# ECMA

## EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

# STANDARD ECMA - 19

for

# THE CODING OF CHARACTER SETS FOR MICR AND OCR

June 1969

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BRIEF HISTORY

In the last few years ECMA have adopted their 7 bit
Coded Character Set (Standard ECMA-6) and three standards
for MICR (ECMA-3) and OCR (ECMA-8, ECMA-11). It appeared
very clearly that there is a need for a definite shape-to-
code assignment. The present Standard ECMA-19 indicates
this correspondence.

This Standard has been adopted at the General Assembly
of June 12, 1969.

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1. PURPOSE

1.1 This Standard ECMA-19 defines the 7 bit and where appropriate the 4 bit coded representation of the characters comprised in the MICR and OCR sets.

1.2 Full specification of these character sets is contained in the Standards:

ECMA-3      Standard for the CMC7 Printed Image Specification, 2nd Edition

ECMA-8      Standard for the Nominal Character Dimensions of the Numeric OCR-A Font

ECMA-11     Alphanumeric Character Set OCR-B for Optical Recognition

ECMA-15     Standard for Printing Specifications for Optical Character Recognition

1.3 This Standard does not specify how the sets are to be introduced within the environment of the ECMA 7 bit Code. Rules for doing so are the subject of other standards on Code Extension and Expansion.

2. SCOPE

This Standard applies to following character sets:

2.1 Standard ECMA-3 - CMC7

2.1.1 Numeric subset:

10 numerals

5 special symbols

2.1.2 Alphanumeric set:

10 numerals

5 special symbols

26 letters

2.2 Standard ECMA-8 - OCR-A

10 numerals

3 special symbols

2.3 Standard ECMA-11 - OCR-B

10 numerals

26 upper case letters

26 lower case letters

    1 alternative lower case letter

  27 graphics

    7 upper case national letters

    3 lower case national letters

    7 further graphics

    4 diacritical signs

## 3. NOTE

For those characters of the MICR and OCR character sets which are included in the ECMA 7 Bit Coded Character Set (Standard ECMA-6) the same bit combinations have been allocated.

## 4. TABLES

The correspondence between the character sets and their coded representation is given in the Tables:

Table I       Numeric Subset CMC7 and OCR-A, 4 bit representation

Table II     CMC7 Numeric Subset, 7 bit representation

Table III    OCR-A, 7 bit representation

Table IV    CMC7, 7 bit representation

Table V     OCR-B, 7 bit representation

## TABLE I

| b₄ | b₃ | b₂ | b₁ | | numerical subset of CMC 7 | OCR–A |
|----|----|----|----|----|----|----|
| 0 | 0 | 0 | 0 | 0 | ⊡ | 0 |
| 0 | 0 | 0 | 1 | 1 | | 1 |
| 0 | 0 | 1 | 0 | 2 | | 2 |
| 0 | 0 | 1 | 1 | 3 | | 3 |
| 0 | 1 | 0 | 0 | 4 | | 4 |
| 0 | 1 | 0 | 1 | 5 | | 5 |
| 0 | 1 | 1 | 0 | 6 | | 6 |
| 0 | 1 | 1 | 1 | 7 | | 7 |
| 1 | 0 | 0 | 0 | 8 | | 8 |
| 1 | 0 | 0 | 1 | 9 | | 9 |
| 1 | 0 | 1 | 0 | 10 | | |
| 1 | 0 | 1 | 1 | 11 | | |
| 1 | 1 | 0 | 0 | 12 | | ⌠ |
| 1 | 1 | 0 | 1 | 13 | | ५ |
| 1 | 1 | 1 | 0 | 14 | | ⊓ |
| 1 | 1 | 1 | 1 | 15 | | |

The various positions are designated from 0000 to 1111 in binary notation and from 0 to 15 in decimal notation.

# TABLE II
## CMC7 NUMERIC SUBSET

| b7 b6 b5 b4 | b3 b2 b1 | 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 1 | 1 | | | | ⚫ | | | | |
| 0 0 1 0 | 2 | | | | ⚫ | | | | |
| 0 0 1 1 | 3 | | | | ⚫ | | | | |
| 0 1 0 0 | 4 | | | | ⚫ | | | | |
| 0 1 0 1 | 5 | | | | ⚫ | | | | |
| 0 1 1 0 | 6 | | | | ⚫ | | | | |
| 0 1 1 1 | 7 | | | | ⚫ | | | | |
| 1 0 0 0 | 8 | | | | ⚫ | | | | |
| 1 0 0 1 | 9 | | | | ⚫ | | | | |
| 1 0 1 0 | 10 | | | | ⚫ | | | | |
| 1 0 1 1 | 11 | | | | ⚫ | | | | |
| 1 1 0 0 | 12 | | | | ⚫ | | | | |
| 1 1 0 1 | 13 | | | | ⚫ | | | | |
| 1 1 1 0 | 14 | | | | ⚫ | | | | |
| 1 1 1 1 | 15 | | | | | | | | |

# TABLE III

## OCR-A

| $b_7$ $b_6$ $b_5$ | $b_4$ | $b_3$ | $b_2$ | $b_1$ | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 0 0 0 | 0 0 1 | 0 1 0 | 0 1 1 | 1 0 0 | 1 0 1 | 1 1 0 | 1 1 1 |
| | 0 | 0 | 0 | 0 | 0 | | | | 0 | | | | |
| | 0 | 0 | 0 | 1 | 1 | | | | 1 | | | | |
| | 0 | 0 | 1 | 0 | 2 | | | | 2 | | | | |
| | 0 | 0 | 1 | 1 | 3 | | | | 3 | | | | |
| | 0 | 1 | 0 | 0 | 4 | | | | 4 | | | | |
| | 0 | 1 | 0 | 1 | 5 | | | | 5 | | | | |
| | 0 | 1 | 1 | 0 | 6 | | | | 6 | | | | |
| | 0 | 1 | 1 | 1 | 7 | | | | 7 | | | | |
| | 1 | 0 | 0 | 0 | 8 | | | | 8 | | | | |
| | 1 | 0 | 0 | 1 | 9 | | | | 9 | | | | |
| | 1 | 0 | 1 | 0 | 10 | | | | | | | | |
| | 1 | 0 | 1 | 1 | 11 | | | | | | | | |
| | 1 | 1 | 0 | 0 | 12 | | | | ſ | | | | |
| | 1 | 1 | 0 | 1 | 13 | | | | ч | | | | |
| | 1 | 1 | 1 | 0 | 14 | | | | ⌐| | | | | |
| | 1 | 1 | 1 | 1 | 15 | | | | | | | | |

# TABLE IV
## CMC7 CHARACTER SET

| b7 | b6 | b5 | b4 | b3 | b2 | b1 | 0 0 0 0 | 0 0 1 1 | 0 0 2 | 0 1 0 3 | 1 0 1 4 | 1 0 1 5 | 1 1 0 6 | 1 1 1 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | 0 | 0 | | | 0 | | P | | |
| | | | 0 | 0 | 0 | 1 | 1 | | | 1 | A | Q | | |
| | | | 0 | 0 | 1 | 0 | 2 | | | 2 | B | R | | |
| | | | 0 | 0 | 1 | 1 | 3 | | | 3 | C | S | | |
| | | | 0 | 1 | 0 | 0 | 4 | | | 4 | D | T | | |
| | | | 0 | 1 | 0 | 1 | 5 | | | 5 | E | U | | |
| | | | 0 | 1 | 1 | 0 | 6 | | | 6 | F | V | | |
| | | | 0 | 1 | 1 | 1 | 7 | | | 7 | G | W | | |
| | | | 1 | 0 | 0 | 0 | 8 | | | 8 | H | X | | |
| | | | 1 | 0 | 0 | 1 | 9 | | | 9 | I | Y | | |
| | | | 1 | 0 | 1 | 0 | 10 | | | | J | Z | | |
| | | | 1 | 0 | 1 | 1 | 11 | | | | K | | | |
| | | | 1 | 1 | 0 | 0 | 12 | | | | L | | | |
| | | | 1 | 1 | 0 | 1 | 13 | | | | M | | | |
| | | | 1 | 1 | 1 | 0 | 14 | | | | N | | | |
| | | | 1 | 1 | 1 | 1 | 15 | | | | O | | | |

## TABLE V
## OCR-B CHARACTER SET

| b7 b6 b5 b4 | b3 b2 b1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 0 0 0 0 | 0 | | | | 0 | @ | P | ` | p |
| 0 0 0 1 | 1 | | | ! | 1 | A | Q | a | q |
| 0 0 1 0 | 2 | | | " | 2 | B | R | b | r |
| 0 0 1 1 | 3 | | | £ # | 3 | C | S | c | s |
| 0 1 0 0 | 4 | | | $ | 4 | D | T | d | t |
| 0 1 0 1 | 5 | | | % | 5 | E | U | e | u |
| 0 1 1 0 | 6 | | | & | 6 | F | V | f | v |
| 0 1 1 1 | 7 | | | ' | 7 | G | W | g | w |
| 1 0 0 0 | 8 | | | ( | 8 | H | X | h | x |
| 1 0 0 1 | 9 | | | ) | 9 | I | Y | i | y |
| 1 0 1 0 | 10 | | | * | : | J | Z | j | z |
| 1 0 1 1 | 11 | | | + | ; | K | [ | k | |
| 1 1 0 0 | 12 | | | , | < | L | | l | |
| 1 1 0 1 | 13 | | | - | = | M | ] | m m | |
| 1 1 1 0 | 14 | | | . | > | N | ^ | n | |
| 1 1 1 1 | 15 | | | / | ? | O | _ | o | |

This table shows only those OCR-B characters which are represented in the 7 bit table of the Standard ECMA-6. The coding of the remaining OCR-B characters is subject to national standardization.

# APPENDIX

## OCR-A

In the ISO Recommendation 1073 an alphabet of 26 upper case letters and 18 symbols having the same stylization are added to the OCR-A numeric set.

It is recommended to adopt for the coding of the whole set the scheme of Table 1.

## OCR-A ALPHANUMERIC CHARACTER SET

| b7 b6 b5 | b4 | b3 | b2 | b1 | | 0 0 0 0 | 1 | 0 0 1 2 | 0 1 0 3 | 1 0 0 4 | 1 0 1 5 | 1 1 0 6 | 1 1 1 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | | | | 0 | | P | | |
| 0 | 0 | 0 | 1 | 1 | | | \| | 1 | A | Q | | |
| 0 | 0 | 1 | 0 | 2 | | | " | 2 | B | R | | |
| 0 | 0 | 1 | 1 | 3 | | | £ | 3 | C | S | | |
| 0 | 1 | 0 | 0 | 4 | | | $ | 4 | D | T | | |
| 0 | 1 | 0 | 1 | 5 | | | % | 5 | E | U | | |
| 0 | 1 | 1 | 0 | 6 | | | & | 6 | F | V | | |
| 0 | 1 | 1 | 1 | 7 | | | ' | 7 | G | W | | |
| 1 | 0 | 0 | 0 | 8 | | | { | 8 | H | X | | |
| 1 | 0 | 0 | 1 | 9 | | | } | 9 | I | Y | | |
| 1 | 0 | 1 | 0 | 10 | | | * | : | J | Z | | |
| 1 | 0 | 1 | 1 | 11 | | | + | ; | K | | | |
| 1 | 1 | 0 | 0 | 12 | | | ⌐ | ⌠ | L | | | |
| 1 | 1 | 0 | 1 | 13 | | | − | =Ч | M | | | |
| 1 | 1 | 1 | 0 | 14 | | | . | � | N | | | |
| 1 | 1 | 1 | 1 | 15 | | | / | ? | O | | | |