Recommendation T/CS 28-01 (Brussels 1980)

MESSAGES AND FORMATS FOR PUSH-BUTTON DIALLING

Recommendation proposed by Working Group T/WG 11 *"Switching and Signalling"* (CS)

Text of the Recommendation adopted by the "Telecommunications" Commission:

"The European Conference of Postal and Telecommunications Administrations,

considering

— that push-button dialling is suitable for the user-to-network control protocols;

— that use of this method, to gain access to the services of the network, will increase in future in proportion to the introduction of new technologies and services;

— that with Recommendations T/CS 46-02 [1] and T/CS 46-03 [2], specifications on push-button signalling are available and also that higher level specifications in the area of subscriber line signalling will be required,

recommends

the application of the following conventions, methods and codes by the members."

1. USE OF MESSAGES

Numerical and non-numerical characters, as provided by the dialling device of the subscriber's set, are used for the transmission of address and other information. This information may indicate a requirement of the user or may be necessary for a control operation.

Depending upon the type of control operation, a more or less extended sequence of such diallable characters is required. The sequences are structured to form one or more messages. This Recommendation deals with the formats and codes of the messages sent from the subscriber's set to the network.

1.1. Definition of a message

A *message* is a defined entity consisting of information from the subscriber to the network. It pertains to a call or the control operations for a service and is sent in one sequence over the signalling medium. A message may consist of one or more characters transmitted in one or more blocks.

1.2. Service request messages and switching orders

Call set-up and most supplementary service control procedures require the transmission of comprehensive information, based upon which the network will automatically carry out a sequence of operations. Such messages are called *service request messages*. There is also a need for commands during a call (e.g. in ringing, speech or engaged condition). These are used for instructing the exchange to undertake certain single actions related to the control of a service, e.g. to change back from enquiry call to original call etc. Such commands are designated *switching orders*.

2. FUNDAMENTAL MESSAGE FORMATS

2.1. Format of a service request message

In principle the format of a service request message is as shown in Figure 1 (T/CS 28-01).

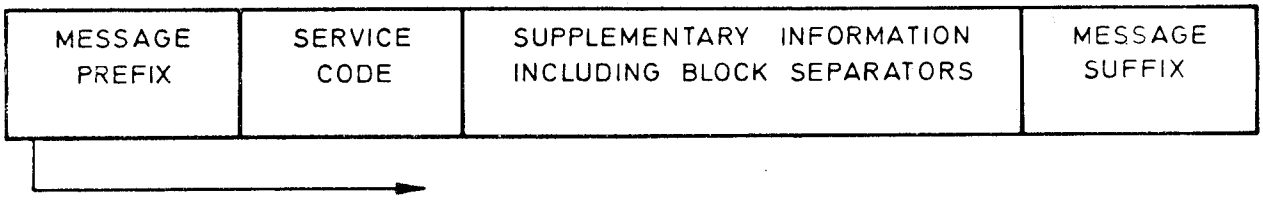

Figure 1 (T/CS 28-01). Format of a service request message.

The format as shown in Figure 1 (T/CS 28-01) containing four fields, is not used in all cases, but in general, any format is made up of one or more of the above fields, i.e. some of the fields can be empty. The fields differ in length. The number of characters in each field is given in Section 3. The message suffix is a character indicating the end of the message.

2.2. **Format of a standard call set-up message**

The standard call set-up message format is shown in Figure 2 (T/CS 28-01).

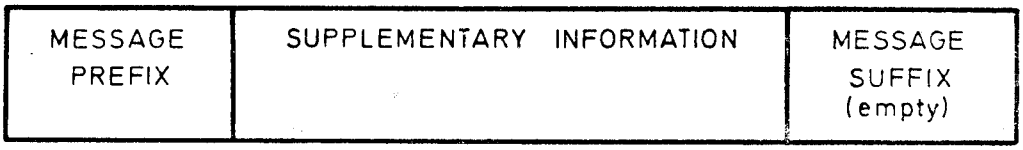

Figure 2 (T/CS 28-01). Standard call set-up message format.

The address signals sent for a standard call set-up can be regarded as a service request message with prefix and supplementary information fields, the remaining fields being empty. The term *address information message* is also used for such a message. It represents the *telephone number* i.e. the full complement of digits that must be dialled to allow the network to identify a terminal or a group of terminals.

Note: The possibility of using a message suffix to indicate the end of the sequence of address signals is envisaged. This Section requires further study.

2.3. **Format of a switching order message**

The procedures involving switching orders are not the same for the two push-button signalling systems specified (Recommendations T/CS 46-02 [1] and T/CS 46-03 [2]). However, transmission of a message from the user to the exchange may be required in both cases. The message is then a rudimentary service request message containing only the supplementary information field, here called *switching order field*, as shown in Figure 3 (T/CS 28-01).

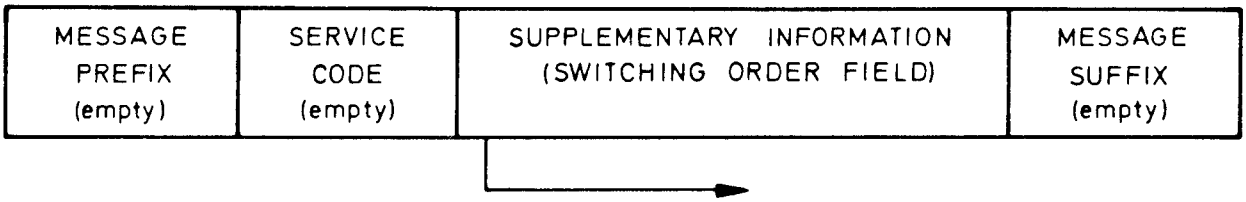

Figure 3 (T/CS 28-01). Switching order message.

The format of the switching order message is thus that of the switching order field which should be kept as short as possible.

Note: The basic multifrequency push-button signalling system (Recommendation T/CS 46-02 [1]) requires use of the auxiliary button R in conjunction with switching orders (see Recommendation T/CS 20-09 [3]). This area needs further study.

2.4. **Format of an abbreviated dialling call**

Set-up message

The abbreviated dialling call set-up message format is shown in Figures 4a and b (T/CS 28-01).

In accordance with Recommendation T/SF 2 [4], either of the two formats shown in Figure 4a and b (T/CS 28-01) can be used. The abbreviated number is in the supplementary information field. No separator between the fields is required in this format.

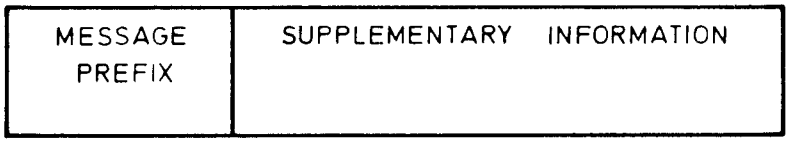

Figure 4a (T/CS 28-01). Prefix method format.

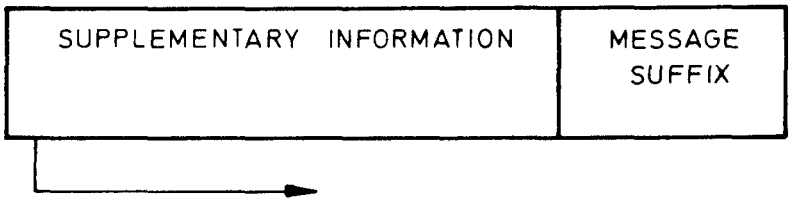

Figure 4b (T/CS 28-01). Suffix method format.

2.5. **Subdivision of the supplementary information field**

The supplementary information field may be subdivided into blocks. Where it is to accommodate several codes of varying length, such subdivision is mandatory. When this is done, a *block separator character* is introduced between the blocks, as shown in Figure 5 (T/CS 28-01).

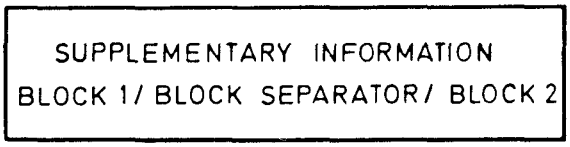

Figure 5 (T/CS 28-01). Supplementary information field divided into blocks.

The supplementary information field may contain more than two blocks. A block separator character may also be used to separate the service code field from the supplementary information field: e.g. to obtain a more uniform control procedure for the user and/or to provide an open-ended structure for the service codes.

3. CONTENTS OF THE MESSAGE FIELDS

The way in which the network interprets service request messages depends upon a system of codes in the various fields.

3.1. Message prefix

The message prefix is used to indicate whether the message is an address information message for a standard call set-up or a supplementary service request. In the latter case, the message prefix is called *service code prefix*. The service code prefix is a non-numerical code while the message prefix field of an address information message is either empty (local and special service calls) or contains a *trunk prefix* or an *international prefix* as specified in CCITT Recommendation E.160/Q.10 [5], both of which are numerical codes.

The first message of a supplementary service request procedure always contains a service code prefix. The prefix identifies the function of the message:
(a) activation, registration;
(b) deactivation, erasure;
(c) interrogation.

According to Recommendation T/SF 2 [4] the service prefix codes are allocated as follows:
★ prefix of an activation and/or registration message;
prefix of a deactivation and/or erasure message;
★★ abbreviated dialling prefix;
★# prefix of an interrogation message;
#★ spare;
spare for national use.

All non-numerical codes with more than two characters are spare.

3.2. Message suffix

According to Recommendation T/SF 2, the message suffix is coded as # for all types of messages containing a message suffix field which is not empty.

3.3. Service codes

The service code is a numerical code used to identify a particular service. Some service codes are used for special purposes. The same code is used when a service is activated, deactivated or interrogated.

3.3.1. *Calls set-up by abbreviated dialling*

When either the prefix method (prefix ★★) or the suffix method is used for abbreviated dialling, no service code is necessary for the use of the service.

3.3.2. *Allocation of service codes*

The allocation of service code is not directly influenced by any arrangement for systematic grouping of services. Codes with initial digits 2, 3, 4 or 5 are reserved for CEPT allocation. CEPT standardised service codes are given in the Annex to Recommendation T/SF 2 [4].

3.4. **Allocation of codes in the supplementary information field of a standard call set-up message**

The codes to be used are set-out in the telephone numbering plans. In accordance with CCITT Recommendations E.160/Q.10 [5], the supplementary information field of a standard call set-up message or address information message contains either:

— the *subscriber's number*, if the message prefix field is empty;
— the *national (significant) number*, if the message prefix field contains the trunk prefix;
— or the *international number*, if the message prefix field contains the international prefix.

The numerical character set 0-9 applies for all codes.

3.5. **Allocation of codes in the supplementary information field of a message containing a service code**

The supplementary information field of a message where the service code field is not empty may contain the keyword, block separators, telephone numbers, abbreviated dialling codes, etc. as applicable.

3.5.1. *Keywords* (or security codes)

A fixed length or a variable length code may be adopted for keywords dependent on the type of control protocol used.

3.5.2. *Block separator*

The block separator is alway coded as ★.

3.5.3. *Telephone number*

Telephone numbers in accordance with the normal telephone numbering plans are used.

3.5.4. *Abbreviated dialling codes*

The codes to be used for abbreviated dialling will be allocated by Administrations. These codes consist of one or two digits making up the abbreviated number.

3.6. **Codes for supplementary information in switching order messages**

The codes used in switching order messages are under study.

References

[1] CEPT Recommendation T/CS 46-02. *Multifrequency signalling system to be used for push-button telephones.*
[2] CEPT Recommendation T/CS 46-03. *Signalling system for push-button telephones combining basic multifrequency signalling with direct current signalling.*
[3] CEPT Recommandation T/CS 20-09. *Register recall.*
[4] CEPT Recommendation T/SF 2. *Standardized code structure for the new services and facilities on modern telephone systems.*
[5] CCITT Recommendation E.160/Q.10. *Definitions relating to national and international numbering plans.*