Australian Standard®

Information technology—3.81 mm wide magnetic tape cartridge for information interchange—Helical scan recording—DDS format

This Australian Standard was prepared by Committee IT/10, Information Systems—Equipment. It was approved on behalf of the Council of Standards Australia on 31 July 1992 and published on 19 October 1992.

The following interests are represented on Committee IT/10:
Australian Bankers Association
Australian Information Industry Association
Data media manufacturers
Interface developers
La Trobe University

Review of Australian Standards. To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

Australian Standard®

Information technology—3.81 mm wide magnetic tape cartridge for information interchange—Helical scan recording—DDS format

First published as AS 4062—1992.

PREFACE

This Standard was prepared by the Standards Australia Committee on Information Systems—Equipment. It is identical with and has been reproduced from ISO/IEC 10777:1991 Information technology—3.81 mm wide magnetic tape cartridge for information interchange—Helical scan recording—DDS format.

Under arrangements made between Standards Australia and the international Standards bodies, ISO and IEC, as well as certain other Standards organizations, users of this Australian Standard are advised of the following:

- (a) Copyright is vested in Standards Australia.
- (b) The number of this Standard is not reproduced on each page; its identity is shown only on the cover and title pages.

For the purposes of this Australian Standard, the ISO/IEC text should be modified as follows:

Terminology The words 'Australian Standard' should replace the words 'International Standard' wherever they appear.

Decimal comma The decimal point should replace the decimal comma wherever it appears.

© Copyright - STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

			Page
Se	ction	1 - General	8
1	Scope	8	
2	Confo	8	
	2.1	Magnetic tape cartridge	8
	2.2	Generating system	8
	2.3	Receiving system	8
3	Norm	9	
4	Definitions		
	4.1	Absolute Frame Number (AFN)	9
	4.2	automatic track finding (ATF)	9
	4.3	Area ID	9
	4.4	Average Signal Amplitude	9
	4.5	azimuth	9
	4.6	back surface	9
	4.7	byte	9
	4.8	cartridge	9
	4.9	Channel bit	9
	4.10	Data Format ID	9
	4.11	Early Warning Point (EWP)	9
	4.12	End of Data (EOD)	9
	4.13	Error Correcting Code (ECC)	9
	4.14	flux transition position	9
	4.15	flux transition spacing	9
	4.16	frame	9
	4.17	housekeeping frame	9
	4.18	Logical Beginning of Tape (LBOT)	10
	4.19	magnetic tape	10
	4.20	Master Standard Amplitude Calibration Tape	10
	4.21	Master Standard Reference Tape	10
	4.22	Optimum Recording Field	10
	4.23	Partition boundary	10
	4.24	Physical Beginning of Tape (PBOT)	10
	4.25	Physical End of Tape (PEOT)	10
	4.26	physical recording density pre-recording condition	10
	4.27	record	10
	4.28 4.29		10 10
	4.29	Reference Recording Field Secondary Standard Amplitude Calibration Tape	10
			10
	·		10
	7.3∠	separator	10

	4.33	Standard Reference Amplitude	11	
	4.34	Tape Reference Edge	11	
	4.35	Test Recording Current	11	
	4.36	track	11	
	4.37	Virtual End of Tape (VEOT)	11	
5	Envir	11		
	5.1	Testing environment	11	
	5.2	Operating environment	11	
	5.3	Storage environment	11	
	5.4	Transportation	12	
	5.5	Safety	12	
	5.6	Flammability	12	
Sec	ction	2 - Requirements for the case	12	
6	Dime	ensional and mechanical characteristics of the case	12	
	6.1	General	12	
	6.2	Overall dimensions (figures 6 and 7)	13	
	6.3	Loading grip (figure 6)	13	
	6.4	Holding areas (figure 6)	13	
	6.5	Notches of the lid (figures 5 and 8)	13	
	6.6	Lid dimensions (figures 6 to 8)	14	
	6.7	Optical detection of the Beginning and End of Tape (figures 9 and 1		
	6.8	Bottom side (figures 10 and 11)	15	
		6.8.1 Locking mechanism of the slider	15	
		6.8.2 Access holes	16	
		6.8.3 Recognition, Sub-datums, and Write-inhibit Holes	16	
		6.8.4 Datum Holes	18	
		6.8.5 Access room for tape guides	18	
		6.8.6 Holes for accessing the hubs	19	
		6.8.7 Internal structure of the lower half (figure 12)	19	
		6.8.8 Light path (figure 12)	20	
		6.8.9 Support Areas (figure 13)	20	
		6.8.10 Datum Areas (figure 13)	21	
		6.8.11 Relationship between Support and Datum Areas and Refere Plane Z (figure 14)	nce 21	
	6.9	Hubs (figures 15, 16)	21	
	6.10	Leader and trailer attachment		
	6.11	1 Interface between the hubs and the drive spindles (figure 17)		
	6.12	2 Opening of the lid (figure 18)		
	6.13	3 Release of the hub locking mechanism (figures 19, 20)		
	6.14	Label areas (figure 21, 22)	23	
Sec	ction	3 - Requirements for the unrecorded tape	34	
7	Mechanical, physical and dimensional characteristics of the tape			
	7.1	Materials	34	
	7.2	Tape length	34	

		7.2.1	Length of magnetic tape	34		
		7.2.2	Length of leader and trailer tapes	34		
	7.3	Tape w	idth	34		
	7.4	Discontinuities				
	7.5	Total thickness				
	7.6	Longitudinal curvature				
	7.7	Cupping				
	7.8	Coating	gadhesion	35		
	7.9	Layer-to	35			
	7.10	Tensile	strength	36		
		7.10.1	Breaking strength	36		
		7.10.2	Yield strength	36		
	7.11	Residua	al elongation	36		
	7.12	Electric	cal resistance of coated surfaces	36		
	7.13	Light tr	ransmittance of the tape	37		
8	Magn	etic reco	rding characteristics	37		
	8.1	Optimu	m Recording Field	38		
	8.2	Signal a	amplitude	38		
	8.3	Resolution				
	8.4	Overwr	ite	38		
		8.4.1	Physical recording densities of 750,6 ftpmm and 3002 ftpmm	38		
		8.4.2	Physical recording densities of 83,4 ftpmm and 1001 ftpmm	39		
	8.5	Ease of	erasure	39		
	8.6	Tape qu	uality	39		
		8.6.1	Missing pulses	39		
		8.6.2	Missing pulse zone	39		
	8.7	Signal-t	to-noise ratio (S/N) characteristic	39		
Se	ction 4	4 - Req	uirements for an interchanged tape	40		
9	Format					
	9.1	9.1 General				
	9.2	Basic G	Groups	40		
		9.2.1	Group Information Table	41		
		9.2.2	Block Access Table	44		
	9.3	Sub-Gro	oups	46		
		9.3.1	G1 Sub-Group	46		
		9.3.2	G2 sub-Group - Randomizing	47		
		9.3.3	G3 Sub-Group	47		
		9.3.4	G4 Sub-Group	49		
		9.3.5	Main Data Block	53		
	9.4	Sub Da	ta Area	55		
		9.4.1	Pack Item No. 1	55		
		9.4.2	Pack Item No. 2	56		
		9.4.3	Pack Item No. 3	57		

		9.4.4 Pack Item No. 4	58			
		9.4.5 Pack Item No. 5	60			
		9.4.6 Pack Item No. 6	61			
		9.4.7 Pack Item No. 7	62			
		9.4.8 Pack Item No. 8	63			
		9.4.9 Sub Data Block	63			
10	Metho	68				
	10.1	Physical recording density	68			
	10.2	Long-term average bit cell length	68			
	10.3	Short-term average bit cell length	68			
	10.4	Rate of change	68			
	10.5					
	10.6	0.6 Read signal amplitude				
	10.7	0.7 Maximum recorded levels				
11	Track	geometry	68			
	11.1	Track configuration	68			
	11.2	Average track pitch	69			
	11.3	Variations of the track pitch	69			
	11.4	Track width	69 70			
	11.5	1.5 Track angle				
	11.6	Track edge linearity	70			
	11.7	1.7 Track length				
	11.8	1.8 Ideal tape centreline				
	11.9	Azimuth angles	70			
12						
	12.1	.1 Recorded Main Data Block				
	12.2	.2 Recorded Sub Data Block				
	12.3	Margin Blocks, Preamble Blocks and Postamble Blocks	70			
	12.4	2.4 Spacer Blocks				
13	Format of a track					
	13.1	Track capacity	71 71			
	13.2	•				
	13.3	Tracking scheme	71			
14	-	Layout of a Single Data Space tape				
	14.1	Device Area	74 75			
	14.2					
	14.3	Position Tolerance Band No. 1	75			
	14.4	System Area	75			
		14.4.1 System Preamble	75			
		14.4.2 System Log	75			
		14.4.3 System Postamble	75			
		14.4.4 Position Tolerance Band No. 2	75			
		14.4.5 Vendor Group Preamble	75			

	14.5	Data A	rea	75
		14.5.1	Vendor Group	76
		14.5.2	Recorded Data Group	76
		14.5.3	ECC3	76
		14.5.4	Multiple recorded instances	77
		14.5.5	Repeated frames	77
		14.5.6	Appending and overwriting	78
	14.6	EOD A	rea	79
	14.7	Post-EC	DD Area	80
	14.8	Early V	Varning Point - EWP	80
	14.9	Initializ	zation	80
15	Layou	it of a Pa	artitioned tape	80
	15.1	Overall	magnetic tape layout	81
		15.1.1	Device Area	81
		15.1.2	Partition 1	81
		15.1.3	Partition 0	82
	15.2	Area IS		83
	15.3	System	Area Pack Items No. 3 and No. 4	83
	15.4	Empty	Partition	83
	15.5	Initializ	zation of Partitioned Tapes	83
16	House	ekeeping	frames	83
	16.1	Amble	Frames	84
	16.2	System	Log Frames	84
	16.3	Tape M	fanagement Frames	84
Anr	nexes			
Anr	nex A -	- Measure	ement of the light transmittance of the prisms	85
Anr	nex B -	Recogni	ition Holes	87
Anr	nex C -	Means t	to open the lid	88
Anr	nex D -	- Measur	ement of light transmittance of tape and leaders	89
Anr	nex E -	Measure	ement of Signal-to-Noise Ratio	92
Anr	nex F -	Method recorded	for determining the nominal and the maximum allowable levels	93
Anr	nex G -	Represe	entation of 8-bit bytes by 10-bit patterns	94
Anr	nex H -	- Measure	ement of bit shift	100
Anr	nex J -	Recomm	nendations for transportation	103
Anr	nex K -	Method	of measuring track edge linearity	104
Anr	nex L -	Read-A	fter-Write	105
Anr	nex M	- Exampl	le of the content of a Basic Group No. 0	106

Information technology—3.81 mm wide magnetic tape cartridge for information interchange—Helical scan recording—DDS format

Section 1 - General

1 Scope

This International Standard specifies the physical and magnetic characteristics of such cartridges. It also specifies the quality of the recorded signal, the format and the recording method, thereby allowing data interchange by means of such magnetic tape cartridges.

2 Conformance

2.1 Magnetic tape cartridge

A tape cartridge shall be in conformance with this International Standard if it meets all mandatory requirements specified herein. A recorded tape shall be either a Single Data Space Tape or a Partitioned Tape.

2.2 Generating system

A system generating a magnetic tape cartridge for interchange shall be entitled to claim 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 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 recording of multiple representations of the same Basic Group,
- the generation of ECC3 Frames.

2.3 Receiving system

A system receiving a magnetic tape cartridge for interchange shall be entitled to claim 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 recognize repeated frames and to make available to the user data and separator marks from only one of these frames,
- to recognize multiple representations of the same Basic Group and to make available to the user data and separator marks from only one of these representations,
- to update the System Log(s) if the Write-inhibit Hole state so permits,
- to recognize an ECC3 frame, and ignore it if the option specified below is not implemented.

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.