

## **Human Factors (HF); Definitions, abbreviations and symbols**

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*European Telecommunications Standards Institute*

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Reference

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Keywords

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# Contents

Foreword .....	4
1 Scope .....	5
2 References .....	6
3 Definitions .....	6
4 Abbreviations .....	11
5 Symbols .....	14
History .....	15

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## Foreword

This ETSI Guide (EG) has been produced by the Human Factors (HF) Technical Committee of the European Telecommunications Standards Institute (ETSI).

# 1 Scope

This ETSI Guide (EG) presents a list of the definitions, abbreviations and symbols used in the documents prepared by the ETSI Technical Committee for Human Factors (TC-HF).

The purpose of this EG is to give guidance to TC-HF rapporteurs in the preparation of their documents, and to assist the usability of these documents through the use of a consistent terminology. The definitions, abbreviations and symbols given are not intended to be exclusive. Other definitions, abbreviations and symbols different from those given here may be found in some TC-HF documents. However, the definitions in this Technical Report are generally to be preferred.

The intended users of this EG include:

**Table 1: Intended users and potential benefits**

	<b>User</b>	<b>ETR used for</b>	<b>Potential Benefit</b>
1	ETSI TC-HF	Provide guidance for TC-HF rapporteurs	Improved quality of TC-HF documents through consistency and coherence of definitions, abbreviations and symbols
2	Other ETSI TCs and STCs	Provide guidance on TC-HF terminology, and on how Human Factors interpret common terms	Increased understanding of TC-HF documentation and of Human Factors aspects
3	User groups	Provide guidance on ETSI TC-HF terminology	Increased awareness in other interested parties of TC-HF terminology and its applications in documents

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## 2 References

For the purposes of the present document, the following references apply:

- [1] ETS 300 738: "Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services".
- [2] ITU-T Recommendation E.161: "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".
- [3] ITU-T Recommendation F.902: "Interactive services design guidelines".
- [4] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".
- [5] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to subscribe them".
- [6] ITU-T Recommendation Z.100: "CCITT Specification and description language (SDL)".
- [7] ETS 300 264: "Integrated Services Digital Network (ISDN); Videotelephony teleservice; Service description".
- [8] (reserved)
- [9] (reserved)
- [10] ETR 055-05: "Universal Personal Telecommunication (UPT); The service concept; Part 5: Types of UPT terminals and access devices".
- [11] ETR 095: "Human Factors (HF); Guide for usability evaluations of telecommunications systems and services".
- [12] ETR 116: "Human Factors (HF); Human factors guidelines for ISDN Terminal equipment design".
- [13] (reserved)
- [14] (reserved)
- [15] (reserved)
- [16] (reserved)
- [17] (reserved)
- [18] (reserved)
- [19] (reserved)
- [20] ISO 31-0 (1992): "Quantities and units - General principles".

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## 3 Definitions

For the purposes of the present document, the following definitions apply:

**3,1 kHz terminal:** A terminal which supports only the ISDN telephony 3,1 kHz teleservice. See also ETS 300 264 [7].

**7 kHz terminal:** A terminal which supports the ISDN telephony 7 kHz teleservice. See also ETS 300 264 [7].

**activation:** An action taken by the user or by the 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. See also ETS 300 738 [1].

**ageing:** The normal physiological and psychological changes in a human being associated with increasing age.

**announcement:** An audible indication in the form of speech, utilized for information, instructions and guidance in a stored voice service.

**audible indication:** A sound composed of frequencies within the range 300 - 3 400 Hz which is used to inform the user about the state of a service.

**busy tone:** Informs the caller that the called party is busy.

**call waiting tone:** Informs the user who is engaged by a call that another caller is attempting to reach him.

**caller waiting tone:** Informs the caller that the called party, though busy, has a call waiting service active.

**cognitive impairment:** A reduction in a person's mental capacities.

**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**.

**communication impairment:** Difficulties in using speech, resulting from damage to structures involved, disorders of brain language processing, early childhood deafness, problems of muscular control, or co-ordination or other causes.

**congestion tone:** Informs the caller that a temporary network congestion, error etc., rejects his call attempt.

**control (action):** A user input to a terminal, network or service that is intended to change the state of the terminal, network or service as part of a **control procedure** to gain access to and control of a telecommunication service.

**control procedure:** A sequence of control actions, terminal, network or service indications and wait states, that facilitate the access to and control of telecommunications services.

**data check:** The interrogation function that compares data input by the user during an interrogation procedure with the data stored with respect to a service. See also ETS 300 738 [1].

**data request:** The interrogation function that enables the user to obtain information on the existing data stored with respect to a service. See also ETS 300 738 [1].

**deactivation:** An action taken by the user or by the 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. See also ETS 300 738 [1].

**dial tone:** Informs the user that the exchange is ready to receive his dialling.

**disability:** Any restriction or lack of ability (resulting from an impairment) to perform an activity in the manner or within the range considered normal for a human being.

**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 allow the sending of Calling Line Identification information although Calling Line Identification Restriction (CLIR) is active.

**earcon:** Small meaningful musical phrase, used as an auditory **icon**.

**effectiveness:** The accuracy and completeness with which specified users can achieve specified goals in a particular environment or context of use (**Usability** component).

**efficiency:** The resources expended in relation to the accuracy and completeness with which users achieve specified goals (Usability component).

**enabling tasks:** Tasks which for a group of users are essential to complete correctly in order to achieve their goal tasks. For example, to achieve a communication with another user it may be necessary to set up the call by a specific procedure (Go Off-hook, Select the correct teleservice, Dial a number, Listen to the call progress tones, etc.) which is the enabling task for that service.

**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.

**entity:** Term used in the UPT report as a common expression to refer to both concrete and abstract concepts or components (such as user, service provider, terminal, interface, etc.) that form part of the UPT Interaction Model.

**erasure:** An action taken by the user or by the service provider to delete data stored against a particular service by a previous registration. See also ETS 300 738 [1].

**fallback:** Mechanism whereby a request for the videotelephony teleservice, which includes an indication that an alternative teleservice is acceptable, results in a call using the alternative teleservice. See ETS 300 264 [7].

**feedback:** Information, with respect to the state of the system (terminal, network, or service), that is provided to the user in response to a 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 [3].

**goal tasks:** Tasks which are the real objectives of a group of users. Goal tasks are to be distinguished from enabling tasks. For example, the communication objective that a user is trying to achieve, such as talking to another user/subscriber to agree on a meeting date, is that user's goal task.

**graphical symbol:** Visually perceptible figure used to transmit information independently of language. It may be produced by drawing, printing or other means.

**handicap:** A disadvantage for a given individual, resulting from **impairment** or **disability**, in the fulfilment of a role that is normal for that individual.

**haptic:** A sense relating to or based on the sense of touch and movement.

**hard of hearing:** Implies a **hearing impairment** with loss of hearing level between normal and profound (deaf), i.e. in the range of 25-65 dB.

**hearing impairment:** A reduction of hearing ability (unilateral or bilateral). The reduction may be mild (> 25 dB hearing loss), moderate (> 45 dB hearing loss), severe (> 65 dB hearing loss) or profound (> 80 dB hearing loss; deafness).

**icon:** A graphic on a visual display terminal that represents a function of the terminal or of the telecommunications network.

**impairment:** Any reduction or loss of psychological, physiological or anatomical function or structure of a user.

**indication:** Information, with respect to the state of the terminal, network, or service, that is provided to the user as part of a control procedure to gain access to and control of a telecommunication service.

**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 the user to request information from the service provider on the status of a particular service. For particular services, Interrogation may also include Status Check, Data Check and Data Request. See also ETS 300 738 [1].

**invocation:** An action taken by the user or by the service provider to execute a specific service function within real time; for example, by the service provider forwarding an incoming call for a user who has activated the call forwarding service and registered a forwarding to number; or by the user invoking the call completion on busy service when a busy state is recognized during call set-up. See also ETS 300 738 [1].

**man-machine interface:** The interface through which a user communicates with a telecommunications terminal or via a 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.

**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.

**people with special needs:** Older people and people with impairments, disabilities or handicaps who need special services or equipment to meet their needs.



**pictogram:** Graphical symbol which depicts objects or actions.

**prompts:** Information presented to the 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 prearranged (where the service is made available to specific subscribers only after prior arrangements are made with the service provider). See also ETS 300 738 [1].

**register recall:** A control defined to enable a user to signal to the local exchange within a fixed network. See also ITU-T Recommendation E.161 [2].

**registration:** An action taken by the user or by the 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. See also ETS 300 738 [1].

**relay service:** A service that enables users of different modes of telecommunication, e.g. text, video, voice, to interact by providing translation between the modes, normally by a human operator.

**ringing tone:** Informs the caller that his call is being presented to the called party.

**satisfaction:** The comfort and acceptability of a system or service to its users and other people affected by its use (**usability** component).

**scenario:** A descriptive illustration of a typical user activity within a telecommunications environment, e.g. the video-telephony service or the UPT service. A scenario may be composed of a number of user goal tasks and enabling tasks.

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

**special dial tone:** A dial tone with a specific modification to remind the user that special conditions apply to his terminal (a special service might have been activated, e.g. call diversion).

**special information tone:** Informs the caller that the dialled number is not valid or that a more lasting network error rejects the call attempt.

**status check:** The interrogation function that enables the user to request information on the existing status of a designated service. See also ETS 300 738 [1].

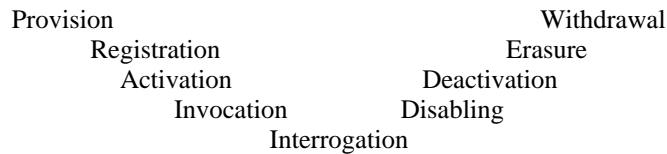
**stored voice service:** A telecommunications service that involves the use of stored (pre-recorded) announcements and (recorded) messages.

**subscriber:** The user or organisational body who has made arrangements with a network provider 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.

NOTE 1: ETSI TCR-TR 008:1993 defines: "Service subscriber: an entity that contracts for services offered by service providers".

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

**supplementary service functions:** The collection of functions that are commonly applied in supplementary services these include: 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**

**supplementary service:** Additional service that modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a stand-alone service; it has to be offered in association with a basic telecommunication service. The same supplementary service may be common to a number of basic telecommunication services. See ITU-T Recommendation I.210 [5].

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

**tactile identifier:** Any physical marking (such as an edge indentation, cut-out, embossing, surface treatment or other) which can be perceived and recognized by the sense of touch.

**terminal:** Physical device which interfaces with a telecommunications network, and hence to a service provider, to enable access to a telecommunications service. A terminal also provides an interface to the user to enable the interchange of control actions and information between the user and the terminal, network or service provider.

**text telephone:** A terminal offering text telephony functions, either as a stand-alone unit or as an addition to a voice telephone or as an application in a multi-function computer based terminal.

**text telephony:** A telecommunications facility offering real time text conversation through telecommunication networks. Text telephony may be combined with voice telephony.

**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 may be one of the non-controlling parties involved in a multi-party call.

**tone:** An **audible indication** comprising a small number of discrete frequencies, but excluding speech. Examples are **dial tone** and **special announcement tone**.

**UPT access device:** A physical device intended to facilitate the UPT user's interactions with the UPT service, i.e. to help the UPT user to carry out the defined UPT procedures, and to increase the security level while doing so. (See ETR 055-05 [10]). No distinction is made between different possible implementations of the UPT device (magnetic strip card, modem, smart card, DTMF signalling device, etc.).

**usability measures:** The specific metrics that quantify the usability components of **effectiveness**, **efficiency**, and **satisfaction**, comprising performance and attitude measures.

**usability:** The **effectiveness**, **efficiency** and **satisfaction** with which specified users can achieve specified goals (tasks) in a particular environment, see ETR 095 [11]. 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 terminals and the telecommunications system, see ETR 116 [12].

**user:** The person who uses a telecommunications terminal to gain access to and control of a telecommunications 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. elderly or disabled persons.

NOTE 2: ITU-T Recommendation I.112 [4] defines: "User, user of a telecommunication network: A person or machine delegated by a customer to use the service and/or facilities of a telecommunications network". Within ETSI/TC-HF, only human users are considered.

**user (control) procedure:** A sequence of user control actions and equipment indications targeted to enable completion of a user's task or sub-task.

**user interface:** The physical interface through which a user communicates with a telecommunications terminal or via a terminal to a telecommunications service. The communication is bi-directional in real time and the interface includes both control and display elements.

NOTE 3: ITU-T Recommendation I.112 [4] defines: "User-network interface: The interface between the terminal equipment and a network termination at which interface the access protocols apply".

**user requirements:** Requirements made by users, based on their needs and capabilities, on a telecommunication service (e.g. the UPT service) and any of its supporting components, terminals and interfaces, in order to make use of this service in the easiest, safest, most efficient and most secure way.

**utility:** The components of utility are the **usability** on the one hand, and the balance between the benefit for the user and the financial cost of using a telecommunications system on the other hand.

**videoconference:** A service providing an interactive, bi-directional, real time audio-visual communication, normally intended for multiple users at either end.

**videotelephony:** A service providing an interactive, bi-directional, real time audio-visual communication, normally intended for a single user at either end.

**videotelephony teleservice:** A real-time audio-visual telecommunication service in which at least speech and moving pictures are interchanged by means of either one (Case 1) or two (Case 2) 64 kbit/s circuit-mode connections in the ISDN. See ETS 300 264 [7].

**visual impairment:** A reduction of visual acuity, or a reduction or distortion of the visual field.

**wait state:** The state of a terminal, network or service that exists prior to a control action from the user, terminal, network or service that will initiate progress to the next state within a control procedure.

**warning tone:** Informs the two users in connection that a third party or a recorder is connected.

**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). See also ETS 300 738 [1].

## 4 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3PTY	Three Party Conference
ADSI	Analogue Display Services Interface
AHL	Average Hearing Loss
AN	Abbreviated Number
AOC	Advice of Charge (supplementary service)
AOC-D	Advice of Charge - During call (supplementary service)
AOC-E	Advice of Charge - at End of call (supplementary service)
AOC-S	Advice of Charge - at Start of call (supplementary service)
AS	Alphanumeric String
ATM	Asynchronous Transfer Mode
AV	Audio-Visual (applicable to case 1 and case 2 of the videotelephony teleservice)
AZERTY	(Standard French language keyboard layout - top row of keys)
B-ISDN	Broadband ISDN
BS	British Standard
BSI	British Standards Institute
C	Control (as a contrast to an indication element within a procedure)
CAD	Computer Assisted Design NOTE: More usually "Computer Aided Design".
CCBS	Completion of Calls to Busy Subscriber
CCITT	Comité Consultatif International Télégraphique et Téléphonique
CCNR	Completion of Call on No Reply (supplementary service)
CD	Call Deflection (supplementary service)
CEN	Comité Européen de Normalisation
CENELEC	Comité Européen de Normalisation Electrotechnique
CEPT	Conférence Européenne des Administrations des Postes et des Télécommunications
CEST	Central European Standard Time
CF	Call Forwarding (supplementary service)
CF-B (CFB)	Call Forwarding - on Busy (supplementary service)
CF-NR (CFNR)	Call Forwarding - on No Reply (supplementary service)
CF-U (CFU)	Call Forwarding - Unconditional (supplementary service)

CIF	Common Intermediate Format (sometimes Common Interchange Format - 352x288 pixels in Video transmissions)
CLI	Calling Line Identification (supplementary service)
CLIP	Calling Line Identification Presentation (supplementary service)
CLIR	Calling Line Identification Restriction (supplementary service)
CN	Corporate Network
CNA	Co-operative Networking Architecture (BT Style Guide)
codec	coder/decoder (Audio or video signal transcriber)
COLP	Connected Line Identification Presentation (supplementary service)
COLR	Connected Line Identification Restriction (supplementary service)
CONF	Conference Call (supplementary service)
CRT	Cathode Ray Tube
CUA	Common User Access (IBM Style Guide)
CUG	Closed User Group (supplementary service)
CW	Call Waiting (supplementary service)
DDI	Direct Dialling In (supplementary service)
DE	Draft ETS (ETSI)
DECT	Digital Enhanced Cordless Telephone
DI	Draft Interim ETS (ETSI)
DIN	Deutsches Institut für Normen
DIS	Draft International Standard (ISO)
DOI	Department of Industry (UK)
DTMF	Dual Tone Multi-Frequency
DTR	Draft Technical Report (ETSI)
EC	European Commission
ECMA	European Computer Manufacturers Association
ECT	Explicit Call Transfer (supplementary service)
EEC	European Economic Community
EN	Europäische Norm
ESPRIT	European Strategic Programme for Research and development in Information Technology
ETACS	Extended TACS
ETNO	European Public Telecommunications Network Operators' Association
FFS	For Further Study
FPH	FreePhone (supplementary service)
FPLMTS	Future Public Land Mobile Telecommunications Systems (US equivalent of UMTS)
GS	Gepürfte Sicherheit (German: Seal of Approval)
GSM	Global System for Mobile communications
GUI	Graphical User Interface
GUIDANCE	RACE Project 1067 Usability Design Information Support for the Integration of IBC Services
HCI	Human-Computer Interface (synonymous with MMI & USI)
HF	Human Factors
HOLD	Hold (supplementary service)
HUFIT	Human Factors in Information Technology (an Esprit project)
I	Indication (as a contrast to a control element in a procedure)
I/O	Input/Output
IBC	Integrated Broadband Communications
IBCN	Integrated Broadband Communications Network
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IPSNI	RACE Project 1066 Integration of People with Special Needs by IBC
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISSUE	RACE Project 1065 IBCN Systems and Services Usability Engineering
IT	Information Technology
ITU-R	International Telecommunication Union - Radiocommunication Sector (previously CCIR)
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector (previously CCITT)
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCID	Malicious Call Identification (supplementary service)
Mil-Std	Military Standard (USA)
MMC	Meet Me Conference (supplementary service)
MMI	Man-Machine Interface

MML	Man-Machine Language
Motif	OSF Graphical User Interface
MOU	Memorandum of Understanding
MSN	Multiple Subscriber Number (supplementary service)
N	Network (as a source of a telecommunication action within a procedure)
NDUB	Network Determined User Busy
NMT	Nordic Mobile Telephone
NRA	National Regulatory Authority
OSF	Open Software Foundation
P	Prefix
PABX	Private Automatic Branch Exchange
PBI	Phone Based Interface
PBI+	Phone-Based Interface (plus spoken messages)
PBI++	Phone-Based Interface (plus spoken messages, plus visual display messages)
PBX	Private Branch Exchange
PCB	Printed Circuit Board
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PSCS	Personal Services Communication Space (RACE name for advanced UPT)
PSTN	Public Switched Telephone Network
PUI	Personal User Identity
PWSN	People with Special Needs (replaces PSN)
QCIF	Quarter CIF
QWERTY	(Standard English language keyboard layout - top row of keys)
QWERTZ	(Standard German language keyboard layout - top row of keys)
RACE	Research and development in Advanced Communications technologies in Europe
RLR	Receive Loudness Rating
RSI	Repetitive Strain Injury
S	Separator
SC	Service Code
SDL	Specification and Description Language (see CCITT Rec. Z.100 [6])
SI	Supplementary Information
SIA	System Interfaces for Applications (Siemens/Nixdorf - Style Guide)
SIM	Subscriber Identification Module
SO	Switching Order
S-PCN	Satellite - Personal Communications Networks
STC	Technical Subcommittee (within ETSI)
STD	State Transition Diagram
SUB	Sub-addressing
SVS	Stored Voice Service
T	Terminal (as a source of a telecommunications action within a procedure)
T	Terminator
TACS	Total Access Communications System (Analogue cellular radio system)
TE	Terminal Equipment
TFC-1	Thin Flexible Card
TIDE	Technology Initiative for Disabled and Elderly people.
TNV	Telecommunication Network Voltage
TP	Terminal Portability (supplementary service)
TWIN	Tele-Working for the Impaired - Networked centers evaluation
UDUB	User Determined User Busy
UMTS	Universal Mobile Telecommunications System (after GSM?)
UPT	Universal Personal Telecommunications
URM	RACE Project 1077 Usage Reference Model
USI	User-System Interface (synonymous with HCI & MMI)
UUS	User User Signalling (supplementary service)
VDT	Visual Display Terminal
VDU	Visual Display Unit
VFD	Vacuum Fluorescent Display
VPN	Virtual Private Network
W	Wait (as in Wait State within a procedure)
WIMPs	Windows, Icons, Menus, Pointers

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## 5 Symbols

For the purposes of the present document, the following symbols apply:

- \* The Star on the standard 3x4 keypad array, see ITU-T Recommendation E.161 [2]. Also known as the asterisk.
- # The Square on the standard 3x4 keypad array, see ITU-T Recommendation E.161 [2]. Also known as the hash, sharp, or number sign ("pound" in the USA).
- R The symbol for Register Recall, see ITU-T Recommendation E.161 [2].

Within HF's documents the symbols used within Specification and Description Language (SDL) figures or diagrams are defined in ITU-T Recommendation Z.100 [6].

In HF's documents, similarly to other ETSI documents, the symbols and abbreviations defined by ISO for units in the international system of units and measures, SI, are used. They are therefore not included in the above list. See further ISO 31-0 [20].

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## History

<b>Document history</b>		
V1.1.1	January 1997	Membership Approval Procedure      MAP 9711: 1997-01-14 to 1997-03-14
V1.1.1	April 1997	First Edition