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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 963

**GUIDE FOR THE DEFINITION OF 4-BIT CHARACTER SETS
DERIVED FROM THE ISO 7-BIT CODED CHARACTER SET
FOR INFORMATION PROCESSING INTERCHANGE**

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 963, *Guide for the definition of 4-bit character sets derived from the ISO 7-bit coded character set for information processing interchange*, was drawn up by Technical Committee ISO/TC 97, *Computers and information processing*, the Secretariat of which is held by the United States of America Standards Institute (USASI).

Work on this question led, in 1967, to the adoption of a Draft ISO Recommendation.

In September 1967, this Draft ISO Recommendation (No. 1322) 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	U.A.R.
Czechoslovakia	Korea, Rep. of	United Kingdom
Denmark	Netherlands	Turkey
France	New Zealand	U.S.A.
Germany	Portugal	U.S.S.R.

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 February 1969, to accept it as an ISO RECOMMENDATION.

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INTRODUCTION

The need has been expressed for 4-bit character sets derived from the 7-bit code for information interchange. There are economic reasons which require a 4-bit set for private or regional organizations with multiple terminals where the use of the full 7-bit code is not justified.

The representation of decimal numbers in packed numerics form according to ISO Recommendation R . . . * does not constitute a 4-bit character set in the sense of this guide.

1. SCOPE

The multiplicity and the diversity of the possible applications make it impossible to define a unique 4-bit character set or even a family of a limited number of sets. The purpose of this ISO Recommendation is therefore to set up rules for the definition of such sets so that

- (a) a given selection of characters from the 7-bit code shall be uniquely arranged in a 4-bit set;
- (b) the subsets are as similar to and as compatible with each other as possible;
- (c) the rules given should make conversion possible at minimum cost to and from 7-bit coded information.

2. FIELD OF APPLICATION

This ISO Recommendation applies to the definition of 4-bit character sets derived from the 7-bit code for information interchange (see ISO Recommendation R 646, *6 and 7-bit coded character sets for information processing interchange***).

3. CHARACTER SET

The characters available to a 4-bit set are

- (a) all the characters of the 7-bit code table;
- (b) other characters whose meaning and graphical representation must be agreed between sender and recipient of the data.

* At present at the stage of draft proposal.

** To facilitate the use of this ISO Recommendation, the 7-bit set table of ISO Recommendation R 646 has been reproduced in Appendix Z.

4. DEFINITION OF A 4-BIT CHARACTER SET

- 4.1 A 4-bit set comprises the ten numerals 0 to 9 and six further characters allocated as described in section 5.
- 4.2 These characters are coded in increasing binary order and referenced Position 0 to Position 15, the numerals being allocated to Positions 0 to 9.

Position	Character	Coded representation
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10		1010
11		1011
12		1100
13		1101
14		1110
15		1111

5. RULES FOR THE ALLOCATION OF CHARACTERS TO POSITIONS 10 TO 15

- 5.1 Decide which characters from the 7-bit code are required for the 4-bit set.

NOTE. – It is important that no attempt be made at this stage to foresee the graphical representation of characters from columns 0 and 1 of the 7-bit code table.

- 5.2 Consider any characters required from row 10 of the 7-bit code table.
- 5.3 Allocate to position 10 the first one encountered when taken in the order of columns : 3 2 1 0 7 6 5 4.
- 5.4 Leave any remaining characters in row 10 to be dealt with under clause 5.6.
- 5.5 Repeat the procedure of clauses 5.2 to 5.4 for each of the rows 11 to 15, with the exception that in the case of row 15 the columns are taken in the order : 7 3 2 1 0 6 5 4.
- 5.6 Sort any character left from rows 10 to 15 together with any other characters required from row 0 to 9 (other than numerals) into ascending order of their 7-bit binary coded representation and insert them into unfilled position of the subset in order of position number.
- 5.7 If a control (i.e. a character from column 0 or 1 of the 7-bit code table) has been used, decide whether a graphical representation of it is required. If so, allocate either the graphic from column 3 of the 7-bit code corresponding to the position the control now occupies in the 4-bit set, or a graphic not included in the 7-bit code.