

AS/NZS 4270.3:1995

Australian/New Zealand Standard

**Geographic information systems—
Spatial data transfer standard**

Part 3: ISO 8211 encoding

[Based on FIPS PUB 173-1992, Spatial Data Transfer Standard]

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Part 3: ISO 8211 encoding

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Standards Committee IT/4 on Geographical Information Systems. It is based on and has been reproduced from the FIPS PUB 173-1992, *Spatial Data Transfer Standard*, Part 3: *ISO 8211 encoding*, a US Federal Information Processing Standard.

The objective of this Standard is to provide users of geographical information systems with a uniform representation of a file set when transferring information using the Spatial Data Transfer Standard.

As this Standard is reproduced from an internationally recognized Standard, its number does not appear on each page of text. Its identity is shown only on the cover.

For the purpose of this Joint Standard, the references in the FIPS PUB text to international or other Standards should be replaced by references to the following Australian/New Zealand Standards:

<i>Reference to International Standard or Other Publication</i>		<i>Australian/New Zealand Standard</i>	
ANSI		AS	
X3.122	Computer Graphics Metafile for the Storage and Transfer of Picture Description Information	3603	(NZS/ISO-8632) Computer graphics—Metafiles for the storage and transfer of picture description information
X3.27	Information Systems—File Structure and Labelling of Magnetic Tapes for Information Interchange (ISO 1001)	1068	Information processing—File structure and labelling of magnetic tapes for information exchange
ISO			
4341	Information processing—Magnetic tape cassette and cartridge labelling and file structure for information interchange	2414	Information processing—Magnetic tape cassette and cartridge labelling and file structure for information interchange
6093	Information processing—Representation of numerical values in character strings for information interchange	3767	Information processing—Representation of numerical values in character strings for information interchange
8211	Information processing—Specification for a data descriptive file for information interchange	3654	Information processing—Specification for a data descriptive file for information interchange
9293	Information processing—Volume and file structure of flexible disk cartridges for information interchange	3714	Data storage and transfer media—Volume and file structure of flexible disk cartridges (diskettes) for information interchange
9660	Information processing—Volume and file structure of CD-ROM for information interchange	3601	Information processing—Volume and file structure of CD-ROM for information interchange

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AUSTRALIAN/NEW ZEALAND STANDARD

Geographic information systems—Spatial data transfer standard**Part 3:
ISO 8211 encoding****1 Introduction****1.1 Purpose of ISO 8211 Encoding**

The ISO 8211¹ encoding provides a representation of a Spatial Data Transfer Standard (SDTS) file set in a standardized method enabling the file set to be exported to or imported from different media by general purpose ISO 8211 software.

1.2 Objectives

This encoding was selected with the following objectives:

- (a) to place this standard within a broader community of interchange based on a general purpose, interchange standard;
- (b) to place the encoding of this standard in a standardized vehicle that provides the syntax and semantics necessary to the transport of files, records, fields and subfields accompanied by their data description in a machine readable form;
- (c) to provide for media independence of the transfer file set;
- (d) to provide for future extensions of the standard (e.g. adding new modules, fields, subfields) without compromise of the then existing implementations;
- (e) to provide for user extensions without compromising the constructs of the standard.

1.3 Relationship to Other Standards

ISO 8211 is a general purpose, media-independent interchange standard whose variable length records may be written on any medium that is able to accept them, including communications lines. In order to promote transfer, the user is advised to employ media for which volume and file structure standards exist as well as widespread implementations. The specific requirements for currently standardized media are given in section 10.

¹ISO 8211 Information Processing - Specification for a Data Descriptive File for Information Interchange (1985) is also the ANSI standard, ANSI/ISO 8211, and the Federal Information Processing Standard, FIPSPUB 123.

1.4 Status of Annexes

2

The annexes do not form an integral part of the standard but are added to provide additional information and explanation.

2 Scope and Field of Application

2.1 Scope

This part of the standard specifies an encoding of an SDTS file set in ISO 8211 and on standardized media.

2.2 Field of Application

This part of the standard applies to all ISO 8211 encodings of part 1 of this standard and to user extensions (see part 3, annex A) of this standard.

3 References

When any of the standards cited in this section is superseded by an approved revision, the revision shall apply.

ANSI X3.122-1986, Computer Graphics Metafile (CGM), FIPSPUB 128, 16 Mar 1987.

ANSI X3.27-1987, American National Standard for File Structure and Labelling of Magnetic Tapes for Information Interchange (ISO 1001)

ANSI/ISO 4341-1978, American National Standard for Magnetic Tape Cassette and Cartridge Labelling and File Structure for Information Interchange

ANSI/ISO 8211-1986, American National Standard for Information Processing - Specification for a Data Descriptive file for Information Interchange (also FIPS 123)

ISO 6093-1985, Information Processing - Specification for Representation of Numeric Values in Character Strings for Information Interchange

ISO 9293-1986, Volume and File Structure of Flexible Disk Cartridges for Information Interchange

ISO 9660-1986, Volume and File Structure of CD-ROM for Information Interchange

4 Definitions

The terms used in this part of the standard are limited to those terms in common usage, or defined in part 1 or part 2, or those found in the cited ISO 8211 document.

5 Nomenclature

The methodology of this part is to define ISO 8211 constructs which, for the purpose of transfer, accept the logical constructs of part 1 of the standard and preserve their meaning. Where possible, a correspondence is maintained between the module subfields and fields of part 1 and the ISO 8211 subfields and fields maintaining both identification and order when required.

The content and size of a transfer determine what fields are present and how they are collected into records and the records into files. Part 1 allows the user considerable freedom to structure records and files as needed and this part does likewise.

Table 1, in section 6, contains the specification for the ISO 8211 encoding of all module fields defined in part 1, section 5. The constructs of table 1 are related to the logical constructs of part 1 by section references, e.g., (see part 1, 5.d.), and by the following nomenclature equivalents:

Part 1	Table 1 (1)
Module Subfield Subfield Name/ Mnemonic	Subfield/Element Label
Module Field Field Name Field Mnemonic	Field Name Tag
Domain	Data type/format

(1) ISO 8211 nomenclature

The identification nomenclature of part 1 has been used for most of the corresponding constructions of this part. The mnemonic for a module field becomes an ISO 8211 tag and the mnemonic for a subfield becomes an ISO 8211 label. Table 1 specifies any exceptions to this practice. The field names are the corresponding names in part 1. Specifications for the substantive contents and semantics of the user data subfields corresponding to the tags and labels are found in parts 1 and 2.

The following is a concordance relating the ISO 8211 data types of this Part to the data types and domains of part 1, section 4.2.1.

Generic Type	ISO 8211 Data Type	Part 1 Data Type(s); Domain
Text	A	A; Graphic characters, Alphanumeric, Alphabetic
Integer	I	I; Integer
Real, fixed	R	R; Real
Real, float	S	S
Logical	C	C
Binary	B	B, BUI, BIdd, BUdd, BFPdd; Binary

The following domains may result in any one of the ISO 8211 data types depending on their use: Allowable values, Standard code sets and Standard field where domain is defined in Data Dictionary.

6 Specifications

This section specifies the allowable subset of tags, names, labels, formats and other control information necessary to the transfer of spatial data. It specifies the limits allowed users for those ISO 8211 parameters that are permitted to vary such that transfer may be accomplished. The specifications for several media are also provided.

Note: Annex A suggests methods by which private agreements can extend the standard within the general specifications of ISO 8211 in order that the user can, by private agreement, transfer data not anticipated by this standard in a manner that does not conflict with this standard.

6.1 Specifications of ISO 8211 Constructs

Table 1 specifies the ISO 8211 tags, control fields, names, labels and formats reserved by this standard for the transfer of a set of complete modules as single or multiple files.

The field controls in table 1 are based on the following rule. An ISO 8211 vector data structure (1x00) is used for all primary fields and other fields of part 1 that do not repeat within a module record. An ISO 8211 array data structure (2x00) is used for fields that may repeat within a module record. Alternatives to the field controls of table 1 are specified in 6.4.1.

6.1.1 Notational Conventions of Table 1

The contents of table 1 are formatted as follows:

Tag st00fuName& (See part 1, section reference)
[n] | [m,n] Label& - continued to next line as necessary
 Format;

where:

Tag is a four character ISO 8211 tag
st00fu are the ISO 8211 field controls (6 bytes)

where: s is the data structure code
 t is the data type code
 00 are required characters
 f is the printable graphic for the field terminator
 u is the printable graphic for unit terminator

Note: The printable graphics ";" and "&" at other locations in table 1 represent FT(1/14) and UT(1/15), the required delimiters of the data description subfields.

Name& is the ISO 8211 name and "&" represents its delimiter

[] signifies that no labels are specified

[n] signifies n subfield elements of an n-tuple

[m,n] signifies the number of elements in a two dimensional array; often an n-tuple, repeating m times

Where n is not explicitly specified, it is determined by the number of items in the user's n-tuple.

Where m is not explicitly specified, the field is a repeating n-tuple whose first extent is determined from the data in the ISO 8211 field.

Label&

is an ISO 8211 vector label or Cartesian label and "&" represents its delimiter

A vector label identifies the components of an n-tuple and has the form, lab1!lab2!...labn.

A Cartesian label identifies the columns of a repeating table and has the form, *col1!col2!...coln.

Format;

is the ISO 8211 format control and ";" represents its delimiter.

When explicitly specified for a subfield, the ISO 8211 data type format code (i.e., A, I, R, S, C, B) is given.

The formats of subfields with user delimiters or fixed extents will require completion by the user.

The presence of "z" implies that the data type must be supplied by the user from the list of allowed types.

See 6.1.3 (e) for format variations.

The presence of:

"lowercase" implies a user assigned name, label or data type code.

Solid lines, "_____", group associated sets of tags and field descriptions that form a spatial data module (i.e., the associated fields lie between the solid lines). The primary field of the set is listed first and the secondary fields, if any, are listed after the primary field.

Table 1

Specification of Tags, Field Controls, Names, Labels and Formats

ISO 8211 File Control Field

0000 0000;&external file title&
[] &
 ;

Note: This field exists only in the ISO 8211 data descriptive record and contains a human-readable file title

ISO 8211 Record Identifier Field

0001 0100;&DDF RECORD IDENTIFIER&
[] &
 ;

Note: This field is required by ISO 8211 in each record and contains a unique identifier of a data record. It is not the SDTS record identifier, RCID.

Global Information Modules (See part 1, 5.2)

IDEN 1600;&IDENTIFICATION& (See part 1, 5.2.1.1)
[15] MODN!RCID!STID!STVS!DOCU!PRID!PRVS!PDOC!
 TITL!DAID!DAST!MPDT!DCDT!SCAL!COMT&
 (A,I,11A,I,A);

CONF 1600;&CONFORMANCE& (See part 1, 5.2.1.2)
[6] FFYN!VGYN!GTYN!RCYN!EXSP!FTLV&
 (4A,2I);

Table 1 (continued)

ATID [m,2]	2600;&ATTRIBUTE ID& *MODN!RCID& (A,I);
CATD [10]	1600;&CATALOG/DIRECTORY& (See part 1, 5.2.2.1) MODN!RCID!NAME!TYPE!VOLM!FILE!RECD!EXTR!MVER!COMT& (A,I,4A,z,3A); where z implies (I A).
CATX [7]	1600;&CATALOG/CROSS-REFERENCE& (See part 1, 5.2.2.2) MODN!RCID!NAM1!TYP1!NAM2!TYP2!COMT& (A,I,5A);
CATS [10]	1600;&CATALOG/SPATIAL DOMAIN& (See part 1, 5.2.2.3) MODN!RCID!NAME!TYPE!DOMN!MAP!THEM!AGOB!AGTP!COMT& (A,I,8A);
SCUR [8]	1600;&SECURITY& (See part 1, 5.2.3) MODN!RCID!CLAS!CTRL!RLIS!RVDT!RVIS!COMT& (A,I,6A);
FRID [m,2]	2600;&Foreign ID& *MODN!RCID& (A,I);
IREF [17]	1600;&INTERNAL SPATIAL REFERENCE& (See part 1, 5.2.4.1) MODN!RCID!COMT!SATP!XLBL!YLBL!HFMT!VFMT! SFAX!SFAY!SFAZ!XORG!YORG!ZORG!XHRS!YHRS!VRES& (A,I,6A,6R,z,z,z); where z implies (I R S)
XREF [10]	1600;&EXTERNAL SPATIAL REFERENCE& (See part 1, 5.2.4.2) MODN!RCID!COMT!RDOC!RSNM!VDAT!SDAT!HDAT!ZONE!PROJ& (A,I,8A);

Table 1 (continued)

ATID [2]	1600;&ATTRIBUTE ID& MODN!RCID& (A,I);
RGIS [3]	1600;&REGISTRATION& (See part 1, 5.2.4.3) MODN!RCID!COMT& (A,I,A);
EADS [m,3]	2600;&EXTERNAL REFERENCE SPATIAL ADDRESS& *X!Y!Z& (3z); where z implies (R S).
IADS [m,3]	2600;&INTERNAL REFERENCE SPATIAL ADDRESS& *X!Y!Z& (3z); where z implies (I R S B).

When B is specified for internal spatial address subfields, the ISO 8211 binary data type is extended by the HFMT (for X and Y) and VFMT (for Z) subfields of the associated Internal Spatial Reference module record.

SPDM [5]	1600;&SPATIAL DOMAIN& (See part 1, 5.2.5) MODN!RCID!DTYP!DSTP!COMT& (A,I,3A);
DMSA [m,3]	2600;&DOMAIN SPATIAL ADDRESS& *X!Y!Z& (3z); where z implies (I R S B).

When Domain Spatial Address = "INTERNAL" and when B is specified for internal spatial address subfields, the ISO 8211 binary data type is extended by the HFMT (for X and Y) and VFMT (for Z) subfields of the associated Internal Spatial Reference module record.

DDDF [8]	1600;&DATA DICTIONARY/DEFINITION& (See part 1, 5.2.6.1) MODN!RCID!EORA!EALB!SRCE!DFIN!AUTH!ADSC& (A,I,6A);
---------------------------	---

Table 1 (continued)

DDOM **1600;&DATA DICTIONARY/DOMAIN&** (See part 1, 5.2.6.2)
[10] **MODN!RCID!ATLB!AUTH!ATYP!ADVF!ADMU!RAVA!DVAL!DVDF&**
 (A,I,6A,z,A); z implies (A|I|R|S|C|B)

When B is specified the ISO 8211 binary data type may be extended by the Attribute Domain Value Format subfield, ADVF.

DDSH **1600;&DATA DICTIONARY/SCHEMA&** (See part 1, 5.2.6.3)
[12] **MODN!RCID!NAME!TYPE!ETLB!EUTH!ATLB!AUTH!**
 FMT!UNIT!MXLN!KEY&
 (A,I,8A,I,A);

STAT **1600;&TRANSFER STATISTICS&** (See part 1, 5.2.7)
[6] **MODN!RCID!MNTF!MNR!NREC!NSAD&**
 (A,I,2A,2I);

Data Quality (See part 1, 5.3)

DQHL **1600;&LINEAGE&** (See part 1, 5.3.1)
[3] **MODN!RCID!COMT&**
 (A,I,A);

ATID **2600;&ATTRIBUTE ID&**
[m,2] ***MODN!RCID&**
 (A,I);

FRID **2600;&FOREIGN ID&**
[m,2] ***MODN!RCID&**
 (A,I);

DQPA **1600;&POSITIONAL ACCURACY&** (See part 1, 5.3.2)
[3] **MODN!RCID!COMT&**
 (A,I,A);

ATID **2600;&ATTRIBUTE ID&**
[m,2] ***MODN!RCID&**
 (A,I);