

Transformed

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 840

CODE FOR NUMERICAL CONTROL OF MACHINES

(Compatible with the ISO 7 bit character set)

1st EDITION

October 1968

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BRIEF HISTORY

The ISO Recommendation R 840, *Code for numerical control of machines (Compatible with the ISO 7 bit character set)*, 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 by the Technical Committee began in 1963 and led, in 1967, to the adoption of a Draft ISO Recommendation.

In August 1967, this Draft ISO Recommendation (No. 1314) 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 :

Belgium	Japan	Switzerland
Czechoslovakia	Netherlands	Turkey
Denmark	New Zealand	U.A.R.
France	Poland	United Kingdom
Germany	Portugal	U.S.A.
Iran	Spain	
Italy	Sweden	

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 October 1968, to accept it as an ISO RECOMMENDATION.

CODE FOR NUMERICAL CONTROL OF MACHINES

(Compatible with the ISO 7 bit character set)

1. SCOPE

This ISO Recommendation describes a 7 bit coded character set for the numerical control of machines and associated equipment (printers, punchers); it is to be implemented on 8-track punched tape. This ISO Recommendation consists of a table, notes and a key. An Annex gives the meanings assigned to the symbols in the ISO Recommendations on punched tape block formats.

2. REFERENCES

- 2.1 The recommended character set is based upon and compatible with the ISO 7 bit coded character set, described in ISO Recommendation R 646, *6 and 7 bit coded character sets for information processing interchange*.
- 2.2 The implementation of this coded character set on punched tapes is in accordance with ISO Recommendation R ..., * *Representation of 6 and 7 bit coded character sets on punched tape*; it includes a parity check (even parity); the parity bit is on track 8.
- 2.3 The technical terms used in this ISO Recommendation are based on ISO Recommendation R ..., ** *Data processing vocabulary*.

* At present, Draft ISO Recommendation No. 1418.

** At present in course of preparation.

3. TABLE AND NOTES

3.1 Table

Bits	b ₇	b ₆	b ₅	b ₄	b ₃	b ₂	b ₁	Row	Column							
									0	0	0	0	1	1	1	1
									0	0	1	1	0	0	1	1
									0	1	0	1	0	1	0	1
									0	1	2	3	4	5	6	7
	0	0	0	0	0	0	0	0	NUL		SP	0		P		
	0	0	0	0	1	1	1	1				1	A	Q		
	0	0	1	0	0	0	0	2				2	B	R		
	0	0	1	1	1	1	1	3				3	C	S		
	0	1	0	0	0	0	0	4				4	D	T		
	0	1	0	1	1	1	1	5			% ⁽⁴⁾	5	E	U		
	0	1	1	0	0	0	0	6				6	F	V		
	0	1	1	1	1	1	1	7				7	G	W		
	1	0	0	0	0	0	0	8	BS ⁽¹⁾		(⁽³⁾	8	H	X		
	1	0	0	1	1	1	1	9	HT) ⁽³⁾	9	I	Y		
	1	0	1	0	0	0	0	10	LF ⁽²⁾			: ⁽⁴⁾	J	Z		
	1	0	1	1	1	1	1	11			+		K			
	1	1	0	0	0	0	0	12					L			
	1	1	0	1	1	1	1	13	CR ⁽²⁾		—		M			
	1	1	1	0	0	0	0	14					N			
	1	1	1	1	1	1	1	15			/		O			DEL

3.2 Notes

- ① The "Backspace" function causes the printer carriage, and not the tape, to move backward one space.
- ② The "End of Block" function is performed by
 - the "Line Feed" function (LF), when the printer requires distinct combinations of holes for the carriage return and line feed;
 - the "New Line" function (NL), when the printer has only one instruction for the combined carriage return and line-feed operation.

The NL and LF functions are represented by the same combination of holes (position 0/10).

When the printer requires distinct combinations of holes for carriage return (CR) and line feed (LF), the machine control ignores the CR character.

- ③ The graphic symbols "(" left parenthesis and ")" right parenthesis are used to indicate that the characters between them must not be interpreted by the machine control equipment. They represent respectively "Control Out" and "Control In" functions.
- ④ The characters "% " and ". " shall not be used between the parentheses.

4. KEY

BS	=	Backspace
CR	=	Carriage Return
DEL	=	Delete
HT	=	Horizontal Tabulation
LF	=	Line Feed
NL	=	New Line
NUL	=	Null
SP	=	Space
%	=	Per cent
(=	Left parenthesis
)	=	Right parenthesis
+	=	Plus
-	=	Minus
/	=	Slash
:	=	Colon

ANNEX

LIST OF MEANINGS ASSIGNED TO THE SYMBOLS
IN PUNCHED TAPE BLOCK FORMATS

Symbol	Meaning	Position in the table
HT	Tabulation	0/9
LF or NL	End of block	0/10
%	Programme start	2/5
(Control out	2/8
)	Control in	2/9
+	Plus	2/11
-	Minus	2/13
/	Optional block skip	2/15
:	Alignment function	3/10

For more details, see relevant ISO Recommendations, as follows :

- ISO Recommendation R ...,* *Interchangeable punched tape variable block format for positioning and straight-cut numerically controlled machines;*
- ISO Recommendation R ...,** *Punched tape variable block format for positioning and straight-cut numerically controlled machines;*
- ISO Recommendation R ...,*** *Punched tape fixed block format for positioning and straight-cut numerically controlled machines.*

* At present, Draft ISO Recommendation No. 1317.
** At present, Draft ISO Recommendation No. 1318.
*** At present, Draft ISO Recommendation No. 1319.