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**Human Factors (HF);
Assignment of alphabetic letters to digits
on push button dialling keypads**

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Foreword

This Technical Committee Reference Technical Report (TCR-TR) has been produced by the Human Factors (TC) Technical Committee of the European Telecommunications Standards Institute (ETSI). This TCR-TR was approved as a TCR-TR by the 20th Technical Assembly (TA).

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1 Scope

The intention of this TCR-TR is to review the background to a global attempt to standardize the assignment of alphabetic letters to digits on keypads in the ITU-T, to review the status in Europe and to provide consequential recommendations.

2 Background

An ITU-T (CCITT) Recommendation on the assignment of letters to digits on push button dialling keypads, ITU-T Recommendation E.161, has existed for many years. The keypad layout originally indicated in ITU-T Recommendation E.161 was in accordance with figure 1.

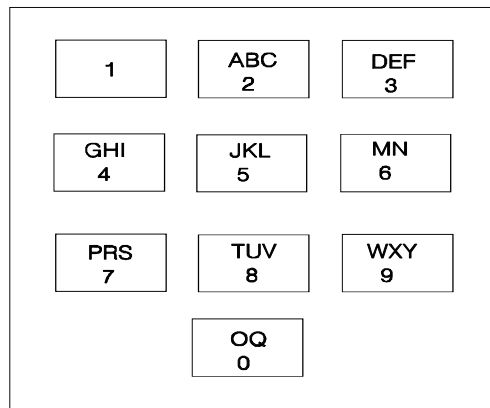


Figure 1

The Recommendation represented an old agreement of some participants in CCITT (i.e. North America and the United Kingdom) to enable mixed alphabetical and numerical numbering plans to be used. Digit 1 was in some cases reserved for special purposes and consequently had no letters assigned to it. Later, the letters Q and Z were introduced in two different ways, as shown in figure 2, Options A and B.

	Option A		Option B
1	2 ABC	3 DEF	1 QZ
	2 ABC	3 DEF	2 ABC
4 GHI	5 JKL	6 MNO	4 GHI
	5 JKL	6 MNO	5 JKL
7 PQRS	8 TUV	9 WXYZ	7 PRS
	8 TUV	9 WXYZ	8 TUV
	9 WXYZ		9 WXY
	0		0

Figure 2

As time has progressed, full numerical numbering plans have been introduced (ITU-T Recommendations E.163 and E.164) instead of the mixed alphabetical and numerical numbering plans. The originally intended use of the letters is now no longer valid.

In Europe there are many variants of letter assignment to the telephone keypad. These variants include the allocation of letters starting with ABC on the 1 key, the allocation of QZ to digit 1, with ABC starting on digit 2, the allocation of OQZ to digit O with ABC on digit 2, as well as the assignment of letters in accordance with CCITT Recommendation E.161 (1988) as found in the Blue Book. Customers will encounter these variations in a number of different contexts including telephones in both the fixed and mobile market from various manufacturing sources and bank cash dispensers.

During 1991 and 1992, TC-HF made attempts to get a common European opinion on the keypad layout but no contributions on the topic were received.

This activity was carried out in parallel with the activity in ITU-TS on this matter. North America and Canada tried to get Option A (figure 2) recommended as the only pattern, however, some ETSI members also made contributions.

In March 1993, ITU-WTSC agreed on a single solution; Option A in ITU-T Recommendation E.161 (figure 2). Option B was recommended to be phased out by 1 April 1996. This date has to be confirmed by ITU-T/SG1.

In the middle of 1993, the draft standard, ISO/IEC 9995-8 "Information technology - Keyboard layouts for text and office systems - Part 8: *Allocation of letters to the keys of a numeric keyboard*", was sent out for voting to be adopted as an International Standard. The layout of this standard is identical to ITU-T Recommendation E.161, Option A, and covers all kinds of applications, not only telecommunications. The indications are that the ISO/IEC standard will be approved by a large majority of countries.

3 Discussion

Assigning letters to the numeric telephone keypad in general may offer certain advantages for subaddressing in ISDN and for controlling new services prompting voice answers, giving PIN-codes in UPT, etc., mainly as "aide-memoires". However, for this purpose, none of the existing solutions with two, three or even four letters per digit are particularly good from a human factors point of view. It is a very strong limitation that not all digits can be used and that there is no unique relation between a digit and a single letter.

Furthermore, ITU-T Recommendation E.161, Option A, is one of the less efficient solutions because neither digit 1 nor digit 0 are assigned letters. Some solutions in use in Europe are somewhat better because the letters are arranged in alphabetical order and digit 1 is included so that codes involving digit 1 can also be translated into a letter.

4 Conclusion

In the light of the present ITU and ISO activities there is no point for ETSI in trying to introduce a separate European solution, even if it is obvious that some of the layouts most often used in Europe have advantages over the proposed international standard. It is simply too late. The most practical way for ETSI would now be to support the ITU-T Recommendation E.161, Option A version.

For many years to come, however, there will be a mixture of patterns for letters on keypads on telephone instruments as well as for other purposes such as banking terminals. The ITU/ISO standard may gradually overrule the other solutions, but it is still very likely that more than one pattern will be found on the market for some time.

5 Recommendations

TC-HF supports the ITU-T Recommendation E.161, Option A version of assignment of letters to digits on keypads.

TC-HF shall presently, and for a considerable time to come, not recommend any telecommunication services that presume a single rule for the assignment of letters to digits.

Consequently, the use of letters together with numeric keyboards should be regarded solely as an individual "aide-memoires" matter.

History

Document history	
October 1994	First Edition
March 1996	Converted into Adobe Acrobat Portable Document Format (PDF)