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Title:

Flexible Disc Process

Keywords:

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Abstract:

This paper describes the conventions of an external process connected to a flexible disc unit.

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General Description

The flexible disc is a sequential device, which in one operation is able to transfer, at maximum, the contents of one sector. The device can support single and double paged discettes with different sector lengths.

A discette is divided into 77 cylinders, of which 75 are user accessible and 2 are used as alternative cylinders. A cylinder holds one track per surface used. A track may consist of either 26, 15 or 8 sectors holding relatively 128, 256 or 512 characters (8 bit units), - except for tracks on cylinder 0, which are always formatted as 26 sectors of 128 characters.

General Rules

Operations can be initiated by an internal process that has initialized or reserved the external process.

The external process can execute the following operations - sense, reset, input, output, set position, set limits, reformat and set mode.

In case of status errors (any status bit except write enable) the state of the device is changed to 'stopped' causing all messages, except reset, to be returned immediately with the erroneous status. The reset operation will reset the device by changing the state to 'running'.

Sense

The device is sensed and the status word delivered in the answer. If the status indicates no errors - the write enable bit is tolerated - the answer also holds the current logical position.

Reset

The device is turned into running state.

Input, Output

The current position is checked against the limit registers. The maximum amount of data that can be read or written is one sector. The data is transferred three characters a word, when reading unused positions in the last word. After input, unused positions in the last word will be filled in with zeroes. When writing less than one sector the remaining part of the sector is filled in with zeroes. After an input - output operation the current position will point out the next sector number, even when less than a sector has been transferred.

Set Position

If 'sector number' is inside the limit registers, it is inserted as 'current position'. The position is interpreted as a logical one, which means that the physical position is evaluated according to the current mode.

Set Limits

This operation inserts the two sector numbers, defined in the message in the lower and upper limit registers. The values are interpreted as logical sector numbers. The operation is returned with result unintelligible, if the lower limit is less than zero or more than the upper limit.

Reformat

At maximum two cylinders on a discette can be replaced using the alternative cylinders. The change of the discette format cannot be executed in connection with the

flexible disc driver described here, - but can be carried out under a special test-system. But using a reformatted discette the numbers of the bad cylinders must be messaged to the controller.

The reformat operation defines one or two cylinders that are to be replaced. The cylinder number zero indicates no replacement, and values outside the interval 0 to 255 will cause an answer with result unintelligible. The reformat operation leaves the current position as undefined.

Set Mode

This operation is used to define the format of the discette, as well as the mode of the operation. The mode field has the format:

| | | | | | | | |
|---|---|---|---|---|---|--|----|
| 0 | | 6 | 7 | 8 | 9 | | 11 |
| | T | | D | C | L | | V |

where

- T is trackformat. The values of T are 0 (26 sectors of 128 chars), 1 (15 sectors of 256 chars) and 2 (8 sectors of 512 chars).
- D indicates a double surface discette.
- C turns on the internal conversion.
- L indicates logical numbering in all operations concerning position. The sector numbers are interpreted as relative to cylinder 1, sector 0. In this mode the cylinder 0 cannot be accessed.
- V indicates verification, which means that all output operations are followed by a 'read after write' check.

The set mode operation leaves the current position as undefined.

Messages and Answers

| Operation | Message | Answer |
|--------------|---|--|
| sense | 0<12 | status 0 0 sector number |
| reset | 2<12 | 0 0 0 |
| input | 3<12 first storage address last storage address | status number of bytes transferred number of chars transferred |
| output | 5<12 first storage address last storage address | status number of bytes transferred number of chars transferred |
| set position | 6<12 dummy dummy sector number | status 0 0 |
| set limits | 8<12 lower limit upper limit | status 0 0 |
| reformat | 10<12 bad cylinder 1 bad cylinder 2 | status 0 0 |
| set mode | 14<12 + mode | status 0 0 |

Status Bits

| | |
|----|---|
| 0 | intervention |
| 1 | parity error |
| 2 | timer |
| 3 | data overrun |
| 5 | position outside limits |
| 8 | write enable |
| 9 | mode error, the trackformat specified does not correspond to the format of the actual discette |
| 10 | sector erased |
| 11 | sender stopped |

RETURN LETTER

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