

INTERNATIONAL
STANDARD

ISO/IEC
15757

First edition
1998-07-15

**Information technology — Data interchange
on 8 mm wide magnetic tape cartridge —
Helical scan recording — DA-2 format**

*Technologies de l'information — Échange de données sur cartouche de
bande magnétique de 8 mm de large — Enregistrement par balayage en
spirale — Format DA-2*



Reference number
ISO/IEC 15757:1998(E)

Contents

Section 1 - General	1
1 Scope	1
2 Conformance	1
2.1 Magnetic tape cartridges	1
2.2 Generating drive	1
2.3 Receiving drive	1
3 Normative references	1
4 Definitions	1
4.1 a.c. erase:	2
4.2 algorithm	2
4.3 append point	2
4.4 Average Signal Amplitude	2
4.5 azimuth	2
4.6 back surface	2
4.7 bit cell	2
4.8 byte	2
4.9 cartridge	2
4.10 Channel bit	2
4.11 Cluster	2
4.12 Cyclic Redundancy Check (CRC) character	2
4.13 Digital Sum Variation (DSV)	2
4.14 Error Correcting Code (ECC)	2
4.15 File Mark	2
4.16 flux transition spacing	2
4.17 Logical Beginning of Partition (LBOP)	2
4.18 Logical Block	2
4.19 magnetic tape	2

4.20 Master Standard Reference Tape	2
4.21 Partition	2
4.22 Physical Beginning of Partition (PBOP)	2
4.23 Physical Beginning of Tape (PBOT)	2
4.24 Physical End of Partition (PEOP)	2
4.25 Physical End of Tape (PEOT)	2
4.26 physical recording density	2
4.27 Read Back Check (RBC)	2
4.28 Reference Field	2
4.29 Secondary Standard Reference Tape (SSRT)	2
4.30 Set Mark	3
4.31 Standard Reference Amplitude (SRA)	3
4.32 Standard Reference Current (Ir)	3
4.33 Tape Reference Edge	3
4.34 Test Recording Current (TRC)	3
4.35 Track	3
4.36 Typical Field	3
5 Conventions and Notations	3
5.1 Representation of numbers	3
5.2 Names	3
5.3 Reserved fields	3
6 Acronyms	3
7 Environment and Safety	4
7.1 Testing environment	4
7.2 Operating environment	4
7.3 Storage environment	4
7.4 Transportation	4
7.5 Safety	4
7.6 Flammability	4
Section 2 - Requirements for the case	5
8 Dimensional and mechanical characteristics of the case	5
8.1 General	5
8.2 Overall dimension	5
8.3 Holding areas	6
8.4 Cartridge insertion	6
8.5 Window	7
8.6 Loading grips	7
8.7 Label areas	7
8.8 Datum areas and datum holes	7
8.9 Support areas	8
8.10 Recognition holes	9
8.11 Write-inhibit hole	9

8.12 Pre-positioning surfaces	10
8.13 Cartridge lid	10
8.14 Cartridge reel lock	11
8.15 Reel access holes	12
8.16 Interface between the reels and the drive spindles	12
8.17 Light path	13
8.18 Position of the tape in the case	14
8.19 Tape path zone	14
8.20 Tape access cavity	14
8.21 Tape access cavity clearance requirements	15
Section 3 - Requirements for the Unrecorded Tape	31
9 Mechanical, physical and dimensional characteristics of the tape	31
9.1 Materials	31
9.2 Tape length	31
9.2.1 Length of magnetic tape	31
9.2.2 Length of leader and trailer tapes	31
9.2.3 Splicing tape	31
9.3 Width	31
9.3.1 Width of magnetic, leader and trailer tape	31
9.3.2 Width and position of splicing tape	31
9.4 Discontinuities	31
9.5 Thickness	31
9.5.1 Thickness of magnetic tape	31
9.5.2 Thickness of leader and trailer tape	31
9.5.3 Thickness of splice tape	31
9.6 Longitudinal curvature	32
9.7 Cupping	32
9.8 Coating adhesion	32
9.9 Layer-to-layer adhesion	33
9.10 Tensile strength	33
9.10.1 Breaking strength	33
9.10.2 Yield strength	33
9.11 Residual elongation	33
9.12 Electrical resistance of the recording surface	34
9.13 Tape winding	34
9.14 Light transmittance of tape	34
9.15 Data cartridge recognition stripe	34
10 Magnetic recording characteristics	35
10.1 Test conditions	35
10.2 Typical Field	35
10.3 Signal Amplitude	35
10.4 Resolution	35
10.5 Narrow-band Signal-to-Noise Ratio	36
10.6 Ease of erasure	36

10.7 Tape quality	36
10.7.1 Missing pulses	36
10.7.2 Missing pulse zone	36
10.7.3 Overwrite	36
Section 4 - Requirements for an Interchanged Tape	37
11 Format of a track pair	37
11.1 General	37
11.2 Physical block format	38
11.2.1 General	38
11.2.2 Common header fields	39
11.2.3 Data Block	40
11.2.4 Erase Block	41
11.2.5 Diagnostic Block	41
11.2.6 Physical Beginning of Partition (PBOP) Block	41
11.2.7 Long File Mark Block	42
11.2.8 Short File Mark Block	42
11.2.9 Logical Beginning of Partition (LBOP) Block	43
11.2.10 Set Mark Block	44
11.2.11 Gap Block	45
11.2.12 End of Data (EOD) Block	45
11.2.13 Recorded patterns	45
11.3 Search field format	46
11.3.1 Search field data	46
11.3.2 Search field ECC	47
11.3.3 Search field recording patterns	48
11.4 Servo area	49
11.5 Track layout	50
12 Method of recording	51
12.1 Physical Recording Density	51
12.1.1 Long Term Average Bit Cell Length	51
12.1.2 Short Term Average Bit Cell Length	52
12.1.3 Rate of Change	52
12.2 Bit Shift	52
12.3 Amplitude of Data Signals	52
13 Track geometry	52
13.1 General	52
13.2 Average track pitch - C	52
13.3 Track pitch variation	53
13.4 Track width - B	53
13.5 Track angle - A	53
13.6 Track length - E	53
13.7 Guard band - F	53
13.8 Azimuth angles	53

13.9 Track linearity	53
14 Layout of a tape	53
14.1 General	53
14.2 Tape History Log (THL)	54
14.3 Physical Beginning of Partition	54
14.4 Logical Beginning of Partition	54
14.5 Data area	54
14.5.1 General	54
14.5.2 Short File Mark	54
14.5.3 Long File Mark	54
14.5.4 Set Mark	54
14.6 End of Data	54
14.7 Physical End of Partition (PEOP)	54

Annexes

A - Measurement of Light Transmittance of Tape and Leaders	55
B - Measurement of bit shift	58
C - Representation of 8-bit bytes by 10-bit patterns	60
D - Generation of Data Area CRC	67
E - Generation of ECC	68
F - Generation of Logical Block CRC	70
G - Generation of Hamming Code ECC	71
H - Generation of Search Field CRC	72
J - Randomization	73
K - Recommendations for transportation	74

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.

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.

International Standard ISO/IEC 15757 was prepared by ECMA (as ECMA-249) 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 J form an integral part of this International Standard. Annex K is for information only.

Information technology — Data interchange on 8 mm wide magnetic tape cartridge — Helical scan recording — DA-2 format

Section 1 - General

1 Scope

This International Standard specifies the physical and magnetic characteristics of a 8 mm wide magnetic tape cartridge 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, thereby allowing data interchange between drives by means of such magnetic tape cartridges.

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 cartridges

A magnetic tape cartridge shall be in conformance with this International Standard if it satisfies all mandatory requirements of this International Standard throughout the extent of the tape.

2.2 Generating drive

A drive generating a magnetic tape cartridge for interchange shall be entitled to claim conformance with this International Standard if all the recordings that it makes on a tape meet the mandatory requirements of this International Standard. A claim of conformance shall state whether or not one or more registered compression algorithm(s) are implemented within the system to process data from the host prior to allocating data to physical blocks.

2.3 Receiving drive

A system receiving a magnetic tape cartridge for interchange shall be entitled to claim conformance with the International Standard if it is able to handle any recording on this tape according to this International Standard. A receiving drive shall be able to recognize the use of a data compression algorithm and make the algorithm registration number available to the host.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 527-1:1993,	<i>Plastics — Determination of tensile properties — Part 1: General principles.</i>
ISO 1302:1992,	<i>Technical drawings — Method of indicating surface texture.</i>
ISO/IEC 11576:1995,	<i>Information technology — Procedure for the registration of algorithms for the lossless compression of data.</i>
IEC 950:1991,	<i>Safety of information technology equipment.</i>