



Special Report

Human Factors (HF), An annotated bibliography of documents dealing with Human Factors and disability

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This Special Report (SR) has been produced by ETSI Technical Committee Human Factors (HF).

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1 Scope

The present document provides a listing of standardization documents relevant to ICT on the subjects of Human Factors and accessibility and gives a brief outline of the content of the listed documents that are published and provides some comments on their applicability.

The present document is a living document which will be updated at intervals.

2 References

As the document is itself a listing of reference documents, it contains no specific references.

3 Abbreviations

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

AT	Assistive Technology
AT&T	American Company named AT&T
CCITT	(The) International Telegraph and Telephone Consultative Committee
CEPT	Conférence des Administrations Europeennes des Postes et Télécommunications
CLI	Calling Line Information
DTMF	Dual Tone Multi-Frequency
DUST	Duplex Universal Speech and Text
EFTA	European Free Trade Association
ETNS	European Telephony Numbering Space
GSM	Group Special Mobile
HATS	Head And Torso Simulator
HMI	Human Machine Interface
ICT	Information and Communication Technology
ISDN	Integrated Services Digital Network
MIA	Multiple Index Approach
MIRS	Multimedia Information Retrieval Services
MMI	Man-Machine Interface
MML	Man-Machine Language
NGN	New Generation Network
NTT	Nippon Telegraph and Telephone Corp
PBI	Phone Based Interface
PBX	Private Branch Exchange
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
SDL	Specification and Description Language
SMS	Short Messaging Service
TE	Terminal Equipment
TETRA	Trans-European Trunked Radio
TMN	Telecommunications Management Network
UCI	Universal Communications Identifier
UI	User Inteface
UPT	Universal Personal Telecommunications
VDT	Visual Display Terminal
WCAG	Web Content Accessibility Guidelines

4 Standards, recommendations and reports

4.1 ETSI documents

4.1.1 ES (ETSI Standard)

ES 200 381-1 (October 2012): Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids; Part 1: Fixed-line speech terminals

This standard is intended to replace ETS 300 381 for fixed-line speech terminals. The test measurements are based on the use of HATS as electro acoustical interface.

ES 200 381-2 (October 2012): Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids; Part 2: Cellular speech terminals

This standard provides requirements and measurement methods for cellular speech terminals. The classes defined in this ES are in line with ANSI-IEEE 63.19.

ES 201 125 (February 1998): Human Factors (HF); Universal Personal Telecommunications (UPT); Specification of the minimum Man-Machine Interface (MMI) for Phase 1 UPT

ES 201 125 defines the minimum Man-Machine Interface for the phase 1 UPT service, describing the requirements to be met by the service provider, the network operator and the terminal device.

The minimum transitions are illustrated with state transition diagrams and the UPT control procedures are profusely described in Specification and Description Language (SDL) in a set of diagrams.

ES 201 275 (August 1998): Human Factors (HF); User control procedures in basic call, point-to-point connections, for Integrated Services Digital Network (ISDN) videotelephony

ES 201 275 specifies the minimum set of user procedure necessary to control a basic call point to point connection for the ISDN videotelephony service. It covers fallback to ordinary ISDN and PSTN telephony. It describes the various videotelephony services available and the different communication modes.

User control procedures and the call handling processes are described in a set of SDL diagrams. Compliance requirements and procedures are described.

ES 201 381 (December 1998): Human Factors (HF); Telecommunications keypads and keyboards; Tactile identifiers

ES 201 381 specifies the form, dimensions and location of tactile identifiers on digit "5" of keypads and on the "F" and "J" keys of keyboards.

ES 201 382 (December 2003): Human Factors (HF); Procedure for registering a supplementary service code

ES 201 382 describes the procedure to be followed when applying for a supplementary service code for use in a public network that is to be registered in the ETSI register of supplementary service codes.

ES 201 930 (May 2001): Human Factors (HF); Specification of user requirements for use in ETSI deliverables

This document lays down a requirement that all ETSI deliverables should contain an annex setting out the users of the product or service described, their goals, the equipment used, the tasks and feedback for users and the circumstances in which the product or service is intended to be used. The annex should also state how the answers have been validated.

ES 202 076 (August 2009): Human Factors (HF); User Interfaces; Generic spoken command vocabulary for ICT devices and services

ES 202 076 specifies a set of spoken commands in five European languages that can be used to control the functions of ICT devices equipped with speech recognition. All languages for the commands were user tested in their respective countries.

The commands are applicable to the functions of navigation, information retrieval, basic call handling and the configuration of preferences and they address the most common telecommunications services.

ES 202 130 (September 2007): Human Factors (HF); User Interfaces; Character repertoires, ordering rules and assignments to the 12-key telephone keypad

ES 202 130 specifies the assignment of characters to the keys in a 12 button keypad to enable such a keypad to be used for writing an SMS message or entering information into a database. It also deals with the ordering of characters.

This latest version of the document is a tour de force of nearly 300 pages that covers Latin Greek and Cyrillic script and is applicable to the official languages of the EU, those used in EFTA and Russian selected non-European languages used by significant minorities. It now extends to 98 languages in all, with an appendix dealing with three Indian languages.

This standard provides a major contribution to the work of handling cultural diversity in Europe.

ES 202 432 (November 2006): Human Factors (HF); Access symbols for use with video content and ICT devices

ES 202 432 is a simple document which defines the symbols to be used to identify the availability of subtitling, audio description, signing, speech output and spoken command on a range of ICT devices and services. The work of development and evaluation of these symbols is described in TR 102 520.

ES 202 642 (September 2010): Human Factors (HF); Personalization of eHealth systems by using eHealth user profiles (eHealth)

This standard builds on ES 202 746 and specifies standardized elements of user profiles relevant to the eHealth environment. It includes personalization of the eHealth information and interaction and deals with user profile preference and information settings.

The document provides a large amount of background information in the eHealth field.

ES 202 746 (February 2010): Human Factors (HF); Personalization and User Profile Management; User Profile Preferences and Information

This standard specifies a set of user profile preference and information settings for use in ICT services and devices including a rule definition for functionality and objects including settings, values and operations.

The document provides detailed instructions, setting out how such information is to be handled, so as to permit a profile to be migrated between User Profile Management systems.

ES 202 975 (October 2009): Human Factors (HF); Harmonized relay services

A standard based mainly on TR 101 806 that sets out the requirements for various types of relay services that enable communication between hearing impaired and other users. It deals with text relay, speech to speech relay, signing and lip reading services as well as text to text and facsimile relay. It is intended to be used mainly by procurers commissioning such services.

4.1.2 ETS (European Telecommunication Standard)

ETS 300 375 (November 1994): Human Factors (HF); Pictograms for point to point videotelephony

ETS 300 375 specifies a set of pictograms representing eight point to point videotelephony functions.

ETS 300 381 (December 1994): Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids

ETS 300 381 specifies the requirements for the magnetic field to be produced at the earphone to permit satisfactory coupling to a hearing aid.

ETS 300 488 (January 1996): Terminal Equipment (TE); Telephony for hearing impaired people; Characteristics of telephone sets that provide additional receiving amplification for the benefit of the hearing impaired

ETS 300 488 specifies the electro-acoustic performance characteristics of telephones with receive amplification greater than that normally provided.

ETS 300 640 (August 1996): Human Factors (HF); Assignment of alphabetical letters to digits on standard telephone keypads

ETS 300 640 specifies which letters go on which keys on keypads for all terminals, both public and private. It is fully harmonized with ITU-T Recommendation E.161 and with ISO/IEC 9995-8.

ETS 300 679 (September 1996): Terminal Equipment (TE); Telephony for the hearing impaired; Electrical coupling of telephone sets to hearing aids

ETS 300 679 specifies the electrical and mechanical requirements for the direct electrical connection of a telephone set to a hearing aid.

ETS 300 738 (June 1997): Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services

ETS 300 738 defines the format of the control actions required to gain access to and to control public network based supplementary services. It describes the necessary information to be provided by the network during the resultant dialogue.

It sets out to provide a complete listing of supplementary services and their codes based upon information derived from CEPT, ETSI standards and common usage. Some of the codes listed appear never to have been brought into use. No definitions are provided for the service names listed.

ETS 300 767 (July 1997): Human Factors (HF); Telephone Prepayment Cards; Tactile Identifier

ETS 300 767 specifies the form, dimensions and position of the shape cut out of the short edge of a machine readable card as a tactile identifier.

4.1.3 EN (European Standard)

EN 301 104 (October 1998): Human Factors (HF); Human factors requirements for a European Telephony Numbering Space (ETNS)

EN 301 104 specifies the human factor requirements dealing with aspects of a European telephony numbering space. It covers those aspects of ETNS services of importance to users of those services and to other affected users.

It provides rules for the formatting of numbers, for migrating from an ETNS service to a global service, for CLI information, call charging information, delays and linguistic difficulties.

EN 301 462 (March 2000): Human Factors (HF); Symbols to identify telecommunications facilities for deaf and hard of hearing people

EN 301 462 specifies a range of symbols to identify telecommunications facilities for deaf and hard of hearing people. The symbols derive from the work described in TR 101 767. The document does not provide any indication of preferred colours.

4.1.4 TS (Technical Specification)

TS 102 511 (August 2007): Human Factors (HF); AT Commands for Assistive Mobile Device Interfaces

TS 102 511 arises from and extends the work of TR 102 068 by making an extensive investigation of the use of existing AT commands to interoperate with assistive devices to provides accessibility to mobile devices and services. It reports on extensive research into existing user needs and current solutions, identifies the gaps where the necessary commands do not exist and makes recommendations for a suggested syntax for some of the missing commands.

Although the document is nominally a TS, most of the content is informative. Even so it presents a comprehensive treatise on the subject

TS 102 577 (September 2008): Human Factors (HF); Public Internet Access points (PIAPs)

TS 102 577 gives guidance to suppliers of facilities publicly provided for general use to access the Internet. A "Design for All" approach is followed so as to ensure that PIAPs are more readily accessible to all people including elderly users and those with disabilities.

It provides a large amount of information on the background and use of PIAPs, gives a number of recommendations that address their accessibility and makes proposals for new standards in the area.

TS 102 747 (December 2009): Human Factors (HF); Personalisation and User Profile Management; Architectural framework

This document builds on the user profile concept described in EG 202 325 by specifying the requirements of an architectural framework to support the personalization and user profile management concepts set out in that document.

In addition, the standard also sets out requirements for the important security and privacy issues associated with user profiles when transferred over networks.

It is intended to permit users to provide the necessary information for a range of differing products and environments without the need for repeated input of the same information.

4.1.5 TCR-TR (Technical Committee Reference Technical Report)

TCR-TR 023 (October 1994): Human Factors (HF); Assignment of alphabetic letters to digits on push button dialling keypads

A report formally stating that TC-HF supports option "A" of ITU-T Recommendation E.161 but with no commitment to recommend any service that assumes this option.

4.1.6 ETR (ETSI Technical Report)

ETR 029 (October 1991): Human Factors (HF); Access to telecommunications for people with special needs. Recommendations for improving and adapting telecommunication terminals and services for people with impairments

ETR 029 identifies some of the main factors that can inhibit the access to and use of telecommunications services by people with special needs, such as those caused by advanced age, temporary or permanent physical disability, intellectual impairment, lack of education or membership of a cultural or linguistic minority group.

It is an early report which has now been superseded by EG 202 116 which incorporates much of its content.

ETR 039 (March 1992): Human Factors (HF); Human Factors standards for telecommunications applications

An early bibliography, now well out of date.

ETR 051 (December 1992): Human Factors (HF); Usability checklist for telephones - Basic requirements

A short report demonstrating the use of a simple usability checklist for the very basic operations of setting up and clearing a call on a simple telephone.

ETR 068 (September 1993): Human Factors (HF); European standard situation of telecommunication facilities for people with special needs

ETR 068 sets out to review the situation on standards and facilities for people with special needs in the major European Countries. The methods used for the document survey are reported and some attempt is made to predict future telecommunications trends. The report provides a somewhat out of date view of the facilities available and makes proposals for further standardization work.

ETR 070 (June 1993): Human Factors (HF); The Multiple Index Approach (MIA) for the evaluation of pictograms

A report describing one method of assessing the value of pictograms. It gives a reasonably detailed description of the experimental procedures and gives an example of the use of a questionnaire for the evaluation of pictograms for use with videotelephones.

The report gives no guidance on mathematical treatment of the results.

ETR 095 (September 1993): Human Factors (HF); Guide for usability evaluations of telecommunications systems and services

A useful and detailed discussion on the concept of usability. The report provides definitions and descriptions of the evaluation process. Descriptions of a number of methods of evaluating usability are provided and their advantages and disadvantages discussed. Measurement theory and scales are described.

It provides a useful introduction to the field of work for anyone needing to assess the usability of a system and gives a number of references for further study. ETR 095 has now been updated by EG 201 472.

ETR 096 (August 1993): Human Factors (HF); Phone Based Interfaces (PBI), Human factors guidelines for the design of minimum phone based user interface to computer services

A very basic introduction in general terms to the use of a telephone with DTMF keypad for services with a voice response.

ETR 113 (October 1993): Human Factors (HF); Results of an evaluation study of pictograms for point to point videotelephony

ETR 113 gives the results of an evaluation study of pictograms for use in videotelephony. It was used to justify the effectiveness of the Multiple Index Approach for evaluation. Unfortunately the results are only as good as the design of the restricted number of original sets of pictograms offered for testing. The work was the basis for ETS 300 375.

ETR 116 (June 1994): Human Factors (HF); Human Factors guidelines for ISDN - Terminal equipment design

ETR 116 has now been superseded by EG 202 116 where its contents have been largely reproduced and expanded. It is a vade mecum and checklist for all of those aspects of a design that affect the user. ETR 116 was the chef-d'œuvre of the ETSI Human Factors group and covered most aspects of terminal design.

ETR 131 (June 1994): Terminal equipment (TE); An investigation into the need for standardisation in the area of stored voice services

ETR 131 reports a study into a range of services which make use of stored voice. The description "Stored Voice Services" was first used in this report which identified the need for guidelines on user procedures and dialogues and on their usability.

ETR 147 (September 1994): Human Factors (HF); Usability checklist for Integrated Services Digital Network (ISDN) telephone terminal equipment

ETR 147 provides a simple list of features of terminal design that should be checked to determine whether human factors aspects have been properly dealt with in a design.

It should be useful both to designers and specifiers of terminal equipment.

ETR 160 (January 1995): Human Factors (HF); Human Factors aspects of multimedia telecommunications

ETR 160 defines and discusses many aspects of multimedia but deals mainly with automatically provided multimedia services. It treats hypermedia issues such as links and navigation and in general provides advice on the main Human Factors problems in multimedia.

ETR 165 (January 1995): Human Factors (HF); Recommendation for a tactile identifier on machine readable cards for telecommunications terminals

ETR 165 presents the results of tests of tactile identifiers on a number of machine readable cards. The results condemned the British Telecom phone cards then in use and a CEN TC 224 draft proposal. The design was subsequently superseded by a different recommendation in ETS 300 767 which was adopted by British Telecom and other manufacturers.

ETR 166 (January 1995): Human Factors (HF); Evaluation of telephones for people with special needs; An evaluation method

ETR 166 is based on the checklist of ETR 051 applied to conventional telephones and adds evaluation criteria said to be appropriate for groups of people with various disabilities. It does not apply to telephones for those people so severely disabled as to need special devices or features which cannot be expected to be supplied in conventional telephones.

It is an early report which has now been superseded by EG 202 116 which incorporates and updates much of its content.

ETR 167 (January 1995): Human Factors (HF); User instructions for public telecommunications services

ETR 167 gives good advice for the design of user instructions intended to be placed on or near payphones. It contains some references to additional source material and gives a couple of (Italian) examples of instruction layouts.

ETR 170 (January 1995): Human Factors (HF); Generic user control procedures for telecommunication terminals and services

ETR 170 describes general concepts related to user control procedures and interaction with telecommunication terminals and services. A number of general rules are described and example user procedures are described in SDL format.

The report is rather theoretical, being purely generic, with no detailed recommendations for particular procedures.

ETR 175 (February 1995): Human Factors (HF); User procedures for multipoint videotelephony

ETR 175 deals with user procedures for setting up multipoint videotelephone calls, procedures for switching multipoint video signals within the framework of the switched mode, and procedures for controlling the mixture of video signals within the framework of the mixed mode.

Much of ETR 175 does little more than identify organizations working in the field. A little over two pages are on preliminary recommendations for the broad outlines of procedures. Recommendations are made for more research.

ETR 187 (April 1995): Human Factors (HF); Recommendation of characteristics of telephone service tones when locally generated in telephony terminals

A largely discredited report based generally on ITU-T Recommendation E.180 written by the author of the Recommendation. Contains the content of a putative ETS that failed its vote.

ETR 198 (October 1995): Human Factors (HF); User trials of user controlled procedures for ISDN videotelephony

ETR 198 gives the results of four European experiments in videotelephony to evaluate a set of control procedures for ITU-T Recommendation E.170. The experiment showed that the original procedures were defective. The report provided the basis for further Human Factors work.

ETR 208 (September 1995): Human Factors (HF); Universal Personal Telecommunications (UPT) User requirements

ETR 208 identifies types of UPT users by reference to a UPT model which was used to generate user requirements. Interaction between users and between users and tasks are described.

The report provides a detailed description of the facilities that may be provided by UPT. An annex describes a number of procedures in SDL.