

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1001

MAGNETIC TAPE LABELLING AND FILE STRUCTURE
FOR INFORMATION INTERCHANGE

1st EDITION

March 1969

COPYRIGHT RESERVED

The copyright of ISO Recommendations and ISO Standards belongs to ISO Member Bodies. Reproduction of these documents, in any country, may be authorized therefore only by the national standards organization of that country, being a member of ISO.

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/R 1001:1969

<https://standards.iteh.ai/catalog/standards/sist/cb0d9248-2376-446d-b67a-5a1b43ac804c/iso-r-1001-1969>

BRIEF HISTORY

The ISO Recommendation R 1001, *Magnetic tape labelling and file structure for information interchange*, was drawn up by Technical Committee ISO/TC 97, *Computers and information processing*, the Secretariat of which is held by the American National Standards Institute (ANSI).

Work on this question led to the adoption of a Draft ISO Recommendation.

In September 1967, this Draft ISO Recommendation (No. 1323) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Israel	Sweden
Belgium	Italy	Switzerland
Canada	Japan	Turkey
Czechoslovakia	Korea, Rep. of	U.A.R.
Denmark	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Portugal	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1969, to accept it as an ISO RECOMMENDATION.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/R 1001:1969

<https://standards.iteh.ai/catalog/standards/sist/cb0d9248-2376-446d-b67a-5a1b43ac804c/iso-r-1001-1969>

MAGNETIC TAPE LABELLING AND FILE STRUCTURE FOR INFORMATION INTERCHANGE

INTRODUCTION

The basic reason for producing an ISO Recommendation for magnetic tape labelling is to give protection, via an operating system, against procedural and human errors in handling data from magnetic tape. When a tape is read a check can be made of the identification on the tape against that supplied by the operator/programmer and writing or reading stopped before any damage has been done.

In producing this ISO Recommendation cognizance has been taken of the fact that the data on tape may be sent from tape to data link and the control characters have been excluded from the characters allowable in labels. However, it should be noted that no restriction has been placed upon the information that may be recorded in data blocks and that, in particular, if the record length is given in binary, control characters could be encountered.

It cannot be overstressed that this ISO Recommendation, in its present form, is a Recommendation for magnetic tape labelling. Even though other media, as the data transmission example above, have been considered, the Recommendation does not have universal applicability.

Although this ISO Recommendation was written to be used specifically with the ISO 7-bit code, the principles contained herein are equally applicable with other code structures.

1. SCOPE

This ISO Recommendation relates to information interchange utilizing magnetic tape, by providing magnetically recorded labels to identify and structure files, and by providing a standard structure for the blocks containing the records that constitute a file.

2. DEFINITIONS OF TERMS

As used in this ISO Recommendation, the following items have the meanings indicated. When a term is in common use in a context related to the subject-matter of this ISO Recommendation, the definition conforms to common usage; when a term has been used in related ISO Recommendations, the definition conforms to its usage there.

2.1 *Record.* Collection of related terms of data which for operating systems logic purposes is treated as a unit of information. Conceptually, a record corresponds (in the context of business data) to a transaction, a customer's account, etc. In other contexts, the delineation of a record may be relatively arbitrary, and is determined by the designer of the information formats.

2.2 *Block.* Group of contiguous characters recorded on and read from magnetic tape as a unit. A block may contain one or more complete records.

- 2.3 *File*. Major collection of information, consisting of all the records pertaining to a general subject. Conceptually, this term (in the context of business data) relates to such collections as a Payroll File, an Inventory File, etc. In other contexts, the delineation of a file may be relatively arbitrary.
- 2.4 *File set*. Collection of one or more related files recorded on one or more volumes. A file set may consist of
 - one file recorded on a single volume,
 - more than one file recorded on a single volume,
 - one file recorded on more than one volume,
 - more than one file recorded on more than one volume.
- 2.5 *Volume*. Physical unit of storage media. The word volume, as used in this ISO Recommendation, is completely synonymous with "reel of magnetic tape".
- 2.6 *Label*. Block at the beginning or end of a volume or a file which serves to identify and/or delimit that volume or file.
- 2.7 *Label Group*. Collection of contiguous labels of the same type (see clause 3.1.3 for label types).
- 2.8 *Tape Mark*. Special configuration recorded on magnetic tape, essentially indicating the boundary between files and labels, and also between certain label groups. The Tape Mark configuration is defined in the relevant ISO Recommendations for recorded magnetic tape.
- 2.9 *Operating System*. Programme or set of programmes, usually provided by the manufacturer, which, among other things, handles the functions of reading and writing blocks on tape, label handling and related functions.

3. LABELLING

3.1 Elements of the labelling scheme

3.1.1 *The labels*. Each label shall be an 80-character block.

3.1.2 *Classes of labels*. Labels are divided into the two following general classes :

- Operating System Labels and
- User Labels.

In addition, labels are classified as required or optional.

3.1.3 *Types of labels*

The two types of labels are

- Volume labels and
- File labels.

3.1.4 *Label Identifiers*. The identifiers and numbers (4 characters) for the various classes and types of labels are shown in the following chart. The labels are also classified to show which labels are required by this ISO Recommendation and which additional labels are permissible (optional).

Type	Class		
	Operating System		User
Volume	VOL1 EOV1	(None) EOV2-9	UVL1-9 UTLx
File	HDR1 EOF1	HDR2-9 EOF2-9	UHLx UTLx
	Required	Optional	

x = any "a" character as defined in clause 3.3

3.1.5 *Tape Mark*. Tape Marks shall be used only where specified in this ISO Recommendation.

3.2 Structuring the file

3.2.1 *Use of Required Label and Tape Marks*. Required Labels and Tape Marks shall be used to establish the file structure according to the following rules, as illustrated in Figure 1. In that Figure, the beginning of the tape is at the left, and the end of the tape is at the right. Required Labels are indicated by the first three characters of their identifiers, and Tape Marks are indicated by asterisks (*).

The rules and the Figure are presented as though there were no Optional Operating System Labels or User Labels. Rules for using these optional classes of labels are set forth in clauses 3.2.3 to 3.2.8.

<p>Single-Volume File VOL HDR * --- Data Blocks --- * EOF **</p>
<p>Multi-Volume File VOL HDR * --- First Volume Data --- * EOF ** VOL HDR * --- Last Volume Data --- * EOF **</p>
<p>Multi-File Volume VOL HDR * -- File A -- * EOF * HDR * --- File B --- * EOF **</p>
<p>Multi-Volume Multi-File VOL HDR * -- File A -- * EOF * HDR * -- File B --- * EOF ** VOL HDR * --- Continuation of File B ----- * EOF ** VOL HDR * -- End of File B -- * EOF * HDR * -- File C -- * EOF **</p>

FIG. 1 – Structure of Magnetic Tape Files
(* means Tape Mark)

VOLUME HEADER LABEL. Every volume shall have a Volume Header Label as the first block in the volume. The Volume Header Label shall not be used at any other place in the volume.

FILE HEADER LABEL. Every file shall be preceded by a File Header Label. Whenever a volume ends within a file, the continuation of that file in the next volume shall also be preceded by a File Header. Every File Header shall be immediately followed by a Tape Mark. (See clause 3.2.6.)

END OF FILE LABEL. The last block of every file shall be followed by an End of File Label. A Tape Mark shall immediately precede, and another Tape Mark shall immediately follow, every End of File Label. The End of File Label that appears at the end of the last (or only) file in a volume set shall be followed by two Tape Marks, rather than one. (See clause 3.2.6.)

END OF VOLUME LABEL. Whenever a volume ends within a file, the last block of the file in that volume shall be followed by an End of Volume Label. One Tape Mark shall immediately precede, and two Tape Marks shall immediately follow, every End of Volume Label. (See clause 3.2.6.)

3.2.2 *Coincidence of End-of-Volume and End-of-File.* Whenever end-of-volume and end-of-file coincide, the labelling configuration shall be one of the following :

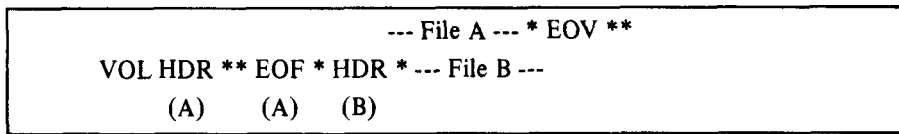


FIG. 2

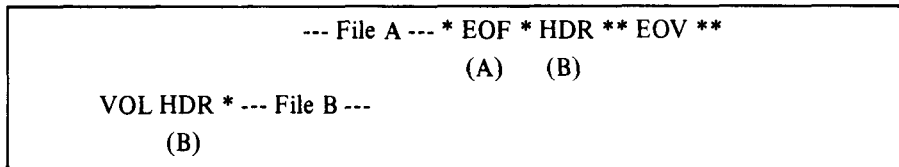


FIG. 3

3.2.2.1 By agreement between the interchange parties, it is allowable to arrange that any file of a set may start at the beginning of a volume. If this procedure is used the labelling configuration shall be as set out in clause Z.2.6 of the Appendix.

3.2.3 *Fitting Optional Labels with the File Structure.* Optional Operating System Labels and User Labels shall be fitted into the file structure as described in clauses 3.2.4 to 3.2.8, without otherwise modifying the relationship between the Required Labels and the files. When these optional classes of labels are used, any reference to a label within clause 3.2 shall be construed to mean the entire label group.

3.2.4 *Optional Operating System Labels.* Optional Operating System Labels of a given type, when used, shall directly follow a Required Label of the same type. The fourth character of consecutive Optional Operating System Labels in a group shall be the numbers 2, 3, 4, 5, 6, 7, 8 and 9 respectively.

3.2.5 *User Labels.* User Labels of a given type, when used, shall directly follow a consecutive group of Operating System Labels of the same type. When no Optional Operating System Labels are used in the label group, the User Labels shall directly follow a Required Label of the same type.

3.2.6 *No Tape Mark within a Label Group.* There shall be no Tape Mark within a group of labels. Wherever Figures 1, 2, 3, and the descriptions in clauses 3.2.1 and 3.2.2, indicate a Tape Mark following a Required Label, that Tape Mark shall actually follow the last label of the entire group.

3.2.7 *Label Group complete on one Volume.* Every label group shall be completed on the volume where the first label of the group was recorded.

3.2.8 *Example of the Grouping of Optional Labels*

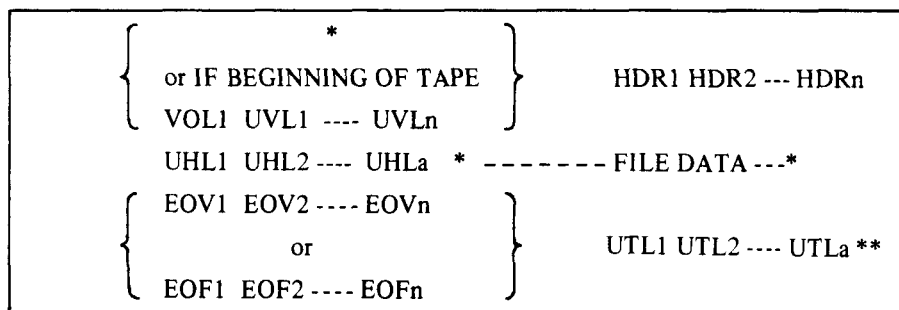


FIG. 4

3.3 Format and contents of labels

In this ISO Recommendation, "n" means any numeric digit 0 to 9. An "a" means any of the characters occupying the central four columns of the ISO 7-bit code table, except position 5/15 and those positions where there is provision for alternative graphic representations.

The limitation on "a" characters is intended as a guide to provide maximum interchangeability and consistent printing especially when international interchange is a possibility. Checking for conformity to this limitation is not implied.

The word "optional" is sometimes used in the name or description of fields in this ISO Recommendation. When used, "optional" means that the field may, but need not, contain the information described. If an optional field does not contain the designated information, it shall contain spaces (or zeros if so indicated).

Fields which are not described as "optional" are considered to be "mandatory". "Mandatory" fields must be written as specified.

Although this ISO Recommendation does not require any particular label processing on reading, certain desirable processing is implied.

3.3.1 Volume Header Label

Field	Name	Length	Description
1	Label Identifier	3	Must be VOL.
2	Label Number	1	Must be 1.
3	Volume Serial Number	6	Six "a" characters permanently assigned by the owner to identify this physical volume (i.e. reel of tape).
4	Accessibility	1	An "a" character which indicates any restrictions on who may have access to the information in the volume. A "space" means unlimited access; any other character means special handling, in a manner agreed between the interchange parties.
5	Reserved for future standardization	20	Must be "spaces".
6	Reserved for future standardization	6	Must be "spaces".
7	Owner Identification	14	Any "a" characters, identifying the owner of the physical volume.
8	Reserved for future standardization	28	Must be "spaces".
9	Label Standard Level	1	1 means the labels and data formats on this volume conform to the requirements of this ISO Recommendation. "Space" means the labels and data formats on this volume require the agreement of the interchange parties.

3.3.1.1 Anyone recording on a magnetic tape that he does not own must preserve the entire Volume Header Label unchanged, except as authorized by the owner. This is not intended to preclude the rewriting, unchanged, of the Volume Header Label.

3.3.2 First File Header Label

Field	Name	Length	Description
1	Label Identifier	3	Must be HDR.
2	Label Number	1	Must be 1.
3	File Identifier	17	Any "a" characters agreed on between the interchange parties.
4	Set Identification	6	Any "a" characters to identify the set of files of which this is one. This identification must be the same for all files of a multi-file set.
5	File Section Number	4	The File Section Number of the first Header Label of each file is 1. This applies to the first or only file on a volume and to subsequent files on a multi-file volume. This field is incremented by one on each subsequent volume of the file.
6	File Sequence Number	4	Four "n" characters denoting the sequence (i.e. 0001, 0002, etc.) of files within the volume or set of volumes. In all the labels for a given file, this field will contain the same number.
7	Generation Number (optional)	4	Four "n" characters denoting the current stage in the succession of one file-generation by the next. When a file is first created, its generation number is 1.
8	Generation Version Number (optional)	2	Two "n" characters distinguishing successive iterations of the same generation. The generation version number of the first attempt to produce a file is 0 (zero).
9	Creation Date	6	A "space" followed by two "n" characters for the year, followed by three "n" characters for the day (001 to 366) within the year.
10	Expiration Date	6	Same format as field 9. This file is regarded as "expired" when today's date is equal to, or later than the date given in this field. When this condition is satisfied, the remainder of this volume may be overwritten. To be effective on multi-file volumes therefore, the expiration date of a file must be less than, or equal to the expiration date of all previous files on the volume.
11	Accessibility	1	An "a" character which indicates any restrictions on who may have access to the information in this file. A "space" means unlimited access; any other character means special handling, in a manner agreed between the interchange parties.
12	Block Count	6	Must be "zeros".
13	System Code (optional)	13	Thirteen "a" characters identifying the Operating System that recorded this file.
14	Reserved for future standardization	7	Must be "spaces".

3.3.3 *Second File Header Label (optional)*. Further explanations concerning the fields in this label are given in Section 4.

Field	Name	Length	Description
1	Label Identifier	3	Must be HDR.
2	Label Number	1	Must be 2.
3	Record Format	1	F = Fixed length. D = Variable with the number of characters in the record specified in decimal. V = Variable with the number of characters in the record specified in binary. U = Undefined.
4	Block Length	5	Five "n" characters specifying the maximum number of characters per block.
5	Record Length	5	Five "n" characters specifying : - If "Record Format" is F, Record Length; - If D or V, Maximum Record Length including any countfield; - If U, undefined.
6	Reserved for Operating Systems	35	Reserved for Operating Systems use. Any "a" characters.
7	Buffer Offset (optional)	2	Two "n" characters specifying the length in characters of any additional field inserted before a data block (viz. Block Length). This length is included in the block length (Field 4).
8	Reserved for future standardization	28	Must be "spaces".

3.3.4 *First End of File Label*

Field	Name	Length	Description
1	Label Identifier	3	Must be EOF.
2	Label Number	1	Must be 1.
3 } to } 11 }	Same as corresponding fields in the first File Header Label (all optional)	Total 50	Same as corresponding fields in the first File Header Label.
12	Block Count	6	Six "n" characters denoting the number of data blocks (exclusive of labels and Tape Marks) since the preceding HDR Label Group.
13 } and } 14 }	Same as corresponding fields in the first File Header Label (optional)	Total 20	Same as corresponding fields in the first File Header Label.