EUROPEAN TELECOMMUNICATION STANDARD

ETS 300 512

September 1994

Source: ETSI TC-SMG

Reference: GSM 02.40

ICS: 33.060.30

Key words: European digital cellular telecommunications system, Global System for Mobile communications (GSM)

European digital cellular telecommunications system (Phase 2); Procedure for call progress indications (GSM 02.40)

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Contents

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS defines the requirements for call progress and related information provided to the users of the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM technical specification GSM 02.40 version 4.4.1.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules

Reference is made within this ETS to GSM-TSs (NOTE).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in GSM ETSs.

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0 Introduction

0.1 Scope

The purpose of this specification is to define requirements for call progress and related information to be provided to users of the GSM system.

0.2 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] GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); Definitions, abbreviations and acronyms".

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

[3] GSM 04.08 (ETS 300 557): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 specification".

[4] CEPT Recommendation T/CS 20-15: "Tones and announcements".

[5] CEPT Recommendation T/S F23: "Relative aux définitions et caractéristiques audibles des tonalités et des annonces parlées".

0.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

1 General

There are aspects of the Man Machine Interface of the GSM Network which relate to users, but which are not covered by GSM 02.30, which deals specifically with the MMI of the Mobile Station. The present specification covers the means by which mobile users, and callers to a GSM network, will be given information regarding progress of their calls.

Indications of call progress, such as ringing, engaged, unobtainable, and no radio channel, may in principle be verbal message, tones, displayed text or graphical symbols. Which combination of these applies may depend on the message, the mobile station and selection by the user or PLMN operator. However, verbal announcements will generally be reserved for situations which are peculiar to a mobile network, where users may be unfamiliar with any tone chosen to indicate conditions such as "call diversion" or "subscriber not available".

It may also be desirable to add comfort indications (e.g. tones, noise, music, clicks) while a call is being connected, since silence may cause an unfamiliar user to believe that nothing is happening.

Generally, on data calls, and on the data part of alternate speech/data or speech-followed-by-data calls, PLMN generated network tones and announcements should be muted.

2 Supervisory tones

2.1 General

Supervisory Tones, indicating primarily ringing, engaged and unobtainable numbers, may be generated by both the PLMN and PSTN.

Except for ring tone, all tones indicating call progress to a Mobile Station user shall be generated in the MS, on the basis of signals from the network where available, and are according to the standard defined in this specification.

Tones sent to a caller to a mobile station will be generated in the network, generally local to the caller, and will be to the standard of his local exchange, except for mobile to mobile calls, where the tones will be generated in the calling MS. For mobile terminated calls, the ring tone will be generated in the called MSC (except OACSU).

2.2 Method

In the interests of early release of the traffic channel on failure to succeed in setting up a (mobile originated) call, where possible supervisory tones should be indicated over signalling channels. The MS will then generate the required tones. However, if the network generates an in-band announcement this will be indicated to the MS. In this case the MS shall connect the user to the announcement until instructed to release the call, either by the user or by the network. An alternate procedure may apply for MS able to generate appropriate announcements internally (see section 3).

The ring tone will be sent over the traffic channel, since this channel must be available for traffic immediately it is answered (exception: Off Air Call Set Up). The Ring Tone is therefore generated by the PLMN or PSTN supporting the called phone.

On failed mobile terminated call attempts, the called MSC will either signal to the caller, if this is possible, or else will generate the required supervisory tones.

"Alert" is not a supervisory tone. The indication is signalled, and the MS may generate any form of indication to the user that the MS is being called.

2.3 Standard tones

MS generated tones will be generally in accordance with CEPT recommendations, where appropriate, and are listed in table 1 below. Any network originated tones will be according to PLMN or PSTN choice.

2.4 Applicability

This method will apply in all cases where signalling is capable of indicating the supervisory tone required.However, for connection to certain fixed networks where this signalling is not possible, fixed network tones will be carried over the traffic channel.

Mobile Stations may employ any suitable technique to indicate supervisory information. However, if tones are employed, they shall be in accordance with this specification. The use of these tones in the MSC is preferred.

2.5 Point of introduction

Introduction E1.

2.6 Comfort tones

If desired by the PLMN operator, the network may optionally introduce "comfort tones" while the call is being connected, during what would otherwise be silence. This would be overridden by indication of a supervisory tone, an announcement or by traffic. PLMNs may offer this feature optionally to incoming or outgoing callers.

The "comfort tones" may take the form of tones, clicks, noise, music or any other suitable form, provided that they cannot be confused with other indications that might be expected.

This feature is intended to indicate to the user that his call is progressing, to prevent him terminating the call prematurely.

Table 1: Supervisory tones in GSM mobile stations

Tone		Frequency	Tolerance	Type
1	Dial tone (optional)	425Hz	15Hz	Continuous
2 *	Subscriber Busy (Called Number)	425Hz	15Hz	Tone on 500ms Silence 500ms
3 *		Congestion	425Hz	15Hz Tone on 200ms Silence 200ms
4	Radio Path Acknowledgement (Mobile originated only) (optional)	425Hz	15Hz	Single tone 200ms
5	{Radio Path Not Available {Call Dropped - Mobile originated only	425Hz	15Hz	200ms} On/off for 200ms} 3 bursts
6 *	Error/Special Information} Number Unobtainable } Authentication Failure }	950Hz 1400Hz 1800Hz	50Hz 50Hz 50Hz	{Triple Tone {Tones on 330ms {Silence 1.0s
7	Call Waiting Tone	425 Hz (tolerance 15Hz), on for 200ms, off for 600ms on for 200ms, off for 3s, on for 200ms, off for 600ms on for 200ms. This tone is superimposed on the audio traffic received by the called user. Alternate tones are *acceptable* but not preferred.		
	Definition of these and other tones, together with advice on announcements, may be found in CEPT T/CS 20-15 and in T/SF 23.			
*	The duration of these tones is an implementation option. However, in each case, the MS should be returned immediately to the idle state, and will be able to originate/receive calls, which will override these tones.			
	Ringing Tone (Alternative national options permitted)	425Hz	15Hz	Tone on 1s Silence 4s
	For application of Call Control Cause Information Elements to these tones, see Annex A, GSM 02.40.			

3 Recorded announcements

In present networks, both fixed and cellular, the language of recorded announcements and displayed information is invariably that of the country of origin. However, this is generally undesirable in a multi-lingual environment such as is encountered on a pan-European network with international roaming. It is therefore probably desirable to minimise the number of such announcements.

Advanced Mobile Stations may be designed which have the ability to generate announcements in the form desired by the user, e.g. in the language preferred by the user. In this case, it becomes necessary to block any verbal announcements sent from the network towards the mobile station, to avoid clashes with those generated by the mobile station. The MS may be allowed to block in-band announcements in case appropriate announcements according to the Cause Information Elements (Annex A) can be generated. The default setting of the MS shall be "non blocking", which could be set by MMI command to "blocking".

Announcements generated by the PLMN and sent to callers to that PLMN will generally be in the language of the PLMN. However, on some fixed networks it will be possible for the message to be signalled back to the caller's local exchange, which will then generate the announcement in its local language.

Annex A (normative): Application of call control cause information elements to supervisory tones

The Cause Information Elements are listed and defined in GSM 04.08. This annex lists these elements and indicates which supervisory tone should be generated in response. It should be noted that some conditions (e.g. radio path not available, dropped call) may be deduced by the mobile station, rather than signalled explicitly over the air interface. All causes not listed below should result in the generation of tone 6. In case of multiple calls a tone should only be generated if it does not disturb an ongoing active call. "-" indicates no tone required.

Cause CC		Tone (see table 1)
16	Normal Clearing	1
17	User Busy	2
22	Number Changed	-
30	Response to STATUS ENQUIRY	-
31	Normal, unspecified	-
34	No circuit/channel available	3
41	Temporary Failure	3
42	Switching Equipment Congestion	3
44	Requested circuit/channel not available	3
49	Quality of Service Unavailable	3
58	Bearer Capability not available	3

History

Document history	
September 1994	First Edition
December 1995	Converted into Adobe Acrobat Portable Document Format (PDF)