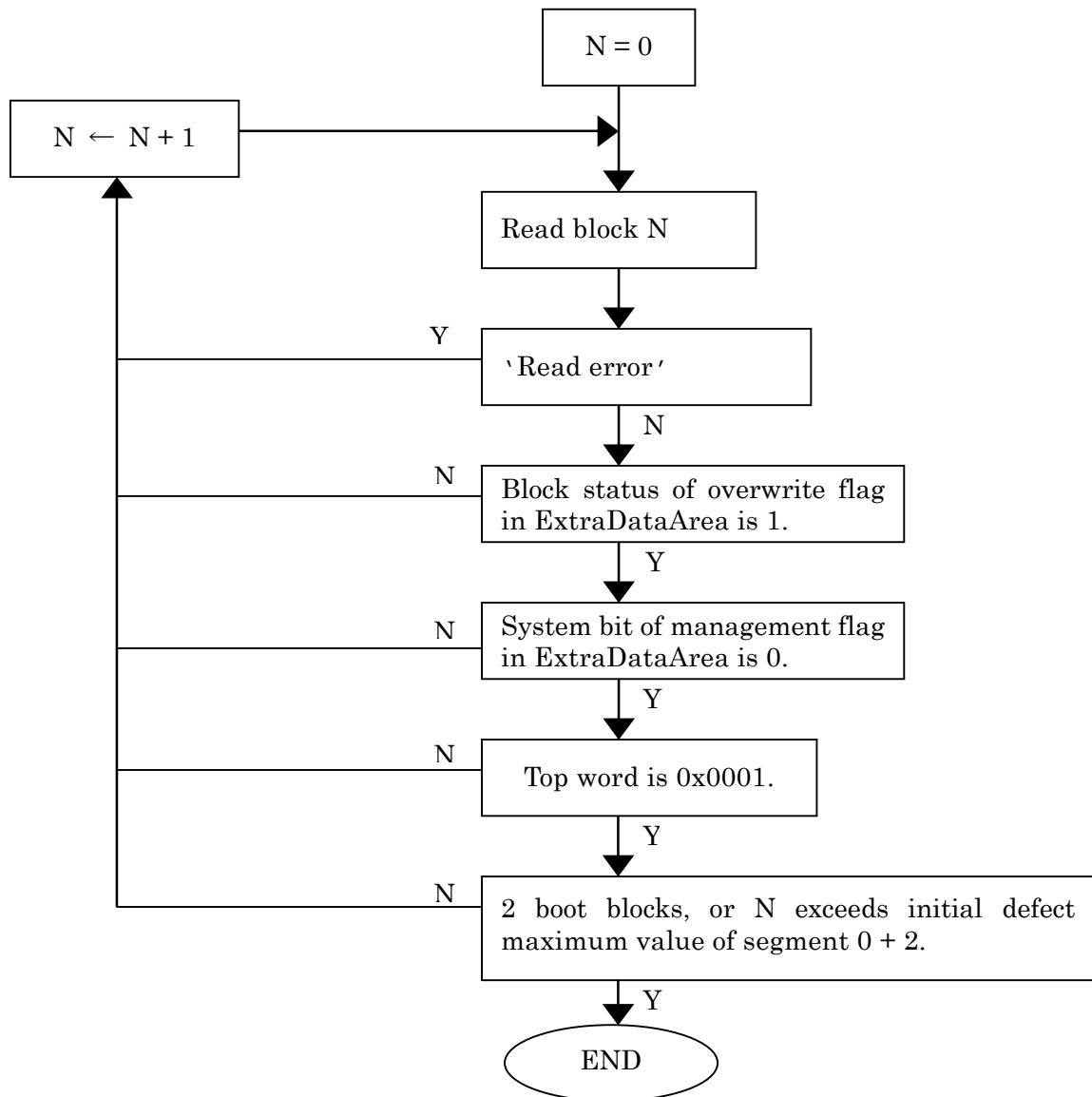


Fig. 7.9.1 Boot Block Retrieval Example

- ◆ If two boot blocks are retrieved, the lower-numbered block shall be used.
- ◆ Even when only one boot block is retrieved, it is not always necessary to generate a new boot block.
- ◆ In case no boot block is found by retrieving the first 10 block of Physical Block (initial defect maximum blocks of segment 0) + 2 block, it is regarded as a booting error.

## 7.10. Example of Sector Data Updating

Logical/physical translation table

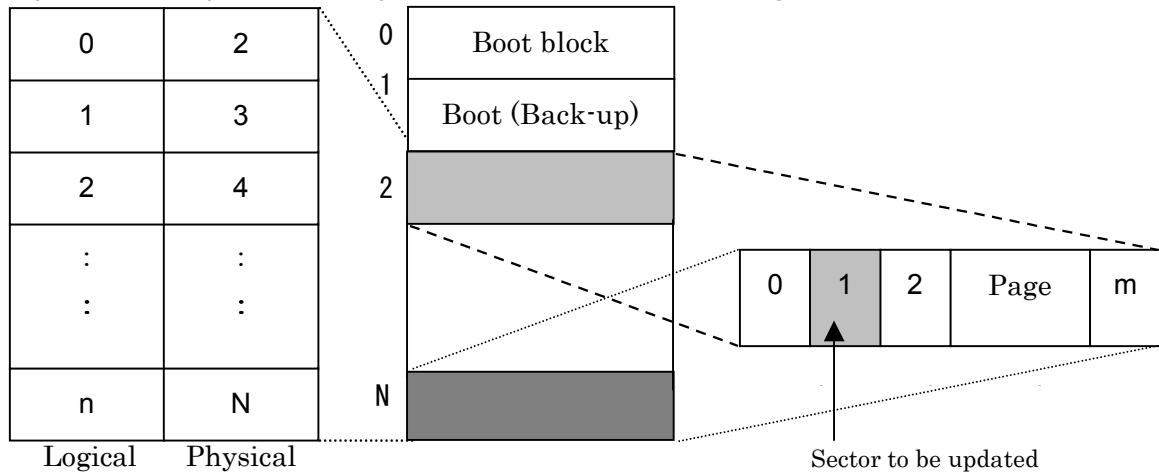


Fig. 7.10.1 Sector Data Updating

◆ Procedure to update FAT

1. Retrieve physical block for logical address using logical/physical translation table (e.g. : Logical block 0 corresponds to physical block of 2.)
2. Read physical block (read extra data area as well), and change update status to 0.
3. Update FAT information on memory.
4. Retrieve unused block (e.g. physical block N). (If unused block is not retrieved, it is regarded as write error.)
5. Erase unused block, then write the FAT information content in memory to the unused block. (Write all the pages from the lowest-numbered page.) When failing to write, set the block status of N to 0 and write in other unused block.
6. Update the value on logical/physical translation table.
7. Erase the original physical block.

(e.g. physical block 2)

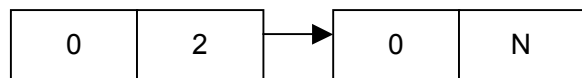


Fig. 7.10.2 Table Updating

- ◆ If a page with page status of 1 (:NG) is in a block, set the block status of top page to 0 (:NG) without erasing it.
- ◆ As to pages with the page status being 1 (:NG), change the page status of the page to 0 (:data error) when writing in unused block.
- ◆ Even when updating only one page in a block, be sure to write all pages from the lowest-numbered page.

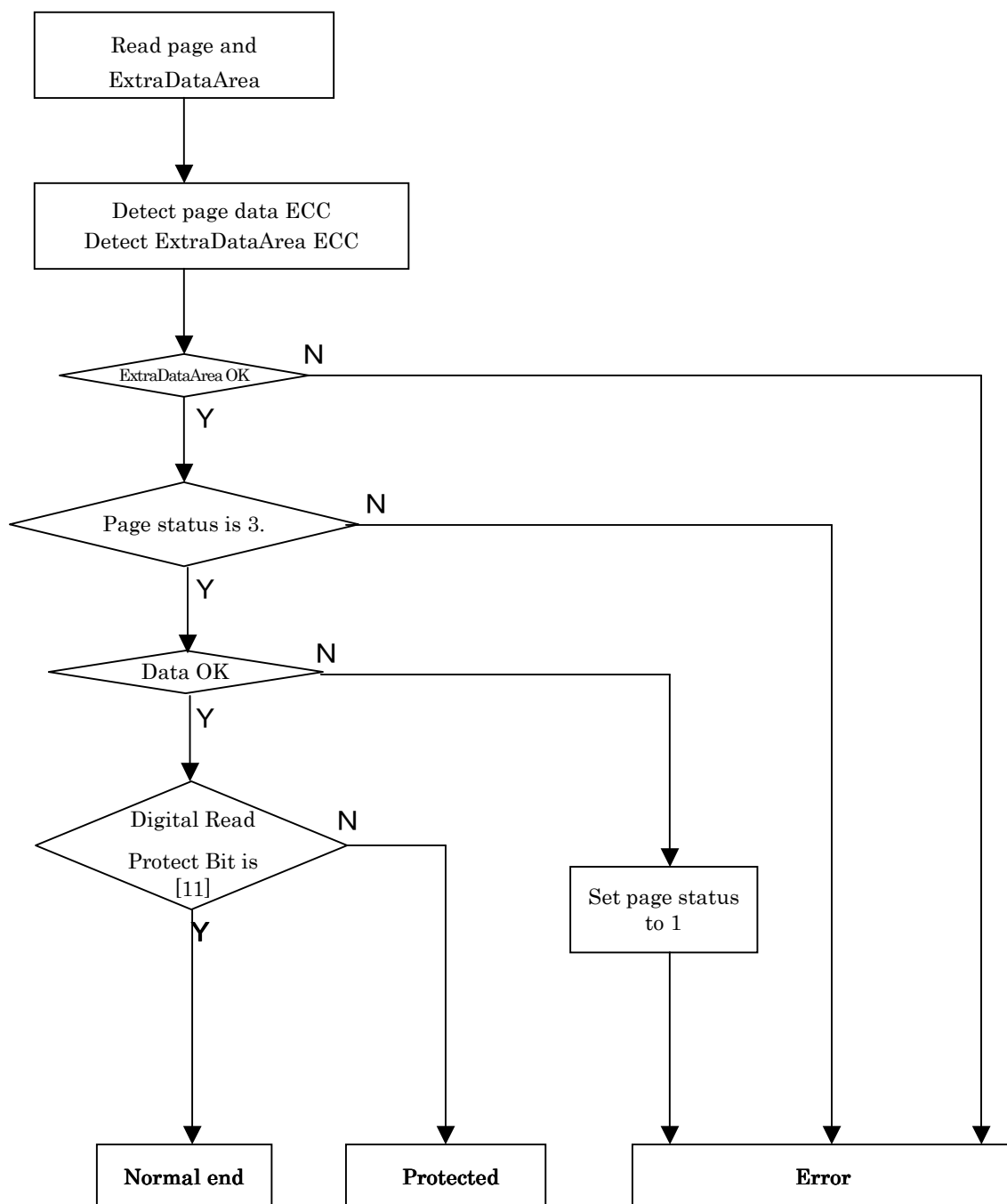
**7.11. Example of Sector Data Readout**

Fig. 7.11.1 Sector Data Readout Procedure

## 7.12. Example of Logical/Physical Translation Table Generation

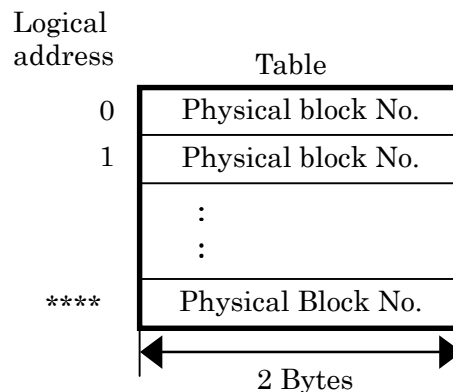


Fig. 7.12.1 Logical/physical Translation Table

### 7.12.1. Procedure Example of Table Generation

1. Initialize the entire table by 0xFFFF.
  2. Detect boot block, and read disabled block data.
  3. Read the ExtraDataArea of physical block (the top page) other than the disabled blocks in user area, retrieve the logical address set and write it in the table.
- ◆ Physical block with block status of 0, or page status of 1 is not written in the table because it is regarded as a block having later-developing defect.
  - ◆ If error occurs when reading ExtraDataArea, the block status of relevant block is set to 0, and is not written in the table because it is regarded as a block having later-developing defect.
  - ◆ If there are more than 2 blocks with same logical address, the block with update status of 0 is adopted. When it cannot be determined by the update status, block with larger physical address is adopted. The content of physical block which was not adopted (including ExtraDataArea) shall be erased.
  - ◆ For high speed processing, it is desirable to construct a table of alternate blocks, as well as the logical/physical translation table.



