
**Information technology — 8 mm wide
magnetic tape cartridge for information
interchange — Helical scan recording AIT-2
with MIC format**

*Technologies de l'information — Cartouche à bande magnétique de 8 mm
de large pour l'échange d'information — Enregistrement par balayage en
spirale AIT-2 avec format MIC*

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Section 1 – General	1
1 Scope	1
2 Conformance	1
2.1 Magnetic tape cartridge	1
2.2 Generating drive	1
2.3 Receiving drive	1
3 Normative references	2
4 Definitions	2
4.1 Absolute Frame Number (AFN)	2
4.2 a.c. erase	2
4.3 Access	2
4.4 algorithm	2
4.5 Area ID	2
4.6 Automatic Track Finding (ATF)	2
4.7 Average Signal Amplitude	2
4.8 azimuth	2
4.9 back surface	2
4.10 byte	2
4.11 cartridge	2
4.12 Channel bit	2
4.13 Codeword	2
4.14 Early Warning Point (EWP)	2
4.15 End of Data (EOD)	2
4.16 Entity	2
4.17 Error Correcting Code (ECC)	2
4.18 flux transition position	2
4.19 flux transition spacing	2
4.20 Frame	3
4.21 Housekeeping Frame	3
4.22 Logical Beginning of Tape (LBOT)	3
4.23 magnetic tape	3
4.24 Master Standard Amplitude Calibration Tape	3
4.25 Master Standard Reference Tape	3
4.26 Memory In Cartridge (MIC)	3
4.27 Partition Boundary	3
4.28 Physical Beginning of Tape (PBOT)	3
4.29 Physical End of Tape (PEOT)	3
4.30 physical recording density	3
4.31 pre-recording condition	3
4.32 processing	3
4.33 processed data	3
4.34 Processed Record	3
4.35 record	3
4.36 Reference Field	3
4.37 Secondary Standard Amplitude Calibration Tape	3
4.38 Secondary Standard Reference Tape	3
4.39 Separator Mark	4

4.40	Standard Reference Amplitude (SRA)	4
4.41	Tape Reference Edge	4
4.42	Typical Field	4
4.43	Standard Reference Current	4
4.44	Test Recording Current	4
4.45	track	4
4.46	unprocessed data	4
4.47	Unprocessed Record	4
5	Conventions and Notations	4
5.1	Representation of numbers	4
5.2	Names	4
6	Acronyms	4
7	Environment and safety	5
7.1	Test environment	5
7.2	Operating environment	5
7.3	Storage environment	5
7.4	Transportation	5
7.5	Safety	5
7.6	Flammability	5
Section 2 - Requirements for the case		6
8	Dimensional and mechanical characteristics of the case	6
8.1	General	6
8.2	Overall dimension	6
8.3	Holding areas	7
8.4	Cartridge insertion	7
8.5	Window	8
8.6	Loading grips	8
8.7	Label areas	8
8.8	Datum areas and Datum holes	8
8.9	Support areas	9
8.10	Recognition holes	10
8.11	Write-inhibit hole	10
8.12	Pre-positioning surfaces	11
8.13	Cartridge lid	11
8.14	Cartridge reel lock	13
8.15	Reel access holes	13
8.16	Interface between the reels and the drive spindles	14
8.17	Light path	15
8.18	Position of the tape in the case	15
8.19	Tape path zone	16
8.20	Tape access cavity	16
8.21	Tape access cavity clearance	16
8.22	Requirements for the MIC	16
8.23	Recognition recesses	18
Section 3 - Requirements for the unrecorded tape		38
9	Mechanical, physical and dimensional characteristics of the tape	38
9.1	Materials	38
9.2	Tape length	38
9.2.1	Length of magnetic tape	38
9.2.2	Length of leader and trailer tapes	38
9.2.3	Length of the splicing tapes	38
9.3	Tape width	38
9.3.1	Width of magnetic, leader and trailer tapes	38

9.3.2	Width and position of the splicing tape	38
9.4	Discontinuities	39
9.5	Tape thickness	39
9.5.1	Thickness of the magnetic tape	39
9.5.2	Thickness of the leader and trailer tape	39
9.5.3	Thickness of the splicing tape	39
9.6	Longitudinal curvature	39
9.7	Cupping	39
9.8	Coating adhesion	39
9.9	Layer-to-layer adhesion	40
9.10	Tensile strength	40
9.10.1	Breaking strength	40
9.10.2	Yield strength	40
9.11	Residual elongation	40
9.12	Electrical resistance of the recording surface	40
9.13	Tape winding	41
9.14	Light transmittance of the tape	41
9.15	Recognition stripe	41
10	Magnetic recording characteristics	42
10.1	Typical Field	42
10.2	Signal Amplitude	42
10.3	Resolution	42
10.4	Overwrite	42
10.5	Ease of erasure	43
10.6	Tape quality	43
10.6.1	Missing pulses	43
10.6.2	Missing pulse zone	43
10.7	Signal-to-Noise Ratio (SNR) characteristic	43
Section 4	Requirements for an interchanged tape	44
11	Format	44
11.1	General	44
11.2	Basic Groups	44
11.2.1	Entity	45
11.2.2	Group Information Table	45
11.2.3	Block Access Table (BAT)	47
11.3	Sub-Groups	50
11.3.1	G1 Sub-Group	50
11.3.2	G2 Sub-Group - Randomizing	51
11.3.3	G3 Sub-Group	52
11.4	Data Block	52
11.4.1	ID information	53
11.4.2	Recording of the ID Information in the Data Block Headers	55
12	Method of recording	61
12.1	Physical recording density	62
12.2	Long-term average bit cell length	62
12.3	Short-term average bit cell length	62
12.4	Rate of change	62
12.5	Bit shift	62
12.6	Read signal amplitude	62
12.7	Maximum recorded levels	62

13	Track geometry	62
13.1	Track configuration	62
13.2	Average track pitch	63
13.3	Variations of the track pitch	63
13.4	Track width	63
13.5	Track angle	63
13.6	Track edge straightness	63
13.7	Track length	63
13.8	Azimuth angles	63
14	Recorded patterns	64
14.1	Recorded Data Block	64
14.2	Margin blocks	64
15	Format of a track	64
15.1	Track structure	64
15.2	Positioning accuracy	65
15.3	Tracking scheme	66
16	Layout of the tape	66
16.1	Device Area	67
16.2	Reference Area	67
16.3	Position Tolerance Band No. 1	68
16.4	System Area	68
16.4.1	System Preamble	68
16.4.2	System Log	68
16.4.3	System Postamble	72
16.4.4	Position Tolerance Band No. 2	72
16.4.5	Vendor Group Preamble	72
16.5	Data Area	72
16.5.1	Vendor Group	72
16.5.2	Recorded Data Group	72
16.5.3	ECC3	72
16.5.4	Multiple Recorded Instances	73
16.5.5	Repeated Frames	73
16.5.6	Appending and overwriting	74
16.6	EOD Area	75
16.7	Optional Device Area	75
16.8	Logical End Of Tape (LEOT)	76
16.9	Logical Beginning of Tape (LBOT)	76
16.10	Early Warning Point - EWP	76
16.11	Empty Partition	76
16.12	Initialization	76
17	Housekeeping Frames	77
17.1	Amble Frames	77
17.2	System Amble Frames	77
18	Content of the MIC	78
Annexes		
A	Measurement of light transmittance	79
B	Measurement of Signal-to-Noise Ratio	82
C	Method for determining the nominal and the maximum allowable recorded levels (pre-recording condition)	83
D	Representation of 16-bit words by 20-Channel bits patterns	84
E	Measurement of bit shift	86

F - Method of measuring the straightness of track edges	88
G - ECC calculation	89
H - Recommendations for transportation	92
J - Read-After-Write	93
K - Example of the content of a Basic Group No. 0	94
L - Examples of chip	95

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 18810 was prepared by ECMA (as ECMA-292) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annexes A to G form a normative part of this International Standard. Annexes H to L are for information only.

Information technology — 8 mm wide magnetic tape cartridge for information interchange — Helical scan recording AIT-2 with MIC format

Section 1 – General

1 Scope

This International Standard specifies the physical and magnetic characteristics of an 8 mm wide magnetic tape cartridge containing a memory chip to enable physical interchange of such cartridges between drives. It also specifies the quality of the recorded signals, the recording method and the recorded format - called Advanced Intelligent Tape No.2 with Memory In Cartridge (AIT-2 with MIC) - thereby allowing data interchange between drives by means of such magnetic tape cartridges. The System Log are recorded in the MIC.

This International Standard specifies two types of cartridge depending on the thickness of the magnetic tape contained in the case.

Information interchange between systems also requires, at a minimum, agreement between the interchange parties upon the interchange code(s) and the specifications of the structure and labelling of the information on the interchanged cartridge.

2 Conformance

2.1 Magnetic tape cartridge

A tape cartridge shall be in conformance with this International Standard if it meets all the mandatory requirements specified herein. The tape requirements shall be satisfied throughout the extent of the tape.

2.2 Generating drive

A drive generating a magnetic tape cartridge for interchange shall be in conformance with this International Standard if all recordings on the tape meet the mandatory requirements of this International Standard, and if either or both methods of appending and overwriting are implemented. In addition, such a drive shall be able to record the System Log in the MIC.

A claim of conformance shall state which of the following optional features are implemented and which are not

- the performing of a Read-After-Write check and the recording of any necessary repeated frames;
- the generation of ECC3 Frames.

In addition a claim of conformance shall state

- whether or not one, or more, registered algorithm(s) are implemented within the system and are able to compress data received from the host prior to collecting the data into Basic Groups, and
- the registered identification number(s) of the implemented compression algorithm(s).

2.3 Receiving drive

A drive receiving a magnetic tape cartridge for interchange shall be in conformance with this International Standard if it is able to handle any recording made on the tape according to this International Standard. In particular it shall

- be able to read the System Log recorded in the MIC,
- be able to recognise repeated frames, and to make available to the host, data and Separator Marks from only one of these frames;
- be able to recognise multiple representations of the same Basic Group, and to make available to the host, data and Separator Marks from only one of these representations;
- be able to recognise an ECC3 frame, and ignore it if the system is not capable of using ECC3 check bytes in a process of error correction;
- be able to recognise processed data within an Entity, identify the algorithm used, and make its registered identification number available to the host;
- be able to make processed data available to the host.

In addition a claim of conformance shall state

- whether or not the system is capable of using ECC3 check bytes in a process of error correction;
- whether or not one or more de-compression algorithm(s) are implemented within the system, and are able to be applied to compressed data prior to making such data available to the host;
- the registered identification number(s) of the compression algorithm(s) for which a complementary de-compression algorithm is implemented.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 527-3:1995	<i>Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets.</i>
ISO 1302:1992	<i>Technical drawings — Method of indicating surface texture.</i>
ISO/IEC 11576:1994	<i>Information technology — Procedure for the registration of algorithms for the lossless compression of data.</i>
IEC 60950:1999	<i>Safety of information technology equipment.</i>