

# ECMA

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

---

## STANDARD ECMA-42

FOR AN

## ALPHA-NUMERIC CHARACTER SET FOR 7 x 9 MATRIX PRINTERS

December 1973

Free copies of this ECMA standard are available from  
ECMA European Computer Manufacturers Association  
114 Rue du Rhône — 1204 Geneva (Switzerland)

# ECMA

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

---

## STANDARD ECMA-42

FOR AN

## ALPHA-NUMERIC CHARACTER SET FOR 7 x 9 MATRIX PRINTERS

December 1973

## BRIEF HISTORY

In June 1971 the General Assembly of ECMA decided to start work on standardization of character sets for matrix printers. This task was entrusted to TC4.

Matrix printing is a technique that is increasingly being used because of certain advantages in many applications in the computer field. Therefore, ECMA felt it necessary to investigate the possibility of generating machine-readable characters by this technique. The main goal of the work was to define characters which could be printed with commonly used matrix printers and could be read by humans and machines. Two projects were undertaken by this Committee : one for the implementation of ECMA-8 (Numeric OCR-A Font) on a 9x9 grid and one for a new alpha-numeric character set for 7x9 matrix printers.

The former has been published as an ECMA White Cover document. The latter is the subject of this Standard ECMA-42, adopted by the General Assembly on December 14, 1973.

1. SCOPE

This Standard defines the printed image and the nominal dimensions of a font for 7x9 matrix printers. The characters have been designed for both human and machine readability.

At present date the machine legibility of the font has been assessed by simulation on computer with proper attention given to the distinguishability between pairs of characters. Future experience in reading applications may imply adjustments which will be taken care of in the course of the maintenance of the Standard.

This Standard does not define paper characteristics, print quality or character positioning. These matters will be subject of other standards or publications.

2. CHARACTER SET

The font is defined for following set of 73 characters :

10 digits:

1234567890

26 capital letters:

ABCDEFGHIJKLM  
NOPQRSTUVWXYZ

7 national letters:

Ä&ÆIJöøÜ

30 other graphics:

\*+ - = / . , : ; " ' ? ! ( ) < > [ ] % # & @ ^  
œ £ \$ | \ §

3. SIZE

This Standard deals with one size only.

4. PRINTED IMAGE DEFINITION

The printed image of each character is defined by a number of dots placed on a grid.

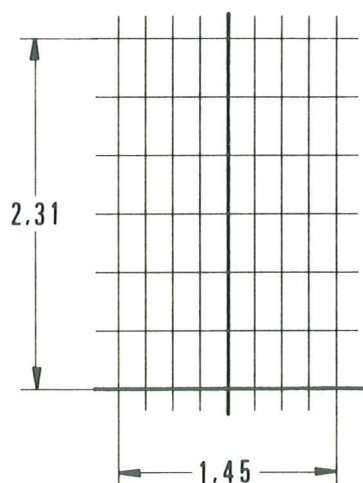
#### 4.1 Grid definition

The grid used for positioning the dots relatively to each other has the following dimensions:

height: 2,310 mm  
width : 1,450 mm

It consists of 7 horizontal lines and 9 vertical lines, the intersections of which define the nominal dot centre positions.

The distance between the horizontal lines (vertical step) is	0,385 mm
The distance between the vertical lines (horizontal step) is	0,181 mm



Scale : 20:1

The thicker lines of the grid indicate the vertical centre-line and the horizontal reference line of each character.

NOTE: The value of the horizontal steps has been chosen so that 14 such steps correspond approximately to a tenth of an inch, the usual OCR character width. The value of the vertical steps has been chosen so that 11 such steps correspond approximately to a sixth of an inch, the usual OCR line spacing.

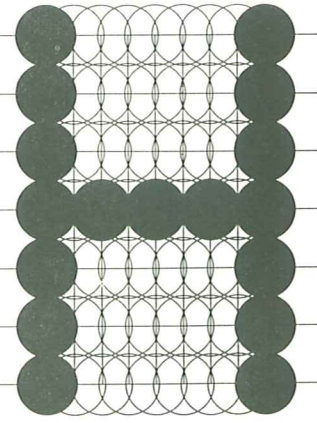
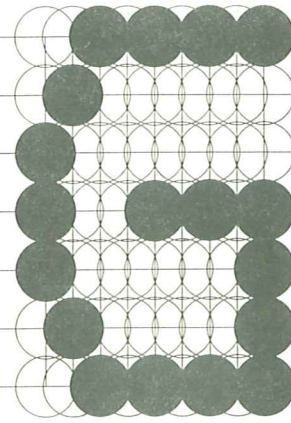
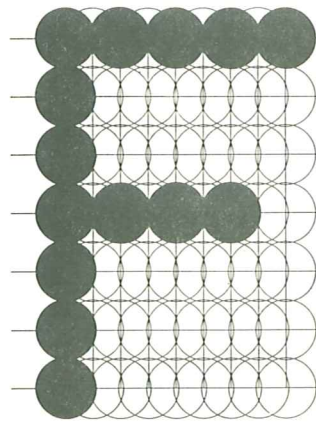
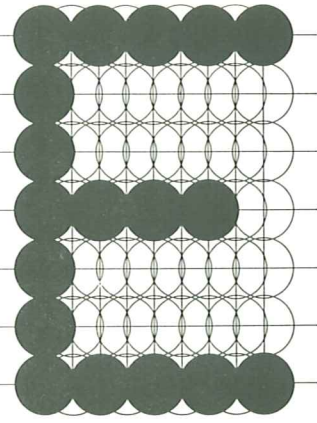
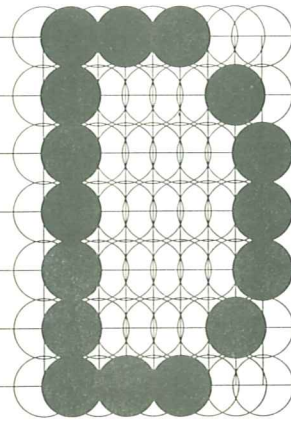
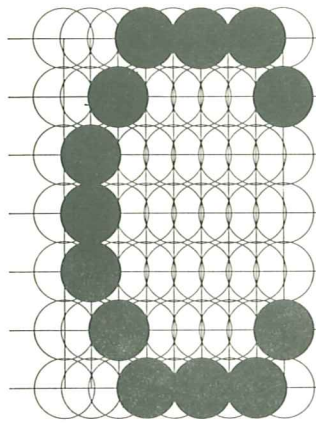
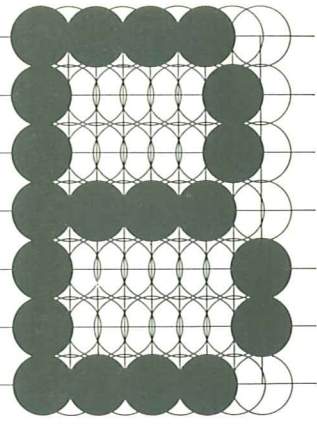
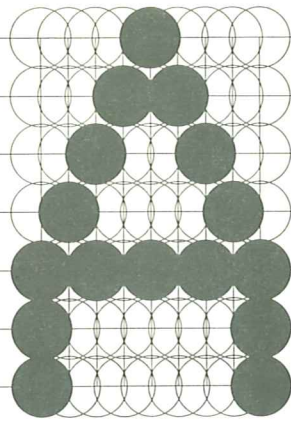
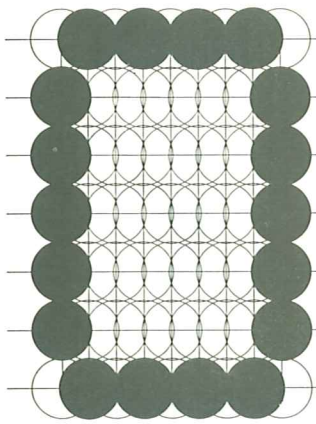
#### 4.2 Dot definition

The dots are dark areas centred on the intersections of the grid. They are circles of 0,4 mm diameter nominal or polygons of equivalent area.

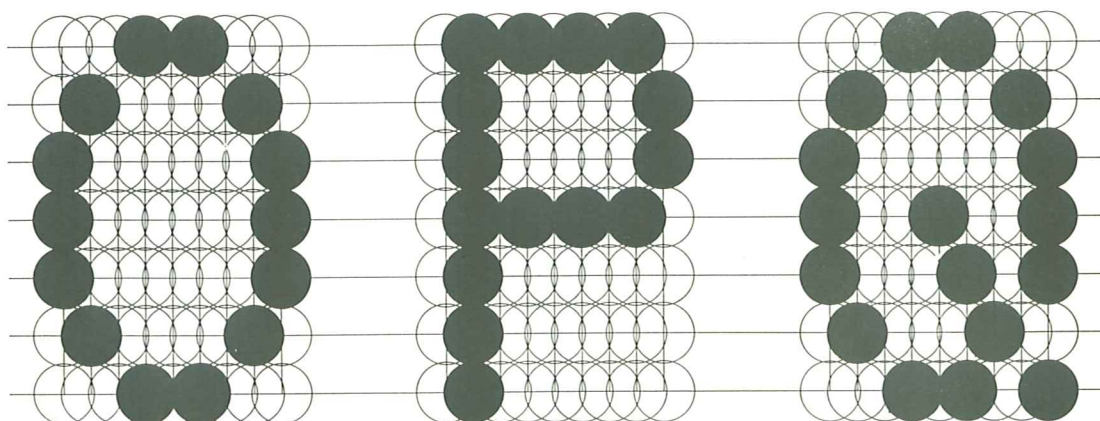
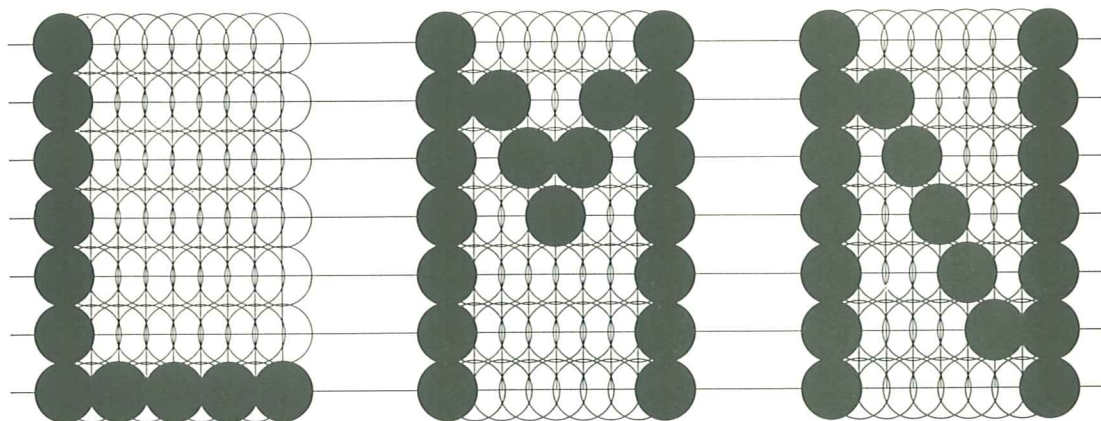
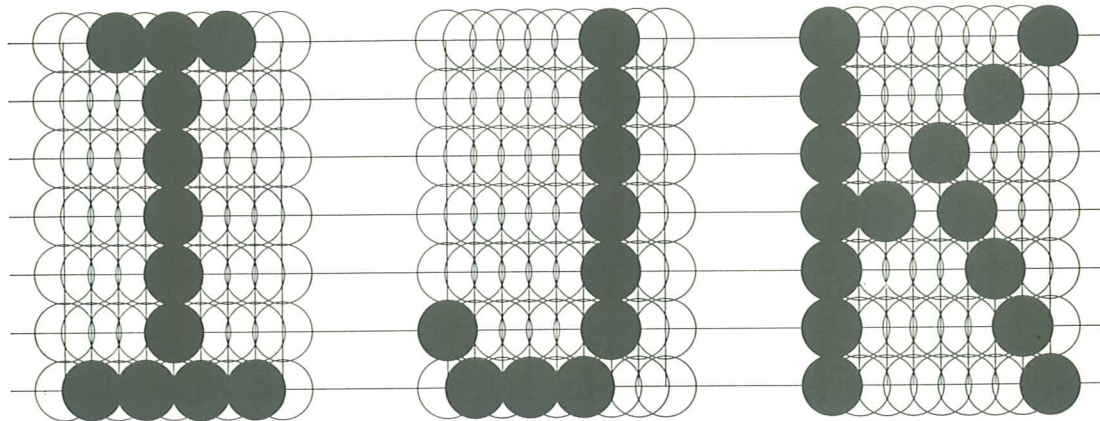
### 5. CHARACTER DEFINITION

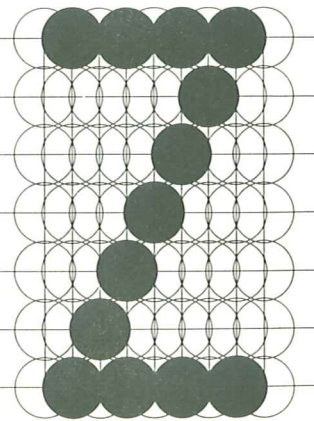
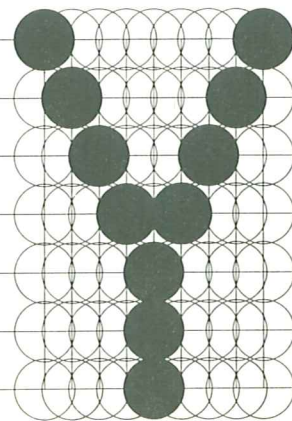
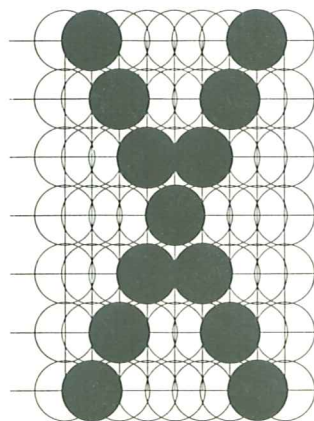
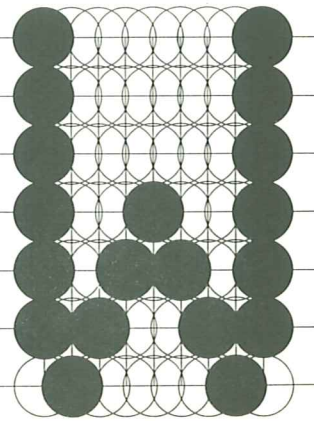
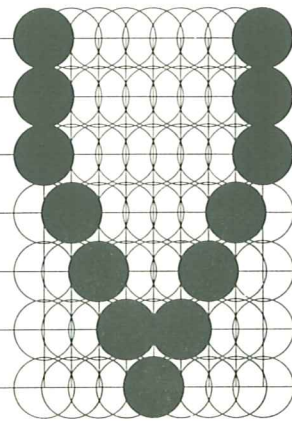
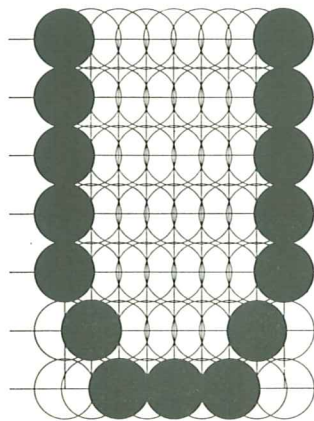
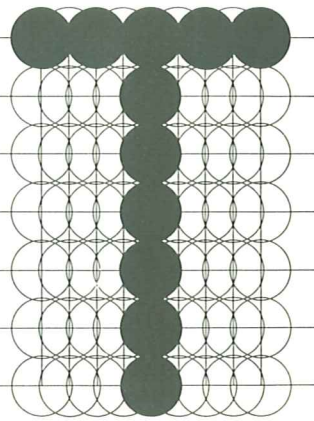
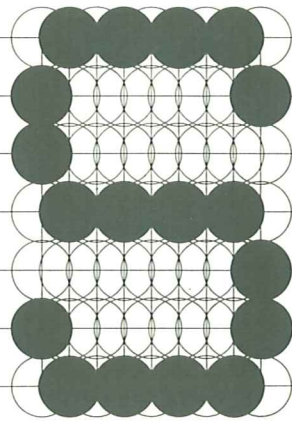
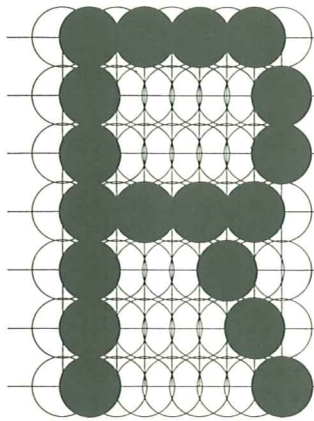
The characters are defined by the enclosed drawings in which they are shown at scale appr. 20 : 1.

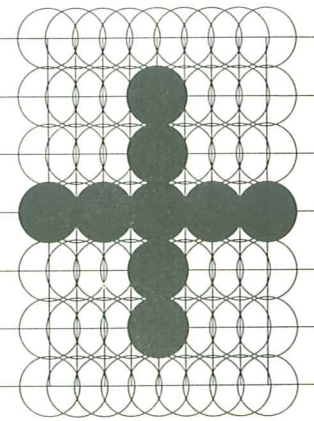
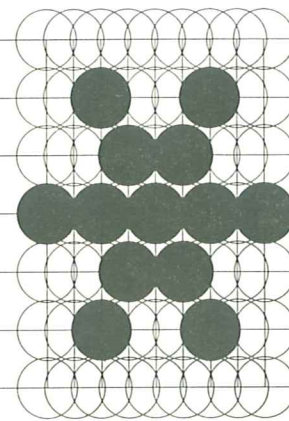
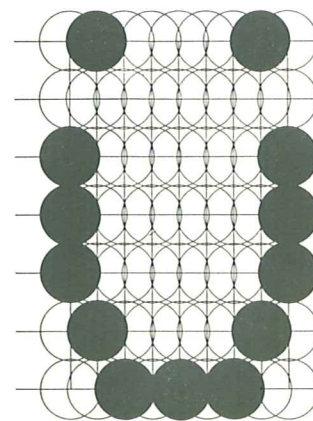
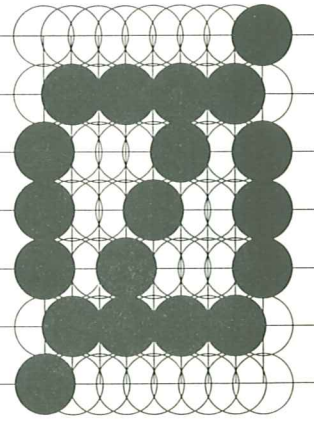
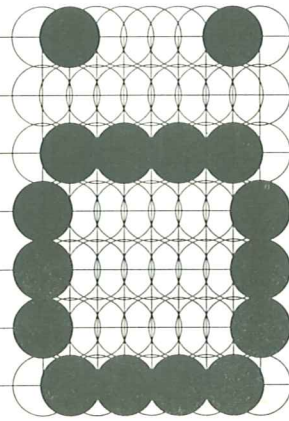
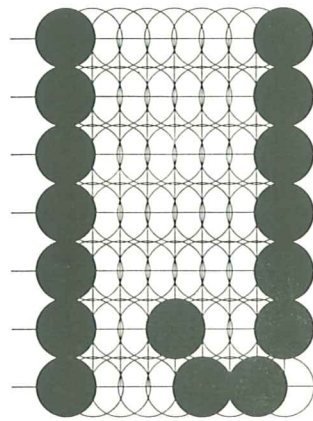
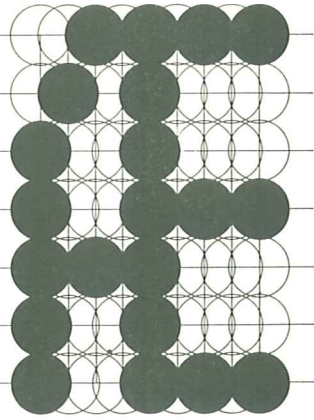
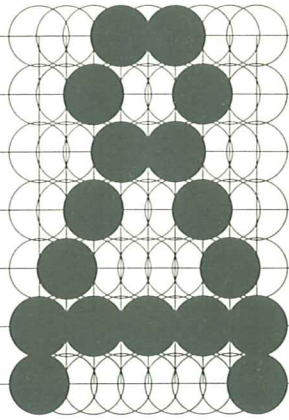
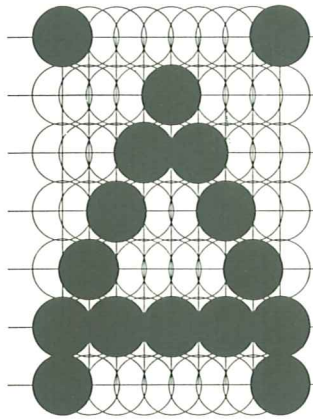


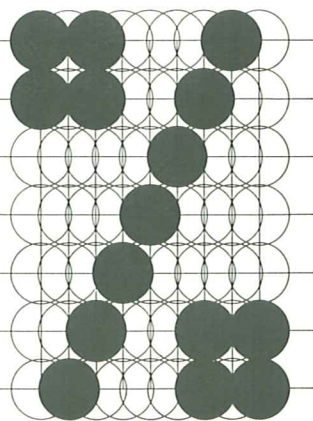
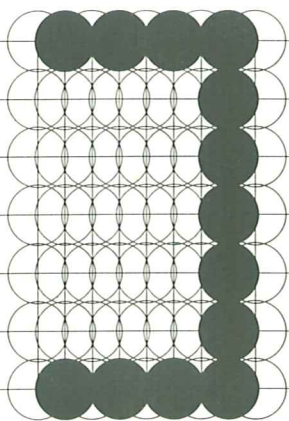
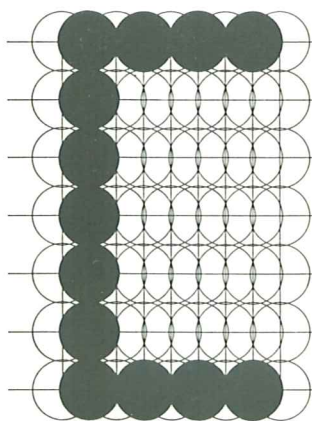
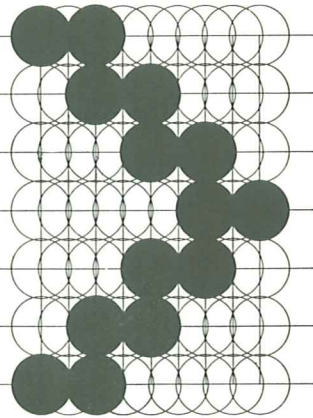
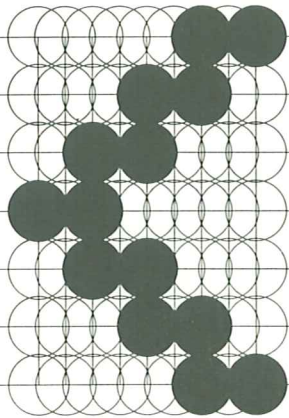
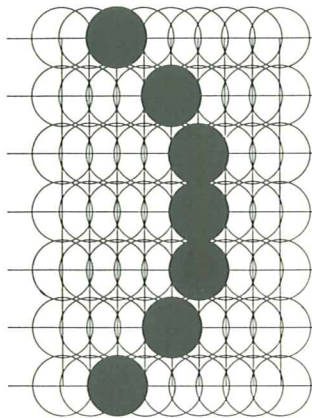
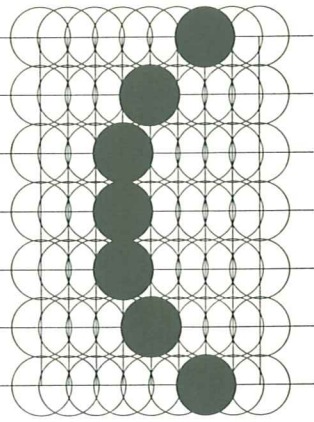
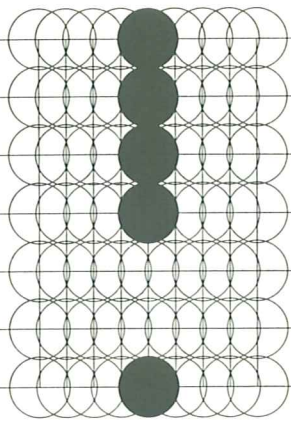
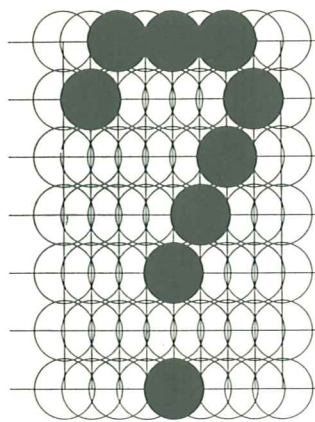


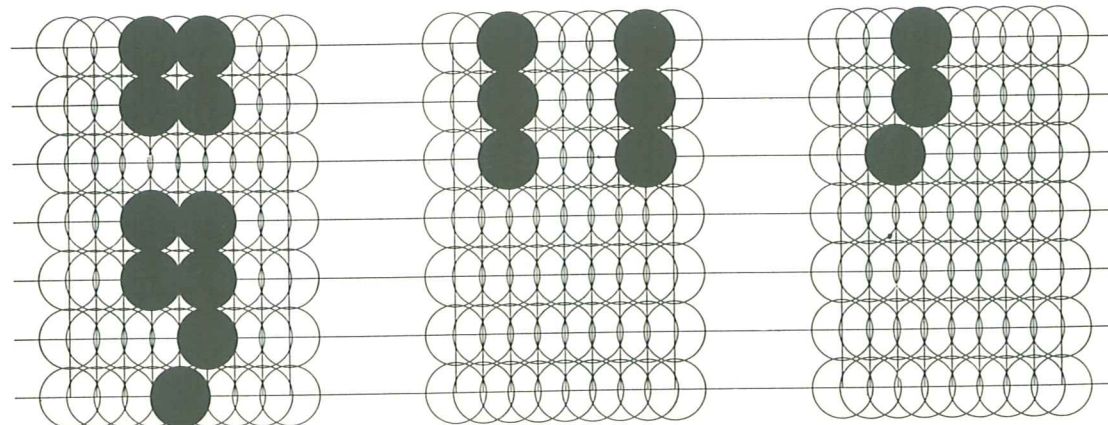
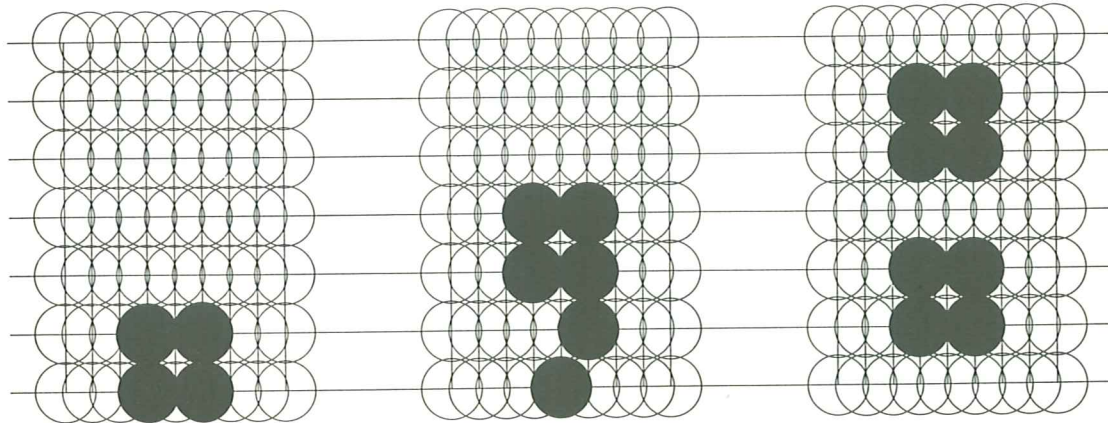
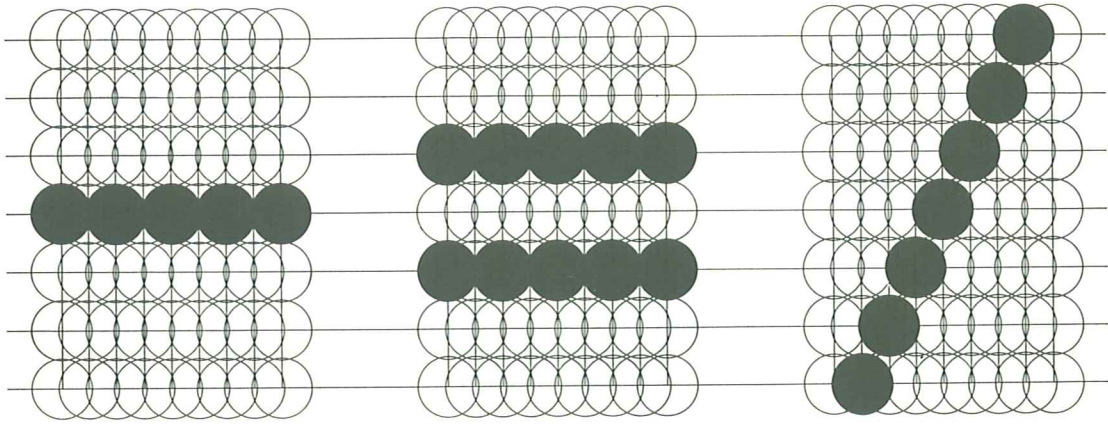


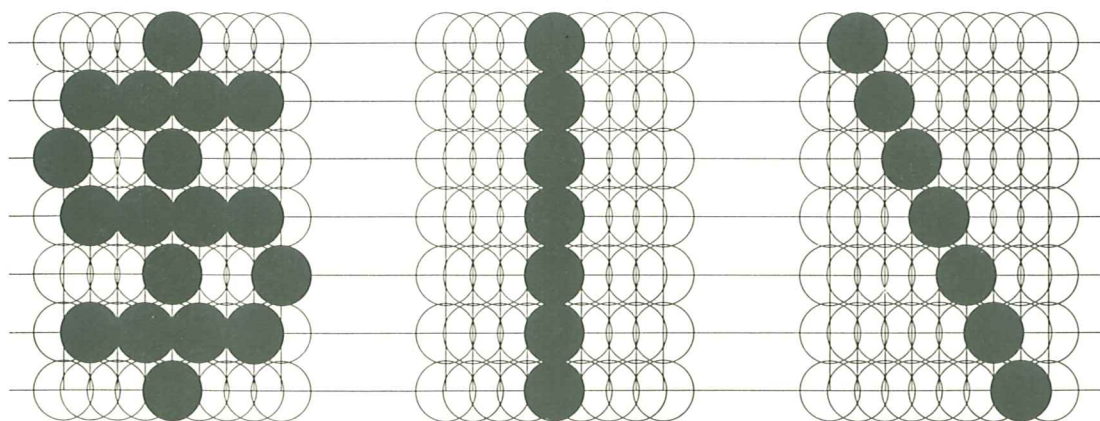
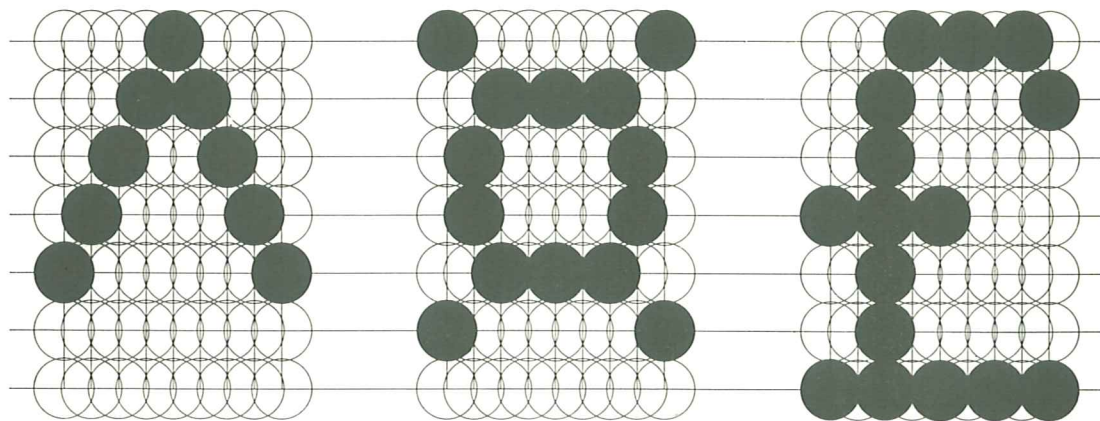
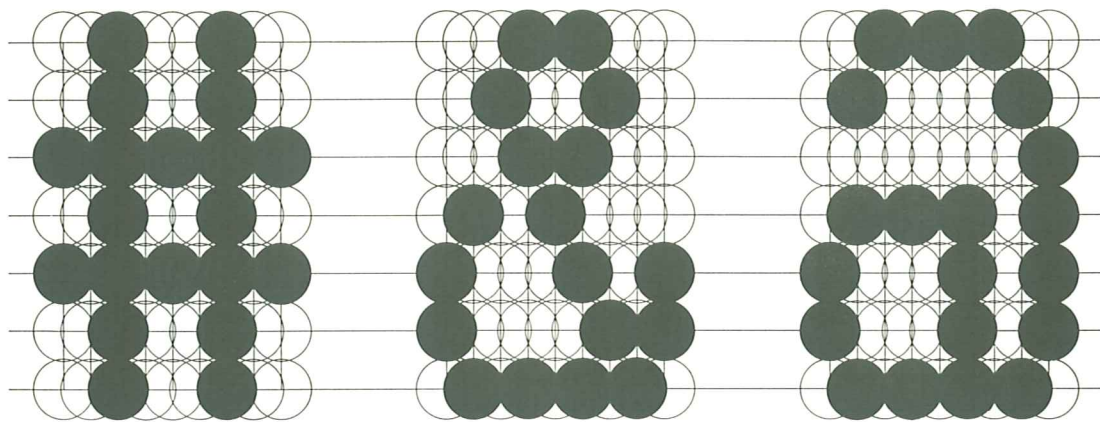


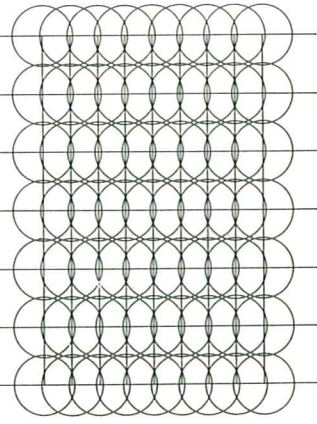
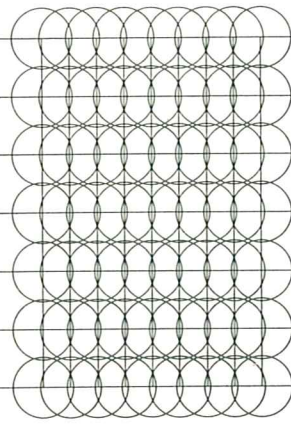
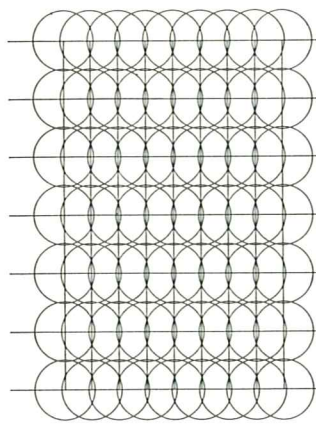
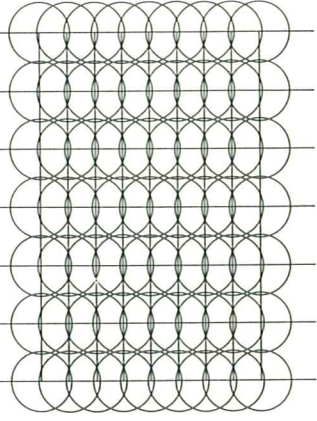
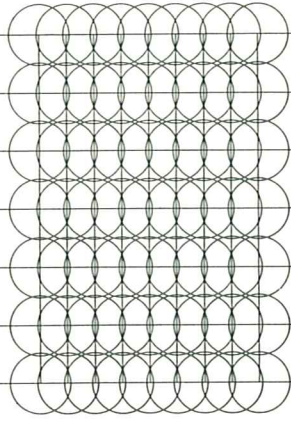
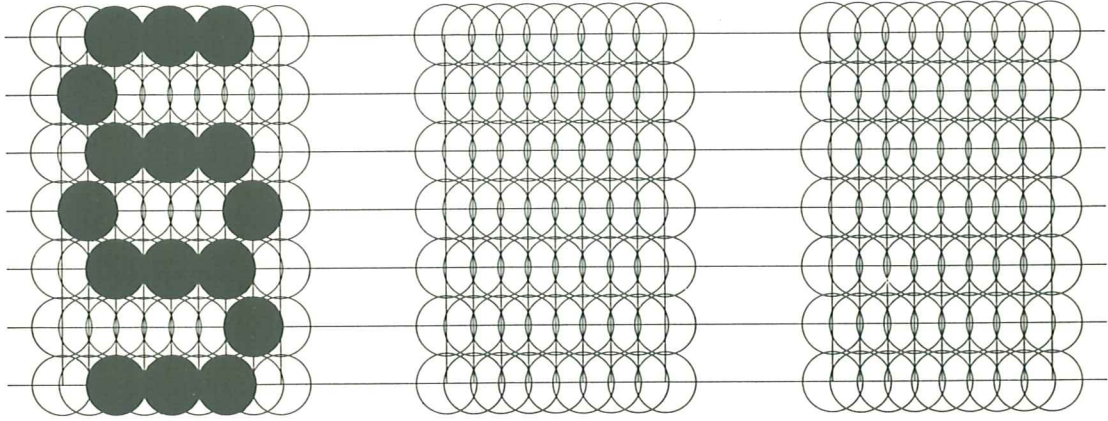












## APPENDIX

### FONT ASSESSMENT

A computer analysis has been made using a program which permits the comparison of any two patterns on the 7x9 grid and the comparison of any pattern with all the others. The comparisons were made not only in the complete overlap position, but also in 62 other positions obtained by moving one pattern with respect to the other by  $\pm 4$  horizontal steps and  $\pm 3$  vertical steps.

It was found that for all pairs of the character set except for those listed below, at least a difference of 2 full dots was achieved in the worst case. Especially all pairs of characters belonging to the basic set and the journal tape set of Standard ECMA-30 have a difference of at least 3 full dots.

There are two critical pairs with less than a 2-dot difference: VERTICAL LINE/SEMICOLON and EXCLAMATION MARK/COMMA.



