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Digital cellular telecommunications system (Phase 2+) (GSM); In-band control of remote transcoders and rate adaptors for Enhanced Full Rate (EFR) and full rate traffic channels (GSM 08.60 version 5.1.1)

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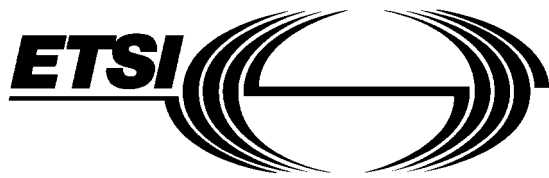
33.070.50 Globalni sistem za mobilno Global System for Mobile
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**Digital cellular telecommunications system (Phase 2+);
Inband control of remote transcoders and rate adaptors for
Enhanced Full Rate (EFR) and full rate traffic channels
(GSM 08.60 version 5.1.1)**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

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Foreword

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

This ETS specifies the inband control of remote transcoders and rate adaptors for full rate speech, Enhanced Full rate speech and full rate data within the Digital cellular telecommunications system (Phase 2+).

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.

Transposition dates	
Date of adoption of this ETS:	23 January 1998
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1 Scope

When 64 kbit/s traffic channels are used on the Abis interface, the speech shall be coded according to CCITT Recommendation G.711 and the data rate adaptation shall be as specified in GSM 04.21 and GSM 08.20.

In the case where 16 kbit/s traffic channels are used for full rate speech or enhanced full rate speech or full rate data service, then this specification shall apply for frame structure and for control of remote transcoders and additional rate adaptors.

The use and general aspects of the Abis interface are given in GSM 08.51.

NOTE: This specification should be considered together with the GSM 06 series of specifications, GSM 04.21 (Rate Adaptation on the MS-BSS Interface) and GSM 08.20 (Rate Adaptation on the BS/MS Interface).

1.1 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 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 04.06 (ETS 300 938): "Digital cellular telecommunications system; Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".
- [3] GSM 04.21 (ETS 300 945): "Digital cellular telecommunications system; Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".
- [4] GSM 06.01 (ETS 300 960): "Digital cellular telecommunications system; Full rate speech; Processing functions".
- [5] GSM 06.10 (ETS 300 961): "Digital cellular telecommunications system; Full rate speech; Transcoding".
- [6] GSM 06.11 (ETS 300 962): "Digital cellular telecommunications system; Full rate speech; Substitution and muting of lost frames for full rate speech channels".
- [7] GSM 06.12 (ETS 300 963): "Digital cellular telecommunications system; Full rate speech; Comfort noise aspect for full rate speech traffic channels".
- [8] GSM 06.31 (ETS 300 964): "Digital cellular telecommunications system; Full rate speech; Discontinuous Transmission (DTX) for full rate speech traffic channels".
- [9] GSM 06.32 (ETS 300 965): "Digital cellular telecommunications system; Voice Activity Detector (VAD)".
- [10] GSM 08.20: "Digital cellular telecommunications system; Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [11] GSM 08.51: "Digital cellular telecommunications system; Base Station Controller - Base Transceiver Station (BSC - BTS) interface; General aspects".

- [12] GSM 08.54: "Digital cellular telecommunications system (Phase 2+); Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 1 structure of physical circuits".
- [13] GSM 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 3 specification".
- [14] GSM 12.21 (ETS 300 623): "Digital cellular telecommunications system (Phase 2); Network Management (NM) procedures and message on the A-bis interface".
- [15] CCITT Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".
- [16] CCITT Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".
- [17] CCITT Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".
- [18] GSM 06.51 (ETS 300 723): "Digital cellular telecommunications system; Enhanced Full rate speech processing functions".
- [19] GSM 06.60 (ETS 300 726): "Digital cellular telecommunications system; Enhanced Full rate speech transcoding".
- [20] GSM 06.61 (ETS 300 727): "Digital cellular telecommunications system; Substitution and muting of lost frames for Enhanced Full rate speech channels".
- [21] GSM 06.62 (ETS 300 728): "Digital cellular telecommunications system; Comfort noise aspect for Enhanced Full rate speech traffic channels".
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- [22] GSM 06.81 (ETS 300 729): "Digital cellular telecommunications system; Discontinuous Transmission (DTX) for Enhanced Full rate speech traffic channel".
- [23] GSM 06.82 (ETS 300 730): "Digital cellular telecommunications system; Voice Activity Detection (VAD)".

1.2 Abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

2 General Approach

When the transcoders/rate adaptors are positioned remote to the BTS, the information between the Channel Codec Unit (CCU) and the remote Transcoder/Rate Adaptor Unit (TRAU) is transferred in frames with a fixed length of 320 bits (20 mS). In this specification, these frames are denoted "TRAU frames". Within these frames, both the speech/data and the TRAU associated control signals are transferred.

The Abis interface should be the same if the transcoder is positioned 1) at the MSC site of the BSS or if it is positioned 2) at the BSC site of the BSS. In case 1), the BSC should be considered as transparent for 16 kbit/s channels.

In case of 4,8 and 9,6 kbit/s channel coding when data is adapted to the 320 bit frames, a conversion function is required in addition to the conversion/rate adaption specified in GSM 08.20. This function constitutes the RAA. In case of 14,5 kbit/s channel coding, no RAA rate adaption is required because V.110 framing is not used.

The TRAU is considered a part of the BSC, and the signalling between the BSC and the TRAU (e.g. detection of call release, handover and transfer of O&M information) may be performed by using BSC internal signals. The signalling between the CCU and the TRAU, using TRAU frames as specified in this specification, is mandatory when the Abis interface is applied.

NOTE: If standard 64 kbit/s switching is used in the BSC, multiplexing according to CCITT Recommendation I.460 should apply at both sides of the switch.

In figure 2.1, a possible configuration of the TRAU and the CCU is shown.

The functions inside the TRAU are:

- "Remote Transcoder and Rate Adaptor Control Function" (RTRACF);
- "Remote Speech Handler Function" (RSHF);
- The RAA function in case of 4.8 and 9.6 kbit/s channel coding;
- The RAA' function in case of 14.5 kbit/s channel coding;
- The RA2 function;
- The transcoder function.

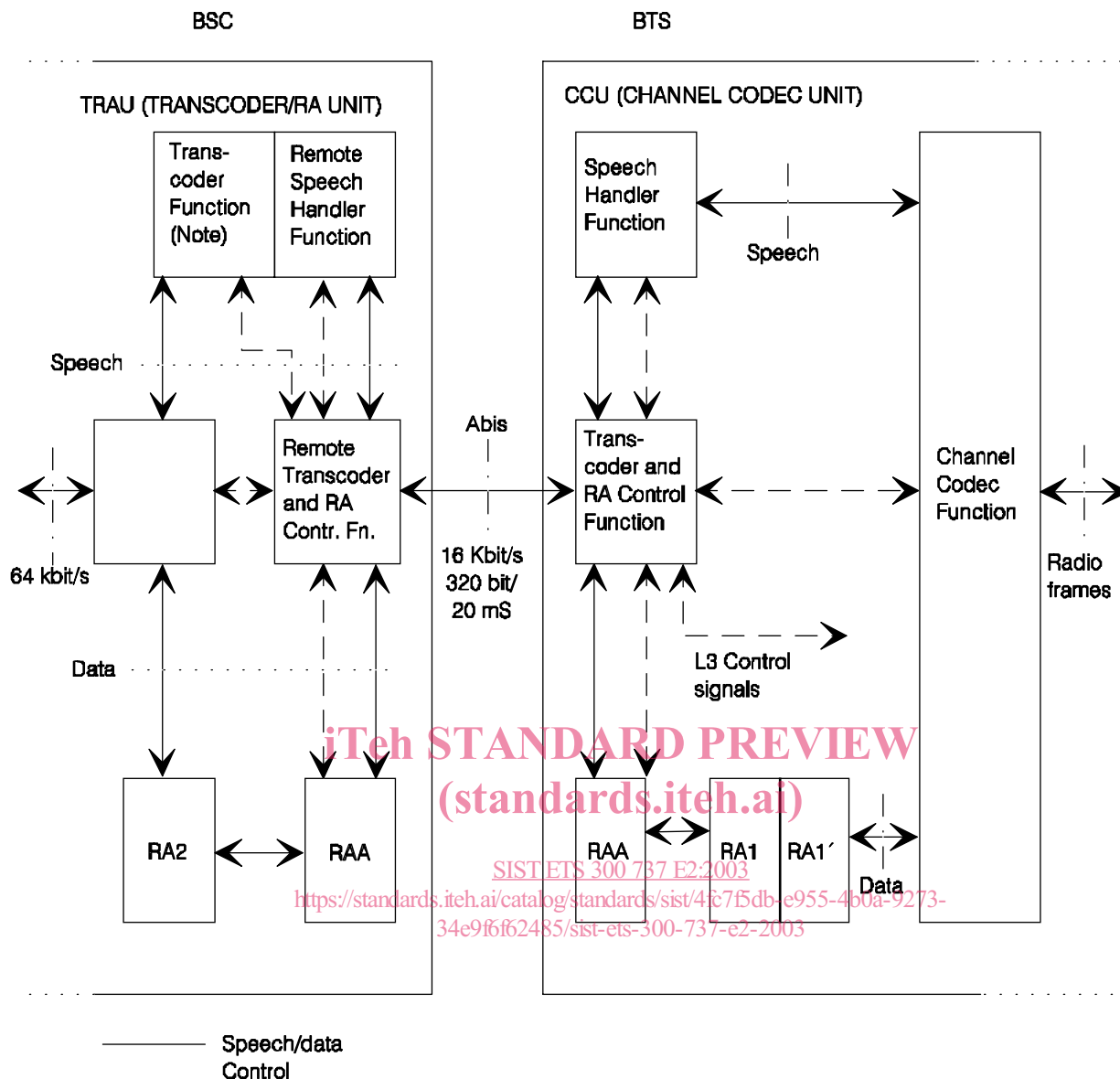
The functions inside the CCU are:

- "Transcoder and Rate Adaptor Control Function" (TRACF);
- "Speech Handler Function" (SHF);
- The RAA function in case of 4.8 and 9.6 kbit/s channel coding;
- The RA1/RA1' function in case of 4.8 and 9.6 kbit/s channel coding;
- The RA1'/RAA' function in case of 14.5 kbit/s channel coding;
- The channel codec function.

This specification will not describe the procedures inside the TRAU and the CCU. The layout in figure 2.1 is only intended as a reference model.

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NOTE: This recommendation assumes the DTX handler function to be a part of the Transcoder Function.

Figure 2.1: Functional entities for handling of remote control of remote transcoders and rate adaptors

NOTE: This figure applies only for 4,8 and 9,6 kbit/s channel coding