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Office machines and data processing equipment — Principles governing the positioning of control keys on keyboards

Machines de bureau et machines employées en traitement de l'information — Principes directeurs pour l'affectation des touches de commande sur les claviers

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3244 was drawn up by Technical Committee ISO/TC 95, *Office machines*, and circulated to the Member Bodies in August 1973.

It has been approved by the Member Bodies of the following countries:

Australia	Japan	Turkey
Bulgaria	New Zealand	United Kingdom
Canada	Romania	U.S.A.
Egypt, Arab Rep. of	Spain	U.S.S.R.
Finland	Sweden	Yugoslavia
France	Switzerland	
Italy	Thailand	

The Member Body of the following country expressed disapproval of the document on technical grounds:

Germany

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0 INTRODUCTION

Many efforts have been made in the past, at both national and international levels, to standardize the area of keyboards implementing the "graphic" character set. The results of this work, covering two main classes of application, numeric and alphanumeric, are dealt with in other International Standards.

In defining the complete layout of a keyboard for specific machines, it is as important to standardize the position of the control keys as it is to specify the position of the "graphic" keys. Certain machines may have several assignments of control keys, based on various applications.

This International Standard contains the main factors affecting the positioning of control keys in both numeric and alphanumeric keyboard layouts. It aims at providing future harmonization of different keyboards by means of an internationally recognized set of guidelines which can be applied to the design of keyboard layouts for specific machines, the principal advantages of which will be:

- to make operation of keyboards easier, particularly where machines performing different functions or of different makes are concerned;
- to minimize operator training and re-training.

1 SCOPE

This International Standard outlines principles which should be observed in the positioning of areas for control keys, in relation to "graphic" areas, of numeric, alphanumeric and composite keyboards for office machines. It provides guidance for the allocation of the control functions to specific keys, taking into account their frequency of use. Other relevant characteristics influencing the allocation of the control functions are also described and given due consideration.

No guidance is given on the positioning of controls which are obtained from graphic keys by means of additional shift operation, but such operation is not excluded by this International Standard.

2 FIELD OF APPLICATION

2.1 This International Standard is intended as a basis for defining complete keyboard layouts for numeric or alphanumeric machines in conjunction with the appropriate International Standards covering the "graphic" area of the layout.¹⁾

Controls may appear outside the graphic area, superimposed on the graphic area, or both.

2.2 Three types of keyboard layout are taken into consideration in this document to satisfy different classes of application:

- a) a numeric keyboard layout

This layout comprises a clustered numeric section for the 10 digits, some optional keys for additional characters and a number of appropriate control keys.

- b) an alphanumeric keyboard layout

This layout comprises an alphanumeric section, designed for operation by both hands, and a number of appropriate control keys.

- c) a composite alphanumeric and numeric keyboard layout

This layout incorporates both the numeric and alphanumeric sections described above, together with control keys appropriate for use with each section. The keyboard layout in which the numeric cluster is superimposed on the alphanumeric section is not included in this International Standard.

2.3 The three types of layout mentioned in 2.2 are represented in schematic form in the figures. These figures are intended to express the basic relative positions of the areas concerned and are not intended to define their sizes or shapes, nor do they imply the number of keys allocated to each area. These characteristics may be covered for specific devices or classes of machines by other International Standards.

1) For the numeric area of the layout see ISO 1092 and ISO . . .

For the alphanumeric area of the layout see ISO/R 2126, ISO 2530 and ISO 3243.

3 REFERENCES

ISO 646, *7-bit coded character set for information processing interchange*.

ISO/R 1091, *Layout of printing and function keys on typewriters*.

ISO 1092, *Adding machines and calculating machines – Numeric section of ten-key keyboards*.

ISO/R 1093, *Keytop and printed or displayed symbols for adding machines and calculating machines*.

ISO/R 2126, *Basic arrangement for the alphanumeric section of keyboards operated with both hands*.

ISO 2530, *Keyboard for international information processing interchange using the ISO 7-bit coded character set – Alphanumeric area*.¹⁾

ISO 3243, *Keyboards for countries whose languages have alphabetic extenders – Guidelines for harmonization*.¹⁾

ISO 3791, *Keyboard layouts for numeric applications*.¹⁾

4 CRITERIA FOR THE ASSIGNMENT OF CONTROL FUNCTIONS TO KEYS²⁾

Controls may be needed on keyboards :

a) to be operated together with the graphic characters in order to perform locally functional operations such as positioning, formatting, editing etc.

b) to be operated together with the graphic characters in order to perform similar functional operations remotely or successively in situations such as :

- telecommunications through data transmission channels;
- data interchange through physical media;
- data flow within a processing system.

c) to perform local functions on the machine of which the keyboard is a component, without interference with other functions the machine may be performing.

In drawing up a keyboard layout, no distinction should be made between the above type of functional effects. Rather, controls should be allocated to keys depending upon the criteria outlined below.

4.1 Frequency of use or operation

Frequency of use or operation should be the main criterion for the allocation of the control functions to keys.

4.2 Frequency of occurrence

In the preceding sub-clause the phrase "frequency of use or operation" was used in the sense of referring to the

frequency with which the control is used. A further factor to be considered is the frequency of provision of a particular control on a certain type of equipment. This may be referred to as the frequency of occurrence of such a control.

For example, a control may occur on all the keyboards of one type of machine whereas another control may only appear in some cases.

If controls are positioned strictly according to the frequency of operation, then in the example quoted the same keyboard location may be allocated to whichever control is the most frequently used.

It may be considered preferable in a case like this to provide a fixed position for the most frequently occurring control even though the less frequently occurring control may well be the most frequently operated when it is provided.

4.3 Traditional placings

There are some controls on typewriters, calculating machines and accounting machines (for example space bar) which are commonly placed in "standard" positions, and such positions should receive careful attention in any attempt to define specific locations for such controls.

This is not to say that traditional placings are mandatory. For example, if tradition places an infrequently used control, then tradition may be discarded because little hardship will result from a change of location of an infrequently used key.

4.4 Methods of operation

There are constraints on the position of controls due to the way in which they are used. In particular, where two control keys have to be used together, or where a control key has to be used in conjunction with another key, then it may not be advisable to place them in the positions which would otherwise be dictated by their frequency of occurrence or of use.

5 ALLOCATION OF CONTROL AREAS IN KEYBOARDS

The criteria for the assignment of control functions to keys outside the graphic areas are as described in clause 4. In determining the control areas, the following items should be examined.

a) Numeric keyboard

The keys on the numeric keyboard are normally operated from left to right with the right hand. Therefore, it is desirable to allocate the controls with a high degree of operation to the right side of the numeric block.

1) At present at the stage of draft.

2) Other ISO documents relevant to this clause are ISO 646, ISO/R 1091 and ISO/R 1093.

b) Alphanumeric keyboard

The alphanumeric keyboard is operated with both hands and it is desirable, therefore, that the controls with a high degree of operation should be dispersed and located on both sides of the alphanumeric block. If it is necessary to position more of the frequently operated controls on one side of the keyboard than on the other, it is preferred that the greater number should be located on the right side of the keyboard.

c) Composite alphanumeric and numeric keyboard

The composite alphanumeric and numeric keyboard is considered to be a combination of alphanumeric and numeric keyboards. Therefore, the allocation of controls will be a composite of items a) and b) mentioned above, so that the controls with a high degree of association with the numeric block should be located on the right side of the numeric block, and those with a high degree of association with the alphanumeric block should be distributed on both sides of the alphanumeric block.

5.1 Numeric keyboards

The control area of a numeric keyboard should consist of two zones (see figure 1) :

- a zone Z1 to the right of a numeric block area;
- a zone Z2 extending to the left of and above the numeric block area.

Control functions which, in the course of operation, need to be used frequently, should be allocated to keys in zone Z1, subject to the limitations of clause 4. Other control functions may be allocated to keys in zone Z1 and/or Z2.

5.2 Alphanumeric keyboards

The control area of an alphanumeric keyboard should consist of two zones (see figure 2).

- a zone Z3 to the right and to the left of the alphanumeric area;
- a zone Z4 extending to the left of and above the alphanumeric area.

Control functions which, in the course of operation, need to be used frequently, should be allocated to keys in zone Z3, subject to the limitations of clause 4. Other control functions may be allocated to keys in zone Z3 and/or Z4.

5.3 Composite alphanumeric and numeric keyboards

A composite keyboard results from combining the numeric and alphanumeric keyboards dealt with in 5.1 and 5.2, the numeric section being located to the right of the alphanumeric area. Therefore, the control area comprises the four zones Z1 to Z4 described above. The zones Z2 and Z3, being side by side, tend to look like a single control zone; however, from the functional point of view, they can still be regarded as separate. Control functions which, in the course of operation of the alphanumeric section, need to be

used frequently, should be allocated to keys in zone Z3, subject to the limitations of clause 4, and control functions which, in the course of operation of the numeric sections, need to be used frequently should be allocated to keys in zone Z1.

Control functions which, in the course of operation of both sections, need to be used frequently, may be either duplicated in both zones or, if preferred, allocated to keys in the zone within easy reach from both areas, i.e. that part of zone Z3 to the right of the alphanumeric area or that part of zone Z2 to the left of the numeric block area. Other control functions may be allocated to keys in zone Z1, Z2, Z3 and/or Z4.

5.4 Additional considerations concerning zones Z1 and Z3

Zones Z1 and Z3 have been designed to contain the most frequently used controls associated with, respectively, numeric and alphanumeric keyboards. In addition, the following considerations apply to these zones :

a) to zone Z1

1) Most frequently used control

The most frequently used control should be located to the right of the lower numeral row and may extend to the right and/or downwards.

2) Second most frequently used control

The next most frequently used control should be located above the most frequently used control.

3) Other frequently used controls

Other frequently used controls should be located in the remaining part of the zone.

b) to zone Z3

1) Most frequently used control

The most frequently used control should be located to the right of the middle letter row and may extend downwards and/or upwards.

2) Second most frequently used control

The next most frequently used control, if placed on the right, should be located above the most frequently used control.

3) Other frequently used controls

Other frequently used controls should be located in the remaining part of the zone.

c) to zones Z1 and Z3

Controls positioned in either of these two zones should not be affected by the operation of the "shift" keys used in conjunction with the graphic keys of the alphanumeric area, i.e. they should be "shift free". While it may be advantageous that other control keys should also be shift free, this is considered to be less important.

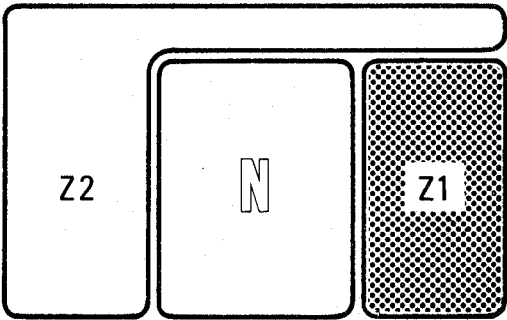


FIGURE 1

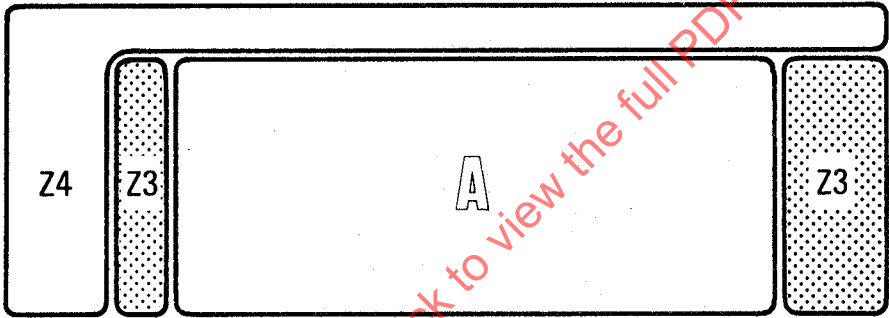


FIGURE 2

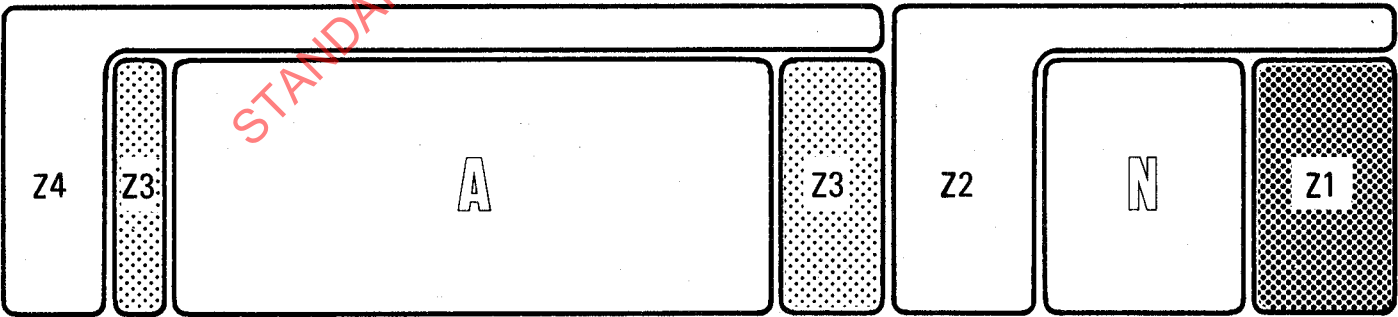


FIGURE 3