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To: SCSI-2 Optical Working Group
and Accredited Standards Committee X3T9.2

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Subject: MEDIA SCAN COMMAND
Proposed command for WORM and Optical Device Types

This is a minor rework of the proposal for the Search for Empty Blocks command (X3T9.2/86-99) based on the discussion at the Optical Working Group session on Monday, 19 January 1987. The name of the command is changed to more naturally incorporate the function of searching for written as well as for empty blocks.

At the Colorado Springs meeting, the suggestion by Mr. Snively (X3T9.2/86-122) was discussed but not adopted. It was felt that there was precedent in the Search commands for returning results in the Sense Data. Further, there is not sufficient room in a 12 byte command format to specify the three parameters without resorting to somewhat awkward 3 byte fields or uncomfortably restrictive field sizes for the Number of Blocks to Scan and/or Verify fields.

Media Scan Command

Peripheral Device Type: WORM, Optical Devices
Operation Type Code: Optional
Operation Code: Group 1, Op Code 38h

The Media Scan command will scan a defined range searching for a contiguous span of the media either empty or written. Results are posted in the Sense Data block.

The area of the media to be scanned starts with the Beginning Logical Block Address and is Number of Blocks to Scan in length. The Command will terminate when this area has been scanned or when a suitable extent Number of Blocks to Verify in length has been located.

A Number of Blocks to Scan of zero shall indicate that the scan shall continue to the end of the media if necessary.

A Number of Blocks to Verify of zero indicates that no scan shall take place. This shall not be considered an error condition.

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Command Descriptor Block:

BIT	7	6	5	4	3	2	1	0
0	Operation Code (38h)							
1	Logical Unit Number		Written Block		Assert Contig		Reverse Search Result	
2	(MSB) Beginning Logical Block Address							
3								
4								
5	Beginning Logical Block Address (LSB)							
6	Reserved							
7								
8	Parameter List Length (0 or 8)							
9	Vendor Unique		Reserved		Flag		Link	

Number of Blocks to Scan and Number of Blocks to Verify are specified with an optional Parameter Block. If this block is omitted by a Parameter List Length setting of zero, the Number of Blocks to Scan shall default to zero (scan to end of media) and the Number of Blocks to Verify shall default to one.

GOOD Completion Status will be returned if the scan completed (without errors) but did not find the required extent. The Valid bit shall be set to zero.

CONDITION MET Completion Status will be returned if the Number of Blocks to Verify extent has been located. The least address of the extent satisfying the scan will be posted in the Sense Data Information Bytes. The number of blocks verified shall be posted in the first four Additional Sense bytes. The Valid bit shall be set to one.

A Written Block Search bit of zero indicates that the command is to search for and verify a series of empty blocks. (This is the default operation.) A one indicates that written blocks are to be searched for.

An Assert Contiguous Data bit of zero specifies the default search algorithm. Logically, each block of the media shall be examined in the order specified by the Reverse Scan Direction bit.

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An Assert Contiguous Data bit of one directs the target to assume that all blocks being searched for (as specified by the Written Block Search bit, if any exist) form a contiguous extent extending to the limit of the area to be scanned. This is advisory to the target.

Implementors note: This definition is intended to allow any of a number of search algorithms of which the classic binary search is one example. Implementation of search algorithms beyond the default linear scan is optional.

The Reverse Search Direction bit if zero selects scanning in the default forward direction scan. Upon success, a forward direction search shall return via the Sense Data Information Bytes the least address of an extent closest to the Beginning Logical Block Address of the type specified in the Written Block Search bit.

The Reverse Search Direction bit if one selects a reverse direction search. Upon success, this shall return in the Sense Data Information Bytes the least address of an extent closest to the end of the area to be scanned Number of Blocks to Verify in length. The reverse direction search is an optional capability; targets which do not support this option shall return a CHECK CONDITION and set an ILLEGAL REQUEST Sense Key if this bit is a one.

A Partial Results OK bit of zero specifies that the scan shall continue after determining that a candidate extent did not meet the Number of Blocks to Verify criteria.

Partial Results OK, if one, specifies that the scan shall terminate as soon as any extent meeting the criteria given by the Written Block Search bit specification is found. The number of consecutive blocks found (up to Number of Blocks to Verify) is returned as the first four Additional Sense Data bytes. If the length of the extent found is equal to Number of Blocks to Verify, CONDITION MET shall be returned. Otherwise, if the scan completed without errors, GOOD completion status shall be returned. If no blocks meeting the Written Block Search bit specification are found the Valid bit of the Sense Data block shall be zero.

A Link bit of one indicates that a following command is linked to the Media Scan command. The linked command will be executed if the Media Scan terminated with CONDITION MET status. If this command has the Relative Address bit set the Logical Block Address determined by the Media Scan command will be used as a base address to compute the linked commands effective address.

Parameter Block:

BIT	7	6	5	4	3	2	1	0
BYTE								
0	(MSB)	Number of Blocks to Verify						
1								
2								
3		Number of Blocks to Verify						(LSB)
4	(MSB)	Number of Blocks to Scan						
5								
6								
7		Number of Blocks to Scan						(LSB)

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