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of telephone services tones when
locally generated in telephony terminals**

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Foreword

This ETSI Technical Report (ETR) on the recommendation for the characteristics of telephone services tones when locally generated in telephony terminals has been prepared by the Human Factors (HF) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

Telephone services information tones are beginning to be generated locally in different telephony terminals. GSM standard, ETS 300 512 [1] for mobile terminals is one example. For ISDN terminals, I-ETS 300 245-7 [2] is another example.

This ETR covers critical Human Factors requirements on telephone services information tones wherever locally generated in telephony terminals. The definitions and recommendations in this ETR reflect the user's point of view.

Introduction

Audible tones have been used as a response or feedback to the user of telecommunication services almost from the very beginning of telephony.

Many years before the fast growing automatic international telephone traffic could be predicted, these tones were often specified at a national level, in many cases originating from some "de facto standard".

In addition, a large number of new telephone services have been introduced over the years. As audible tones represent the only language independent means for feedback in the existing telephone network (comprising only one transmission channel to the end user) the new services have in many cases led to new tones. The outcome of this is the existence of more than one hundred different tones in the international telephone network.

A person's ability to learn, distinguish between and remember different tones representing abstract conditions is limited to about four to six tones. The situation described above has caused a lot of confusion to the end users and inefficient occupation of transmission paths to the network providers (occupation without payment).

The existing CCITT Recommendation E.180 [3], allows for several combinations and very wide limits. To some extent it just describes the different national tone patterns. It does not lead to a harmonization from the users' point of view.

When tones are locally generated in the telephony terminals (e.g. terminals in Integrated Services Digital Network (ISDN) or mobile networks), a manufacturer might feel invited to introduce any kind of new tones if no firm rules are given.

Now the world-wide interchange of culture, merchandise and travellers is ever growing. The difficulty in interpreting all the different feedback tones will gradually become a serious obstacle to frequent and easy use of telecommunication.

At the international level it is now necessary to:

- achieve a tighter specification of services tones;
- limit the number of tones to those which have a real information value to the end user (see annex A) and which can also be remembered and distinguished between by the vast majority of end users.

This ETR regarding information tones locally generated in telephony terminals has been produced due to the rapid expansion of the market for telephony terminals following the liberalization of European telecommunications.

The characteristics of tones provided in this ETR have been chosen in accordance with early investigations and test results. Many countries are already following these recommendations and consequently the tones provided are, in many cases, the most frequently used in the existing national networks. The aim has also been that the telephony terminal generated tones do not cause confusion when compared with the existing national network generated tones (e.g. when a user moves from an ISDN terminal to an analogue terminal or vice versa). However, users of this ETR should be aware that the use of the tones recommended in this ETR might, in some cases, conflict with or differ from the network tones of the country in which the telephony terminal is located. In such cases the implementation of the recommendations, in the short term, may cause problems for users.

The long term aim is that locally generated and network generated tones should be the same in the whole of Europe from a Human Factors point of view. This ETR forms the basis of a contribution to ITU-T with the aim of worldwide harmonization of telephone service tones.

1 Scope

This ETR describes characteristics of telephone services information tones when locally generated in telephony terminals (e.g. terminals in ISDN or mobile networks). It does not cover services tones generated and transmitted in the public network or connected private networks.

Specification of tone generation will be provided by telephony terminal specific ETSs (e.g. for ISDN telephony terminals see I-ETS 300 245-7 [2]).

2 References

This ETR incorporates by dated and undated reference, provisions from other publications. These 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 ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 512 (1994): "European digital cellular telecommunications system (Phase 2) - Procedures for call progress indications (GSM 02.40)".
- [2] I-ETS 300 245 (Part 7): "Integrated Services Digital Network (ISDN); Technical characteristics of telephony terminals; Part 7: Locally generated information tones".
- [3] CCITT Recommendation E.180 (1988): "Technical characteristics of tones for the telephone service".

3 Definitions and abbreviations

3.1 Definitions of the names of the tones

For the purposes of this ETR, the following definitions of the names of the tones apply. The definitions reflect the user's point of view. Further information may be found in the technical application standards.

dial tone: Informs the caller that he may start dialling.

special dial tone: A dial tone with a special modification to remind the caller that special conditions apply to his terminal (special services might have been activated, for example call forwarding services or information needs to be brought to the user's attention e.g. message waiting indication).

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

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

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

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

special information tone: Informs the caller that there is a special reason of generally more lasting nature for rejecting the call attempt (e.g. the dialled number is not valid or there is a more lasting obstacle in the network or at the called terminal). An auditory or visual announcement clarifying the special reason should normally follow.

call waiting tone: Informs the called party who is already engaged by a call that another caller is attempting to reach him.

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

3.2 Abbreviations

For the purposes of this ETR, the following abbreviation applies:

ISDN Integrated Services Digital Network

4 Description of recommended tone characteristics

When telephone services tones are locally generated in telephony terminals, the tone characteristics provided in subclauses 4.1 to 4.8 should be applied. The tone characteristics are presented in the graphical format shown in figure 1.

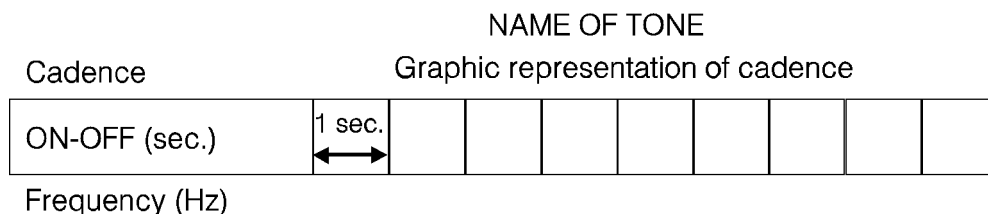


Figure 1

4.1 Dial tone

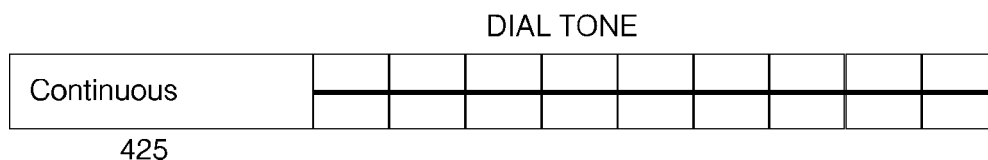


Figure 2

If a special dial tone is required, the basis should be the same continuous 425 Hz tone as specified above so that the tone should still be recognisable as a dial tone and not be confused with any other tone. It should be clear that, in this state, the telephony terminal can be used for dialling as usual.

A special modification of the dial tone for reminding the user that particular conditions apply can be achieved in different ways, for example:

- addition of a second tone (continuous or intermittent);
- short periodical interruptions of the dial tone;
- voice messages superimposed on the dial tone.

4.2 Ringing tone

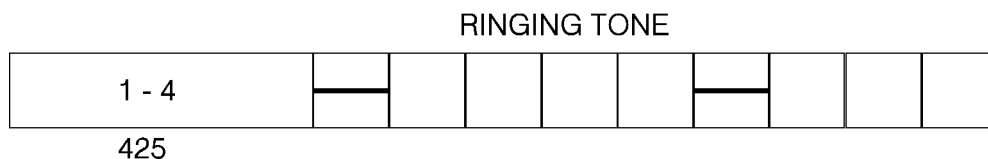


Figure 3

4.3 Busy tone

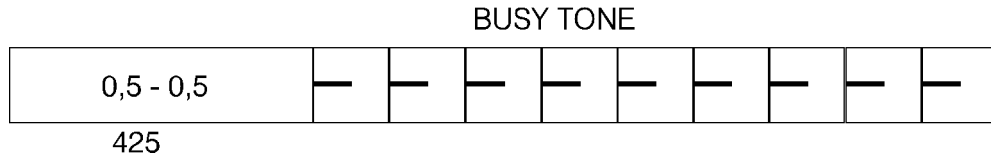


Figure 4

4.4 Congestion tone

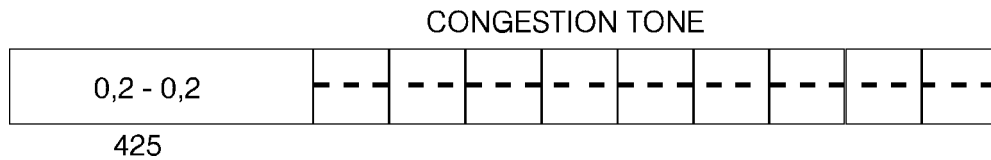


Figure 5

4.5 Special information tone

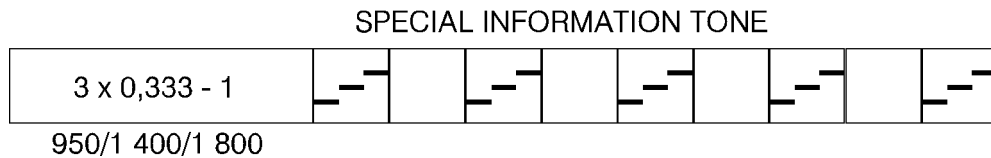


Figure 6

4.6 Call waiting tone

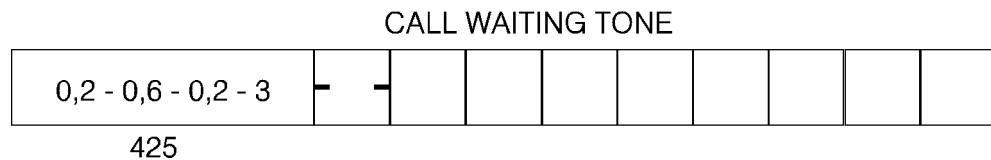


Figure 7

The call waiting tone may be repeated but only once during the time interval within which the called party can accept the call. If a number of distinctive call waiting tones are required, they should be recognisable as call waiting tones and not be able to be confused with any other tone.

4.7 Warning tone

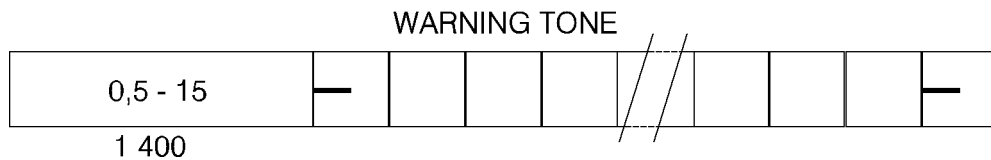


Figure 8

4.8 Caller waiting tone

The caller waiting tone should be the ringing tone (see subclause 4.2) sent for as long as the called party can accept the call. When the ringing tone ends the caller should receive the busy tone (see subclause 4.3).

5 Tolerance limits of tone characteristics

The pulse and pause duration should be kept within the tolerance limits of $\pm 10\%$.

The frequency should be kept within the tolerance limits of $\pm 3,5\%$.

NOTE: The application and removal of tones may not produce disturbing clicks.

Annex A: Indication tones of real information value to the end user

A.1 Before dialling

Dial tone: informs the caller that he may start dialling.

Special dial tone: a dial tone with a special modification to remind the caller that special conditions apply to his terminal (special services might have been activated, for example call forwarding services or information needs to be brought to the user's attention, e.g. message waiting indication).

A.2 After dialling

Ringling tone: informs the caller that his call is presented to the called party.

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

The information value of this tone in addition to what is given by a normal ringing tone is fairly limited.

To restrict the number of information tones the caller waiting tone should be a normal ringing tone sent for as long as the called party can accept the call. When the ringing tone ends the calling party should receive the busy tone. (This tone indication procedure will reduce the total amount of service tones and give a very logical feedback to the calling party; if the called party does not want to finish or put on hold the ongoing call to receive the new call he is obviously busy to the new calling party).

Busy tone: informs the caller that the called party is busy.

Congestion tone: informs the caller that a temporary network congestion, error, etc., rejects his call attempt. The congestion tone can very well be the same as the busy tone (compare with special information tone). Where it is different from the busy tone, the characteristics should be close enough so that it cannot be mistaken for any other tone than the busy tone.

Special information tone: informs the caller that there is a special reason of generally more lasting nature for rejecting the call attempt (e.g. the dialled number is not valid or there is a more lasting obstacle in the network or at the called terminal). An auditory or visual announcement clarifying the special reason should normally follow. The caller is advised not to repeat dialling the same number within a few minutes but rather call the operator for information if needed.

A.3 After a connection has been established

Call waiting tone: informs the called party who is already engaged by a call that another caller is attempting to reach him.

Warning tone: informs the two persons in telecommunication that a third party or a recorder is connected.

History

Document history	
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