

Date: September 9, 1994

To: Mr. John Lohmeyer, Chairman, X3T10

From: Mr. Ken Cummings, IBM, Tucson

Subject: Proposal for FORMAT MEDIUM command for Sequential Access Devices

This proposal is for a FORMAT MEDIUM command to be used with Sequential Access Devices. This command is required for an as-yet-to-be announced tape drive currently under development by IBM. This command supports other vendors as well.

The Operation Code (04x) is the same op code used by Direct Access devices. This code point is currently open in the Sequential Access device set of op codes.

The additional sense code: POSITION PAST BEGINNING OF MEDIUM, is a scanner ASC. However, it seems to fit and does not require the addition of another ASC. I request that this field (38h 0Ch) be extended to include sequential devices.

The Immed field is required because of the length of the format operation.

While the default mode is sufficient for today's requirements, a vendor-specific mode is included to allow for growth in formatting sequential medium.

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x.x.xx FORMAT MEDIUM command

The FORMAT MEDIUM command (see table 1) is used to prepare the medium for use by the logical unit.

Table 1 - FORMAT MEDIUM command

Bit	7	6	5	4	3	2	1	0
Byte								
0	Operation code (04h)							
1	Reserved				Verify Immed			
2	Reserved			Format				
3	MSB							
4	Transfer Length				LSB			
5	Control							

The FORMAT MEDIUM command is an optional command for Sequential Access devices.

The FORMAT MEDIUM command shall be rejected with RESERVATION CONFLICT status if the logical unit is reserved.

The FORMAT MEDIUM command will be accepted only when the medium is at Beginning of Tape (BOT) or Beginning of Partition 0 (BOP 0). If the medium is at other than these locations, the command will be rejected with CHECK CONDITION status. The sense key shall be ILLEGAL REQUEST, and the additional sense code shall be POSITION PAST BEGINNING OF MEDIUM.

A valid FORMAT MEDIUM command shall cause all data on the entire physical volume to be lost.

At the successful completion of a FORMAT MEDIUM command, the medium will be positioned at BOT or BOP 0, and will be un-initialized. Any prior data on the volume is no longer accessible.

During the format operation, the logical unit shall respond to commands as follows:

- a) In response to all commands except REQUEST SENSE and INQUIRY, the logical unit shall return CHECK CONDITION status unless a reservation conflict exists, in which case RESERVATION CONFLICT status shall be returned.

b) In response to the INQUIRY command, the logical unit shall respond as specified by that command.

c) In response to the REQUEST SENSE command, unless an error has occurred, the logical unit shall return a sense key of NOT READY and an additional sense code of LOGICAL UNIT NOT READY FORMAT IN PROGRESS, with the sense key specific bytes set for progress indication (as described in 8.2.14.1). Refer to 8.2.14.2 for a description of deferred error handling that may occur during the format operation.

An immediate (Immed) bit of zero indicates that the logical unit shall not return status until the FORMAT MEDIUM command has completed. An Immed bit of one shall return status as soon as the valid medium location has been verified and the command descriptor block of the FORMAT MEDIUM command has been validated. If CHECK CONDITION status is returned for a FORMAT MEDIUM command with an Immed bit of one, the format operation shall not be performed.

The verify field causes the logical unit to verify that the format was accomplished successfully. The method used to perform the verification operation is vendor-specific. The medium shall be at BOT or BOP 0 following the completion of the verify operation. If the verify operation determines that the format was not accomplished successfully, the logical unit shall return a sense key of MEDIUM ERROR and an additional sense code of MEDIUM FORMAT CORRUPTED. If the verify field is zero, the logical unit shall not perform the verify check.

The format field is defined in Table 2.

Table 2 - FORMAT MEDIUM format field

Mode	Description	Implementation requirements
0000b	Use Default Format	Mandatory
0001b to 0111b	Reserved	Reserved
1000b to 1111b	Vendor-specific	Vendor-specific

If the format field is 0000b, the device will determine which format to use. If the format field is 1000b to 1111b inclusive, the format to be used by the device is vendor-specific and is specified by the parameter data. The format of the parameter data is vendor-specific.

The transfer length specifies the length in bytes of format information that shall be transferred. If the format field is 0000b, the transfer length shall be zero. A transfer length of zero indicates that no format information shall be transferred. This shall not be considered to be an error condition. If the format field is

1000b to 1111b inclusive, the format of the transferred data shall be vendor-specific.