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Foreword

This European Telecommunication Standard (ETS) on a minimum Man-Machine Interface for access and control of supplementary services has been produced by the Human Factors (HF) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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NOTE: This ETS is intended to replace CEPT T/CAC 02 (formerly CEPT T/SF 2).

Introduction

This ETS has been developed in response to the rapid growth of telecommunications networks and services, and the increasing mobility of the human user, both within and between networks.

The initial stimulus for the work was the recognition that two complementary networks were developing the same, or a very similar, set of supplementary services with significantly different Man-Machine Interfaces (MMIs). At least two different MMIs, based on the 12 keys (0 - 9, * and #) have been defined for supplementary services provided within European public networks (CEPT Recommendation T/CAC 0 2 [12] and ETS 300 511 [13]), and yet a third non-standard MMI was in common use by a number of European public network operators (ETR 261 [14]). See annex B for a Bibliography which gives these references in full. In addition, a European service provider has introduced a new code scheme, based on an all numeric syntax, for some of its services. At the same time there was increasing recognition that the existing minimum Man-Machine Interface for the access and control of these services did not offer an adequate level of usability.

To address these concerns, this ETS describes a minimum MMI for the access and control of supplementary services within the public telecommunications networks, fixed and mobile, analogue and digital.

Its purpose is to provide a consistent set of user control procedures that will ensure that the access and control of public network based supplementary services can be harmonized, such that a user can access and control the same service in the same way irrespective of the public network providing the service, or of the terminal providing access to it (ITU-T Recommendation E.330 [15]). Its purpose is also to ensure that the user is consistently provided with the necessary information both before and during access and control of a service to establish a minimum acceptable level of usability.

1 Scope

This European Telecommunication Standard (ETS) defines the minimum MMI for use to gain access to and control of supplementary services within public telecommunications networks. It describes the requirements to be met jointly by the service provider, the network operator and the terminal manufacturer necessary to ensure provision of the minimum MMI.

This ETS applies to network based supplementary services provided within:

- the Public Switched Telephone Network (PSTN);
- the Integrated Services Digital Network (ISDN);
- the analogue Public Land Mobile Networks (PLMN), including: Total Access Communication Systems (TACS), Extended Total Access Communication Systems (ETACS) and Nordic Mobile Telephone System (NMT);
- the Global System for Mobile Communications Public Land Mobile Network (GSM - PLMN), including the Digital Cellular System (DCS) 1800;
- the Trans-European Trunked Radio system (TETRA);
- Satellite Personal Communications Service (S-PCS);
- Universal Mobile Telecommunications System (UMTS);
- Universal Personal Telecommunications (UPT).

This ETS does not apply to supplementary services provided within private telecommunications networks, but will apply to public network based services accessed from a private network.

This ETS does not apply to supplementary services that are provided by private networks (or servers) which are attached to the public network and can be accessed from it.

This ETS applies to all telecommunications terminals that are intended to access the supplementary services provided within the public networks.

2 Normative References

This ETS incorporates by dated and undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETR 095 (1993): "Human Factors (HF); Guide for usability evaluation of telecommunications systems and services".

[2] ETR 096 (1993): "Human Factors (HF); Phone based interfaces (PBI) Human factors guidelines for the design of minimum phone based user interface to computer services".

[3] ETR 116 (1994): "Human Factors (HF); Human factors guidelines for ISDN terminal equipment design".

[4] ETR 329 (1996): "Human Factors (HF); Guidelines for procedures and announcements in Stored Voice Services (SVS) and Universal Personal Telecommunication (UPT)".

[5] ITU-T Recommendation E.161: "Arrangement of figures, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".

[6] ITU-T Recommendation E.182: "Application of tones and recorded announcements in telephone services".

[7] ITU-T Recommendation E.183: "Guiding principles for telephone announcements".

[8] ITU-T Recommendation F.902: "Interactive services design guidelines".

[9] ITU-T Recommendation G.115: "Mean active speech level for announcements and speech synthesis systems".

[10] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

[11] ITU-T Recommendation Q.932: "Generic procedures for the control of ISDN supplementary services".

[12] CEPT Recommendation T/CAC 0 2 (formerly T/SF 2): "Subscriber control procedures for supplementary services in modern telecommunication systems".

[13] ETS 300 511: "European digital cellular telecommunications system (phase 2): Man-Machine Interface (MMI) of the Mobile Station (MS) (GSM 02.30)".

[14] ETR 261: "Human Factors (HF); Assessment and definition of a harmonized minimum Man-Machine Interface (MMi) for accessing and controlling public network based telecommunication services - Final Report"; 7 parts.

[15] ITU-T Recommendation E.330: "User control of ISDN - Supported Services".

3 Definitions, Abbreviations and Symbols

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

activation: An action taken by a user or by a service provider to change the state of a service from inactive to active. For example, to activate (switch on) call waiting enables the call waiting indication and service to be invoked by the service provider whenever a call is presented to a busy terminal.

command dialogue: A dialogue format which enables user commands to control a supplementary service by entering the complete string of information necessary to execute the required service function. The service's response will either confirm the execution of the service function, or confirm an error condition. The service's response does not include a prompt for further information. See Interactive Dialogue.

control action: A user input to a telecommunication terminal, network or service that is intended to change the state of the terminal, network or service as part of a man-machine interface to gain access to and control of a telecommunication service.

data check: The interrogation function that compares data input by a user during an interrogation procedure with the data stored with respect to a service. For example, to confirm a Personal Identity Number (PIN) or other secure data item.

data request: The interrogation function that enables a user to obtain information on the existing data stored with respect to a service.

deactivation: An action taken by a user or by a service provider to change the status of a service from active to inactive. For example, to deactivate (switch off) call waiting means the call waiting indication and service will not be invoked by the service provider whenever a call is presented to a busy terminal.

descriptive information: Information provided for the subscriber and user which describes aspects of a supplementary service that are necessary for, or supportive to, the usage of the service; but which excludes the control procedures required to operate the service. See Procedural Information.

disabling: An action taken by a user on a per call basis to prevent (i.e. temporarily suspend) the action of a supplementary service. For example, to switch off CLIR and allow the sending of Calling Line Identification information for the current call, although Calling Line Identification Restriction (CLIR) is normally active.

en-bloc dialling: From a user's perspective, the form of dialling where a user inputs an address or supplementary service command before going off-hook or "sending" it to the network. The address or command may or may not be available to the user for editing before the user goes off-hook or "sends" the information to the network.

erasure: An action taken by a user or by a service provider to delete data stored against a particular service by a previous registration.

feedback: Information, with respect to the state of the system (terminal, network, or service), that is provided to a user in response to their previous control action. Feedback includes confirmation indications, error indications, and status information, as well as implicit or explicit guidance information that further control action may, or may not, be required. See also Prompts and ITU-T Recommendation F.902 [8].

functional protocol: A generic form of protocol for sending information from the user’s equipment (i.e. a terminal) to a network or service provider, which implies in this case, that the user’s equipment has knowledge of the supplementary service. In effect the terminal translates the users commands into specific supplementary service function related signals that the network or service provider can interpret. (See also ITU-T Recommendation Q.932 [11]).

interactive dialogue: A dialogue format which enables user commands to control a supplementary service by entering a sequence of information strings in response to prompts, from the terminal, network or supplementary service, to compile the full information necessary to execute a service function. The service's response will either confirm the execution of the service function, or confirm an error condition and may include a prompt for further information or offer help facilities.

interrogation: An action taken by a user to request information from a service provider relating to a particular service. For the purposes of this ETS, the interrogation function shall include Status Check, Data Request and enable Data Check.

invocation: An action taken by a user or by a service provider to execute a specific service function within real time. For example, by a service provider forwarding an incoming call for a user who has activated the call forwarding service and registered a forwarding-to number; by a user invoking an active call transfer service when the two current calls are in the relevant states (see table 6 in subclause 7.1.2.5); or by a user, on a per call basis, to invoke (i.e. temporarily activate) a supplementary service, e.g. to switch on CLIR and allow the restriction of Calling Line Identification information for the current call, although Calling Line Identification Restriction is NOT normally active.

man-machine interface: The interface through which a user communicates with a telecommunications terminal or via a telecommunications terminal to a telecommunications service provider. The communication is bi-directional and includes the information presented to the user before a control action, the control actions initiated by the user and the information presented to the user after a control action.

network operator: The entity which provides the telecommunications network offering connection to the service provider. For the purposes of this ETS the network operator may be one or many, between a user and a "supplementary service" service provider, and should also include any telecommunications infrastructure providers.

overlap dialling: From a user's perspective, the form of dialling where a user goes off-hook and then inputs the address or supplementary service command digit by digit.

procedural information: Information provided for the subscriber and user which describes the user control procedures required to operate a supplementary service correctly, including control procedures required to recover from user errors. See Descriptive Information.

prompts: Information presented to a user that a specific service state is current and that a control action is expected in order for the service state to be changed.

provision: An action taken by a service provider to make a service available to a subscriber. Provision may be general (where the service is made available to all subscribers without prior arrangement with the service provider) or pre-arranged (where the service is made available to specific subscribers only after prior arrangements are made with the service provider).

register recall: A control defined by ITU-T Recommendation E.161 [5] to enable a user to signal to the local exchange within a fixed network during a call.

registration: An action taken by a user or by a service provider to store specific data necessary to enable subsequent operation of a service. For example, the "forwarding-to number" in the Call Forwarding Unconditional service.

separator: A one character string, the star (*) symbol, used within a command dialogue control action to separate two digit strings. The digit strings may be a service code or a supplementary information string.

service code: A two or three digit string used within a command dialogue control action to identify a supplementary service.

service prefix: A one or two character string composed entirely of the star (*) or square (#) symbols and used to define which of a set of functions should be applied to a service, within a command dialogue control action.

service provider: The entity which provides one or more supplementary services to a user. The network operator may be the service provider.

service suffix: A one character string, the square (#) symbol, used within a command dialogue control action to define the end of the command string.

status check: The interrogation function that enables a user to request information on the existing status of a designated service.

stimulus protocol: A generic form of protocol for sending information from the user’s equipment (i.e. a terminal) to a network or service provider, which implies in this case, that the user’s equipment does not require any knowledge of the supplementary service. In effect the terminal is transparent to the user's commands. (See also ITU-T Recommendation Q.932 [11]).

subscriber: The person or organisational body who has made arrangements with a network operator to have connection with a telecommunications network and who may make arrangements for the provision of telecommunications services via that network with a service provider.

supplementary information: A digit, symbol and/or letter string of undefined length used within a control command sequence to transfer data to the supplementary service provider.

supplementary service: A supplementary service modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a stand-alone service. It must be offered together with or in association with a basic telecommunication service. The same supplementary service may be common to a number of telecommunication services. See ITU-T Recommendation I.210 [10].

supplementary service functions: The collection of functions that are commonly applied in supplementary services including: Activation, Deactivation, Disabling, Erasure, Interrogation, Invocation, Provision, Registration and Withdrawal. Two of these, Provision and Withdrawal, are usually handled at subscription and do not usually require a user interface. These nine functions can be viewed hierarchically and reciprocally as shown in figure 1.

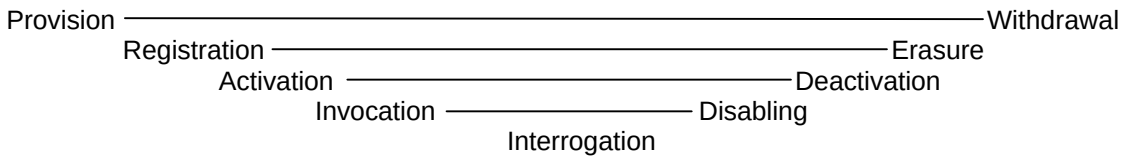

Figure 1: Supplementary service functions, hierarchical and reciprocal view

switching order: A one or two digit string used within a command dialogue control action to identify a telecommunications order.

syntax: The particular sequence of service prefix, service code, switching order, separator, supplementary information, service suffix, etc. specified for a command dialogue information string.

third party user: The person who interacts with or may be affected by a supplementary service which has been activated, invoked, disabled, or deactivated, by another person. For example, the third party user may be calling a person who has activated a call forwarding service, or he may be one of the non-controlling parties involved in a multi-party call (e.g. Call Waiting, Hold, Explicit Call Transfer, 3-Party Conference, etc.).

usability: The effectiveness, efficiency and satisfaction with which specified users can achieve specified goals (tasks) in a particular environment, see ETR 116 [3]. In telecommunications usability should also include the concepts of learnability and flexibility; and reference to the interaction of more than one user (the A and B parties) with each other and with the telecommunications system, see ETR 095 [1].

user: The person who uses a telecommunications terminal to gain access to and control of a telecommunications service, in this case a supplementary service. The user may or may not be the person who has subscribed to the provision of the service. Also, the user may or may not be a person with an impairment, e.g. an elderly or disabled person.

withdrawal: An action taken by a service provider to make a service unavailable to a subscriber. Withdrawal may be general (where the service is removed from all subscribers previously provided with the service) or specific (where the service is removed from individual subscribers previously provided with the service).

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

3PTY	Three Party Conference
AN	Abbreviated Number
AOC-D	Advice of Charge - During a Call
AOC-E	Advice of Charge - at End of Call
AOC-S	Advice of Charge - at Start of Call
AS	Alphanumeric String
CCBS	Completion of Call to Busy Subscriber
CCNR	Completion of Call on No Reply
CD	Call Deflection
CFB	Call Forwarding on Busy
CFNR	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CONF	Conference Call, Add-on
CW	Call Waiting
DCS 1800	Digital Cellular System 1800
DTMF	Dual Tone Multi-frequency
ECT	Explicit Call Transfer

ETNO	European public Telecommunications Network Operators' Association
FLMPTS	Future Land Mobile Public Telecommunications System
GSM	Global System for Mobile Communications
GUI	Graphical User Interface
HF	Human Factors
HOLD	Hold
IMT 2000	International Mobile Telecommunications 2000 (formerly FLMPTS)
ISDN	Integrated Services Digital Network
MCID	Malicious Call IDentification
MMC	Meet Me Conference
MMI	Man-Machine Interface
NMT	Nordic Mobile Telephone System
NRA	National Regulatory Authority
TACS	Total Access Communication Systems
ETACS	Extended Total Access Communication Systems
N	Number (a one digit number)
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PRI	Priority
PSTN	Public Switched Telephone Network
PUI	Personal User Identity
PX	Service Prefix
S-PCS	Satellite Personal Communications Service
SC	Service Code
SCT	Single Step Call Transfer
SI	Supplementary Information
SO	Switching Order
SR	Separator
SX	Service Suffix
TETRA	Trans-European Trunked Radio
TP	Terminal Portability
UMTS	Universal Mobile Telecommunications System
UPT	Universal Personal Telecommunications
UUS	User to User Signalling

3.3 Symbols

For the purposes of this ETS, the following symbols apply:

*	The Star on the standard telephone keypad arrays, see ITU-T Recommendation E.161 [5]. Also known as the asterisk.
#	The Square on the standard telephone keypad arrays, see ITU-T Recommendation E.161 [5]. Also known as the hash, number or sharp sign ("pound" in the USA).
R	Register Recall, see ITU-T Recommendation E.161 [5].

4 The Minimum Man-Machine Interface

A MMI is the bi-directional communication interface provided to enable communication between a system and its human users. The MMI for public network based supplementary services is the communication interface between the system (the terminal, the network/s and the supplementary service) and the user. The interface is defined here to include: informative and instructional material that allow a user to select and use an appropriate service, the software and physical items of hardware that facilitate control and command actions that effect a service and static or dynamic elements that provide information (prompts and feedback) about a service.

The minimum MMI which shall be used to gain access to and control of public network based supplementary services shall comprise the following elements:

a) the information provided to a user before a control action is performed;

b) the control actions a user performs to, gain access to and control of, a service;

c) the information provided to a user after a control action has been performed.

The minimum MMI is intended to be facilitated by all telecommunications terminals that can access the services provided. This is irrespective of the type of signalling protocols used between the terminal and the network or service provider, (stimulus or functional); and of the method of signalling, (dualtone multi-frequency (DTMF), or digital). It is also independent of the media used for presenting information back from the service provider (auditory - tones or verbal messages; or visual - text based messages, symbols, signalling lights, etc.). In this respect there are no predefined assumptions of how the MMI is implemented.

For the detailed requirements to be included in each element of the minimum MMI, see clauses 5, 6 and 7.

5 Information before a control action

The information provided to a user before a control action is performed, as part of the minimum MMI for gaining access to and control of public network based supplementary services, shall include:

a) information provided before a service can be used, see subclause 5.1;

b) information provided before a service is activated, de-activated or invoked, see subclause 5.2.

5.1 Information before a service can be used

The information that is provided to the subscriber and other users before a service can be used shall be:

a) descriptive, see subclause 5.1.1;

b) procedural, see subclause 5.1.2.

The descriptive and procedural information shall be presented to the subscriber in a form appropriate to the subscriber and the other user's capabilities. Provision shall also be made to accommodate the requirements of users with special needs.

The supplementary service provider shall ensure that the descriptive and procedural information relevant to the services it provides is made available to the service subscribers. The service subscribers are assumed to be responsible for ensuring the information is available to other users.

This requirement applies equally to all formats and media used for the presentation of this descriptive and procedural information. For example, it may be incorporated into:

- promotional material, advertisements, brochures, etc.;
- training material, handbooks, prompt cards, user guides, etc.;
- terminal-presented material, keyboard labels / symbols / pictograms, display-based help messages / tutorials, etc.

These materials may be published as printed material or in electronic formats, e.g. as recorded messages, broadcast advertisements, etc. Whatever the format or medium used, the service provider should take all practicable measures to ensure that the information is accurate, consistent and relevant. Whenever transient information media are used, e.g. auditory or audio-visual broadcast messages, the user should always be provided with supporting information in a more permanent form, e.g. printed text.

The format and presentation of the descriptive and procedural information should conform with the recommendations included within the relevant guidelines in ETR 116 [3].

5.1.1 Descriptive information

The descriptive information provided to a user before a service is used shall include:

- a description of the service and its purpose. The description should include concrete examples of the situations the service is intended to address together with any limitations or restrictions on its use. The description should also refer to any complementary services necessary for the full control of a particular service, e.g. a description of calling (or connected) line identification presentation should also include reference to the controlling services, calling (or connected) line identification restriction;

- a statement of the costs incurred by the subscriber for the provision of the service, and of the costs incurred by the subscriber in the use of the service. The statement should where practicable include worked examples of these costs in typical user situations;

- a statement of how the user arranges provision of the service. The statement should include details of the service provider's point of contact and of the service provider's fault reporting facility. It should also include information on the conditions for withdrawal of the service.

5.1.1.1 Supporting descriptive information

Where the service provider makes provision of a range of services, supporting descriptive information should be provided to improve the user's comprehension of the services. Three examples are offered:

EXAMPLE 1: The descriptive information material should be presented in such a way as to give the subscriber and other users insight into the natural groupings of supplementary services that complement each other. For example, a sub-group of call forwarding services may be considered complementary. Depending on the users' circumstances, they may wish to use Call Forwarding Unconditional, Call Forwarding Busy, or Call Forwarding No Reply. Describing these services as a complementary group can assist users to make the correct choice for their needs.

EXAMPLE 2: Where two or more services can provide the user with alternative options within a specific situation, these should be presented as options together with the benefits each option offers. For example, when the calling party encounters a busy indication he may be able to:

- activate Completion of Call to Busy Subscriber;
- invoke User to User Signalling;
- or hang-up, knowing that calling line identification will have been given (e.g. if a Call Waiting service is active).

Conversely, a called party may be able to use several options to help calling parties who encounter a busy condition. For example, the called party may be able to:

- activate Call Waiting, to get an indication when a second party calls;
- activate Call Forwarding on Busy, to transfer the call to somebody else.

EXAMPLE 3: Where two or more services interact, for example, Call Waiting and Call Forwarding Unconditional, or can be used in parallel, e.g. Call Forwarding on Busy and Call Forwarding on No Reply, the effects of their interaction or the facility for their use in parallel should also be explained.

5.1.2 Procedural information

The procedural information provided to a user before a service is used shall describe each of the control functions available for a service and include:

- how the service may be set-up, or how provisioning may be completed;
- how the service can be accessed and controlled.

If the service is accessed and controlled by a command dialogue format (see subclause 6.1), the procedural information shall also include:

- how the service can be activated or invoked;
- how any data required by the service can be registered with the activation, or separately;
- how the service can be deactivated;
- how any data stored for use with the service can be erased at the time of deactivation, or separately;
- how the service may be interrogated, to check its status (activated or deactivated) and the status and content of any data stored for use with the service.

If the service is accessed and controlled by the interactive dialogue format (see subclause 6.2), the procedural information shall also include:

- how to start a session with the interactive dialogue, e.g. go off-hook and dial a number giving access to the service;
- how to recover from an error within a session with an interactive dialogue, e.g. return to the first menu or entry point;
- how to exit from a session with the interactive dialogue, e.g. go on-hook, whether the interaction is complete or not.

The procedural information shall be presented in sequential steps, in the same order in which those steps should be implemented. The procedural information shall be complete, consistent and relevant.

- Complete, by including for example:
  - any start or finish actions also required, e.g. "Power on", "Off-hook", "Send";
  - reference to both the feedback and prompting information that is given in response to the user's actions.

- Consistent, for example:
  - with the descriptive information also provided;
  - with the terminology used in the feedback and prompting information.

- Relevant, for example:
  - by orientating the procedural information to reflect the user's task.

The procedural information should also include:

- information on the user's options when error conditions are encountered in the access and control of a service;
- information on how the user may recover from his own errors, e.g. how to undo an unintentional command, or how to overwrite unintended data.

5.1.2.1 Supporting procedural information

In addition to the basic provision, the service provider should provide supporting procedural information to improve the user's comprehension. Two examples are offered:

EXAMPLE 1: If a command dialogue format is used (see subclause 6.1), explanatory information relating to the syntax of the command used (e.g. the sequence Service Prefix, Service Code, Separator, Supplementary Information, and Service Suffix), or a generic set of rules (e.g. * to switch on, # to switch off, etc.) can help users remember the correct command.

EXAMPLE 2: If an interactive dialogue format is used (see subclause 6.2), explanatory information relating to how the dialogue and feedback prompts will be provided; and a description of the overall structure of the interactive dialogue (e.g. a plan of a hierarchical menu structure and the menu options) can help users remember the correct dialogue.

5.2 Information before a service is activated, deactivated or invoked

The information that shall be provided to a subscriber and other users before a service is activated, deactivated or invoked relates to the operational state of the service. The information shall be provided by the service provider or network, and displayed by the terminal.

This requirement applies equally to all forms in which the information may be transferred between the service provider (or network) and the terminal. For example, the information may be transferred as:

- acoustic tones and signals;
- recorded spoken messages;
- digital or DTMF data signals, etc.

This requirement applies equally to all formats and presentations of the status and operational information on the terminal. For example the information may be displayed as:

- acoustic tones or spoken messages;
- text or graphic display messages;
- flashing or steady state indicator lights;
- Braille or other tactile display, etc.

The service provider, network operator and terminal manufacturer shall ensure the information displayed at the terminal conforms with the recommendations included within the relevant guidelines in ITU-T Recommendations E.182 [6] E.183 [7] and ETR 116 [3].

5.2.1 Information on the operational state of the service

The information provided to a user on the operational state of the service will depend on the status of the terminal and its connection to the network, and on the existing state of the service. Four situations are defined:

a) when no services are operational;

b) when a service(s) is operational whilst the terminal is idle;

c) when a service(s) becomes operational at call set-up or when a connected call is active;

d) when a service(s) becomes operational when the terminal is alerting.

5.2.1.1 When no services are operational

If no services, that effect the setting up and receiving of calls at the terminal, are operational, the following information shall be provided:

- at start, e.g. "Off-hook" or "Power-on", the normal "Connected to network" display e.g. "Normal Dial Tone".

In addition the following information may also be provided during idle and/or at start, at the service provider's and terminal manufacturer's discretion:

- the identity and status of any services available, whether currently operational or not;
- any data that is registered for use with any of the available services;
- any choices that the user may have in relation to the available services.

5.2.1.2 When a service/s is operational during idle

If a service is operational whilst the terminal is idle and affects the setting up and receiving of calls at the terminal, e.g. call forwarding unconditional, call barring or UPT registration, the following information shall be provided:

- at start, e.g. "Off-hook" or "Power-on", a special "Connected to network" display e.g. "Special Dial Tone".

In addition, the following information may also be provided during idle or at start, at the service provider's and terminal manufacturer's discretion:

- the identity and status of the service(s) that are operational;
- any data that is registered for use with the service(s) that are operational;
- any choices for action that the user may have with respect to the service(s).

5.2.1.3 When a service/s becomes operational during a call set-up or during a call

If the service(s) becomes operational and/or available whilst a call set-up is in progress or when a connected call is active and subsequently enables the user the control of the service, e.g. CW or CCBS, the following information shall be provided:

- an auditory and/or visual prompt that the service(s) is operational.

In addition, the following information may also be provided during call set-up or whilst a connected call is active, at the service provider's and terminal manufacturer's discretion:

- the identity and status of the service(s) that are operational;
- any data that is registered for use with the service(s) that are operational;
- any choices for action that the user may have with respect to the service/s.

5.2.1.4 When a service/s becomes operational during alerting

If the service(s) becomes operational and/or available when the terminal is alerting the user of a call arriving, e.g. UPT incoming call, CD, or CLIP, the following information shall be provided:

- at the alerting state, the normal or a special incoming call signal, e.g. "Ring Signal".

In addition, the following information may also be provided during the alerting state, at the service provider's and terminal manufacturer's discretion:

- the identity and status of the service(s) that have become operational;
- any data that is registered for use with the service(s) that have become operational;
- any choices for action that the user may have with respect to the service(s).

6 Control action

The control action used to gain access to, and control of, supplementary services shall comprise either of two formats:

a) the Command Dialogue Format, see subclause 6.1;

b) the Interactive Dialogue Format, see subclause 6.2.

The supplementary service provider, network operator and terminal manufacturer shall support either the Command Dialogue Format or both the Command Dialogue and Interactive Dialogue Formats.

This requirement applies equally to either type of protocol, stimulus or functional, that is used to facilitate communication of the command dialogue or interactive dialogue formats between the terminal and the service provider.

Specific areas of responsibility for service providers, network operators and terminal manufacturers are defined in more detail in clause 8.

This requirement applies equally to all terminal facilities provided for performing control actions within either the command or interactive dialogue formats. For example they may be implemented by:

- key presses using a standard 12 key keypad (0-9, * and #, see ITU-T Recommendation E.161 [5]), and perhaps a Register Recall (R) key, on terminals providing either stimulus or functional protocols;

- key presses using an alphanumeric keyboard;

- pointer selections (mouse, cursor keys, touch panels, etc.) from menus or other dialogue tools within a graphical user interface (GUI);

- spoken words presented to a terminal using voice recognition techniques.

No specific requirements are defined for the time-outs which may be provided by the terminal manufacturer, network operators or service provider for the prevention of undue network congestion, etc. Where a time-out is provided it should not be so short as to reduce the usability of the services below the criteria recommended in subclause 8.2. Particular attention may be necessary to enable users with a one piece or mobile terminals (where the controls and displays are often combined in the handset) to read and respond to service prompts.

If applicable, specific recommendations for time-outs and response times are included within ETR 096 [2], ETR 116 [3] and ETR 329 [4].

6.1 Command Dialogue Format

The command dialogue format used to gain access to, and control of, a supplementary service shall take one or more of four forms:

a) Service Code Command, see subclause 6.1.1;

b) Switching Order Command, see subclause 6.1.2;

c) Abbreviated Dialling Command, see subclause 6.1.3;

d) Alphanumeric Command, see subclause 6.1.4.

The supplementary service provider, network operator and terminal manufacturer shall support the Service Code Command and the Switching Order Command and may additionally support the Abbreviated Dialling Command and the Alphanumeric Command.

This requirement applies equally to either type of protocol, stimulus or functional, that is used to facilitate communication of the command dialogue format between the terminal and the service provider.

The mandatory requirement is that there shall be the means available to a user to enter the characters 0-9, ***** and # and the means to signal these to the connected network to support the Service Code, Switching Order, Abbreviated Dialling or Alphanumeric Commands. The physical means, provided on any particular telecommunications terminal, of entering these characters and signalling them in a format acceptable to the network, is a matter for the terminal manufacturer.

6.1.1 Service Code Command

The Service Code Command used to gain access to and control of supplementary services shall have the following syntax:

"**START PX SC (SR SI) SX**" or "**PX SC (SR SI) SX FINISH**"

Where:

START is the start command, e.g. "Off-hook", an alternative to the finish command;

PX is a mandatory service prefix;

SC is a mandatory service code;

SR is one or more separator/s, as required;

SI is one or more units of supplementary information, as required;

SX is a service suffix as required;

FINISH is a finish command, e.g. "Send", an alternative to the start command.

Where units of supplementary information are required, each unit of supplementary information shall be preceded by a separator. The number of supplementary information units that can be included within a single command sequence is at the discretion of the terminal, network, or service provider.

NOTE: Services which require more than two supplementary information units may be better supported by the interactive dialogue format, see subclause 6.2.

6.1.1.1 Service Prefix

The service prefix used in the service code command shall define the function requested of the service. The service prefix shall consist of the star and/or square symbols. The service prefixes and the functions that shall be recognised are defined in table 1. See clause 3 for the definitions of the seven service functions: Activation, Deactivation, Disabling, Erasure, Interrogation, Invocation, and Registration.

Table 1: Allocation of service prefix to service function

Service prefix	Service function
**	Registration without Activation
*	Activation with Registration; or Activation, or Invocation
*# (note 1)	Interrogation, including: - Data Check; - Data Request; - Status Check.
#	Deactivation without Erasure; or Disabling
## (note 2)	Deactivation with Erasure; or Erasure (note 3)

NOTE 1: As it is desirable not to punish minor keying errors, a service prefix of #* may be interpreted as interrogation (*#) and a reminder error message given.
NOTE 2: If a service provider's preferred default is to delete registered data on deactivation, the service prefix for Deactivation with Erasure may be # and not ##.
NOTE 3: When a service is erased from the active state, it should be also automatically deactivated.

6.1.1.2 Service code

The service code shall be a two or three digit code that is used to identify the service being accessed.

Informative annex A provides a listing of the service codes that have been allocated or recorded as "in use" for supplementary and other services. This compilation is extrapolated from the CEPT Recommendation T/CAC 02 [12] and existing and proposed ETSI standards (see the Bibliography listed in informative annex B).

Service providers are strongly recommended to harmonize their implementations of service codes with these lists, especially when introducing new services, and if possible when updating existing services.

6.1.1.3 Separator

If it is required, the separator used to separate the service code and any supplementary information, or to separate two items of supplementary information, shall be the star (*) symbol.

6.1.1.4 Supplementary Information

If it is required, the supplementary information shall consist of a data string of undefined length. The data string will normally be composed of digits, but may include alphabetic characters or symbols at the discretion of the service provider. The supplementary information shall not include the star (*) or the square (#) symbols.

Passwords or passcodes, such as Personal Identity Numbers (PINs), or Personal User Identities (PUIs), necessary to access and control a service shall be regarded as supplementary information.

NOTE: Where supplementary information is required to provide control within a number of services, the service provider and/or responsible national regulatory authority (NRA) should try to ensure that the provision is made consistently across services.

For example: where a supplementary information digit code is required to define the teleservice to which a call forwarding service is being applied, the code should be consistent at least across all call forwarding services.

E.g. *21*1234567*0# Call Forwarding Unconditional for all teleservices

*67*1234567*2# Call Forwarding on Busy for audio-visual teleservices only

where 0 = all teleservices, (default value);

1 = voice teleservices only;

2 = audio-visual teleservices only,

3 = facsimile teleservices etc.

6.1.1.5 Service suffix

If it is required, the service suffix used to signal the end of a complete service code command string shall be the square (#) symbol. At the service provider's discretion the service suffix may be replaced by other technical solutions to detect the end of the command string, e.g. a time-out or predetermined Supplementary Information (SI) length.

NOTE: Where possible, a user's accidental omission of the service suffix should not result in unnecessary error conditions. In general, omission of the suffix should not be encouraged as the normal practice.

6.1.1.6 Start or finish command

The start command used to initiate a control command sequence will, in the case of overlap dialling, normally be an "off-hook". Where a service code command needs to be invoked within a call, the start command should be "Register Recall" (R) or an equivalent at the service provider's discretion.

The finish command used to request the transmission of a control command sequence will, in the case of en-bloc dialling, normally be an "off-hook" or "send".

6.1.2 Switching order command

The switching order command for the access and control of supplementary service shall have the following syntax:

"**START SO (SR SI)**" or "**SO (SR SI) FINISH**"

Where:

START is a start command, e.g. "Register Recall (R)", an alternative to the finish command, as required;

SO is a mandatory switching order;

SR is one or more separators, as required;

SI is one or more units of supplementary information, as required;

FINISH is a finish command, e.g. "send", an alternative to the start command, as required.

Additional separators and units of supplementary information may be included if required.

NOTE: Services which require units of supplementary information within the switching order command may be better supported by the interactive dialogue format, see subclause 6.2.

6.1.2.1 Switching order

The switching order is a one- or exceptionally two-digit command, that is used to invoke a particular service or service function during an active call state. The switching orders in table 2 shall be recognized, whenever the relevant services are active.

Table 2: Allocation of switching orders

Switching order digit	Function	Example services
0	Terminate held call (note 1); Reject incoming call (note 2) (e.g. User Determined User Busy);	Hold; Call Waiting; 3-Party Conference (note 3); Conference (Add-on) (note 3).
1	Terminate active call and switch to held or waiting call (note 1).	Hold; Call Waiting; 3-Party Conference (note 3); Conference (Add-on) (note 3).
1N	Terminate the specific active call defined by N (note 4).	Conference (Add-on).
2	Hold active call and enable call set-up (note 5); Switch between active call and held or waiting call (note 1)	Hold; Call Waiting; 3 Party Conference (note 3); Conference (Add-on) (note 3).
2N	Hold all active calls except the specific active call defined by N (note 4);	Conference (Add-on) (note 3).
3	Establish Multi-party call or add new party to Multi-party call (note 3)	Hold; Call Waiting; 3-Party Conference (note 3); Conference (Add-on) (note 3).
4	Invoke Call Transfer service and terminate active and transfer held call; Invoke Call Deflection service	Hold; Call Waiting; Explicit Call Transfer;. Incoming Call (4*Directory Number)
5	Activate a Call Completion service	Completion of Call to Busy Subscriber; Completion of Call on No Reply.
6	Not allocated.	
7	Not allocated.	
8	Terminate active call, all other calls remain unchanged (note 6).	Hold; Call Waiting; 3-Party Conference (note 3); Conference (Add-on) (note 3).
9	Not allocated	

NOTE 1: Calls may be a single or multi-party (conference) calls.

NOTE 2: Incoming call may be an alerting or call waiting call.

NOTE 3: Multi-party calls include: 3-Party in PSTN and ISDN, Add-on Conference in PSTN, ISDN, and GSM.

NOTE 4: N defines the number of a specified call (e.g. between 1 and 9). Two digit switching orders are available only when en-bloc dialling is required.

NOTE 5: Used within a basic call in some PSTN implementations to put the current call on hold. This function is not required within GSM and may not be required in ISDN.

NOTE 6: For consistency, if there is only one active call, it may be appropriate to recognise SO 8 also within a basic call.

6.1.2.2 Separator

As defined in subclause 6.1.1.3.

6.1.2.3 Supplementary information

As defined in subclause 6.1.1.4.

6.1.2.4 Start or finish command

If it is required, e.g. for technical reasons within the public network exchange, the start command within the switching order format should be "Register Recall" (R) or an equivalent at the service provider's discretion.

If it is required, the finish command within the switching order format, should be "send" or an equivalent at the service provider's discretion.

6.1.3 Abbreviated dialling command

The abbreviated dialling command for access to an abbreviated dialling service where a user or subscriber has numbers stored within the public network shall have the following syntax:

"**START AN SX**" or "**AN SX FINISH**"

Where:

START is a start command, e.g. "off-hook", an alternative to a finish command;

AN is a mandatory abbreviated number;

SX is a mandatory service suffix;

FINISH is a finish command, e.g. "send", an alternative to a start command.

NOTE: This is equivalent to the suffix method formerly recommended in CEPT Recommendation T/CAC 0 2.

6.1.3.1 Abbreviated number

The abbreviated number shall be a one, two or more digit number within a range defined by the service provider and/or the responsible national regulatory authority. The abbreviated number defines the store where the full directory number, the user wishes to dial, is registered.

NOTE: When allocating abbreviated number ranges, regulatory authorities may want to consider their own national numbering or dialling plans, to avoid conflict with (or accidental access to) reserved or special service numbers.

6.1.3.2 Service suffix

The service suffix used to signal the end of a complete abbreviated number command string shall be the square (#) symbol.

NOTE: The alternative of using a time-out to determine the end of the abbreviated number command string should not be provided.

6.1.3.3 Start and finish commands

As defined in subclause 6.1.1.6.

6.1.4 Alphanumeric command

The Alphanumeric Command for the access to, and control of, supplementary services shall have the following syntax:

"**START AS (SI)**" or "**AS (SI) FINISH**"

Where:

START is a Start command, e.g. "Off-hook", an alternative to a Finish command;

AS is a mandatory Alphanumeric String;

SI is a unit of Supplementary Information;

FINISH is a finish command, e.g. "Send", an alternative to a Start command.

6.1.4.1 Alphanumeric string

The alphanumeric string, composed of any combination of alpha (a-z) or numeric (0-9) characters, used to gain access to, or control of a supplementary service is defined in length, content and application by the responsible national regulatory authority.

NOTE 1: The allocation of numeric strings to access and control supplementary services should be limited, in deference to services which are intended to be available to all subscribers, including those with rotary dial telephones.

NOTE 2: The allocation of alpha-character strings or mixed alpha-numeric strings to services or service functions is not currently recommended for public network based supplementary services, as there is no guarantee of consistency in the assignment of alpha-characters to numeric keypads on existing terminals.

NOTE 3: The use of alpha and alphanumeric strings within alphanumeric commands may be possible within private networks or closed user groups, or within an interactive dialogue.

6.1.4.2 Supplementary Information

As defined in subclause 6.1.1.4.

NOTE: No provision is made for multiple units of supplementary information within the alphanumeric command syntax. If supplementary information is provided for, it should be restricted to a single string.

6.1.4.3 Start and finish commands

As defined in subclause 6.1.1.6.

6.2 Interactive dialogue format

The interactive dialogue format used to gain access to and control of a supplementary service shall take the general form of repeated sequences of the two elements:

a) Control Action;

b) Feedback and/or Prompt Information.

For the purposes of this ETS, the interactive dialogue format shall require a minimum of two separate control action and feedback / prompt sequences to complete any of the seven service functions (activation, deactivation, disabling, erasure, interrogation, invocation or registration). This minimum requirement does not include any off-hook / power-on and on-hook / power-off control actions necessary.

A simple example for the call forward service may require four sequences:

Control action	=	**Go off-hook**
Prompt Information	=	Dial Tone
Control action	=	**Call Forward function key**
Prompt information	=	"Please enter Call Forwarding address"
Control action	=	**Dial address NNNNNN**
Feedback information	=	"Your calls will be forwarded to NNNNNN"
Control action	=	**Go on-hook**
Feedback information	=	"All calls forwarded to NNNNNN"

The definition of the necessary control and information elements and the numbers and length of control / information sequences required as part of any specific interactive dialogue to gain access to and control of a supplementary service shall be at the discretion of the terminal manufacturers, network operators and/or service providers.

This requirement applies equally to either type of protocol, stimulus or functional, that is used to facilitate communication of the interactive dialogue format between the terminal and the service provider.

Where the interactive dialogue provided uses only the standard telephone keypad array (the twelve keys 0-9, * and #) for control inputs, and uses acoustic tones and recorded voice announcements for the prompting and feedback information, service providers should ensure their dialogue meets the recommendations provided in ETR 096 [2] and/or ETR 329 [4].

6.2.1 Control Type and Information Format

This requirement applies equally to all formats and presentations of the feedback/prompt material (e.g. visual, auditory or tactile displays), and to different types of controls (e.g. keys, soft-keys, menus, dialogue boxes, etc.). For example, the Call Forwarding dialogue above could also be provided by:

Control action	=	**Select "Menu" function key**
Prompt information	=	Show menu items, including "Supplementary Services"
Control action	=	**Select "Supplementary Services"**
Prompt information	=	Show menu items, including "Call Forwarding"
Control action	=	**Select "Call Forwarding"**
Prompt information	=	Show menu items, including "Activate Call Forwarding"
Control action	=	**Select "Activate Call Forwarding"**
Prompt information	=	"Enter Call Forwarding address"
Control action	=	**Dial "Call Forwarding address"**
Feedback information	=	Setting up call forwarding to "address"
Feedback information	=	"Your calls will be forwarded to "address"
Prompt information	=	"Do you want another service?"
Control action	=	**Select "No"**

Service providers, network operators and terminal manufacturers or suppliers should ensure that the interactive dialogue used to access and control supplementary services does not reduce the usability below the criteria recommended in subclause 8.2.

6.2.2 Control concatenation

The interactive dialogue format shall permit concatenation of command sequences by enabling the user to "dial through" or pre-empt feedback / prompt messages. For example, in the first interactive dialogue described above, Call Forwarding Unconditional could also be accommodated by the sequence:

Control action	=	**Call Forward function key NNNNNN**
Feedback information	=	"Your calls will be forwarded to NNNNNN"

6.2.3 Time-outs

No specific requirements are defined for the time-outs within interactive dialogues which may be provided by the terminal manufacturer, network operator or service provider. Where a time-out is provided it should not be so short as to reduce the usability of the services below the criteria recommended in subclause 8.2. Particular attention to time-outs may be necessary to enable users with a one piece or mobile terminals (where the controls and displays are often combined in the handset) to read and respond to service prompts.

If applicable, specific recommendations for time-outs and response times are included in ETR 096 [2], ETR 116 [3] and ETR 329 [4].

7 The information after a control action

The information provided to a user after a control action shall include:

a) information provided to support a command dialogue, see subclause 7.1;

b) information provided to support an interactive dialogue, see subclause 7.2;

c) information provided to support a third party user, see subclause 7.3.

The supplementary service provider, network operator and terminal manufacturer shall support the Command Dialogue Information and may additionally support the Interactive Dialogue Information. Specific areas of responsibility for service providers, network operators and terminal manufacturers are defined in more detail in clause 8.

7.1 Information provided to support a command dialogue

The information provided to support a command dialogue control action shall include:

a) information provided to support a service code command, see subclause 7.1.1;

b) information provided to support a switching order command, see subclause 7.1.2;

c) information provided to support an abbreviated dialling command, see subclause 7.1.3;

d) information provided to support an alphanumeric command, see subclause 7.1.4.

The supplementary service provider, network operator and terminal manufacturer shall support the Service Code and Switching Order Command information and may additionally support the Abbreviated Dialling and Alphanumeric Command information.

This requirement applies equally to all sources of the information displayed by the terminal. It may be provided directly by the service provider and/or the network, or by the terminal in response to signals from the service provider and/or network.

This requirement applies equally to all formats or media in which this information may be presented, e.g. auditory tones, recorded or synthetic voice messages, indicator lights, character-based visual display, printed text, etc.

The service provider, network operator and terminal manufacturer should ensure the format and presentation of the information presented to support a command dialogue control action conforms with the recommendations included within the relevant guidelines in ITU-T Recommendations E.182 [6], ITU-T Recommendation E.183 [7] and ITU-T Recommendation G.115 [9], ETR 096 [2], ETR 116 [3] and ETR 329 [4].

No specific recommendation is made for the timing of the information to be provided as feedback. The service provider, network(s) and terminal manufacturer should ensure that the timing of feedback information meets the users' expectations and conforms to the general recommendations included within the relevant guidelines in ETR 116 [3]. To give general feedback that a user's command has been accepted, the terminal manufacturer or network may provide a generic "please wait" indication.

7.1.1 Information provided to support a service code command

The information provided to support a service code command shall depend on the service code command initiated and the correctness of its composition. Seven cases can be defined:

a) Activation with registration, or activation only;
b) Invocation and disabling;
c) Interrogation;
d) Deactivation with erasure, or erasure only;
e) Registration without activation;
f) Deactivation without erasure;
g) Command errors.

As no deduction can be made on the correctness of the service command with respect to the user's intention, the general principle is that all user information included in a command string should be presented back to the user so that he can be reassured as to the service addressed, the current status of the service and the correctness of any data being used by the service. An exception to this principle may be made if the data is perceived to be security sensitive, e.g. a password, in which case the service provider may enable the user to request a data check, e.g. by including the data to be checked as supplementary information within an interrogation command.

In all cases, where registered data includes a PIN or other security identification, the PIN or other secure data may be excluded from the information provided to the user as feedback to a command. Alternatively, the secure data may be referenced anonymously (e.g. as a series of asterisks ********).

In all cases, if the services invoked by the service code command are not subscribed to or are not available for other reasons, e.g. no conference facilities, then an error indication shall be presented to the user. For an example, see ITU-T Recommendation E.182 [6].

7.1.1.1 Activation with registration, or activation only

On the activation of a service, with or without registration, the following information shall be provided to the user:

- the service which has been activated;
- any data that is now registered for use with the service;
- the current status of the service, following completion of the activation command.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- the teleservice which applies to the service being activated.

7.1.1.2 Invocation and disabling

On the invocation or disabling of a service, the following information shall be provided to the user:

- the current status of the call that was the subject of the service which has been invoked or disabled, e.g. following a call set up which included a Calling Line Identification Restriction on a per call basis, "ring tone" or another call progress indication (busy or congestion tone) may be presented; or, following Call Deflection to a defined number, the terminal may return to idle or standby.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- the service which has been invoked or disabled;
- any data that the user provided to support the service invocation or disabling;
- the current status of the service, following completion of the invocation or disabling command;
- the teleservice which applies to the service that has been invoked or disabled.

7.1.1.3 Interrogation

On the interrogation of a service the following information shall be provided to the user:

- the service which is being interrogated;
- any data that has been registered for use with the service;
- the current status of the service being interrogated.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- the teleservice which applies to the service being interrogated.

Where registered data includes a PIN or other security identification, the PIN or secure data may be excluded from the information provided to the user on interrogation, or referenced anonymously (e.g. as a series of asterisks ********). If the user wishes to check the content of registered security information a data check command should be used e.g. *****#SC*****PIN# and a simple "agree" or "disagree" response given.

7.1.1.4 Deactivation with erasure, or erasure only

On completion of deactivation with erasure, or erasure, of data for a service, the following information shall be provided to the user:

- the service which has been deactivated and/or from which data has been erased;
- the current status of the service, following completion of the deactivation and/or erasure command.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- the teleservice which applies to the service being deactivated or for which the data is being erased.

7.1.1.5 Registration only

On completion of the registration of data for a service the following information shall be provided to the user:

- the service for which data has been registered;
- the data that has been registered for use with the service;
- the current status of the service, following completion of the registration command.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- the teleservice which applies to the service for which the data is being registered.

Where registered data includes a PIN or other security identification, the PIN or security element may be excluded from the information provided to the user on registration, or referenced anonymously (e.g. returned as a series of asterisks ********).

7.1.1.6 Deactivation without erasure

On deactivation without erasure of a service the following information shall be provided to the user:

- the service which has been deactivated;
- the current status of the service, following completion of the deactivation command.

In addition, the following information may also be presented, at the service provider's or terminal manufacturer's discretion:

- any data that is still registered for use with the service;
- the teleservice which applies to the service being deactivated.

7.1.1.7 Command errors

Command errors may be undetected or detected.

Undetected errors are those considered by the system as correct but which result in a state or situation other than that intended by the user. The best provision for undetected errors is the full and accurate feedback of each command as defined in subclauses 7.1.1.1 to 7.1.1.6.

The system may detect errors due to commands which are incomplete, contradictory or using the wrong syntax. The provision for detected errors should include:

a) request for missing information;
b) clarification of contradictory commands;
c) clarification of command syntax.

In the case of delayed control actions from the user, the terminal, network or service provider should display a prompt or error indication after a suitable time-out, see also clause 6. Where these time-outs occur after the command sequence has been started, the time-out may be shorter than that provided if no command sequence has been started, e.g. on "off-hook".

7.1.2 Information provided to support a switching order command

The information provided to support a switching order command shall depend on the switching order command initiated and its appropriateness to the current call states. Seven cases are currently defined, see subclause 6.1.2.1:

a) Switching order 0, see subclause 7.1.2.1;
b) Switching order 1 or 1N, see subclause 7.1.2.2;
c) Switching order 2 or 2N, see subclause 7.1.2.3;
d) Switching order 3, see subclause 7.1.2.4;
e) Switching order 4, see subclause 7.1.2.5;
f) Switching order 5, see subclause 7.1.2.6;
g) Switching order 8, see subclause 7.1.2.7.

In all cases, if the services invoked by the switching orders are not subscribed to or are not available for other reasons, e.g. if for technical reasons, no conference bridges are available, then an appropriate error indication shall be presented to the user, see ITU-T Recommendations E.182 [6], E.183 [7], and ETR 116 [3].

The information provided to support switching order commands should follow the general principles that:

- the party initiating the switching order should be kept fully informed of the state of the call or calls following the switching order command;

- any other parties involved in the calls affected by the switching order should be kept fully informed of the state of the calls they are involved with;

- when calls are on hold or waiting, the controlling and held / waiting parties should be reminded that the calls are still in the hold / waiting state.

7.1.2.1 Switching order 0

Table 3 defines the information that shall be presented in response to switching order 0.

Table 3: Indications in response to switching order 0

Call State	Activity	Indication
Held Call If there is a held call.	The held call should be terminated. Any active calls should continue.	Any held call indication shall be updated.
Incoming Call If there is an incoming call and no other active calls.	The incoming call should be terminated.	The alerting signal shall cease and the terminal shall show the normal idle display.
Call Waiting Call If there is a call waiting indication.	The waiting call should be terminated.	The call waiting indication shall cease and the current call should continue.
Indications to Other Parties In the states above, the held or calling party shall be presented with an indication of the new state, e.g. busy tone or voice announcement to declare "User Determined User Busy", and other supplementary services may come into operation, e.g. Call Forward On Busy, Completion of Call to Busy Subscriber.		
Error States In all other states, the switching order 0 shall be rejected and an error indication presented.		

7.1.2.2 Switching order 1 or 1N

Table 4 defines the information that shall be presented in response to switching order 1 and table 5 defines the information that shall be presented in response to switching order 1N.

Table 4: Indications in response to switching order 1

Call State	Activity	Indication
Held and Active Call If there is a held call (or call waiting call) and an active call.	The active call should be terminated and the held or call waiting call made active.	Any held or call waiting indication shall be updated to show no calls are held/waiting, and any active calls indication shall be updated to show the new active call.
Indications to Other Parties In the above state, the previously active party shall be presented with an indication of the new state e.g. call disconnected.		
Error States In all other states, the switching order 1 shall be rejected and an error indication presented.		

Table 5: Indications in response to switching order 1N

Call State	Activity	Indication
Multi-Party Call If there is a multi-party call active.	The call defined by N should be terminated.	An indication given to confirm that N was terminated and that all other parties are still active. There should be no change to the state of any held/waiting call indication.
Indications to Other Parties In the above state, the previously active party shall be presented with an indication of the new state e.g. call disconnected.		
Error States In all other states, the switching order 1N shall be rejected and an error indication presented.		

7.1.2.3 Switching order 2 or 2N

Table 6 defines the information that shall be presented in response to switching order 2 and table 7 defines the information that shall be presented in response to switching order 2N.

Table 6: Indications in response to switching order 2

Call State	Activity	Indication
Active Call only If there is only an active call.	The active call should be held and call set-up should be enabled.	Any held call indication shall be updated and a call set-up prompt, e.g. dial tone, offered. (NB: GSM and perhaps other terminals cannot support this scenario).
Held Call and Active Call If there is a held call (or call waiting call) and an active call.	The active call should be held and the held/waiting call made active.	Any held/waiting call indication shall be updated to show the new held call, and any active calls indication shall be updated to show the new active call.
Indications to Other Parties In the above states, the previously active party shall be presented with an indication of the new state e.g. on hold.		
Error States In all other states, the switching order 2 shall be rejected and an error indication presented.		

Table 7: Indications in response to switching order 2N

Call State	Activity	Indication
Multiparty Call If there is a multi-party call active and no held calls.	The call defined by N should remain active and all other calls put on hold.	Any held or active call indications shall be updated.
Indications to Other Parties In the above state, the previously active parties shall be presented with an indication of the new state e.g. on hold.		
Error States In all other states, the switching order 2N shall be rejected and an error indication presented.		

7.1.2.4 Switching order 3

Table 8 defines the information that shall be presented in response to switching order 3.

Table 8: Indications in response to switching order 3

Call State	Activity	Indication
Held Call and Active Call If a Conference service is active and there is a current held call (or call waiting call) and an active call.	The active, held/waiting calls are combined into a conference.	Any held/waiting or active call indications shall be updated to reflect the conference state.
Error States In all other states, the switching order 3 shall be rejected and an error indication presented.		

7.1.2.5 Switching order 4

Table 9 defines the information that shall be presented in response to switching order 4.

Table 9: Indications in response to switching order 4

Call State	Activity	Indication
Held Call and Active Call If an Explicit Call Transfer Service is active and there is a current held call (or call waiting call) and an active call.	The active and held/waiting calls are transferred to each other	Any held/waiting or active call indications shall be updated to confirm the transfer of calls and the invoking party presented with a call disconnected indication.
Error States In all other states, the switching order 4 shall be rejected and an error indication presented.		

7.1.2.6 Switching order 5

Table 10 defines the information that shall be presented in response to switching order 5.

Table 10: Indications in response to switching order 5

Call State	Activity	Indication
Busy Indication If a Completion of Call on Busy Subscriber Service is provided and there is a current busy party indication, e.g. network or user determined user busy	The call completion on busy subscriber service should be activated, if available.	An indication shall confirm the CCBS service has been activated, and should indicate any conditional parameters, e.g. a time-out when the service will be automatically deactivated.
Ringing Indication If a Completion of Call on No Reply Service is provided and there is a current ringing indication.	The call completion on no reply service should be activated, if available.	An indication shall confirm the CCNR service has been activated, and should indicate any conditional parameters, e.g. a time-out when the service will be automatically deactivated.
Error States In all other states, the switching order 5 shall be rejected and an error indication presented.		

7.1.2.7 Switching order 8

Table 11 defines the information that shall be presented in response to switching order 8.

Table 11: Indications in response to switching order 8

Call State	Activity	Indication
Active Call only If there is an active call.	The active call should be terminated.	Any active call indications shall be updated and dial tone or a dial prompt indication presented.
Active Call and Held Call If there is an active call and a held or waiting call.	The active call should be terminated. There is no change expected in any held or call waiting calls.	Any active call indications shall be updated and dial tone or a dial prompt indication presented.
Indications to Other Parties In the above states, the previously active party shall be presented with an indication of the new state, e.g. call disconnected. There is no change in the indications presented to any held or call waiting parties.		
Error States In all other states, the switching order 8 shall be rejected and an error indication presented.		

7.1.3 Information provided to support an abbreviated dialling command

The following information shall be provided to support an abbreviated dialling command:

- if the abbreviated dialling code has a directory number registered, the user shall receive the normal call progress indications. At the service provider's and terminal manufacturer's discretion the registered number that has been called may be presented back to the user.

In all other cases the abbreviated dialling command should be rejected and an error indication presented.

7.1.4 Information provided to support an alphanumeric command

The information that shall be provided to support an alphanumeric command shall follow the same form as that provided to support a similar service code command, see subclause 7.1.1.

7.2 Information provided to support an interactive dialogue

The information provided to support an interactive dialogue shall be at the discretion of the terminal manufacturer, network and service providers. In all cases, the information offered as prompts or feedback to any user's control actions based on the Service Code and Switching Order Commands shall conform to the information content defined in subclauses 5.2.1, 7.1.1 and 7.1.2.

No distinction is made as to the source of the information displayed by the terminal. It may be provided directly by the service provider and/or the network, or by the terminal in response to signals from the service provider and/or network.

No distinction is made between the formats or media this information may be presented in, e.g. auditory tones, recorded or synthetic voice messages, indicator lights, character-based visual display, printed text, etc.

The service provider, network and terminal manufacturer shall ensure the format and presentation of the information presented to support an interactive dialogue conforms with the recommendations included within the relevant guidelines in ITU-T Recommendation E.182 [6], E.183 [7], ITU-T Recommendation F.902 [8] and ETR 116 [3].

No distinction is made over the timing of the information to be provided as feedback or prompts. The service provider, network/s and terminal manufacturer should ensure that the timing of feedback/prompt information meets the user's expectations and conforms to the general recommendations included within the relevant guidelines in ETR 116 [3]. To give general feedback that a user's command has been accepted the terminal manufacturer or network may provide a generic "Please wait" indication.

7.3 Information provided to support a third party user

The information provided to support a third party user, includes:

a) information provided to support the calling or receiving party when an incoming call barring, call deflection or call forwarding service is invoked, see subclause 7.3.1;

b) information provided to support the non-controlling parties involved when a multiparty service is active or invoked, e.g. Call Waiting, Hold, Conference Add On, Conference Three Party, Call Transfer, see subclause 7.3.2.

The supplementary service provider, network operator and terminal manufacturer should support the information provided to support third parties effected by the activation or invocation of a service.

This recommendation applies equally to all sources of the information displayed by the terminal. It may be provided directly by the service provider and/or the network, or by the terminal in response to signals from the service provider and/or network.

This recommendation applies equally to all formats or media in which this information may be presented in, e.g. auditory tones, recorded or synthetic voice messages, indicator lights, character-based visual display, printed text, etc.

The service provider, network operator and terminal manufacturer should ensure the format and presentation of the information presented to support third parties, conforms with the recommendations included within the relevant guidelines in ITU-T Recommendation E.182 [6], ITU-T Recommendation E.183 [7], ITU-T Recommendation G.115 [9], ETR 096 [2], ETR 116 [3] and ETR 329 [4].

7.3.1 Information provided to support an incoming call barring, call deflection or call forwarding service

The user who activates an incoming call barring, call deflection or call forwarding service requires confirmation that the service is active, see subclause 7.1. In addition, the third party user who initiates a call to the user who activated the service requires feedback on why the call set-up has not been completed as expected. Equally, the third party user who receives a deflected, diverted or forwarded call requires additional information, e.g. on the source or reason for the call.

Information clarifying the reason for the change in call set-up procedures should be provided to initiating third parties:

a) if there is a delay in completing the call set-up caused by the invoked service;

b) if the call set-up cannot be completed because of the invoked service;

c) if there are any additional charges to be incurred by the calling party caused by the invoked service;

d) if there is an unexplained real time change in the normal tone feedback, e.g. where a ring tone changes to a busy tone.

Information may also be provided to initiating third parties on the identity of the connected party.

Information should be provided to receiving third parties:

a) on the identity of the user who initiated the deflecting, diverting or forwarding service invoked by the call;

b) if any special conditions apply to the incoming call, e.g. an audio-visual call;

c) if there are any unexpected charges to be incurred by the receiving party.

Information may also be provided to receiving third parties on the identity of the calling party.

7.3.2 Information provided to support a multiparty service

The user who activates and controls a multiparty service requires feedback on the current status and progress of the calls currently involved, see subclauses 7.1.1 and 7.1.2. In addition the third party user who initiates a call to the party who has activated or invoked a multiparty service, e.g. Call Waiting, requires feedback on why the call set-up has not been completed as expected. Equally, the third party users who are not controlling the multiparty service, but who are also directly involved in the call require feedback on the existing state of the service/call and the actions of the controlling user.

Information should be provided to third parties initiating calls that invoke a multiparty service, e.g. Call Waiting, on the reason the call set-up has not been completed as expected, and what action or actions the calling party should take. Further information may be required if the service times-out to another call state.

Information should be provided to non-controlling third parties involved in multiparty services, see tables 3 to 11 in subclauses 7.1.2.1 to 7.1.2.7.

8 Compliance

Compliance with this ETS shall be the responsibility of the supplementary service provider, the network operator and the terminal manufacturer or supplier. Their separate responsibilities are dependent on the type of protocol (stimulus or functional) implemented within the network.

Where stimulus protocols are implemented (e.g. within the PSTN), the division of responsibilities is defined as follows:

For the service provider:

- to provide the descriptive and procedural information for the services offered;
- to provide information on the operational state of the service necessary before a user's control action;
- to recognise the user's control actions, as stimulus protocols;
- to provide information on the operational state of the service after a user's control action.

For the network operator:

- to provide signals relating to the call states of the various parties involved within the supplementary services;
- to provide for the transfer of information relating to indications for the users from the service provider to the user's terminal;
- to provide for the transfer of information relating to user's control actions from the user's terminal to the service provider.

For the terminal manufacturer or supplier:

- to support the provision of the descriptive and procedural information for the services offered;
- to facilitate the display of information provided on the operational state of the service necessary before a user's control action;
- to facilitate the user's control actions, as stimulus protocols;
- to facilitate the display of information provided on the operational state of the service after a user's control action.

Where functional protocols are implemented (e.g. within the ISDN and GSM), the share of responsibilities are defined as follows.

For the service provider:

- to provide the descriptive and procedural information for the services offered;
- to provide signals relating to information on the operational state of the service necessary before a user's control action;
- to recognise signals relating to the user's control actions, as functional protocols;
- to provide signals relating to information on the operational state of the service after a user's control action.

NOTE: Within the ISDN and GSM, the signals relating to the information to be presented to the user may be as data that has to be translated by the terminal and/or as auditory tones and messages to be presented directly to the user.

For the network operator:

- to provide signals relating to the call states of the various parties involved within the supplementary services;
- to provide for the transfer of information relating to indications for the users from the service provider to the user's terminal;
- to provide for the transfer of information relating to user's control actions from the user's terminal to the service provider.

For the terminal manufacturer or supplier:

- to support the provision of the descriptive and procedural information for the services offered;
- to translate and present the signals relating to the display of information provided on the operational state of the service necessary before a user's control action;
- to facilitate the user's control actions, as functional protocols within the terminal, as far as these are recognised, or to facilitate the transmission of unrecognised user control actions to the network;
- to translate and present the signals relating to the display of information provided on the operational state of the service after a user's control action.

Within other specialised public networks or network facilities (e.g. S-PCN, UMTS and UPT) the responsibilities should be defined after the definition of the supplementary services is completed.

8.1 Compliance testing a minimum MMI based on the command dialogue format

Compliance with the minimum man-machine interface to supplementary services based on the command dialogue format shall be demonstrated by 100 % compliance with the mandatory statements in the following clauses and subclauses:

4 The Minimum Man-Machine Interface

5 The information before a control action
- 5.1 Information before a service can be used
  - 5.1.1 Descriptive information
  - 5.1.2 Procedural information
- 5.2 Information before a service is activated, deactivated or invoked
  - 5.2.1 Information on the operational state of the service

6 The control action
- 6.1 The command dialogue format
  - 6.1.1 The service code command
  - 6.1.2 The switching order command
- 6.2 The interactive dialogue format

7 The information after a control action
- 7.1 Information provided to support a command dialogue
  - 7.1.1 Information provided to support a service code command
  - 7.1.2 Information provided to support a switching order command

8.2 Compliance testing a minimum MMI based on the interactive dialogue format

Compliance with the minimum MMI to supplementary services based on the interactive dialogue format shall be demonstrated by either (a) or (b) as follows:

a) 100 % compliance with the mandatory statements in the following clauses and subclauses:

4 The minimum Man-Machine Interface

5 The information before a control action
- 5.1 Information before a service can be used
  - 5.1.1 Descriptive information
  - 5.1.2 Procedural information
- 5.2 Information before a service is activated, deactivated or invoked
  - 5.2.1 Information on the operational state of the service

6 The control action
- 6.2 The interactive dialogue format

7 The information after a control action
- 7.2 Information provided to support an interactive dialogue

b) A level of usability, as demonstrated in a usability test, equal to or better than the following usability statement:

- "Using only the information provided by the service provider, 75 % of a sample of the intended target users of the service should be able to access and control the service successfully at the first attempt; and 90 % of the same sample should be able to access and control the service successfully at the second attempt."

The usability test used shall conform to the recommendations included within the relevant guidelines in ETR 095 [1].

Annex A (informative): The service codes

A.1 Introduction

This annex presents a set of tables which provide the record of the service codes allocated to supplementary services within the public network.

NOTE 1: Responsibility for the co-ordination and allocation of these service codes was transferred from CEPT to ETNO, and in 1995 was transferred to ETSI.

The data for these tables has been extrapolated from the CEPT Recommendations T/CAC 0 2 [12] and T/CAC S 10 , and a number of ETSI and GSM standards, both existing and proposed. See annex B.

NOTE 2: The CEPT service code recommendations are also referenced in the former CEPT Services and Facilities (SF) "Handbook on services and facilities offered to the subscribers in modern telephone systems".

For information purposes, the relevant service descriptions for those services which have been standardized are cross-referenced to their ITU-T and CEPT Recommendations, and by their ETS or GSM Technical Specification numbers. In these tables, these documents are given for information and are not cited as formal references; where a document is not included in the References clause (by virtue of a reference elsewhere in the present ETS), it may be found in the Bibliography. See annex B.

A.2 The service code tables

Tables A.1 to A.10 present the record of service codes allocated to supplementary services.

Table A.1 - 0 series: Lists service codes 00-09 and 000 - 099

Table A.2 - 1 series: Lists service codes 10-19 and 100 - 199

Table A.3 - 2 series: Lists service codes 20-29 and 200 - 299

Table A.4 - 3 series: Lists service codes 30-39 and 300 - 399

Table A.5 - 4 series: Lists service codes 40-49 and 400 - 499

Table A.6 - 5 series: Lists service codes 50-59 and 500 - 599

Table A.7 - 6 series: Lists service codes 60-69 and 600 - 699

Table A.8 - 7 series: Lists service codes 70-79 and 700 - 799

Table A.9 - 8 series: Lists service codes 80-89 and 800 - 899

Table A.10 - 9 series: Lists service codes 90-99 and 900 - 999

Table A.1: Service Codes for Supplementary Services - 0 series

Service Code	Allocation	Supplementary Service
00	Spare	Possibly reserved for UPT access (ETSI TC-HF Nov. 95)
001 pre #	CEPT	General deactivation of supplementary services
001 pre *	CEPT	General data or status check
002	CEPT	General cancellation of diversion services GSM 02.30 (ETS 300 511 Service Code) GSM 02.82 (ETS 300 515 Diversion Services)
004	USE	GSM General cancellation of conditional diversion services GSM 02.30 (ETS 300 511 Service Code) GSM 02.82 (ETS 300 515 Diversion Services)
01	CEPT	Closed User Group (CUG) ITU-T Recommendation I.255.1 Former CEPT SF Handbook Section II Service 3.3 CEPT T/CAC S 10.7 annex 6.1 ETS 300 136
02	CEPT	Prevent services to this number
03	CEPT	Password registration (GSM) GSM 02.30 (ETS 300 511)
04	USE	GSM Personal Identification Number (PIN) registration GSM 02.30 (ETS 300 511)
042	USE	GSM Personal Identification Number two (PIN2) registration GSM 02.30 (ETS 300 511)
05	USE	GSM Unblock Personal Identification Number (PIN) GSM 02.30 (ETS 300 511)
052	USE	GSM Unblock Personal Identification Number two (PIN2) GSM 02.30 (ETS 300 511)
06	CEPT USE	Remote control of supplementary services CEPT T/CAC S 10.7 annex 17 GSM Presentation of IMEI GSM 02.30 (ETS 300 511)
07	ETSI	GSM Private Numbering Plan (PNP) support GSM 02.95
070	ETSI	GSM Private Numbering Plan "0" (for accessing the Public Numbering Plan)
071	ETSI	GSM Private Numbering Plan "1"
072	ETSI	GSM Private Numbering Plan "2"
073	ETSI	GSM Private Numbering Plan "3"
074	ETSI	GSM Private Numbering Plan "4"
075	ETSI	GSM Private Numbering Plan "5"
076	ETSI	GSM Private Numbering Plan "6"
077	ETSI	GSM Private Numbering Plan "7"
078	ETSI	GSM Private Numbering Plan "8"
079	ETSI	GSM Private Numbering Plan "9"
08	Spare	
09	Proposed Nov, 94	Reserved for Carrier Selection (following request from ETSI STC NA2.NUA dated Nov. 94)

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Table A.2: Service Codes for Supplementary Services - 1 series

Service Code	Allocation	Supplementary Service
10	National	For national use
11	National	For national use
12	National	For national use
13	National	For national use
14	National	For national use
15	National	For national use
16	National	For national use
17	National	For national use
18	National	For national use
19	National	For national use
NOTE: National = For allocation by the relevant National Regulatory Authority		

Table A.3: Service Codes for Supplementary Services - 2 series

Service Code	Allocation	Supplementary Service
20	CEPT	Absent subscriber, date, time, telephone number Former CEPT SF Handbook Section II Service 4.1.9/4.1.10 CEPT T/CAC S 10.7 annex 10.1
21	CEPT	Absent subscriber, immediate diversion on to any number Call Forwarding Unconditional (CFU) ITU-T Recommendation I.252.4 Former CEPT SF Handbook Section II Service 4.1.3 CEPT T/CAC S 10.7 annex 10.1 ETS 300 200 GSM 02.82 (ETS 300 515)
210	CEPT	Selective diversion Former CEPT SF Handbook Section II Service 5.2.1
211	CEPT	Selected diversion, up to ten numbers diverted
212	CEPT	Selected diversion, all but ten numbers diverted
22	CEPT	Absent subscriber, immediate diversion on to a fixed number. Call Forwarding Unconditional (CFU) Former CEPT SF Handbook Section II Service 4.1 CEPT T/CAC S 10.7 annex 10.1
23	CEPT	Absent subscriber, operator Call Forwarding Unconditional (CFU) CEPT T/CAC S 10.7 annex 10.1
24	USE	Absent subscriber, announcement Call Forwarding Unconditional (CFU) Former CEPT SF Handbook Section II Service 4.1 CEPT T/CAC S 10.7 annex 10.1
25	USE	Absent subscriber, one of a group Call Forwarding Unconditional (CFU) Former CEPT SF Handbook Section II Service 4.1 CEPT T/CAC S 10.7 annex 10.1
26	CEPT	Do not disturb, announcement Former CEPT SF Handbook Section II Service 5.1
27	USE	Do not disturb, operator or number Former CEPT SF Handbook Section II Service 5.1
28	CEPT	Do not disturb, selective to an announcement Former CEPT SF Handbook Section II Service 5.1
29	USE	Absent subscriber dictated announcement. Call Forwarding Unconditional (CFU) Former CEPT SF Handbook Section II Service 4.1 CEPT T/CAC S 10.7 annex 10.1
NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS USE = In use by one or more network operators		

Table A.4: Service Codes for Supplementary Services - 3 series

Service Code	Allocation	Supplementary Service
30	CEPT	Calling Line Identification Presentation (CLIP) ITU-T Recommendation I.251.3 CEPT T/CAC S 10.7 annex 5.1 ETS 300 089 (ISDN), ETS 300 648 (PSTN) GSM 02.81 (ETS 300 514)
31	CEPT	Calling Line Identification Restriction (CLIR) ITU-T Recommendation I.251.4 CEPT T/CAC S 10.7 annex 5.2 ETS 300 090 (ISDN), ETS 300 649 (PSTN) GSM 02.81 (ETS 300 514)
32	USE	Digital Connectivity PLMN: Data-MS
33	CEPT	Outgoing Call Barring, Subscriber controlled (OCB) ITU-T Recommendation I.255.5 Former CEPT SF Handbook Section II Service 3.1.3 CEPT T/CAC S 10.7 annex 6.2 GSM 02.88 (ETS 300 520, Call Barring Services, Barring All Outgoing Calls - BAOC)
330	USE	General deactivation of Outgoing Call Barring (GSM)
331	USE	Outgoing Call Barring, Subscriber controlled GSM 02.88 (ETS 300 520 Call Barring Services, Barring All Outgoing International Calls - BAOIC)
332	USE	Outgoing Call Barring, Subscriber controlled GSM 02.88 (ETS 300 520 Call Barring Services Barring All Outgoing International Calls excluding to HPLMN - BAOIC ex H)
34	CEPT	Outgoing Call Barring, Subscriber selected Former CEPT SF Handbook Section II Service 3.1.3 CEPT T/CAC S 10.7 annex 6.2
35	CEPT	Incoming Call Barring, Subscriber controlled Former CEPT SF Handbook Section II Service 3.2.2 GSM 02.88 (ETS 300 520 Call Barring Services Barring All Incoming Calls - BAIC)
351	USE	Incoming Call Barring, Subscriber controlled GSM 02.88 (ETS 300 520 Call Barring Services Barring All Incoming Calls when roaming BAIC roam)
36	CEPT	User to User Signalling (UUS) ITU-T Recommendation I.257.1 CEPT T/CAC S 10.7 annex 21 ETS 300 284 GSM 02.87
360	ETSI	GSM User to User Signalling, All Services (1-3)
361	ETSI	GSM User to User Signalling, Service 1
362	ETSI	GSM User to User Signalling, Service 2
363	ETSI	GSM User to User Signalling, Service 3
37	CEPT	Completion of Call to Busy Subscriber (CCBS) ITU-T Recommendation I.253.3 Former CEPT SF Handbook Section II Service 6.1.1 CEPT T/CAC S 10.7 annex 7 ETS 300 357
38	CEPT	Queue Service
39	CEPT	Malicious Call Identification (MCID) Former CEPT SF Handbook Section II Service 14.2 CEPT T/CAC S 10.7 annex 13 ETS 300 128

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Table A.5: Service Codes for Supplementary Services - 4 series

Service Code	Allocation	Supplementary Service
40	CEPT	Automatic announcement, one call Former CEPT SF Handbook Section II Service 7.2.1 - 7.2.5
41	CEPT	Automatic announcement, series of calls Former CEPT SF Handbook Section II Service 7.2.6
42	CEPT	Call specification, request before call
43	CEPT	Call Waiting (CW) ITU-T Recommendation I.253.1 Former CEPT SF Handbook Section II Service 6.4 CEPT T/CAC S 10.7 annex 2 ETS 300 056 GSM 02.83 (ETS 300 516)
44	CEPT	Call forwarding service, subscriber controlled
45	CEPT USE	Printed charge/duration record, all calls Private meter reading
46	CEPT	Printed charge/ duration record, one call
461	CEPT	Advice of Charge, Information at Call Set-up Time (AOC-S) ITU-T Recommendation I.256.2 Former CEPT SF Handbook Section II Service 7.2/7.3 CEPT T/CAC S 10.7 annex 1.1 ETS 300 178
462	CEPT	Advice of Charge, Information During the Call (AOC-D, Cumulative) ITU-T Recommendation I.256.2 Former CEPT SF Handbook Section II Service 7.2/7.3 CEPT T/CAC S 10.7 annex 1.2 ETS 300 179 GSM 02.86 (ETS 300 519, No Service Code Requirement)
463	CEPT	Advice of Charge, Information During the Call (AOC-D, Incremental) ITU-T Recommendation I.256.2 Former CEPT SF Handbook Section II Service 7.2/7.3 CEPT T/CAC S 10.7 annex 1.2 ETS 300 179 GSM 02.86 (ETS 300 519, No Service Code Requirement)
464	CEPT	Advice of Charge, Information at the End of a Call (AOC-E) ITU-T Recommendation I.256.2 Former CEPT SF Handbook Section II Service 7.2/7.3 CEPT T/CAC S 10.7 annex 1.3 ETS 300 180 GSM 02.86 (ETS 300 519, No Service Code Requirement)
47	CEPT	Line hunting, inhibit, reduce ITU-T Recommendation I.252.6 Former CEPT SF Handbook Section II Service 12.2 CEPT T/CAC S 10.7 annex 12
48	ETSI	Area Selection (AS) ETS 300 392-10 (TETRA Supp. Services.) ETR 294
49	USE	Line hunting, switch ITU-T Recommendation I.252.6 Former CEPT SF Handbook Section II Service 12.2 CEPT T/CAC S 10.7 annex 12

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Table A.6: Service Codes for Supplementary Services - 5 series

Service Code	Allocation	Supplementary Service
50	USE	Abbreviated dialling, packet selection (CENTREX: change in private numbering plan)
51	CEPT	Abbreviated dialling, registration Former CEPT SF Handbook Section II Service 1.1
52	CEPT	Last number repetition Former CEPT SF Handbook Section II Service 6.2
53	CEPT	Fixed destination call Former CEPT SF Handbook Section II Service 1.2
54	CEPT	Repeat stored number
55	CEPT	Alarm call casual Former CEPT SF Handbook Section II Service 2.1.3
56	CEPT	Alarm call regular, number of days Former CEPT SF Handbook Section II Service 2.1.4/2.1.5
57	USE	Alarm call regular, programme
58	USE	Automatic booked call Former CEPT SF Handbook Section II Service 2.2
59	ETSI	GSM Multiple Subscriber Profile (MSP) GSM 02.97
590	ETSI	GSM Multiple Subscriber Profile "0"
591	ETSI	GSM Multiple Subscriber Profile "1"
592	ETSI	GSM Multiple Subscriber Profile "2"
593	ETSI	GSM Multiple Subscriber Profile "3"
594	ETSI	GSM Multiple Subscriber Profile "4"
595	ETSI	GSM Multiple Subscriber Profile "5"
596	ETSI	GSM Multiple Subscriber Profile "6"
597	ETSI	GSM Multiple Subscriber Profile "7"
598	ETSI	GSM Multiple Subscriber Profile "8"
599	ETSI	GSM Multiple Subscriber Profile "9"
NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF USE = In use by one or more network operators		

Table A.7: Service Codes for Supplementary Services - 6 series

Service Code	Allocation	Supplementary Service
60	CEPT	Override diversion and do not disturb services
61	CEPT	Diversion on No Reply, Operator or any number Call Forward No Reply (CFNR) ITU-T Recommendation I.252.3 Former CEPT SF Handbook Section II Service 4.1.15 CEPT T/CAC S 10.7 annex 10.3 ETS 300 201 GSM 02.82 (ETS 300 515)
62	CEPT	Diversion on no reply, One of a group Former CEPT SF Handbook Section II Service 4.1.14 CEPT T/CAC S 10.7 annex 10.3 GSM Call Forwarding Not Reachable GSM 02.82 (ETS 300 515)
63	USE	Call Forwarding on no reply (PLMN; To operator) Former CEPT SF Handbook Section II Service 4.1.13 CEPT T/CAC S 10.7 annex 10.3
64	USE	Diversion on no reply, dictated announcement Former CEPT SF Handbook Section II Service 4.1.24 CEPT T/CAC S 10.7 annex 10.3
65	ETSI	Late Entry (LE) ETS 300 392-10 (TETRA Supp. Services) ETR 294
66	CEPT	Call Deflection (CD) ITU-T Recommendation I.252.5 CEPT T/CAC S 10.7 annex 10.4 ETS 300 202 GSM 02.72
67	CEPT	Diversion on Busy, to any number Call Forward Busy (CFB) ITU-T Recommendation I.252.2 Former CEPT SF Handbook Section II Service 6.3.8 CEPT T/CAC S 10.7 annex 10.2 ETS 300 199 GSM 02.82 (ETS 300 515)
68	CEPT	Diversion on busy, one of a group Former CEPT SF Handbook Section II Service 6.3.2/6.3.4/6.3.6 CEPT T/CAC S 10.7 annex 10.2
69	USE	Diversion on busy, number of sequence Former CEPT SF Handbook Section II Service 6.3.5/6.3.7 CEPT T/CAC S 10.7 annex 10.2

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Table A.8: Service Codes for Supplementary Services - 7 series

Service Code	Allocation	Supplementary Service
70	CEPT	Predetermined conference call
71	CEPT	Conference, Subscriber number registration Conference Call, Add-on (CONF) ITU-T Recommendation I.254.1 Former CEPT SF Handbook Section II Service 11.2.3 CEPT T/CAC S 10.7 annex 8.1 ETS 300 183 GSM 02.84 (ETS 300 517 Multiparty Calls Service, No Service Code Requirement)
72	CEPT	Meet-me Conference (MMC) ITU-T Recommendation I.254.5 Former CEPT SF Handbook Section II Service 11.2.6 CEPT T/CAC S 10.7 annex 8.2 ETS 300 164
73	USE	Automatic personal call
74	CEPT ETSI	Priority (PRI) ITU-T Recommendation I.255.4 Former CEPT SF Handbook Section II Service 6.5 CEPT T/CAC S 10.7 annex 16 TETRA Access Priority (AP) ETS 300 392-10 (TETRA Supp. Services) ETR 294
75	 ETSI ETSI	 (Multi-level Precedence and Priority ITU-T Recommendation I.255.3) GSM enhanced Multi-level Precedence and Pre-emption service (eMLPP) GSM 02.67 TETRA Priority Call (PC) ETS 300 392-10 (TETRA Supp. Services) ETR 294
750	ETSI ETSI	GSM eMLPP Precedence Level "0" (Highest) TETRA Pre-emptive Priority Call (PPC) ETS 300 392-10 (TETRA Supp. Services) ETR 294
751	ETSI ETSI	GSM eMLPP Precedence Level "1" TETRA Priority Call (PC) Level "1" (Highest - without Pre-emption) ETS 300 392-10 (TETRA Supp. Services) ETR 294
752	ETSI ETSI	GSM eMLPP Precedence Level "2" TETRA Priority Call (PC) Level "2" ETS 300 392-10 (TETRA Supp. Services) ETR 294

(continued)

Table A.8 (concluded): Service Codes for Supplementary Services - 7 series

Service Code	Allocation	Supplementary Service
753	ETSI	GSM eMLPP Precedence Level "3"
	ETSI	TETRA Priority Call (PC) Level "3" ETS 300 392-10 (TETRA Supp. Services) ETR 294
754	ETSI	GSM eMLPP Precedence Level "4" (Lowest)
	ETSI	TETRA Priority Call (PC) Level "4" ETS 300 392-10 (TETRA Supp. Services) ETR 294
755	ETSI	TETRA Priority Call (PC) Level "5" ETS 300 392-10 (TETRA Supp. Services) ETR 294
756	ETSI	TETRA Priority Call (PC) Level "6" ETS 300 392-10 (TETRA Supp. Services) ETR 294
757	ETSI	TETRA Priority Call (PC) Level "7" ETS 300 392-10 (TETRA Supp. Services) ETR 294
758	ETSI	TETRA Priority Call (PC) Level "8" ETS 300 392-10 (TETRA Supp. Services) ETR 294
759	ETSI	TETRA Priority Call (PC) Level "9" ETS 300 392-10 (TETRA Supp. Services) ETR 294
76	CEPT	Connected Line Identification Presentation (COLP) ITU-T Recommendation I.251.5 CEPT T/CAC S 10.7 annex 5.3 ETS 300 094 GSM 02.81 (ETS 300 514)
77	CEPT	Connected Line Identification Restriction (COLR) ITU-T Recommendation I.251.6 CEPT T/CAC S 10.7 annex 5.4 ETS 300 095 GSM 02.81 (ETS 300 514)
78	CEPT	Transfer charge services
79	CEPT	Terminal portability (TP) CEPT T/CAC S 10.7 annex 19 ETS 300 053
NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF USE = In use by one or more network operators		

Table A.9: Service Codes for Supplementary Services - 8 series

Service Code	Allocation	Supplementary Service	
80	USE	Diversion to pager	
81	CEPT	Paging call Former CEPT SF Handbook Section II Service 10.3	
82	CEPT	Page pick-up Former CEPT SF Handbook Section II Service 10.3	
83	CEPT	Reverse charging Former CEPT SF Handbook Section II Service 7.9	
84	ETSI	TETRA Listening ETS 300 392-10 (TETRA Supp. Services) ETR 294	
841	ETSI	Ambience Listening (AL) ETS 300 392-10 (TETRA Supp. Services) ETR 294	
842	ETSI	Discrete Listening (DL) ETS 300 392-10 (TETRA Supp. Services) ETR 294	
85	ETSI	Dynamic Group Number Assignment (DGNA) ETS 300 392-10 (TETRA Supp. Services) ETR 294	
86	ETSI	Calls Authorised by Dispatcher (CAD) ETS 300 392-10 (TETRA Supp. Services) ETR 294	
87	USE	Emergency alarm service	
88	USE	Emergency alarm service	
89	CEPT	Sub-Addressing (SUB) CEPT T/CAC S 10.7 annex 18	

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Table A.10: Service Codes for Supplementary Services - 9 series

Service Code	Allocation	Supplementary Service
90	CEPT	Time dependent control
91	CEPT	Distinctive ringing
92	CEPT	Call return
921	CEPT	Call return activate/deactivate
93	CEPT	Selective incoming barring
931	CEPT	Selective incoming barring up to ten numbers barred
932	CEPT	Selective incoming barring up to ten numbers allowed
94	CEPT	Call Hold (HOLD) ITU-T Recommendation I.253.2 Former CEPT SF Handbook Section II Service 11.1 CEPT T/CAC S 10.7 annex 3 ETS 300 139 GSM 02.83 (ETS 300 516 No Service Code Requirement)
95	CEPT	Three Party Conference (3PTY) ITU-T Recommendation I.254.2 Former CEPT SF Handbook Section II Service 11.1 CEPT T/CAC S 10.7 annex 20 ETS 300 186 GSM 02.84 (ETS 300 517 Multiparty Calls Service, No Service Code Requirement)
96	CEPT	Explicit Call Transfer (ECT) ITU-T Recommendation I.252.1 CEPT T/CAC S 10.7 annex 4.1 ETS 300 367 GSM 02.91
97	CEPT	Single Step Call Transfer (SCT) ITU-T Recommendation I.252.1 CEPT T/CAC S 10.7 annex 4.2
98	Spare	
99	ETSI	Over The Air Rekeying (OTAR) ETS 300 392-10 (TETRA Supp. Services) ETR 294

NOTE: CEPT = Code allocated by CEPT WG SF or CAC-BUS
ETSI = Code allocated by ETSI TC-SMG or TC-RES in co-ordination with ETSI TC-HF
USE = In use by one or more network operators

Annex B (informative): Bibliography

The following references are provided for information.

- CEPT Recommendation T/CAC S 10: "Services and facilities aspects of an Integrated Services Digital Network (ISDN)".

- CEPT Services and Facilities (SF) "Handbook on services and facilities offered to the subscribers in modern telephone systems". Note: This document is no longer publicly available, but is listed because of its status as a former definitive reference.

  ETS 300 053: "ISDN: Terminal Portability (TP) supplementary service, Service description".

  ETS 300 056: "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service, Service description".

- ETS 300 089: "Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service, Service description".

- ETS 300 090: "Integrated Services Digital Network (ISDN); Calling Line Identification Restriction (CLIR) supplementary service, Service description".

- ETS 300 094: "Integrated Services Digital Network (ISDN); Connected Line Identification Presentation (COLP) supplementary service, Service description".

- ETS 300 095: "Integrated Services Digital Network (ISDN); Connected Line Identification Restriction (COLR) supplementary service, Service description".

- ETS 300 128: "Integrated Services Digital Network (ISDN); Malicious Call Identification (MCID) supplementary service, Service description".

- ETS 300 136: "Integrated Services Digital Network (ISDN); Closed User Group (CUG) supplementary service, Service description".

- ETS 300 139: "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service, Service description".

- ETS 300 164: "Integrated Services Digital Network (ISDN); Meet Me Conference (MMC) supplementary service, Service description".

- ETS 300 178: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at call set-up time (AOC-S) supplementary service, Service description".

- ETS 300 179: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information during the call (AOC-D) supplementary service, Service description".

- ETS 300 180: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at the end of the call (AOC-E) supplementary service, Service description".

- ETS 300 183: "Integrated Services Digital Network (ISDN); Conference call, add-on (CONF) supplementary service, Service description".

- ETS 300 186: "Integrated Services Digital Network (ISDN); Three-Party Conference (3PTY) supplementary service, Service description".

- ETS 300 196: "Integrated Services Digital Network (ISDN); "Generic functional protocol for the support of supplementary services, Digital Subscriber Signalling System No.1 (DSS1) protocol". Six parts

- ETS 300 199: "Integrated Services Digital Network (ISDN); Call Forwarding Busy (CFB) supplementary service, Service description".

- ETS 300 200: "Integrated Services Digital Network (ISDN); Call Forwarding Unconditional (CFU) supplementary service, Service description".

- ETS 300 201: "Integrated Services Digital Network (ISDN); Call Forwarding No Reply (CFNR) supplementary service, Service description".

- ETS 300 202: "Integrated Services Digital Network (ISDN); Call Deflection (CD) supplementary service, Service description".

- ETS 300 284: "Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service, Service description".

- ETS 300 357: "Integrated Services Digital Network (ISDN); Completion of Calls to Busy Subscriber (CCBS) supplementary service, Service description".

- ETS 300 367: "Integrated Services Digital Network (ISDN); Explicit Call Transfer (ECT) supplementary service, Service description".

- ETS 300 392-10: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1". 25 subparts.

- ETS 300 514: "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 1 (GSM 02.81)".

- ETS 300 515: "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1 (GSM 02.82)".

- ETS 300 516: "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Holding (HOLD) supplementary services - Stage 1 (GSM 02.83)".

- ETS 300 517: "European digital cellular telecommunications system (Phase 2); MultiParty (MPTY) supplementary services - Stage 1 (GSM 02.84)".

- ETS 300 518: "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1 (GSM 02.85)".

- ETS 300 519: "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 1 (GSM 02.86)".

- ETS 300 520: "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 1 (GSM 02.88)".

- ETS 300 625: "European digital cellular telecommunications system (Phase 2); Stage 1 description of Unstructured Supplementary Service Data (USSD) (GSM 02.90)".

- ETS 300 648: "Public Switched Telephone Network (PSTN); Calling Line Identification Presentation (CLIP) supplementary service, Service description".

- ETS 300 649: "Public Switched Telephone Network (PSTN); Calling Line Identification Restriction (CLIR) supplementary service, Service description".

- ETR 294: "Trans-European Trunked Radio (TETRA); Voice and Data (V+D) and Direct Mode Operation (DMO) Mobile Station (MS); Man Machine Interface (MMI)".

- GSM 02.67: "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1 (GSM 02.67)".

- GSM 02.68: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS) - Stage 1 (GSM 02.68)".

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- ITU-T Recommendation I.250: "Definition of supplementary services".

- ITU-T Recommendation I.251: "Number identification supplementary services".

- ITU-T Recommendation I.252: "Call offering supplementary services".

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