Accredited Standards Committee *
X3, Information Processing Systems

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Project: X3T10-1228D
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Reply to: R. Roberts

To: Membership of X3T10
From: R. Reisch/R. Roberts
Subject: Minutes of X3T10 MMC II Working Group - May 6 and 7, 1997

AGENDA
DRAFT AGENDA
- 1.0 Openning Remarks
- 2.0 Introductions
- 3.0 Document Distribution
- 4.0 Call for Patents
- 5.0 Approval of Agenda
- 6.0 Meeting Agenda
    - 6.1 - Review ANSI EDITOR Comments to MMC1 (REV 09) Use Rev 10!
    - 6.2 - Review MMC2 Draft
        - 6.2.1 - Clause 5 "Feature Sets" (Philips)
        - 6.2.2 - Clause 6 "New Commands" (HP)
        - 6.2.3 - Clause 7 " Parameters"
        - 6.2.4 - Review Annexes
- 7.0 New Business
- 8.0 Review of Action Items
- 9.0 Future Meeting Schedule
- 10.0 Adjournment

Minutes:
1.0 Opening Remarks
Ron Roberts called the meeting to order at 9:00 AM on Tuesday 05/06/97. He thanked Charles Monia of Digital Equipment for hosting the meetings. Ron asked Mr. Rob Reisch of Kodak to act as recording secretary for the meetings.

2.0 Introductions
Introductions of attendees were made and a sign-up sheet was distributed. The following attendees were present during the two days of meetings:

Name:	Company:	E-mail address:
Ron Roberts	Apple Computer	rkroberts@alo.com
Robert Reisch	Eastman Kodak	reisch@kodak.com

Rob Sims   Hewlett Packard robsims@hootie.lvld.hp.com
Bill McFerrin   Philips   bill.mcferrin@na.km.philips.com
Devon Worrell   Western Digital worrell@dt.wdc.com
Masa Morizumi   Yamaha   mmorizumi@yamaha.com
Wen Lin   Adaptec   wenlin@btc.adaptec.com
Michael Nguyen   Fujitsu   michael.nguyen@fcpa.fujitsu.com

3.0 Document Distribution
Ron Roberts distributed hard and soft copies of the following documents:
Document Number   Title   File Name
X3.304:199X   SCSI 3 Multimedia Commands   mmc-r10a.doc
Note, only a soft copy of SCSI 3 Multimedia Commands was provided, all attendees had a note book
available for review of ANSI editor comments.
                                  Clause 01, rev 0, MMC II   cls01r0.doc
                                  Clause 02, rev 0, MMC II   cls02r0.doc
                                  Clause 03, rev 0, MMC II   cls03-r0.doc
                                  Clause 04, rev 1, MMC II   cls04-r1.doc
                                  Clause 05, rev 0, MMC II   cls05r0.doc
                                  Clause 07, rev 0, MMC II   cls07r0.doc

4.0 Call for Patents
The normal request for patent disclosures was made. No patents were identified.

5.0 Approval of Agenda
No modifications were made.

6.0 Meeting Agenda
        6.1 - Review ANSI EDITOR Comments to MMC I (REV 09) Use Rev 10

        A reviewed of the ANSI editor comments for MMC I, revision 9 was conducted.
        All edits were accepted and applied to revision 10 that resulted in MMC I , version
        10 A.

        6.2 - Review MMC2 Draft
                6.2.1 - Clause 5 "Feature Sets" (Philips)
                Bill and Randy of Philips presented the following "Feature Set"
                information:

0.1 READ CONFIGURATION Command
The Read Configuration command requests that the device respond with the current
configuration of the device and medium. This command is intended to provide information
to the initiator about the overall capabilities of the device and the current capabilities of
the medium installed. The maximum number of feature sets is 65,536; the maximum
number of bytes that a device may return to describe its features sets is 65,536.

The device shall always report feature set descriptors for every feature set supported by the device, even if the currently installed media does not support the given feature set. Both static and dynamic information shall be returned.

Table 1 - READ CONFIGURATION Command Descriptor Block

Bit Byte	7	6	5	4	3	2	1	0
0	Operation code (??h)							
1	Reserved							
2	Reserved							
3	Reserved							
4	Reserved							
5	Reserved							
6	Reserved							
7	Reserved							
8	(MSB)			Allocation_Length				
9								(LSB)
10	Reserved							
11	Control							

The Allocation_Length field specifies the maximum length in bytes of the read configuration list. An Allocation_Length field of zero indicates that no data shall be transferred. This condition shall not be considered an error.

The Read Configuration Parameter list returned contains a header, followed by zero or more fixed-length Feature Set Tables.

Table 2 - Read Configuration Parameter List

Bit Byte	7	6	5	4	3	2	1	0
0-7	Read Configuration Header							
8-n	Feature Set Table(s)							

Table 3 - Read Configuration Header

Bit Byte	7	6	5	4	3	2	1	0
0	(MSB)			Medium_Type				
1								
2								
3								
4								
5								(LSB)
6	(MSB)			Length_of_Feature_Sets				
7								(LSB)
8 - n	Feature Set Tables (1-n)							

Medium_Type allows an initiator to be able to differentiate between different types of media. The field is constructed as a union of the attributes of the media. It is useful for associating icons with a device and its medium or determining the default file system for an unwritten medium.

When the Allocation_Length field is 8, Length_of_Feature_Sets shall be the number of bytes that should be used in the Allocation_Length field to read all feature sets. When the Allocation_Length field is greater than 8, Length_of_Feature_Sets shall be the number of bytes that has been returned.

Table 4 - Medium Type Codes

Bit Code	Medium Attribute
000000000001_{16}	Rotating
000000000002_{16}	Streaming
000000000004_{16}	Fixed
000000000008_{16}	Removable
000000000010_{16}	Magnetic
000000000020_{16}	Optical
000000000040_{16}	Paper
000000000080_{16}	Plastic
000000000100_{16}	Read Only
000000000200_{16}	Write Once
000000000400_{16}	Read and Write
000000000800_{16}	Limited Read and Write Cycles
000000001000_{16}	CD
000000002000_{16}	DVD
000000004000_{16}	Audio
000000008000_{16}	Video
000000010000_{16}	Earth
000000020000_{16}	Wind
000000040000_{16}	Fire
000000080000_{16}	Water
000000010000_{16} - 800000000000_{16}	Reserved

Table 5 - Feature Set Table Response Format

Bit / Byte	7	6	5	4	3	2	1	0
0	(MSB)			Feature Set Code				
1								(LSB)
2	Current	Reserved			Revision			
3				Additional Feature Length				

Values that may be assigned to the Feature Set Code field are enumerated in Table 6.
The Current bit, indicates that the feature is available in the current configuration.
The Revision field provides the current revision number of the feature set.
The Additional Feature Length field indicates the number of additional feature set specific bytes that follow.

Table 6 - Feature Set List

Feature Set Code	Feature Set
1	Core Device
2	Core Block Device
3	Power Management
4	Failure Analysis (SMART)
5	Event Status Notification
6	Embedded Changer
7	Removable
8	Analog I/O
9	Content I/O
10	CDROM
11	CDR
12	CDRW
13	DVD-ROM
14	DVD-R
15	DVD-RAM
16	DVD Key Management
17	Core Sequential
18	Core A/V Streaming

Table 7 - C/DVD Feature Set

```
16 DVD Key Management
15 DVD-RAM
14 DVD-R
13 DVD-ROM
12 CD-RW
11 CD-R
10 CD-ROM
9 Content Digital I/O
8 Content Analog I/O
7 Removable
6 Embedded Changer
5 Event Status Notification
4 SMART
3 Power Management
2 Core Block
1 Core Device
```
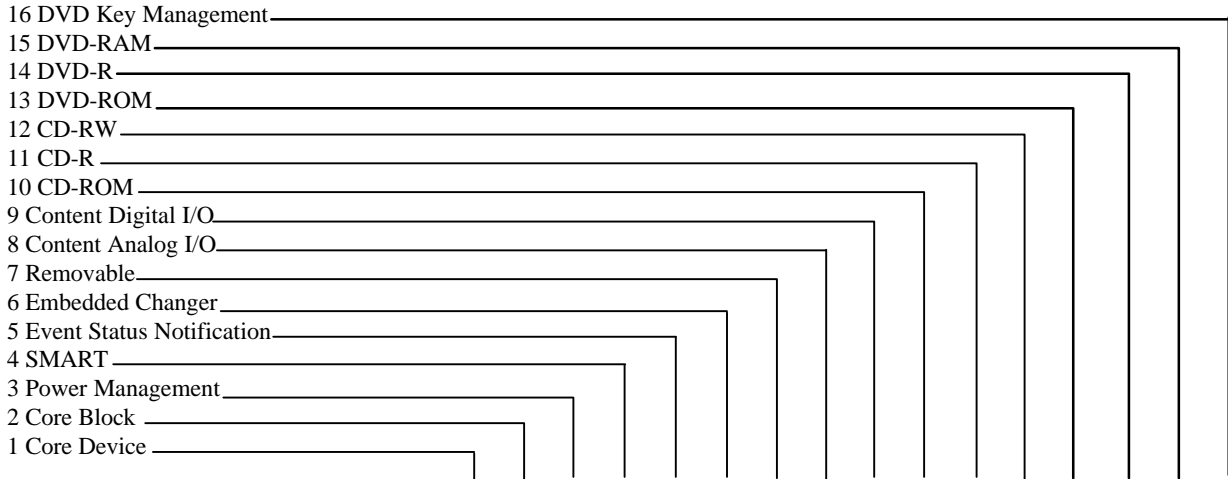
Command Name	Op Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Referer
Blank	A1h												X					MMC
Close Track/Session	5Bh											X	X					MMC
Format Unit	04h												X					MMC
Get Event Status Notification	4Ah			X		X												MMC
Inquiry	15h	X																SPC
Load/Unload Medium	A6h						X	X										MMC
Mechanism Status	BDh						X	X	X	X								MMC
Mode Select (10)	55h		X	X	X	X	X	X	X		X	X	X	X				SPC
Mode Sense (10)	5Ah		X	X	X	X	X	X	X		X	X	X	X				SPC
Pause/Resume	4Bh							X	X									MMC
Play Audio (10)	A5h								X									MMC
Play Audio MSF	47h								X									MMC
Play CD	BCh									X								MMC
Prevent/Allow Medium Removal	1Eh					X		X										SPC
Read (10)	28h		X								X	X	X	X	X	X		SBC
Read Buffer Capacity	5Ch										X	X	X					MMC
Read CD	BEh								X	X	X	X						MMC
Read CD MSF	B9h								X	X	X	X						MMC
Read Capacity	25h						X	X	X	X	X	X	X					MMC
Read Disc Information	51h								X	X	X	X						MMC
Read DVD Structure	ADh													X				MMC

Key: X = command is implemented
            E = returns error

Table 7 (cont) - C/DVD Feature Set

16 DVD Key Management
15 DVD-RAM
14 DVD-R
13 DVD-ROM
12 CD-RW
11 CD-R
10 CD-ROM
9 Content Digital I/O
8 Content Analog I/O
7 Removable
6 Embedded Changer
5 Event Status Notification
4 SMART
3 Power Management
2 Core Block
1 Core Device
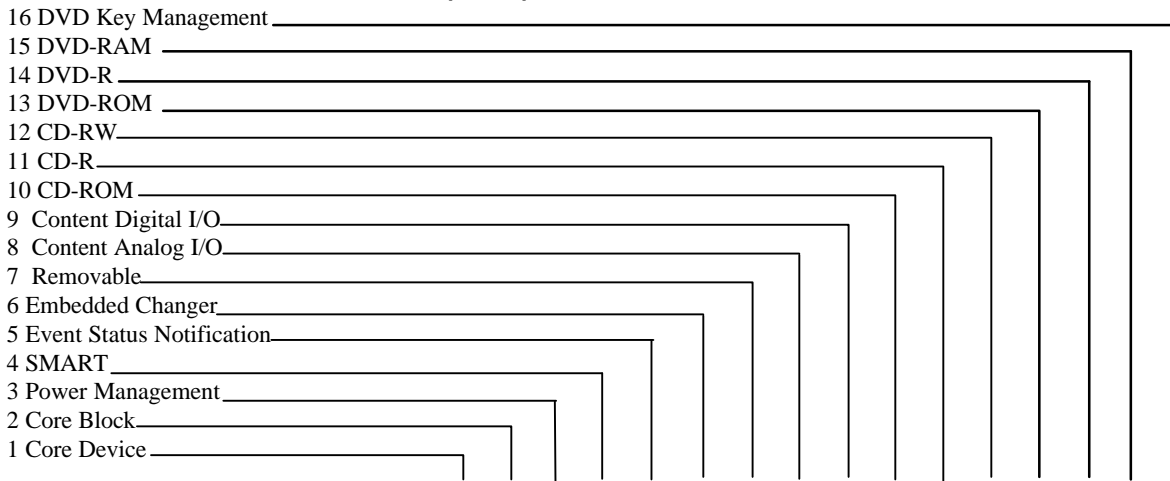
Command Name	Op Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Reference
Read Header	44h										X	X	X					MMC
Read Subchannel	42h								X	X	X	X	X					MMC
Read TOC/PMA/ATIP	43h								X	X	X	X	X					MMC
Read Track Information	52h										X	X	X					MMC
Repair Track	58h											X	X					MMC
Report Key	A4h																X	MMC-2
Request Sense	03h	X																
Reserve Track	53h											X	X					MMC
Send Key	A3h																X	MMC-2
Start/Stop Unit	1Bh			X				X										SBC
Stop Play	4Eh								X	X								MMC
Synchronize Cache	35h		X					X										MMC
Test Unit Ready	00h	X	X					X			X	X	X	X	X	X		SPC
Write(10)	2Ah		X								E	X	X	E	X			SBC
Write Buffer	3Bh		X								X	X	X	X	X	X		SPC
Write Verify(10)	2Eh		X								E	E	E	E				SBC
Write DVD Structure	BFh														X	X		MMC-2

Key: X = command implementation is mandatory
E = returns error

Table 8 - 1394 Hard Disk Drive Feature Set

```
5 Event Status Notification ─────────────────┐
4 SMART ──────────────────────────────┐     │
3 Power Management ────────────────┐   │     │
2 Core Block Device ──────────┐    │   │     │
```
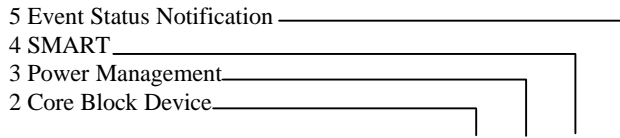
Command Name	Op Code	2	3	4	5	Reference
Mode Select (10)	55h	X	X	X	X	
Mode Sense (10)	5Ah	X	X	X	X	
Read (10)	28h					
Start/Stop Unit	1Bh		X			
Synchronize Cache	35h	X				
Test Unit Ready	00h	X				
Write	2Ah	X				
Write Verify	2Eh	X				
Write Buffer	3Bh	X				

Key: X = command is implemented
       E = returns error

Table 9 - 1394 Removable Disk Drive Feature Set

```
7 Removable
5 Event Status Notification
4 SMART
3 Power Management
2 Core Block
```
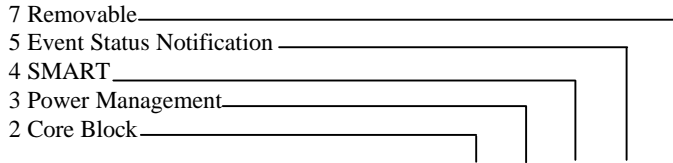
Command Name	Op Code	2	3	4	5	7	Reference
Load/Unload Medium	A6h					X	
Mode Select (10)	55h	X	X	X	X	X	
Mode Sense (10)	5Ah	X	X	X	X	X	
Prevent/Allow Medium Removal	1Eh					X	
Read (10)	28h						
Read Capacity	25h					X	
Start/Stop Unit	1Bh		X			X	
Synchronize Cache	35h	X					
Test Unit Ready	00h	X					
Write	2Ah	X					
Write Verify	2Eh	X					
Write Buffer	3Bh	X					

Devon, of Western Digital raised the following issues during the presentation:
1. Medium Type Code, Devon felt that medium type code was not a useful information for an O.S. .
2. The presentation did not define what a hard drive is. This is critical to understanding how a profile could limit the definition of a device's functionality.
3. Table 8, 1394 Hard Disk Drive Feature Set will only cause errors because it redefines information that is already defined within SMART, Power Management, etc. .
4. The correct goals for feature sets must be defined.

Feature Set Open Issue List
1. Feature set definitions need to be immutable (unchangeable).
2. Feature set needs to be defined across all devices and media types.
3. Feature set definitions will require that profile information for a device type will be placed in a separate section of a standards specification.
4. A decision weather Profile Information will be informative or normative in a standards specification.

Ron Roberts will integrate the information above information into Clause 5. The group will review the result.

Ron Roberts will maintain record speed information when integrating DVD information into MMC II.

      6.2.2 - Clause 6 "New Commands" (HP)

      Rob Sims pointed out that there were no new commands at this time. However, new behaviors for existing commands will be brought into MMC as they are developed.

      6.2.3 - Clause 7 " Parameters"

      6.2.4 - Review Annexes

7.0   New Business
8.0   Review of Action Items
Ron Roberts will integrate the information above information into Clause 5. The group will review the result.

Ron Roberts will maintain record speed information when integrating DVD information into MMC II.

Ron Roberts and Devon Worrell will resolve NDA issues associated with DVD-R and DVD-RAM

9.0   Future Meeting Schedule
Next meeting in Colorado Springs T10 plenary meeting the week of July 14.

10.0   Adjournment
The meeting adjourned at 4:00 PM, May 7, 1997.