MSX2 MEMORY MAPPER SPECIFICATION
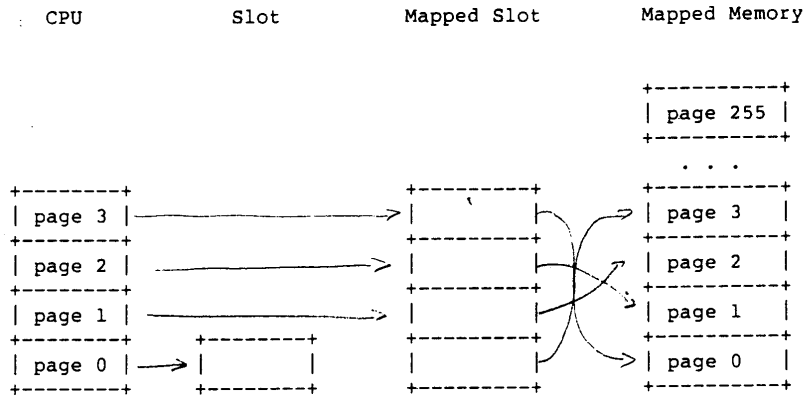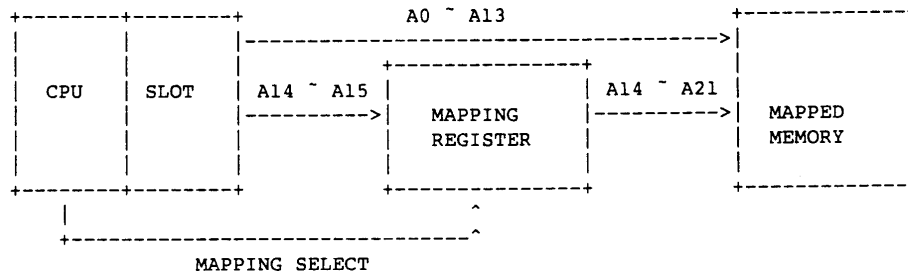
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1. Introduction

Memory Mapper is a device which is placed in a slot to change logical
addresses of CPU's memeory to physical address and expand the memory by 4M
bytes. You can map a maximum of 256 pages (16K byte). The mapping of logical
pages to physical pages is determined by the contents of mapping register. The
mapping registers are at FCH to FFH of I/O address. They are both read and
write addresses. Memory mapper is an option for MSX2 and minimum mapped memory
is to be 64K.

```
        I/O address    Page
               FCH        0
               FDH        1
               FEH        2
               FFH        3
```

Logical structure of Memeory Mapper

```
  CPU              Slot         Mapped Slot       Mapped Memory

                                              +----------+
                                              | page 255 |
                                              +----------+
                                                 . . .
+--------+         +---------+     +----------+
| page 3 |----------------------->|          |      | page 3   |
+--------+         +---------+     +----------+
| page 2 |  ------------------->|          |      | page 2   |
+--------+         +---------+     +----------+
| page 1 |  ------------------->|          |      | page 1   |
+--------+   +--------+     +---------+     +----------+
| page 0 |-->|        |     |          |      | page 0   |
+--------+   +--------+     +---------+     +----------+
```

Physical Structure of Memory Mapper

```
+--------+--------+           A0 ~ A13              +-------------+
|        |        |  |---------------------------------->|             |
|        |        |        +---------------+        |             |
|        |        |        |               | A14 ~ A21 |         |
| CPU    | SLOT   | A14 ~ A15 |           |---------->|             |
|        |        |  |---------->| MAPPING       |        | MAPPED      |
|        |        |        | REGISTER      |        | MEMORY      |
|        |        |        |               |        |             |
+--------+--------+        +---------------+        +-------------+
    |                              ^
    +------------------------------^
            MAPPING SELECT
```

Memory Mapper system software
      MSX2 system will initialise the mapping register as follows:-

I/O Address	Initial Data	Logical Page	Physical Page
FCH	03H	0	3
FDH	02H	1	2
FEH	01H	2	1
FFH	00H	3	0

The initialisation of Memory Mapper only writes the above value to the I/O
ports so it does not affect those hardware which does not have memory mapper.
The initialisation will not carry out a task to detect whether there is a
mapper or not. After the mapper is initialised the system software carries out
the basic ROM and RAM searchs. Whether the CPU's RAM is in Mapped slot or not
is entirely dependant on hardare of the slot. The slot and the amount of
mapped memory depends on the hardware so an application software will have to
find this out.

NOTES

Application software which uses the mapper must initialise the mapping address
when it returns the control to either BASIC or MSX DOS.

Commercail software which requires memory mapper should indicate 'Requires
xxxKBtye MEMORY MAPPER'.