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**Information technology – Intelligent Peripheral
Interface**

Part 4:

Device generic command set for magnetic tape drives

*Technologies de l'information – Interface pour les périphériques intelligents –
Partie 4: Jeu de commandes génériques pour les unités de bandes magnétiques*

ISO/IEC 9318-4:1990

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Contents

	Page
Foreword	ix
Introduction	x
1 Scope	1
2 Normative references	2
3 Definitions and Conventions	3
3.1 Definitions	3
3.2 Conventions	4
4 Logical interface characteristics of the tape	5
4.1 PhysicalBlocks (4.4.1 of ISO/IEC 9318-3)	5
4.2 DataBlocks (4.4.2 of ISO/IEC 9318-3)	5
4.3 Extents (4.4.3 of ISO/IEC 9318-3)	5
4.4 Partitions (4.4.4 of ISO/IEC 9318-3)	6
4.5 Alternate data areas (4.4.5 of ISO/IEC 9318-3)	6
4.6 Partition parameters (4.6.7 of ISO/IEC 9318-3)	6
4.7 Block numbering	7
4.8 Data buffer operation	7
4.9 Positioning	8
4.9.1 Mount or rewind	8
4.9.2 Partition transition	8
4.9.3 Normal data operation completion	8
4.9.4 Abnormal data operation completion	8
4.9.5 Normal position operation completion	8
4.9.6 Abnormal position operation completion	8
4.9.7 Tape mark detected	8
4.9.8 BOM detected (reverse operations)	9
4.9.9 EMW detected	9
4.9.10 PEOM detected	9
4.10 Command usage	9
5 Message packet structure	10
6 Control commands	11
6.1 NOP	11
6.2 FACILITY OPERATION	11
6.3 ATTRIBUTES	11
6.3.1 Command Packet	11
6.3.2 Response Packet	11
6.3.3 Description	11
6.3.4 Parameters	13
6.3.4.1 Parameters 3A, 3E, 50.	14
6.3.4.2 Parameters 51-58	14
6.3.4.2.1 Size of tape datablocks parameter	14

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6.3.4.2.2	Size of tape physical blocks parameter	14
6.3.4.2.3	Variable data block sizes supported parameter	14
6.3.4.2.4	Variable PhysicalBlock sizes supported parameter	15
6.3.4.2.5	Fixed DataBlock size(s) supported parameter	15
6.3.4.2.6	Fixed PhysicalBlock size(s) supported parameter	15
6.3.4.3	Parameters 59-5A	15
6.3.4.4	Parameters 5B-5D	16
6.3.4.5	Parameter 5E - Multi-port characteristics	16
6.3.4.6	Parameter 61 - Transfer rate	16
6.3.4.7	Parameters 64-65	16
6.3.4.7.1	Physical interface attributes parameter	16
6.3.4.7.2	Addressee configuration parameter	17
6.3.4.8	Parameter 66 - Slave configuration (bit significant)	17
6.3.4.9	Parameter 67 - Slave configuration (fields)	17
6.3.4.10	Parameter 68 - Facilities attached to slave	17
6.3.4.11	Parameters 69-6A	17
6.3.4.11.1	Parameter 69	17
6.3.4.11.2	Command supported parameter	17
6.3.4.12	Parameter 6B - Masks of octets supported	18
6.3.4.13	Parameters 6C-6D	18
6.3.4.13.1	Request parm parameter	18
6.3.4.13.2	Parm Length parameter	18
6.3.4.14	Parameter 6E - Slave reconfiguration (bit significant)	18
6.3.4.15	Parameter 6F - Slave reconfiguration (fields)	18
6.3.4.16	Parameters 70-71	18
6.3.4.16.1	Size of data buffer blocks parameter	19
6.3.4.16.2	Data buffer block size supported parameter	19
6.3.4.17	Parameter 72 - Tape characteristics (bit significant)	19
6.3.4.18	Parameter 73 - Tape characteristics (fields)	22
6.3.4.19	Parameters 74 and 75	23
6.3.4.19.1	Current tape configuration (bit significant)	23
6.3.4.19.2	Current tape configuration (fields)	23
6.3.4.20	Parameters 76-79	24
6.3.4.20.1	Block numbering parameter	24
6.3.4.20.2	Encryption parameter	24
6.3.4.20.3	Translation Table parameter	25
6.3.4.20.4	Translation parameter	25
6.4	REPORT ADDRESSEE STATUS	26
6.4.1	Command packet	26
6.4.2	Response packet	26
6.4.3	Description	26
6.4.4	Parameters 50-53	26
6.4.4.1	Port mask parameter	27
6.4.4.2	Condition parameter	27
6.4.4.3	Media status	27
6.4.4.4	Vendor unique status	27
6.5	PORT ADDRESS	28
6.6	PATH CONTROL	28
6.7	ATTENTION CONTROL	28
6.8	OPERATING MODE	28
6.8.1	Command packet	28
6.8.2	Response packet	28
6.8.3	Description	28
6.8.4	Parameters 3E, 50, 53, 54	29
6.8.4.1	Partition (common) parameter	29
6.8.4.2	Response conditions parameter	29
6.8.4.3	Tape modes (bit significant) parameter	29
6.8.4.4	Parameter 53 - Tape modes (fields)	30
6.8.4.5	Operating mode parameter 54 - Data operation	32
6.9	ABORT	32
6.10	ACCESS PERMITS	32
6.11	RESUME	32
6.12	PORT RESPONSE	32
6.13	ANTICIPATED ACTION	33
6.14	OPERATOR DISPLAY	33

7	Position commands	34
7.1	SPACE BLOCK/FILE MARK	34
7.1.1	Command packet	34
7.1.2	Response packet	34
7.1.3	Description	34
7.1.4	Parameters 31, 32, 35	35
7.1.4.1	Command extent (common) parameter	35
7.1.4.2	Response extent (common) parameter	36
7.1.4.3	Access key (Common) Parameter	36
7.2	POSITION CONTROL	36
7.2.1	Command packet	36
7.2.2	Response packet	36
7.2.3	Description	36
7.2.4	Parameters 31, 32, 35, 3A, 3E, 51, 52, 53	37
7.2.4.1	Command extent (common) parameter	37
7.2.4.2	Response extent (common) parameter	37
7.2.4.3	Access key (Common) Parameter	37
7.2.4.4	Data address (common) parameter	37
7.2.4.5	Partition (common) parameter	37
7.2.4.6	Tape position parameter	38
7.2.4.7	Cartridge source address parameter	39
7.2.4.8	Cartridge destination address parameter	39
7.3	REPORT POSITION	39
7.3.1	Command packet	39
7.3.2	Response packet	39
7.3.3	Description	39
7.3.4	Parameters 32, 35, 3A, 3E, 51-52	40
7.3.4.1	Response extent (common) parameter	40
7.3.4.2	Access key (Common) Parameter	40
7.3.4.3	Data address (common) parameter	40
7.3.4.4	Partition (common) parameter	40
7.3.4.5	Extended position	41
7.3.4.6	Media Position	41
7.4	RECORD POSITION	41
7.4.1	Command packet	41
7.4.2	Response packet	42
7.4.3	Description	42
7.4.4	Parameters 31, 32, 35, 51	42
7.4.4.1	Command extent parameter	42
7.4.4.2	Response extent parameter	42
7.4.4.3	Access key (Common) Parameter	43
7.4.4.4	Tape mark parameter	43
7.5	Reserved	43
8	Transfer commands	44
8.1	READ	44
8.1.1	Command packet	44
8.1.2	Response packet	44
8.1.3	Description	44
8.1.4	Parameters 31-32, 3A, 35, 3E, 51, 52	45
8.1.4.1	Command extent (common) parameter	45
8.1.4.2	Response extent (common) parameter	45
8.1.4.3	Access key (Common) Parameter	45
8.1.4.4	Data address (common) parameter	45
8.1.4.5	Transfer (common) parameter	46
8.1.4.6	Partition (common) parameter	46
8.1.4.7	Information Transfer Size Override Parameter	46
8.1.4.8	Master termination permitted parameter	46
8.2	READ RAW DATA	47
8.2.1	Command packet	47
8.2.2	Response packet	47
8.2.3	Description	47
8.2.4	Parameters 31, 32, 35, 3A, 3C, 3E	47
8.2.4.1	Command extent (common) parameter	47
8.2.4.2	Response extent (common) parameter	48
8.2.4.3	Access key (Common) Parameter	48

8.2.4.4	Data address (common) parameter	48
8.2.4.5	Transfer (common) parameter	48
8.2.4.6	Partition (common) parameter	48
8.3	Reserved	48
8.4	SEARCH	48
8.5	WRITE	48
8.5.1	Command packet	49
8.5.2	Response packet	49
8.5.3	Description	49
8.5.4	Parameters 31-32, 35, 3A, 3C, 3E, 51, 52	50
8.5.4.1	Command extent (common) parameter	50
8.5.4.2	Response extent (common) parameter	50
8.5.4.3	Access key (Common) Parameter	50
8.5.4.4	Data address (common) parameter	50
8.5.4.5	Transfer (common) parameter	50
8.5.4.6	Partition (common) parameter	50
8.5.4.7	Information transfer size override parameter	50
8.5.4.8	Master termination permitted parameter	51
8.6	WRITE PATTERN	52
8.7	Reserved	52
9	Combination commands	53
9.1	COPY	53
9.2	COMPARE SLAVE DATA	53
9.3	COMPARE DATA	53
9.4	Reserved	53
9.5	Reserved	53
9.6	SHADOW READ	53
9.7	SHADOW WRITE	53
9.8	SHADOW RESTORE	53
10	Other transfer commands	54
10.1	READ VERIFY	54
10.1.1	Command packet	54
10.1.2	Response packet	54
10.1.3	Description	54
10.1.4	Parameters 31, 32, 35, 3A, 3C, 3E	55
10.1.4.1	Command extent (common) parameter	55
10.1.4.2	Response extent (common) parameter	55
10.1.4.3	Access key (Common) Parameter	55
10.1.4.4	Data address (common) parameter	55
10.1.4.5	Transfer (common) parameter	55
10.1.4.6	Partition (common) parameter	56
10.2	Reserved	56
10.3	READ FROM BUFFER	56
10.3.1	Command packet	56
10.3.2	Response Packet	56
10.3.3	Description	56
10.3.4	Parameters 31, 32, 35, 3A, 3E, 50	57
10.3.4.1	Command extent (common) parameter	58
10.3.4.2	Response extent (common) parameter	58
10.3.4.3	Access key (Common) Parameter	58
10.3.4.4	Data address (common) parameter	58
10.3.4.5	Partition (common) parameter	58
10.3.4.6	Buffer address parameter	58
10.4	READ FACILITY DATA TO BUFFER	58
10.5	READ PHYSICAL DATA AND ECC	58
10.6	READ PHYSICAL HEADER	58
10.7	READ IPL	59
10.7.1	Command packet	59
10.7.2	Response packet	59
10.7.3	Description	59
10.8	READ PHYSICAL HEADER AND ECC	59
10.9	WRITE TO BUFFER	59
10.10	WRITE BUFFER TO FACILITY	59
10.11	WRITE PHYSICAL DATA AND ECC	60

10.12	WRITE PHYSICAL HEADER	60
10.13	LOAD SLAVE IML	60
10.14	ERASE	60
10.14.1	Command packet	60
10.14.2	Response Packet	60
10.14.3	Description	60
10.14.4	Parameters 31, 32, 35, 3A, 3E	61
10.14.4.1	Command extent (common) parameter	61
10.14.4.2	Response extent (common) parameter	61
10.14.4.3	Access key (Common) Parameter	61
10.14.4.4	Data address (common) parameter	61
10.14.4.5	Partition (common) parameter	61
10.15	WRITE PHYSICAL HEADER AND ECC	62
11	Diagnostic Commands	63
11.1	PERFORM SLAVE DIAGNOSTICS	63
11.2	PERFORM FACILITY DIAGNOSTICS	63
11.3	Reserved	63
11.4	Reserved	63
11.5	READ ERROR LOG	64
11.5.1	Command Packet	64
11.5.2	Response Packet	64
11.5.3	Description	64
11.6	WRITE ERROR LOG	65
11.7	DIAGNOSTIC CONTROL	65
12	Command summary	66
12.1	Control commands	66
12.2	Position commands	67
12.3	Transfer commands	67
12.4	Combination commands	68
12.5	Other transfer commands	69
12.6	Diagnostic commands	70
Annex A		71
A.1	Interface levels	71
A.2	Concepts	71
A.2.1	Relationship of master, slave, and facility	71
A.2.2	Relationship of facilities and partitions	72
A.2.3	Command structure	72
A.3	Application environments	72
A.3.1	Control of facilities by the master	72
A.3.2	Shared Control of Facilities	73
A.3.3	Control of Facilities by the Slave	73
Annex B		74
B.1	Informative references	74
B.2	Equivalent ANSI standards	74

Figures

	Page
Figure 1 – Command packet for attributes	11
Figure 2 – Response packet for attributes	11
Figure 3 – Command packet for report addressee status	26
Figure 4 – Response packet for report addressee status	26
Figure 5 – Command packet for operating mode	28
Figure 6 – Response packet for operating mode	28
Figure 7 – Command packet for space block/file mark	34
Figure 8 – Response packet for space block/file mark	34
Figure 9 – Command packet for position control	36
Figure 10 – Response packet for position control	36
Figure 11 – Command packet for report position	39
Figure 12 – Response packet for report position	39
Figure 13 – Command packet for record position	41
Figure 14 – Response packet for record position	42
Figure 15 – Command packet for read	44
Figure 16 – Response packet for read	44
Figure 17 – Command packet for read raw data	47
Figure 18 – Response packet for read raw data	47
Figure 19 – Command packet for write	49
Figure 20 – Response packet for write	49
Figure 21 – Command packet for read verify	54
Figure 22 – Response packet for read verify	54
Figure 23 – Command packet for read from buffer	56
Figure 24 – Response packet for read from buffer	56
Figure 25 – Command Packet for read ipl	59
Figure 26 – Response packet for read ipl	59
Figure 27 – Command packet for erase	60
Figure 28 – Response packet for erase	60
Figure 29 – Command packet for read error log	64
Figure 30 – Response packet for read error log	64

Tables

	Page
Table 1 – Attributes parameters 3A, 3E, 50	14
Table 2 – Attributes parameters 51-58	15
Table 3 – Attributes parameters 59-5A	16
Table 4 – Attributes parameters 5B-5D	16
Table 5 – Attributes parameters 5E-65	16
Table 6 – Attributes parameters 66-67	17
Table 7 – Attributes parameter 68	17
Table 8 – Attributes parameters 69-6A	17
Table 9 – Attributes parameters 6B-6F	18
Table 10 – Attributes parameters 70-71	18
Table 11 – Attributes parameter 72	20
Table 12 – Attributes parameter 73	22
Table 13 – Attributes parameters 74-75	24
Table 14 – Attributes parameters 76-79	25
Table 15 – Report addressee status parameters 50-53	27
Table 16 – Operating mode parameters 3E, 50, 52	30
Table 17 – Operating mode parameter 53	31
Table 18 – Operating mode parameter 54	32
Table 19 – Space block/file mark parameters 31, 32, 35	35
Table 20 – Position control parameters 31-32, 35, 3A, 3E, 51-53	38
Table 21 – Report position parameters 32, 35, 3A, 3E, 51-52	40
Table 22 – Record position parameters 31, 32, 35, 51	42
Table 23 – Read parameters 31, 32, 35, 3A, 3C, 3E, 51, 52	46
Table 24 – Read raw data parameters 31, 32, 35, 3A, 3C, 3E	48
Table 25 – Write parameters 31-32, 35, 3A, 3C, 3E, 51, 52	50
Table 26 – Read verify parameters 31, 32, 35, 3A, 3C, 3E	55
Table 27 – Read from buffer parameters 31, 32, 35, 3A, 3E, 50	57
Table 28 – Erase parameters 31, 32, 35, 3A, 3E	61

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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 9318-4 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 9318 consists of the following parts, under the general title *Information technology — Intelligent Peripheral Interface*:

- *Part 1: Physical level*
- *Part 2: Device specific command set for magnetic disk drives*
- *Part 3: Device generic command set for magnetic and optical disk drives*
- *Part 4: Device generic command set for magnetic tape drives*

Annex A forms an integral part of this part of ISO/IEC 9318. Annex B is for information only.

Introduction

This part of ISO/IEC 9318 does not replace any existing standard, but it does complement other Intelligent Peripheral Interface (IPI) standards (see clause 2).

This part of ISO/IEC 9318 provides a definition of the device-generic command set portion of a series of standards called the Intelligent Peripheral Interface (IPI), a high performance, general-purpose parallel peripheral interface. This part of ISO/IEC 9318, responds to an industry market need (expressed both by users and manufacturers) to limit the increasing costs in hosts associated with changes in peripherals.

The first five clauses of this part of ISO/IEC 9318-4 contain material that is useful across all classes of device that the device-generic command sets can support. Clauses 6 to 12 are oriented to particular device classes and in this document these clauses are intended for use with Magnetic Tape Drives.

- Clause 1 describes the scope
- Clause 2 lists the normative references
- Clause 3 provides descriptions of conventions
- Clause 4 describes the Environment of Use and projected application areas.
- Clause 5 describes the Message Packet structure used for commands and responses.
- Clause 6 describes Control commands.
- Clause 7 describes Position commands.
- Clause 8 describes the most generic Transfer commands.
- Clause 9 describes the Combination Transfer commands, which require a minimum of two sets of extents.
- Clause 10 describes the other Transfer commands, which are more device specific than those in clause 6.
- Clause 11 describes the Diagnostic commands.
- Clause 12 summarizes the commands defined in the document.

Information technology - Intelligent Peripheral Interface -

Part 4 :

Device generic command set for magnetic tape drives

1 Scope

This part of ISO/IEC 9318 describes the Logical Level 3 (generic level) Interface for tape drives. See clause 6 of the ISO/IEC 9318-1 for an explanation of the levels.

The physical, electrical, and configuration characteristics and the transmission protocol of this interface are in accordance with ISO/IEC 9318-1. The interface is capable of handling data rates from 0 to at least 10 Mbytes/s per second, depending on driver and receiver classes.

The purpose of this part of ISO/IEC 9318 is to facilitate the development and utilization of an intelligent interface which permits the interconnection of multiple peripheral types such as disk, tape, communications, to a controller.

This part of ISO/IEC 9318 does not replace any existing standard, but it does complement other Intelligent Peripheral Interface (IPI) standards (see clause 2).

This part of ISO/IEC 9318 provides a definition of the device-generic portion of a family of standards called the Intelligent Peripheral Interface (IPI), a high performance, general-purpose parallel peripheral interface.

The intent of the IPI is to isolate the host (CPU), both hardware and software, from changes in peripherals by providing a "function-generic" command set to allow the connection of multiple types of peripherals (disks, printers, tapes, communications). To smooth the transition from the current methods to the generic approach, the IPI supports device-specific command sets to aid in bridging the gap between the two approaches.

To accomplish this set of goals, the design of the IPI includes device-specific and device-generic command sets, both utilizing a common physical bus. The device-specific command set provides

- device-oriented control;
- physical data addressing;
- timing critical operations;
- lower device cost.

The device-generic command set provides a higher level of functionality and portability. It includes

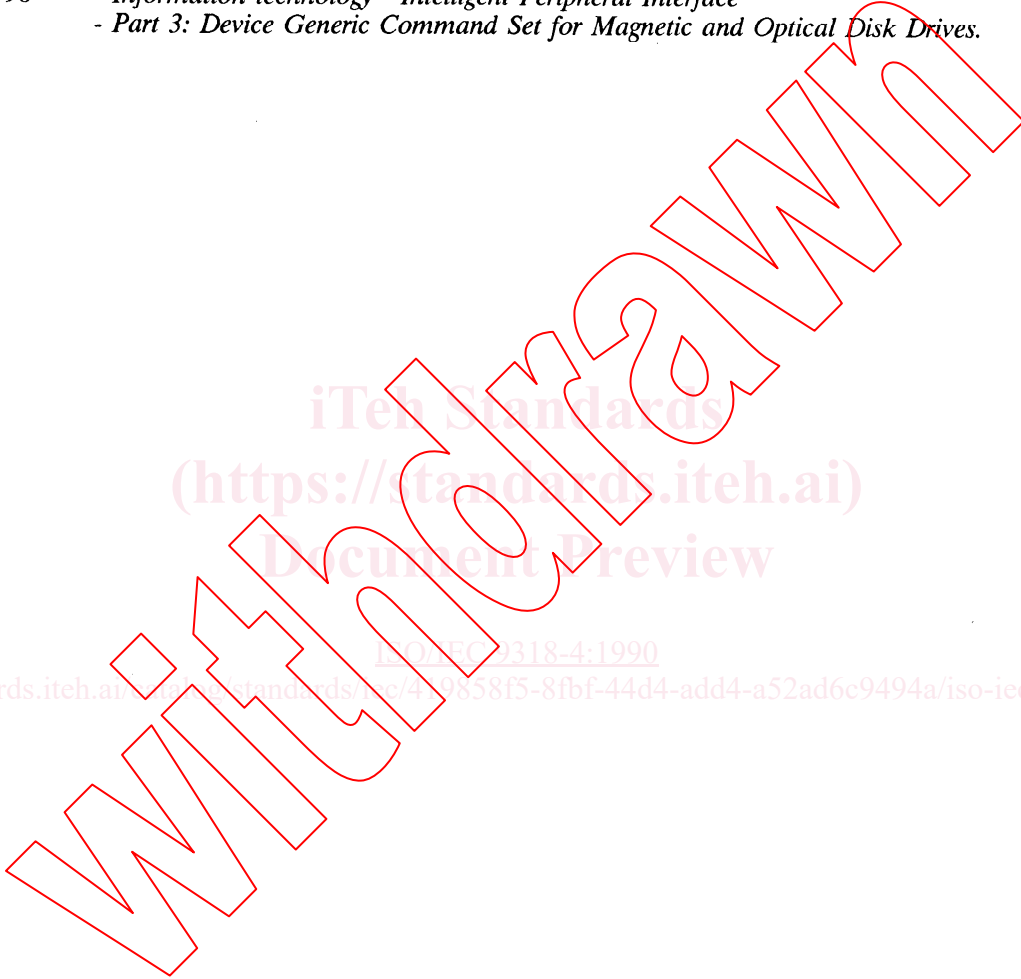
- host/device independence;
- logical data addressing;
- timing independence;
- command queuing capability.

A system is not restricted to the use of one level of command set or the other. It is possible that both levels of command sets will be utilized with a given system's architecture to balance such parameters as system performance, cost, and peripheral availability. It is also possible for the host to provide for the migration from device-specific to device-generic levels while still retaining the same physical interface.

2 Normative references

The following standards contain provisions which, through reference in this text, constitutes provisions of this part of ISO/IEC 9318. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9318 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

- ISO/IEC 9318-1:—¹⁾ - *Information technology - Intelligent Peripheral Interface*
- *Part 1: Physical Level.*
- ISO/IEC 9318-3: 1990 - *Information technology - Intelligent Peripheral Interface*
- *Part 3: Device Generic Command Set for Magnetic and Optical Disk Drives.*



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1) To be published.

3 Definitions and Conventions

3.1 Definitions

For the purpose of this part of ISO/IEC 9318 the definitions in ISO/IEC 9318-3 and the following definitions apply.

3.1.1 beginning of file: A recorded mark on the medium that marks the beginning of a file.

3.1.2 beginning of media (BOM): The beginning of the default data partition. This media position is usually marked by some physical (not recorded) marker on the medium. The marker is detectable by a facility and allows the tape to be automatically positioned at the beginning of the default data partition and to be properly positioned to the beginning of the default data partition when rewound. The implementation of the BOM marker is defined in the vendor specification.

NOTE – Certain ISO Information Processing Systems standards contain physical requirements for the position of the BOM marker in the default data partition (Beginning-of-Tape (BOT) marker on reel-to-reel tape).

3.1.3 end-of-media warning (EMW): Usually a physical marker on the medium that indicates the end of the normal recording area of a partition.

NOTE – Certain ISO Information Processing Systems standards contain physical requirements for the position of the EMW marker in the default data partition (End-of-Tape (EOT) marker on reel-to-reel tape).

3.1.4 end of file: A mark recorded on the medium to mark the end of a file detectable by a facility.

3.1.5 erase gap: The physical sections of the medium that contain no recognizable data. An Erase Gap may be used to overcome media defects by extending an interblock gap such that the next recorded element occurs past the defect on the medium.

3.1.6 file mark: See tape mark.

3.1.7 forward motion: The tape motion logically proceeding from BOM toward Physical End of Media (PEOM).

3.1.8 ID burst: A burst of special recorded data that may be used by the facility to identify the recording format or density of data written on the medium - usually occurring as the first recorded element on a volume. The ID Burst content is an attribute of a volume and not considered part of any partition.

3.1.9 interblock gap: A physical section of the medium that contains no recognizable data and separates adjacent recorded elements (i.e., PhysicalBlocks and file marks). Interblock gaps are automatically introduced by a facility between adjacent recorded elements without explicit action by a master.

3.1.10 partition: This term defines a recording area that may be logically addressed. A partition may be slave defined (e.g., data area, CE area, IML area) or may be master defined (e.g., an addressable set of contiguous blocks within the data area).

A partition may be defined to exist within a tape volume by the slave, the master, or both. Since tape volumes are removable, such a partition will be removed with the volume. A slave or facility may define other partitions that are not associated with a volume and that may or may not be removable. Typically, such partitions may be used for Maintenance partitions as defined in ISO/IEC 9318-3, but are not limited to such use.

3.1.11 PhysicalBlock: This term is uniquely defined in this part of ISO/IEC 9318 as meaning the physical representation of data on the media (e.g., sectors or records on disk and blocks or records on tape). It is used to prevent confusion between industry usage of terms.

A facility may record any two adjacent blocks with different physical lengths, depending upon the capability of the facility and the selection of a master. Tape volumes typically are not preformatted, as disks are, so that references to DataBlocks or PhysicalBlocks within a partition that has not been previously written usually fail.

A tape volume having preformatted PhysicalBlocks is very similar to a fixed-block disk volume and may be used in a similar fashion.

3.1.12 physical end of media (PEOM): A position on the medium beyond which normal tape operation is impossible (i.e., data cannot be written or the medium cannot be positioned).

3.1.13 reverse motion: The tape motion contrary to forward motion (i.e., logical motion from PEOM toward BOM).

3.1.14 tape mark: A recorded element on the medium, not containing data that is used to separate or otherwise identify groups of DataBlocks on the medium. The most common tape mark is known as a file mark.

3.1.15 volume: A removable entity of tape media.

3.1.16 write protect: An attribute of a tape volume, usually requiring some physical sensing by a facility, indicating whether the facility is allowed to write data on the medium. When a volume is write protected, the facility is prevented from writing on the medium.

3.2 Conventions

In this part of ISO/IEC 9318, certain terms that are proper names of signals are printed in uppercase to avoid possible confusion with other uses of the same words (e.g., ATTENTION IN). Any lowercase uses of these words have the normal English meaning.

A number of conditions, sequence parameters, events, English text, states or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., In, Out, Selective Reset, Bi-directional, Bus Control, Operation Response). Any lowercase uses of these words have the normal English meaning.