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Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group GSM EDGE Radio Access Network;
Base Station Controller - Base Transceiver Station
(BSC - BTS) interface;
Layer 1 structure of physical circuits
(Release 1999)**

Keywords

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The present document defines the structure of the physical layer (layer 1) of the BSC - BTS/TRX interface for supporting traffic channels and control channels within the digital cellular telecommunications system (Phase 2/Phase 2+).

The contents of the present document is subject to continuing work within 3GPP and may change following formal 3GPP approval. Should 3GPP modify the contents of the present document it will be re-released with an identifying change of release date and an increase in version number as follows:

Version 8.x.y

where:

8   GSM Phase 2+ Release 1999;

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

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

1 Scope

The use and general aspects of the A-bis interface are given in Technical Specification 3GPP TS 08.51.

The present document defines the structure of the physical layer (layer 1) of the BSC - BTS/TRX interface for supporting traffic channels and control channels. Use of the physical layer for supporting link protocol is covered in Technical Specification 3GPP TS 08.56.

The physical layer is the lowest layer in the OSI Reference Model and it supports all functions required for transmission of bit streams on the physical medium.

For the present document only digital transmission will be considered, the use of analogue transmission is a national concern.

2 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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 01.04: "Abbreviations and acronyms".

[2] 3GPP TS 08.20: "Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[3] 3GPP TS 08.51: "Base Station Controller - Base Transceiver Station (BSC - BTS) interface General aspects".

[4] 3GPP TS 08.56: "Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 2 specification".

[5] 3GPP TS 08.60 (ETS 300 597): "Inband control of remote transcoders and rate adaptors".

[6] 3GPP TS 08.61: "Inband control of remote transcoders and rate adaptors (half rate)".

[7] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".

[8] CCITT Recommendation G.705: "Characteristics required to terminate digital links on a digital exchange".

[9] CCITT Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[10] CCITT Recommendation G.732: "Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s".

[11] CCITT Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

3 Abbreviations

Abbreviations used in the present document are listed in 3GPP TS 01.04

4 Layer 1 specification

All the CCITT recommendations referred to are Blue Book.

Layer 1 shall utilize digital transmission at a rate of 2 048 kbit/sec with a frame structure of 32 * 64 kbit/sec time slots, as specified in CCITT Recommendation G.705 section 3 or at a rate of 64 kbit/sec.

The physical/electrical characteristics are defined in CCITT Recommendation G.703.

Synchronization at the BTS/TRX for the transmitted bit stream toward the BSC shall be derived from the received bit stream from the BSC.

For transmission rate at 64 kbit/sec it shall be an interface as defined in CCITT Recommendation G.703.

For transmission rate at 2 048 kbit/s the functional characteristics are defined in CCITT Recommendation G.732 section 2 and 3, and fault conditions should be treated in accordance with CCITT Recommendation G.732 clause 4.

The idle pattern must be transmitted on every timeslot that is not assigned to a channel, and to every timeslot of a channel that is not allocated to a call. The idle pattern shall be 01010100 for a 64 kbit/s channel and the 2-bit pattern 01 for 16 kbit/s channels. For 8 kbit/s channels, the idle pattern shall be consecutive ones or zeros according to the corresponding idle pattern bit of a 16 kbit/s channel.

If transcoders are located in BTS speech encoding shall be the A-law as defined in CCITT Recommendation G.711.

If speech transcoders are located in the BSC the speech, data and signalling channels will utilize transmission rates of 8 kbit/s, 16 kbit/s or 64 kbit/s according to Technical Specifications 3GPP TS 08.60 and 3GPP TS 08.61. They shall be rate adapted or multiplexed according to CCITT Recommendation I.460 with fixed format, to fit into the physical interface.

Data encoding is covered in Technical Specification 3GPP TS 08.20.

In the case of a 2 048 kbit/sec circuit, multidrop solutions should be possible. Dynamic sharing of terrestrial 64 kbit/sec channels between BTS:s on a per-call basis must not be used.

Annex A (informative):
Change History

Meeting#	CR	Subject/Comment	New Version
SGM#31	-	Version for Release 99	8.0.0
May 2002	-	Update to 3GPP TS style. Editorial corrections to reference clause. IPR clause removed.	8.0.1