

Access symbols for use with video content and ICT devices

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Abstract

This paper reports the background research, symbols development and evaluation undertaken by a Special Task Force (STF) within ETSI to create a new European Standard (ETSI ES 202 432) on Symbols to identify the availability of access services applicable to a range of ICT devices.

Key words: Access symbols, ICT, accessibility

1. Introduction

eEurope 2005 carries the ambitious objective of achieving “an Information Society for All” which has been enlarged as “to give everyone the opportunity to participate in the global information society”. This requires the overcoming of social and geographical differences, ensuring an inclusive digital society that provides opportunities for all, thus minimising the risk of ‘digital divide’.

The overcoming of these differences often requires the use of access services. Access services are alternative formats of content that may be provided to supplement the content in order to enable people to access aspects of the content that may otherwise be hindered.

The provision of the services and equipment needed to use them is currently being hampered by the lack of awareness of such provision by the people who would most benefit from them. In order to promote the necessary awareness of the provision of access services and, in some cases, to establish better methods of providing them, a need for international symbols relating to the access services has been recognised.

2. General

The access services that are required to be identified are:

- Subtitling;
- Audio description;
- Signing;
- Speech output;
- Spoken command

It is intended that subtitling should apply to all transcripts of the spoken dialogue whether for deaf users or to provide language translation. Audio description is an additional audible narrative, interleaved with the dialogue, which describes the significant aspects of the visual

content of any audio-visual media for the benefit of blind users. Signing describes the use of sign language to convey the significant aspects of the audible content of any audio-visual media. The speech output symbol is intended to convey that a device could communicate to its user using spoken language whereas spoken command indicates the ability of a device to accept and respond to spoken instructions from a user.

The symbols defined are intended to be applicable to all access services, ICT devices and associated media that provide the defined facilities.

3. Testing

In order to derive symbols that would be acceptable for international standardisation it was decided that testing should be carried out in accordance with ISO 9186 but that an attempt should be made to generate information so as to meet the Multiple Index Approach (MIA) set out in ETSI ETR 070 if possible.

3.1 ISO 9186 test

ISO 9186 provides test methods for judged comprehensibility and for comprehension. The test of comprehensibility asks a respondent to estimate the percentage of the population likely to be able to understand the meaning of a symbol. It was decided to ask the subject to give a score out of 10 for each symbol as such a score was considered to be easier to comprehend.

When there are three or fewer variants of a symbol under test, or where the results of the comprehensibility test is inconclusive the comprehension test has to be performed by asking a respondent to write his own description of the meaning of a symbol. Judges subsequently assign a category to each answer on the following basis and a score is then derived for each answer.

- 1 = Correct understanding certain
- 2 = Correct understanding is very probable
- 3 = Correct understanding is probable
- 4 = The meaning understood is opposite of intention
- 5 = Any other response
- 6 = Response "Don't know"
- 7 = No response

In order to provide the information to satisfy most of the requirements of ETR 070 and also to guard against the possibility of an indeterminate result from the judged comprehensibility test, it was decided to perform both tests in parallel.

3.2 MIA test

ETR 070 describes seven multiple indices to evaluate a pictogram. They are:

- 1 The hit rate
- 2 The false alarm rate
- 3 Missing values
- 4 Subjective certainty
- 5 Subjective suitability
- 6 Pictogram preference
- 7 Pictogram set preference.

The score for comprehensibility judgement could be considered to indicate a parameter similar to the Subjective suitability for ETR 070.

The highest score achieved in this test gives an answer that can be considered to be similar to the Pictogram preference for ETR 070.

Answers classified as correct understanding with a score of 1, 2 or 3 can be used to estimate the Hit rate for ETR 070

Opposite or unclassified answers (4 & 5) can be considered to be equivalent to the False alarm rate for ETR 070

Answers of Don't know or No response (6 & 7) can be considered to be equivalent to the Missing values for ETR 070

Answers classified as 1, 2 & 3 can be used to give a score indicating the Subjective certainty for ETR 070

It was not possible to allocate a pictogram set preference from the answers but this was not considered significant as the symbols were not grouped in sets.

Because of the limitations of the available timescale it was decided to carry out the testing over the World Wide Web.

4. Derivation of the symbols

Work started with research to find any available symbols that were intended for use in similar fields. Amongst the documents surveyed were EN 301 462, ETS 300 375, ISO 7000, ISO 7001, ISO/IEC 11581-5, ISO/IEC 13251, IEC 60417-1 and ITU-T E.121.

In this study, only one possibly relevant symbol was found, in IEC 60417-1. It was symbol 5520, representing sub title (in teletext mode) but number of visual metaphors that could be used were found in the various references.

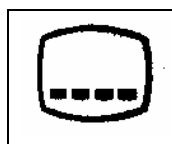


Figure 1: IEC 60417-1 (Symbol 5520)

In an attempt to create a larger number of candidate symbols for testing, a brainstorming session was held in order to generate as many symbols as possible. Figure 2 shows some of the results of this work.

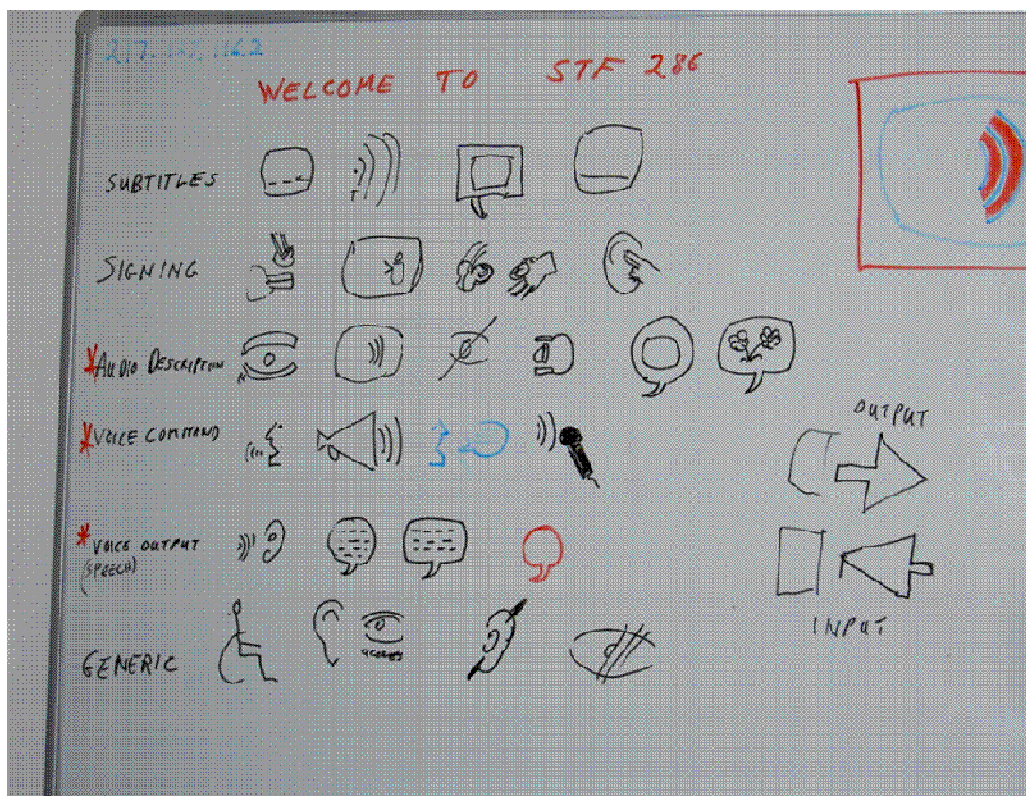


Figure 2: Results of brainstorming session

Following this session it was considered that the project would benefit from some additional candidate symbols designed by a professional graphic designer.

This activity produced a large number of candidate symbols which needed to be reduced to the lower number needed for the ISO 9186 testing. Rather than the members of the STF making this selection, it was decided that all of the potential candidate symbols would be put to the ETSI Human Factors committee, asking that each be scored out of ten as to its subjective suitability for each particular purpose. This questionnaire was carried on a specially created website.

The results of this questionnaire were analysed in order to choose the symbols that were used for the final comprehensibility judgement and comprehension tests to ISO 9186. It was decided that six symbols should be tested for each access service.

5. The WWW test

A web site was obtained and tests were constructed to appear on the site. The requirements of ISO 9186 were followed as far as possible but it was not possible to follow the requirements for computer screen presentation in a number of aspects. For example it was not possible to control the screen size or the resolution, nor was it possible to ensure that the centre of the circle of symbols was at the centre of the screen as this was to some extent dependent on the resolution chosen by the user.

Tests of Comprehensibility Judgement and of Comprehension were offered at random to those who visited the website at www.accesssymbols.org. A copy of the example page of the

Comprehensibility Judgement test is shown in figure 3. Six symbols were offered for each of the five access services.







Symbols Survey

Example of a completed questionnaire

Example only. Do not answer!

Each symbol is intended to mean **Text Phone**.

How many people out of 10 would you expect to understand this meaning?

 6 out of 10	 3 out of 10
 7 out of 10	 8 out of 10
 7 out of 10	 7 out of 10

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[More information](#) about the project.

If you have any difficulty using this website, please [email webmaster](#).

Figure 3: Example page of the Comprehensibility Judgement test


A copy of the example page of the Comprehension test is shown in figure 4. As there were six symbols and five access services there were thirty symbols to be offered, each asking for a description of its meaning.

Symbols Survey

Example of a completed questionnaire

Example only. Do not answer!

You may see this symbol in association with a telephone.



What do you think this symbol means?

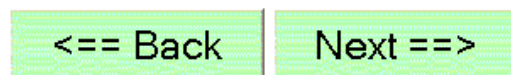
Make louder

If you cannot guess the meaning, please answer "Don't know".

Do not worry if you give the same answer to more than one symbol.

The next pages are for you to fill in.

Please do not discuss this with other people when you are completing the test.



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Figure 4: Example page of the Comprehension test

Each test was translated and offered in 7 European languages, English, French, German, Greek, Italian Spanish and Russian. It was not possible to ensure that the sample of respondents resembled the user population in terms of age, sex, educational level, occupation, cultural background and physical ability as the respondents were largely self selected. Nevertheless these factors were recorded and will be analysed at the end of the testing to determine whether there are significant departures from the norm.

6. Symbols in other modalities

In addition to the work on the five visual symbols the Terms of Reference of the STF required that representations of the symbols in other modalities should be investigated.

Contact has been made with the National Centre for Tactile Diagrams in Birmingham and arrangements made for tactile versions to be developed of the symbols for Speech output, Spoken command and Audio description. They will be tested at [Sight Village](#), an exhibition aimed people who are blind or visually impaired organised by Queen Alexandra College over three days in July 2006.

The STF has just started to consider the development of audible versions of symbols for Audio description, Spoken command and Speech output, aiming for audio icons to indicate the on/off state. Note will be taken of the advice given in ETSI TR 101 047-1, a report on the harmonisation of network tones and by Donald Andersen et al.

7. Results so far

There have so far been over 1500 accesses to the test web site and nearly 600 surveys have been completed. Responses have come from 30 different countries, eight of them being outside Europe.

For the purposes of analysis of any cultural effects, the European responses have been grouped as coming from Scandinavia, Central Europe, Eastern Europe, Iberia, the Mediterranean and UK and Ireland.

Sufficient responses have been obtained from Iberia (Spain and Portugal) and the UK and Ireland. More are needed from Scandinavia (Denmark, Finland, Norway and Sweden) and from Central Europe (Austria, Belgium, Germany, Luxembourg, Netherlands and Switzerland). There has been negligible response from Eastern Europe.

So far the results of the Comprehensibility Judgement test are showing best median scores of 7/10 for Signing and Spoken command, 6/10 for Subtitles and 5/10 for Audio description and Speech output.

For the comprehension test, as some of the proposed access services were fairly new it was not possible to ensure that respondents were familiar with a given referent. This led to some strange but interesting answers in the comprehension test! Some responses were attempts at humour, e.g. on a sign language symbol, "somebody is clapping, or it's a duck wearing a pompom hat".

It is difficult to illustrate these answers without showing the symbols on which the comments were made. As the tests are continuing the symbols cannot be shown without the possibility of prejudicing further tests, but the answers gave useful information on the respondent's perception of the visual metaphors used. It was clear that in a number of cases some metaphors for speech output were taken to indicate volume control.

The work is still continuing, with the Standard being due for publication by September 2006. Information on the current state of the work can be found on the ETSI website at <http://portal.etsi.org/stfs/hf/STF286.asp>.

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ETSI references can be obtained free of charge from
http://www.etsi.org/services_products/freestandard/home.htm