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Digitalni celiļ ni telekomunikacijski sistem (faza 2+) ï Opis informacije o obvestilu o ceni (CAI) (GSM 02.24, razliļ ica 6.0.1, izdaja 1997)

Digital cellular telecommunications system (Phase 2+) (GSM); Description of Charge Advice Information (CAI) (GSM 02.24 version 6.0.1 Release 1997)

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Foreword

This European Standard (Telecommunications series) has been produced by the Special Mobile Group (SMG) of the European Telecommunications Standards Institute (ETSI).

This EN describes the overall view of how the supplementary service of Charge Advice Information (CAI) operates within the digital cellular telecommunications system.

The contents of this standard may be subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of this standard it will then be re-submitted for formal approval procedures by ETSI with an identifying change of release date and an increase in version number as follows:

Version 6.x.y

where:

6 GSM Phase 2+ Release 1997

x the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc.;

y the third digit is incremented when editorial only changes have been incorporated in the specification.

Proposed national transposition dates	
Date of adoption of this EN:	28 May 1999
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1 Scope

The charging supplementary service is described in GSM 02.86 [2] and the relevant charging principles are given in the relevant GSM MoU Association documents. These services are designed to supply to a mobile user sufficient information to allow a real-time estimate to be made of the bill which will eventually be levied in the home PLMN on the Mobile Station (MS) subscriber.

In the case of certain MS uses, for example a mobile payphone, this estimate could be subject to further processing (e.g. to present the charges in currency, rather than units, this may include an additional mark up). This additional processing is not described in this EN in order to avoid constraining the evolution of the MS product in this area.

This EN gives an overall view of how this supplementary service shall operate both in the PLMN and within the MS. Text given in this EN is required to define functionality and is not intended to constrain implementation.

1.1 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 02.86: "Digital cellular telecommunication system (Phase 2+); Advice of Charge (AoC) Supplementary Services - Stage 1".

[3] GSM 11.11: "Digital cellular telecommunication system (Phase 2+); Specification of the Subscriber Identity Module-Mobile Equipment (SIM-ME) interface".

1.2 Definitions and abbreviations

In addition to the following, abbreviations used in this ETS are listed in GSM 01.04 [1].

Mark up (MU):

An increase over the basic charge e.g. to provide extra revenue or to cover additional costs.

Service Provider (SP):

The organization through which the subscriber obtains GSM telecommunication services. This may be the network operator or possibly a separate body.

Home Units (HU):

The published basic telecommunication unit as published by the HPLMN. This has a published value expressed in the currency of the Home country.

Local PLMN (LPLMN):

The LPLMN is the HPLMN or VPLMN depending on the location of the MS at the time and is the PLMN with which the MS is interworking via the radio interface.

Local Units (LU):

The published basic telecommunication unit as published by the LPLMN. This has a published value expressed in the currency of the local country.

Price per Unit and Currency Table (PUCT):

The PUCT is the value of the Home unit in a currency chosen by the subscriber. The PUCT is stored in the SIM. The value of the PUCT can be set by the subscriber and may exceed the value published by the HPLMN. The PUCT value does not have any impact on the charges raised by the HPLMN.

Current Call Meter (CCM):

The accumulated charge as computed by the MS, expressed in terms of Home units.

Accumulated Call Meter (ACM):

The accumulated charge for both the current call and all preceding calls as computed by the MS, expressed in terms of Home units. The ACM is stored in the SIM.

ACM Maximum value (ACMmax):

The ACMmax sets the upper limit for the ACM. The ACMmax is stored in the SIM. The value of the ACMmax can be set by the subscriber.

Charging point (CHP):

The time at which charging commences i.e. at the point when the called party answers or the equivalent.

End of charge point (CEND):

The time at which the calling, or called, party stops charging by the termination of the call or by an equivalent procedure invoked by the network or by failure of the radio path.

Advice of Charge (AOC):

The charge as computed by the MS, expressed in terms of Home Units.

Segment:

A charging element as defined by CCITT, in octets (up to 64).

2 Introduction

The principle of this service is that the MS shall be capable of indicating the cost of a call in home units as a basic service. This is the Advice of Charge (AOC).

The ability for the MS to perform further processing on AOC is not precluded. If the subscriber wishes, the MS shall indicate the value of CCM, ACM, ACMmax in the currency she has indicated using the PUCT.

At the charging point, the MS is informed of the charging rate.

The MS shall then use its independent internal clock to time the call from the charging point to the end of call i.e. the chargeable duration (CDUR) is measured by the MS. In the case of multiple calls this applies separately for each call (see subclause 4.3 l). The time taken attempting to perform call reestablishment is not included in CDUR (see subclause 4.3 m).

By using the calculations described in clause 4, the MS shall be able to derive the number of home units used.

Due to the independence of the calculated value, an exact one-to-one relation with the bill cannot be guaranteed. This discrepancy is due to the short delays in signalling between the MS and the network, e.g. transmission of charging point and end of call signals.

In deriving this ETS the following principles are assumed:

i) For mobile originated calls, the mobile user pays for the connection to the dialled number, as per the published tariff of the Local PLMN, plus a mark-up defined by the HPLMN to cover additional administration costs, when roaming.

It is assumed that the MS subscriber will **not** be charged for the forwarded leg if the dialled number has set call forwarding. If additional charging is required for this forwarded leg, then it is assumed that such charging will be applied only to the called party. This follows current telecommunications practice.

ii) For mobile terminated calls, any charge set for incoming calls is that based on the tariff as published by the HPLMN.

The tariff as published for the roaming extension charges is assumed to be time and date invariant. For the avoidance of doubt, this assumption does not preclude routine tariff changes.

iii) Charge rates for calls originating within a PLMN vary depending upon, for example, location, destination, service, time of day, type of day and any mark ups.

iv) The units indicated in the advice of charge are always given in terms of Home units, the value of which is defined and published by the HPLMN, regardless of the PLMN in which they were incurred or the call direction or the type of call including supplementary service and data calls.

3 Charge Advice Information

The MS is supplied with the necessary Charge Advice Information (CAI) at the charging point on a per call basis, in a signalling message over the radio interface.

The MS uses the CAI elements to compute the AOC value for the relevant call. Thus the signalling CAI not only provides charging information, but indicates the charging point and hence initiates the timing of the chargeable duration.

The information sent to the MS from the MSC consists of seven elements as follows:

Table 1: Information elements

Element	Dimensions	Description	MIN	MAX	RES
e1	u/i	Units per interval	0	819.1	0.1
e2	t/i	Seconds/time interval	0	819.1	0.1
e3	-	Scaling Factor	0	81.91	0.01
e4	u	Unit increment	0	819.1	0.1
e5	u/d	Units per data interval	0	819.1	0.1
e6	seg/d	Segments/data interval	0	8191	1
e7	t/i	Initial secs/t interval	0	819.1	0.1

where:

u = units; t = time; i = interval; seg = segments; d = data interval.

The CAI Message need only contain those elements required for the particular situation. If elements are missing from the initial CAI message of a call, they shall be treated as zero.

Element e1 -

This element defines the number of units incremented per interval. It is set in terms of LPLMN units/interval to a resolution as defined in the table above under RES.

Element e2 -

This element defines the time interval for unitization, and is specified in seconds, to a resolution as defined in the table above under RES.

Element e3 -

This element defines the scaling factor to convert from LPLMN units to HPLMN units. It is a dimensionless multiplier given to a resolution as defined in the table above under RES.