## Recommendation T/SF 31-08 E (Vienna 1989 (CAC))

## USER CONTROL FUNCTIONS OF ISDN TERMINAL EQUIPMENT

Recommendation proposed by Working Group T/GT 7 "Services and facilities" (SF)

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

## Contents

1.  **GENERAL**

It is expected that ISDN terminals will differ greatly, ranging from simple single service terminals to complex multi-service terminals.

A terminal can be seen as the gateway between the user and a service. A number of services will be provided by or through the network. If the gateway for these services is too narrow (if it is hard to handle services for the users), it will affect the use of the network services. Thus it is important to influence the functionality and quality of terminals.

From a human factor point of view difficulties can arise in handling services on all kinds of different terminals. To avoid those problems attention is needed for consistency and uniformity in user procedures, i.e. the handling of calls and controlling supplementary services. Consistency and uniformity means that user procedures have similar elements and it is possible to use them in the same order. These elements should be easily recognizable to a user, thus allowing a user to use telecommunication services on all kinds of telecommunication equipments without previous training period.

Especially the different capabilities of the simple and the more complex terminal could cause other approaches in handling calls and services. Therefore it is necessary to develop a concept of handling calls and services that is applicable on both simple and complex terminals to avoid problems in understanding user procedures on different terminals.

It is not the intention to lay down rules for the construction of telecommunication terminals, as this is seen as the domain of the manufacturers. But to provide guidelines that, when applicated, will result in a general approach to handling calls and services. These guidelines should be independent of a particular implementation.

Another matter of interest that is related with the above is the minimum set of functions that should be incorporated in a simple ISDN terminal.

In the ISDN a number of services will be available for the user. To make the use of these services easy and thus resulting in a higher and more efficient use of those services, the most simple terminal should have additional functions to those required by the basic service.

With these additional functions the minimum ISDN terminal should fit in the general approach mentioned above.

2.  **SCOPE**

This document describes an approach, in the form of functions, for the handling of calls and the control of services on an ISDN terminal.

The functions are described as seen by the user, the exact location of those functions is not defined (terminal, network or else).

The approach is applicable on both voice and non-voice services (if "call" is used it means non-voice communication as well).

The concepts expressed in the introduction support, in general terms, the ergonomic concept which is considered as an important factor in terminal equipment harmonization.

Manufacturers wishing their terminals to conform to a uniform method of controlling services should follow the principles within this Recommendation. It is not the intention that this Recommendation should be used as a basis of an approval specification for the connection of terminals to the networks.

3.  **TERMINAL ELEMENTS**

It is possible to distinguish two levels of terminal elements: a low level called *Physical Modules* and a high level called *Control Functions*.

**Physical Modules**

Physical Modules are the tangible or visible parts that together form a telecommunication terminal.

Examples: numeric keypad, function keys, display, handset, etc.

**Control Functions**

Control Functions are functions that perform actions with the use of Physical Modules. Control Functions do not have a fixed relation with particular Physical Modules.

Example: "address selection"
1.  a numeric keypad can be used to select an address;
2.  to select an address from a list shown on a screen without using the keypad.

4.  **SUPPORT OF SERVICES**

For the specification of services it is necessary to consider the functions that are available on the terminal.

As mentioned in the introduction this set of functions is not a restriction for the use of any kind of Physical Module by the manufacturers.

This set of functions should support:
— call control (basic and switching orders),
— supplementary service procedures such as:
    — registration
    — erasure
    — activation
    — deactivation
    — invocation
    — interrogation

5.  **RECOMMENDATION OF CONTROL FUNCTIONS**

*Used terminology:*

**Active call**

An active call is the call the user can control and interchange information with (send and/or receive). The number of calls that can be active at the same time depends on the nature of the calls and the type of terminal.

**Inactive call**

An inactive call is a call that is set on hold in the network or in the terminal (second B-channel).

**Service procedure**

A service procedure is one of the interactions between user and service (registration, erasure, activation, deactivation, invocation, interrogation).

**Service element**

A service element is a function that can be invoked within a service (e.g. alternate, add, split, isolate, reattach in three party service and add-on conference).

An ISDN terminal, single service or multi-service, with capability to access supplementary services, should have at least the following *Control Functions*, which can be grouped as indicated below:

a) Call control functions
   — START
   — STOP
   — ACCEPT
   — SERVICE
   — CONTROL

b) Input/Output functions
   — SELECT
   — EDIT
   — INDICATION

c) Other functions
   — DO
   — REJECT
   — INFO

These functions can operate independently or can be used in conjunction with each other. In the descriptions some examples of the latter situation are stated for every function.

It is also acceptable for the functions to be controlled automatically by terminals or the network, thereby removing the necessity for users to individually request each function required by the control procedure.

*Descriptions of the functions:*

START

This function initiates a call set-up procedure.

START can be used in combination with other functions, e.g. with SELECT and DO.

This function can be implemented in various ways. One way to realize this function is a function key "start". Pressing this key will invoke the function.

Other ways are for instance:
— Opening a window, representing a communication service, on the screen of a mouse-controlled system.
— Lifting the handset for starting a telephone call.

STOP

This function terminates the current active call.

If there are more calls active at a time, the user should indicate which call should be terminated.

The user should get an indication if there are still inactive calls.

STOP can be used in combination with other functions, e.g. with SELECT (if there are more active calls).

This function can be implemented in various ways. One way to realize this function is a function key "stop". Pressing this key will invoke the function.

Other ways are for instance:
— Selecting a "stop" mark on a window that represents an active call.
— Replacing handset.

ACCEPT

This function provides acceptation of an incoming call. The incoming call is made active.

ACCEPT is used alone or in combination with SELECT if there are more incoming calls.

This function can be implemented in various ways. One way to realize this function is a function key "accept". Pressing this key will invoke the function.

Other ways are for instance:
— Selecting an "accept" mark on a window that represents an incoming call.
— Selecting this function from a menu.

SERVICE

This function initiates a supplementary service procedure.

SERVICE can be used in combination with other functions, e.g. SELECT, DO, REJECT and INFO.

This function can be implemented in various ways. One way to realize this function is a function key "service". Pressing this key will invoke the function.

Other ways are for instance:
— Activiting a supplementary service window on a mouse-controlled system.
— Selecting the function from a menu.

CONTROL

This function initiates invocation of a service element within a supplementary service or within the terminal.

CONTROL can be used in combination with other functions, e.g. SELECT and DO.

This function can be implemented in various ways, e.g.:
— Pressing a function key "control".
— Pressing a function key "alternate", "add", etc., thus combining also the SELECT and DO functions in it.

SELECT

This function provides a selection mechanism that can be used to select an address, a teleservice, a supplementary service, a service element or possibly other matters.

The function can be used either for direct input (e.g. typing in a telephone number) or as a selection means, giving the possibility to select an item displayed with an indication function.

SELECT can be used in combination with other functions, e.g. DO, REJECT, START, STOP, etc.

This function can be implemented in various ways. One way to realize this function is to use function keys for the items that can be selected.

Other ways are for instance:
— Presentation of a menu, from which an item can be selected with a numeric key.
— Direct input of the item (inputting the address via a dial, keypad or keyboard).
— By typing a mnemonic which is converted into a "dial address" in an internal database.

EDIT

This function provides the possibility to modify information previously input to and stored by the terminal.

This function can be implemented in various ways. One way to realize this function is a function key "correction". Pressing this key will invoke the function (e.g. delete the last digit).

Other ways are for instance:
— Extensive edition facilities with cursor control, etc.

INDICATION

This function provides the user with visible and/or audible information.

The information can be:
— Feedback of typing.
— Information for use with the select function.
— Status information.
— Information from the network.
— Information from the other party.

This function can be implemented in various ways. Examples are:
— A message on a screen giving information about an incoming call.
— Pictograms on a graphic screen representing the state of a call.
— A means capable of giving verbal messages.

DO

This function provides the effectuation of a command or the effectuation of the action that is shown by means of an indication function.

DO can be used in combination with other functions, e.g. SELECT and INDICATION.

This function can be implemented in various ways. One way to realize this function is a function key "do". Pressing this key will invoke the function.

Other ways are for instance:
— Pressing a mouse button after having selected an item on a screen.
— Typing "do" as a direct command.

REJECT

This function provides the release of the result of a command given before or the rejection of the action that is shown at an indication function.

REJECT can be used in combination with other functions, e.g. SELECT and INDICATION.

This function can be implemented in various ways. One way to realize this function is a function key "reject". Pressing this key will invoke the function.

Other ways are for instance:
— Select a "reject" mark on a window representing an action or command.
— Select the function from a menu.

INFO

This function provides the possibility to get information about status and data in relation with a particular service or all services.

INFO can be used in combination with other functions, e.g. SERVICE and SELECT.

Information that is provided depends on the used combination.

This function can be implemented in various ways. One way to realize this function is a function key "info". Pressing this key will invoke the function.

Other ways are for instance:

— Select an "info" item from a menu.

— Typing the word "info" followed by some parameters as a direct command.

6. **EXAMPLES OF CONTROL PROCEDURES**

Listed below are example uses of the defined functions. The list is not exhaustive and other procedures not detailed are acceptable.

1. **Call set up**

    *Procedure:*

    | | |
    |---|---|
    | START: | Function key "start" |
    | SELECT: | Number via numeric keypad |
    | DO: | Function key "do" |
    | INDICATION: | Message on LCD (result) |

2. **Call acceptance**

    *Procedure:*

    | | |
    |---|---|
    | INDICATION: | Alerting signal and message on LCD |
    | ACCEPT: | Function key "accept" |
    | INDICATION: | Message on LCD (result) |

3. **More calls**

    *Procedure:*

    | | |
    |---|---|
    | START: | Function key "start" |
    | SELECT: | Number |
    | DO: | Function key "do" |
    | INDICATION: | Message on LCD (connection) [one call active (A)] |
    | START: | Function key "start" [one call inactive (A)] |
    | SELECT: | Number |
    | DO: | Function key "do" |
    | INDICATION: | Message on LCD (connection) [one call active (B), one call inactive (A)] |
    | CONTROL: | Function key "control" [one call active (A), one call inactive (B)] |
    | STOP: | Function key "stop" [one call inactive (B)] |
    | INDICATION: | Message on LCD (inactive connection) |
    | CONTROL: | Function key "control" [one call active (B)] |
    | STOP: | Function key "stop" |

4. **Registration**

    *Procedure:*

    | | |
    |---|---|
    | SERVICE: | Function key "service" |
    | SELECT: | Indication of possible services on a display, select the services by typing a digit |
    | SELECT: | Indication of possible service data on a display, select the data by typing "to be registered" |
    | DO: | Function key "do" (effectuation of the registration) |

### 5. Erasure and/or Deactivation

*Procedure:*

SERVICE:        Function key "service"
SELECT:         Indication of possible services on a display, select the service by typing a digit
REJECT:         Function key "reject" (effectuation of erasure)

### 6. Activation

*Procedure:*

SERVICE:        Function key "service"
SELECT:         Indication of possible services on a display, select the service by typing a digit
DO:             Function key "do" (effectuation of activation)

### 7. Rejection of an incoming call
(e.g. when Call Waiting S. Service is activated)

*Procedure:*

INDICATION:     Alerting signal and message on LCD
REJECT:         Function key "reject"

### 8. Interrogation

*Procedure 1:*

INFO:           Function key "info"
INDICATION:     Status of the current call(s) on display

*Procedure 2:*

SERVICE:        Function key "service"
INFO:           Function key "info"
INDICATION:     Status information on all (active) services

*Procedure 3:*

SERVICE:        Function key "service"
SELECT:         Indication of possible services on a display, select the service by typing a digit
INFO:           Function key "info"
INDICATION:     Information on a particular service

### 9. Invocation of service element

*Procedure:*

                [Conference call active]
SERVICE:        Function key "service"
SELECT:         Indication of possible service elements on a display, select the function by typing a digit
DO:             Function key "do"