Digital Imaging and Communications in Medicine (DICOM)

DICOM Supplement 69:

640 MB and 1.3 GB 90mm MOD Medium format and use in US profiles

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This Supplement has been prepared by the DICOM Working Group 12 according to the procedures of the DICOM Committee.

Foreword

The American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA) formed a joint committee to develop a standard for Digital Imaging and Communication in Medicine (DICOM). This DICOM Standard was developed according to the NEMA procedures.

This Standard is developed in liaison with other standardization organizations including CEN TC251 in Europe and JIRA in Japan, with review also by other organizations including IEEE, HL7 and ANSI in the USA.

The DICOM Standard is structured as a multi-part document using the guidelines established in the following document:

- ISO/IEC Directives, 1989 Part 3: Drafting and Presentation of International Standards.

This document is a Supplement to the DICOM Standard. It is an extension to Part 11 and 12 of the published DICOM Standard which consists of the following parts:

PS 3.1	-	Introduction and Overview
PS 3.2	-	Conformance
PS 3.3	-	Information Object Definitions
PS 3.4	-	Service Class Specifications
PS 3.5	-	Data Structures and Encoding
PS 3.6	-	Data Dictionary
PS 3.7	-	Message Exchange
PS 3.8	-	Network Communication Support for Message Exchange
PS 3.9	-	Point-to-Point Communication Support for Message Exchange
PS 3.10	-	Media Storage and File Format for Data Interchange
PS 3.11	-	Media Storage Application Profiles
PS 3.12	-	Media Formats and Physical Media for Data Interchange
PS 3.13	-	Print Management Point-to-Point Communication Support
PS 3.14	-	Grayscale Standard Display Function
PS 3.15	-	Security Profiles
PS 3.16	-	Content Mapping Resource

These parts are related but independent documents. Their development level and approval status may differ. Additional parts may be added to this multi-part standard. PS 3.1 should be used as the base reference for the current parts of this standard.

Supplement 69: 640 MB and 1.3 GB MOD Medium format and use in US profiles

Introduction - will not appear in final standard

I.1 INTRODUCTION

This supplement introduces the 640 MB and 1.3 GB 90mm MOD medium for DICOM storage. It is intended for US and US Multi-frame SOP Classes.

Two changes to the DICOM standard are introduced:

1. Part 11 is extended with a US application profile for 640 MB and 1.3 GB 90mm MOD

2. Part 12 is extended with the medium specification

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Changes to NEMA Standards Publication PS 3.11-2000

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Part 11: Media Storage Application Profiles

Add entries for 90mm 640 MB, 90mm 1.3 GB, and DVD-RAM to Table C.3-3 Media Classes:

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Table C.3-3 MEDIA CLASSES

Media	Media Classes	Media Format	PS 3.12
640MB 90mm MOD	MOD640	DOS unpartitioned (removable media)	Annex X
1.3GB 90mm MOD	MOD13	DOS unpartitioned (removable media)	Annex Y

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Changes to NEMA Standards Publication PS 3.12-2000

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Part 12: Media Formats and Physical Media for Data Interchange

Modify Section A.2 to permit media specific values for bytes/sector for different media types

~~The PC File System requires that the media be organized into 512 byte sectors. The media specific mechanism for doing this is in each media annex.~~ The PC File System requires that the media be organized into sectors. The media specific value for bytes/sector and the mechanism for doing this is in each media annex.

Modify Section A.2 to permit different values for bytes/sector for specific media types

Table A.2-1
BOOT SECTOR

Byte(s)	Value	Description
11 - 12	~~**0200H**~~ see note 5	~~**512**~~ bytes/sector

Modify media specific annexes to specify the bytes/sector for each specific media type

Add to Table B.2-2 to also specify the bytes/sector for 1.44 MB Diskette

Table B.2-2
BOOT SECTOR PARAMETER VALUES FOR 1.44 MB DISKETTE

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table C.2-1 to also specify the bytes/sector for 90mm 128 MB MO media

Table C.2-1
BOOT SECTOR PARAMETER VALUES FOR 90mm 128MB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table D.2-1 to also specify the bytes/sector for 130mm 650 MB MO media

Table D.2-1
BOOT SECTOR PARAMETER VALUES FOR 130mm 650MB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table E.2-1 to also specify the bytes/sector for 130mm 1.2 GB MO media

Table E.2-1
BOOT SECTOR PARAMETER VALUES FOR 130mm 1.2GB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table G.2-1 to also specify the bytes/sector for 90mm 230 MB MO media

Table G.2-1
BOOT SECTOR PARAMETER VALUES FOR 90mm 230MB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table H.2-1 to also specify the bytes/sector for 90mm 540 MB MO media

Table H.2-1
BOOT SECTOR PARAMETER VALUES FOR 90mm 540MB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add to Table I.2-1 to also specify the bytes/sector for 130mm 2.3 GB MO media

Table I.2-1
BOOT SECTOR PARAMETER VALUES FOR 130mm 2.3GB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0200H	512 bytes/sector

Add an Annex for 90mm 640 MB MO media

Annex X (Normative) 640 MB Magneto-Optical Disk

X.1 DICOM MAPPING TO MEDIA FORMATS

Only one DICOM File-set shall be stored onto a single 90mm disk.

X.2 MEDIA FORMATS

The media format comprises two distinct components:

a. The Recording format, which addresses magnetic recording, track definition, sector headers, etc.

b. The Logical format, which addresses the organization of the data portion of sectors to support semantics of the file system.

X.2.1 Recording Format

The low level formatting shall be done using the ISO/IEC 15041 standard. The Secondary Defect List shall be used.

X.2.2 Logical Format

The Logical Format for the 90mm 640MB disk shall be the PC File System (Annex A).

The boot sector defined in Annex A shall have the following values.

Table X.2-1
BOOT PARAMETER VALUES FOR 90mm 640 MB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0800H	2048 Bytes/Sector
13	08H, 10H, 20H, or 40H	Sectors / cluster, either 8, 16, 32, or 64
21	F8H	Flag for disk type F8H = Hard Disk
24-25	0019H (Nominal)	Nominally 25 sectors/track, but may vary, and any value should not affect interoperability
26-27	0001 (Nominal)	Nominally 1 head, but may vary, and any value should not affect interoperability.

Note: When formatted the total formatted capacity of the disk is approximately 640 MB.

X.3 PHYSICAL MEDIA

The physical media shall be the 90mm Magneto-Optical Rewritable disk with 2048 bytes per sector. It shall be compatible with the R/W Type cartridge defined in the ISO/IEC 15041 Data Interchange on 90mm Optical Disk Cartridges – Capacity 640 MB Per Cartridge standard.

Add an Annex for 90mm 1.3 GB MO media

Annex Y (Normative) 1.3 GB Magneto-Optical Disk

Y.1 DICOM MAPPING TO MEDIA FORMATS

Only one DICOM File-set shall be stored onto a single 90mm disk.

Y.2 MEDIA FORMATS

The media format comprises two distinct components:

a. The Recording format, which addresses magnetic recording, track definition, sector headers, etc.

b. The Logical format, which addresses the organization of the data portion of sectors to support semantics of the file system.

Y.2.1 Recording Format

The low level formatting shall be done using the GIGAMO standard. GIGAMO is published as a Sony-Fujitsu document and is currently not an ISO/IEC standard. The document specifying this formatting is the "GIGAMO 1.3GB 90mm Magneto-optical Disk System in Cherry Book version 1.0". The Secondary Defect List shall be used.

Y.2.2 Logical Format

The Logical Format for the 90mm 1.3GB disk shall be the PC File System (Annex A).

The boot sector defined in Annex A shall have the following values.

Table Y.2-1
BOOT PARAMETER VALUES FOR 90mm 1.3 GB MAGNETO-OPTICAL DISK

Byte(s)	Value	Description
11 - 12	0800H	2048 Bytes/Sector
13	08H, 10H, 20H, or 40H	Sectors / cluster, either 8, 16, 32, or 64
21	F8H	Flag for disk type F8H = Hard Disk
24-25	0019H (Nominal)	Nominally 25 sectors/track, but may vary, and any value should not affect interoperability
26-27	0001 (Nominal)	Nominally 1 head, but may vary, and any value should not affect interoperability.

Note: When formatted the total formatted capacity of the disk is approximately 1.3GB.

Y.3 PHYSICAL MEDIA

The physical media shall be the 90mm Magneto-Optical Rewritable disk with 2048 bytes per sector. It shall be compatible with the R/W Type cartridge defined in the "GIGAMO 1.3GB 90mm Magneto-optical Disk System in Cherry Book version 1.0".