ECMA

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

STANDARD ECMA-21

for

CHARACTER POSITIONING ON OCR JOURNAL TAPE

June 1969

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ECMA European Computer Manufacturers Association
114, Rue du Rhône - 1204 Geneva (Switzerland)

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BRIEF HISTORY

ECMA TC4 started their standardization work in the field of Optical Character Recognition in June 1961. This work led to the adoption of the Standards ECMA-8 (Nominal Character Dimensions of the OCR-A font), ECMA-11 (Alpha-numeric Character Set for OCR-B) and ECMA-15 (Printing Specification for OCR). In order to ensure better information interchange, further work has been undertaken on the arrangement of the information on specific data media. The Standard ECMA-18 is directed to documents bearing a single line of characters recognizable by machine.

This Standard ECMA-21 concernes Character Positioning on OCR Journal Tape. Further work is in progress on other media.

Adopted on June 12, 1969 by the General Assembly of ECMA as Standard ECMA-21

TABLE OF CONTENT

1. PURPOSE

The purpose of this Standard is to establish the positioning on OCR Journal Tapes of characters to be read by an optical character reader.

2. SCOPE

This Standard contains the basic definitions and recommendations concerning the position of characters on a Journal Tape. It also contains rules for splicing two tapes.

3. DEFINITIONS

3.1 Reference Edge

The Reference Edge is the right hand edge of the tape with regard to the direction of movement of the tape.(See Fig. 1)

3.2 Clear Area

The Clear Area is the zone of the tape containing characters to be read optically. It is limited by the leader and the trailer. (See Fig. 1)

3.3 Character Boundary

The Character Boundary is the rectangle with sides parallel and perpendicular to the Reference Edge which is drawn tangential to the character outline and contains the character completely. (See Fig. 3)

3.4 Line Boundary

The Line Boundary is the smallest rectangle with sides parallel and perpendicular to the Reference Edge, which contains all the boundaries of the characters of the line, whether they are grouped in one or more fields. (See Fig. 2).

3.5 Vertical Character Misalignment

The Vertical Character Misalignment is the vertical distance between the character alignment reference lines of two characters in the same line. (See also Standard ECMA-15, para. 5.14). (See Fig. 3)

3.6 Line Separation

The Line Separation between the Line Boundaries of two consecutive lines is the vertical distance between the lower side perpendicular to the Reference

Edge of the boundary of the first line and the upper side perpendicular to the Reference Edge of the boundary of the second line. (See Fig. 2)

3.7 Line Spacing

The Line Spacing of two consecutive lines is the vertical distance between the average horizontal centerline positions of all characters printed on the first line and that of all characters printed on the second line. (See Fig. 2)

3.8 Line Density

The Line Density is the number of lines per 25,4 mm.

3.9 Margin

The Margin is the width of a zone along an edge of the tape in which no printing may occur (See Fig. 1).

4. DIMENSIONS

4.1 Vertical Character Misalignment

The allowed Vertical Character Misalignment in a line is indicated in Table 1.

Table 1

Size	Max. vertical misalignment in mm
I	1,0
II	1,0
III	1,2
IV	1,3

4.2 Maximum Height of the Line Boundary

The maximum height of the Line Boundary varies with the font sizes as indicated in Table 2.

Table 2

Size	Max. Line Boundary height in mm
I	3,9
II	4,3
III	5,1
IV	5,9

4.3 Line Separation, Line Spacing, Line Density

The min. Line Separation between subsequent Line Boundaries, the min. Line Spacing and the resulting maximum Lines Density are indicated in Table 3.

Table 3

font size	Min. Line Separation in mm	Min. Line Spacing in mm	Max. Line Density in Lines per 25,4 mm
I	1,2	5,1	5,0
II	1,4	5,7	4,4
III	1,6	6,7	3,8
IV	2,0	7,9	3,25

When the vertical misalignment tolerances can be controlled better than specified in Table 1, the Line Density may be increased provided that the minimum Line Separation values are met. In these cases special consideration must be given to the compatibility between printing and reading equipment.

4.4 Margin

4.4.1 The Right Hand Margin must be greater than 2,5 mm. The entire low order character in a line to be read must be within 10 mm of the right hand edge.
(When smaller values of margin are required, attention is called on point 5.5 of ECMA-15).

4.4.2 The Left Hand Margin may not be less than 2,5 mm.
(When smaller values are required, attention is called on point 5.5 of ECMA-15).

4.5 Width of the tape

4.5.1 The width of the tape must be contained within the following limits:

minimum : 33 mm

maximum : 90 mm

If a larger width is required special consideration must be given to the compatibility between printing and reading equipment.

4.5.2 For any roll, even when spliced, the width must be uniform within 0,5 mm.

4.6 Dimensions of the roll before reading

External diameter of the paper roll: max. 82,5 mm

The internal diameter of the paper roll shall be: min. 12,7 mm

5. SPLICING

The following rules apply:

5.1 The angle between the reference edge of the two ends shall be smaller than 1°.

5.2 The misalignment of the reference edges must be contained within 0,5 mm.

5.3 Only transparent adhesive tape shall be used. It shall be placed on the reverse side and not extend beyond the tape edges.

5.4 No part of any character shall be closer than 6,35 mm to the splice.

5.5 The tensile strength of the spliced tape shall not be smaller than that of the paper tape.

5.6 When the ends are butted the gap between them shall be smaller than 0,35 mm.

5.7 When the ends are overlapped, they extend over each other up to a maximum of 2,5 mm. The leading tape must lay on top of the trailing tape when passing through the transport.

6. LEADER AND TRAILER

6.1 The length of leader and trailer must be min. 460 mm each.

6.2 When some reference data (not intended for OCR scanning) is printed on the leader or trailer, this should not extend nearer than 15 mm from the Reference Edge.

7. DRAWING

A drawing comprising 8 figures is provided for illustrative purpose only. All dimensions are indicated in mm.

Fig. 1 represents a plan view of a piece of tape,
Fig. 2 represents two line boundaries,
Fig. 3 represents two vertically misaligned characters,
Fig. 4 represents a roll of tape,
Fig. 5 represents two misaligned tape ends,
Fig. 6 represents at a longer scale two overlapping tape ends with the permissible angle between their Reference Edges,
Fig. 7 represents two butted tape ends, and
Fig. 8 represents two overlapping tape ends.

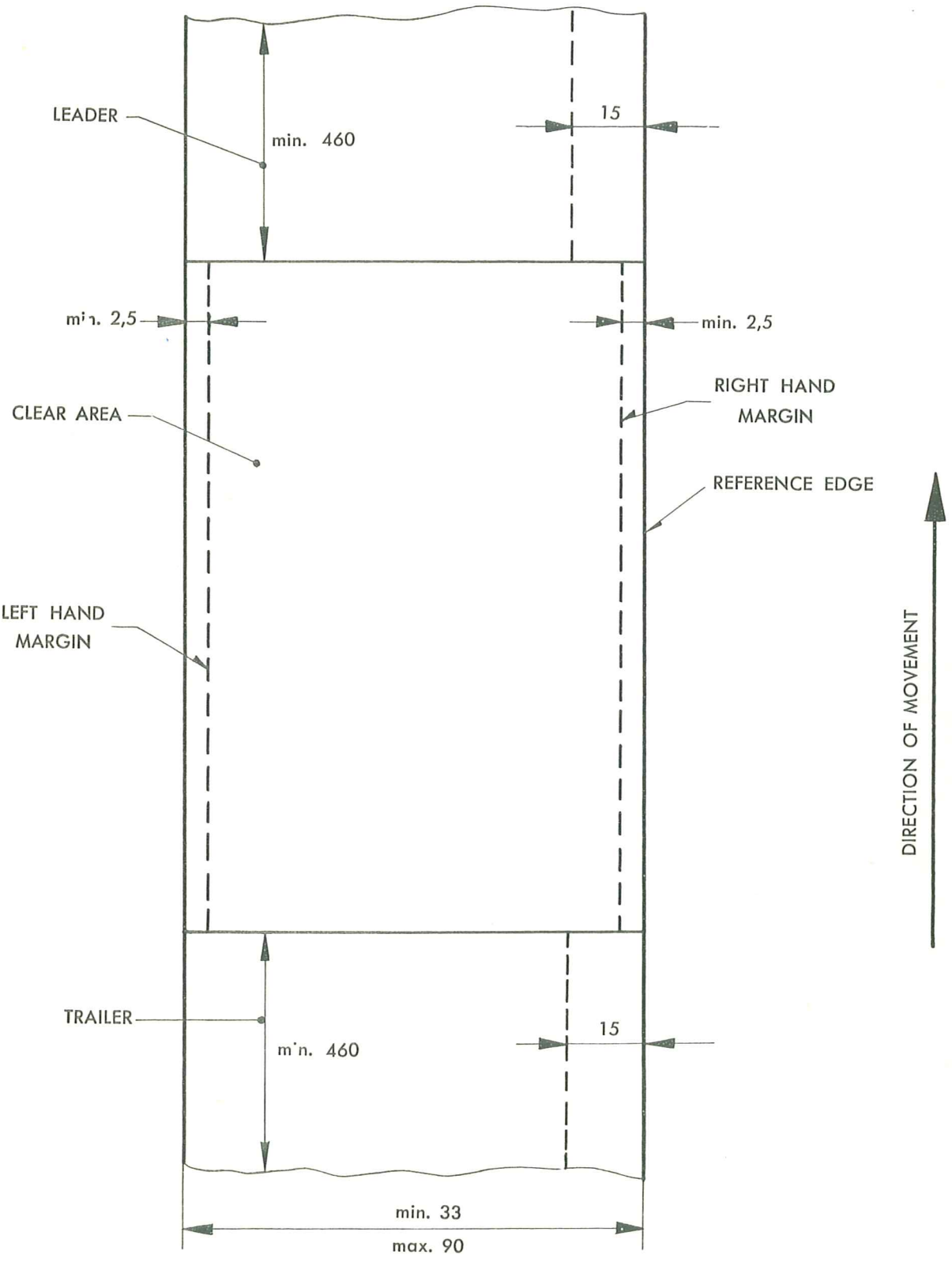

LEADER
min. 460
15
min. 2,5
min. 2,5
RIGHT HAND MARGIN
CLEAR AREA
REFERENCE EDGE
LEFT HAND MARGIN
DIRECTION OF MOVEMENT
TRAILER
min. 460
15
min. 33
max. 90

Fig. 1

Fig. 2

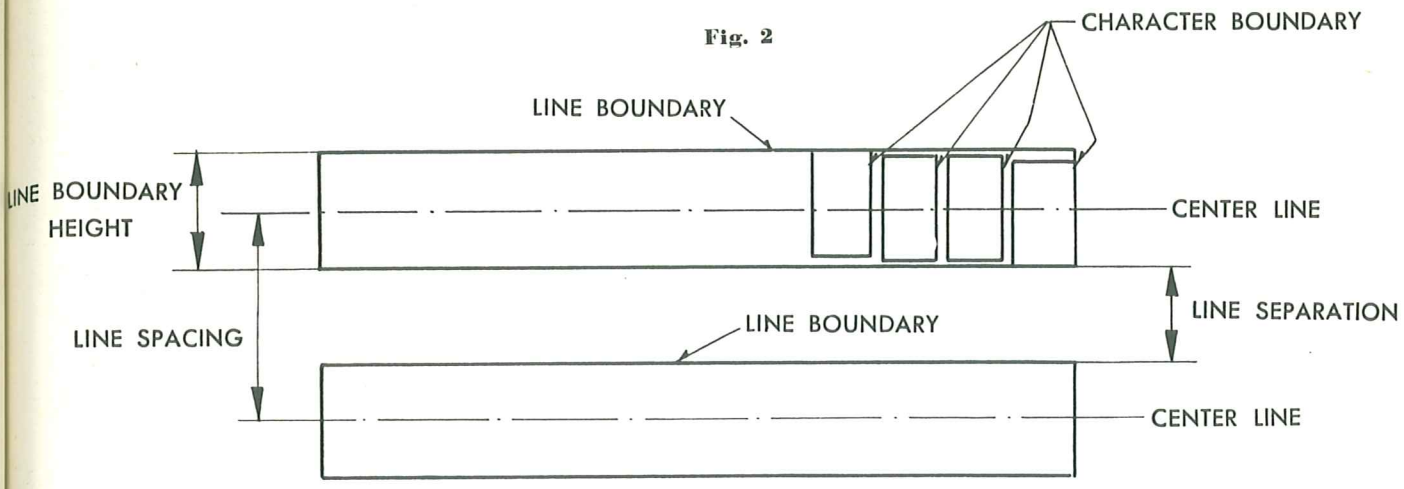


Fig. 3

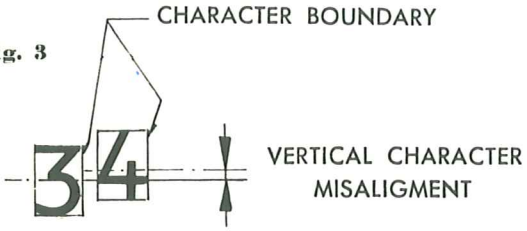


Fig. 4

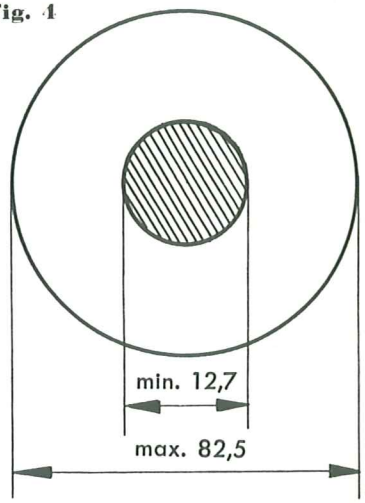


Fig. 5

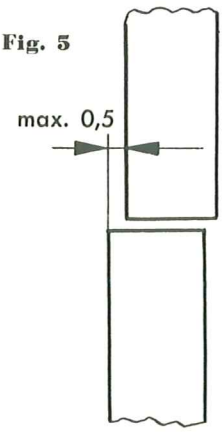
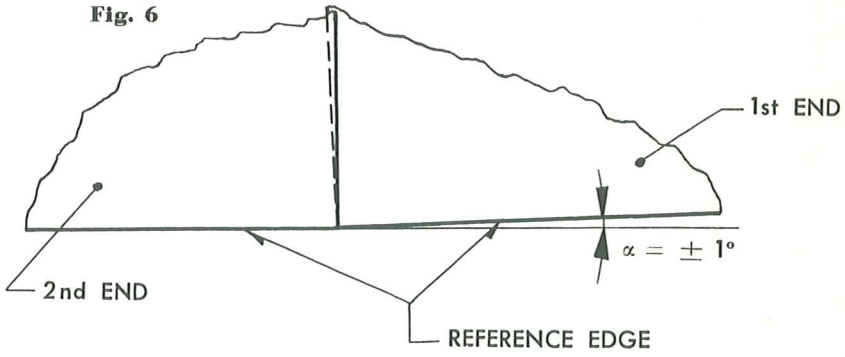
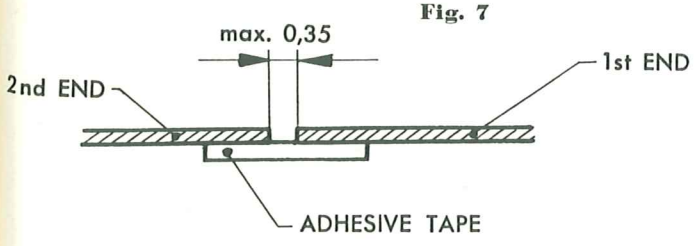


Fig. 6



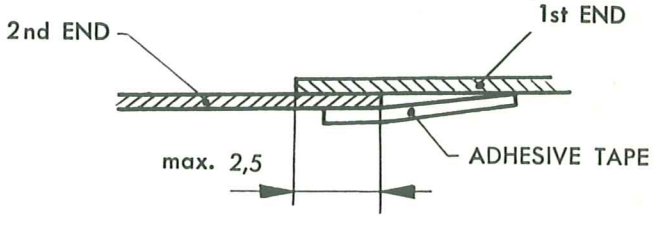
BUTTED ENDS

Fig. 7



OVERLAPPING ENDS

Fig. 8



DIRECTION OF MOVEMENT