
Foreword

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

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

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

The present document is part 1 of a multi-part deliverable covering the Digital cellular telecommunications system (GSM Phase2 and Phase 2+ Releases 1996, 1997, 1998, 1999, 3GPP Release 4, 3GPP Release 5, 3GPP Release 6, 3GPP Release 7 and 3GPP Release 8); Mobile Station (MS) conformance specification, as identified below:

- Part 1: Conformance specification**
Reference: 3GPP TS 51.010-1.
- Part 2: Protocol Implementation Conformance Statement (PICS) pro forma specification.
Reference: 3GPP TS 51.010-2.
- Part 3: Layer 3 (L3) Abstract Test Suite (ATS).
Reference: 3GPP TS 51.010-3.
- Part 4: SIM Application Toolkit conformance specification.
Reference: 3GPP TS 11.10-4.
- Part 5: Inter-RAT (GERAN to UTRAN) Abstract Test Suite (ATS)
Reference: 3GPP TS 51.010-5.
- Part 7: Location Services (LCS) test scenarios and assistance data.
Reference: 3GPP TS 51.010-7.

1 Scope

The present document describes the technical characteristics and methods of test for Mobile Stations (MS), for the Pan European digital cellular communications system and Personal Communication Systems (PCS) operating in the 400 MHz, 700 MHz, 810 MHz, 850 MHz, 900 MHz, 1 800 MHz and 1 900 MHz band (GSM 450, GSM 480, GSM 710, GSM 750, T-GSM 810, GSM 850, GSM 900, DCS 1 800 and PCS 1 900), standardized by ETSI Special Mobile Group (SMG).

The present document is valid for MS implemented according to GSM Phase2 or Phase2+ R96, or R97, or R98, or R99 or 3GPP Release 4 or 3GPP Release 5 or 3GPP Release 6, 3GPP Release 7 or 3GPP Release 8.

A subset of the tests is referenced in the GSM Common Technical Regulations (CTRs) and is used for regulatory conformance testing according to the EEC procedures for Telecommunications Terminal Equipment (TTE) type approval (EC Directive 91/263/EEC; also known as the "Terminal Directive" or "Second Phase Directive"). The remaining tests can be used to verify conformance with the GSM core technical specifications for those requirements that are not considered "essential" in the sense of the EC Directive 91/263/EEC (Article 4).

The present document covers the minimum characteristics considered necessary in order to provide sufficient performance for mobile equipment and to prevent interference to other services or to other users, and to the PLMNs.

It does not necessarily include all the characteristics which may be required by a user or subscriber, nor does it necessarily represent the optimum performance achievable.

It applies to the public land mobile radio service in the GSM systems named above, using constant envelope modulation and operating on radio frequencies in the frequency bands listed above respectively with a channel separation of 200 kHz and carrying 8 full rate channels or 16 half rate channels per carrier according to the TDMA principle.

The present document is part of the GSM-series of technical specifications. The present document neither replaces any of the other GSM technical specifications or GSM related ETSs or ENs, nor is it created to provide full understanding of (or parts of) GSM systems. The present document lists the requirements, and provides the methods of test for testing a MS for conformance to the GSM standard.

For a full description of the system, reference should be made to all the GSM technical specifications or GSM related ETSs or ENs. Clause 2 provides a complete list of the GSM technical specifications, GSM related ETSs, ENs, and ETRs, on which this conformance test specifications is based.

The present document applies to the unit which includes the hardware to establish a connection across the radio interface.

If there is a difference between this conformance document, and any other GSM technical specification or GSM related ETS or EN, or 3GPP TS, then the other GSM technical specification or GSM related ETS or EN or 3GPP TS shall prevail.

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 and/or edition number or version number) 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 relevant Release*.
 - For a GSM Phase 2+ Release 7 MS, references to GSM documents are to version 7.xy, when available.
 - For a GSM Phase 2+ Release 6 MS, references to GSM documents are to version 6.xy, when available.

- For a GSM Phase 2+ Release 5 MS, references to GSM documents are to version 5.x.y, when available.
- For a GSM Phase 2+ Release 4 MS, references to GSM documents are to version 4.x.y, when available.
- For a GSM Phase 2+ Release 1999 MS, references to GSM documents are to version 8.x.y (for 01.-series to 12.-series) or (3.x.y for 21.-series to 35.-series), when available.
- For a GSM Phase 2+ Release 1998 MS, references to GSM documents are to version 7.x.y, when available.
- For a GSM Phase 2+ Release 1997 MS, references to GSM documents are to version 6.x.y, when available.
- For a GSM Phase 2+ Release 1996 MS, references to GSM documents are to version 5.x.y, when available.
- For a GSM Phase 2 MS, references to GSM documents are to version 4.x.y.

NOTE: References to 3GPP Technical Specifications and Technical Reports throughout the present document shall be interpreted according to the Release shown in the formal reference in this clause, based upon the Release of the implementation under test.

EXAMPLE 1: References for a Ph2 MS shall be interpreted as:

[1] 3GPP TS 01.04 Ph2

[2] 3GPP TS 02.02 Ph2

etc.

EXAMPLE 2: References for a Rel-4 MS shall be interpreted as:

[1] 3GPP TS 21.905 Rel-4

[2] 3GPP TS 22.002 Rel-4

etc.

- [1] 3GPP TS 01.04 (Ph2 to R99): "Abbreviations and acronyms".
3GPP TR 21.905 (R99 onwards): "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 02.02 (Ph2 to R98): "Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".
3GPP TS 22.002 (R99 onwards): "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".
- [3] 3GPP TS 02.03 (Ph2 to R98): "Teleservices supported by a GSM Public Land Mobile Network (PLMN)".
3GPP TS 22.003 (R99 onwards): "Circuit Teleservices supported by a Public Land Mobile Network (PLMN)".
- [4] 3GPP TS 02.04 (Ph2 to R98): "General on supplementary services".
3GPP TS 22.004 (R99 onwards): "General on supplementary services".
- [5] 3GPP TS 02.06 (Ph2 to R98): "Types of Mobile Stations (MS)".
- [6] 3GPP TS 02.07 (Ph2 to R98): "Mobile Station (MS) features".
- [7] 3GPP TS 02.09 (Ph2 to R99): "Security aspects".
3GPP TS 42.009 (Rel-4 onwards): "Security aspects".
- [8] 3GPP TS 02.11 (Ph2 to R98): "Service accessibility".
3GPP TS 22.011 (R99 onwards): "Service accessibility".
- [9] 3GPP TS 02.17 (Ph2 to R99): "Subscriber Identity Modules (SIM); Functional characteristics".
3GPP TS 42.017 (Rel-4 onwards): "Subscriber Identity Modules (SIM); Functional characteristics".
- [10] 3GPP TS 02.24 (Ph2 to R98): "Description of Charge Advice Information (CAI)".
3GPP TS 22.024 (R99 onwards): "Description of Charge Advice Information (CAI)".

- [11] 3GPP TS 02.30 (Ph2 to R98): "Man-Machine Interface (MMI) of the Mobile Station (MS)".
3GPP TS 22.030 (R99 onwards): "Man-Machine Interface (MMI) of the User Equipment (UE)".
- [12] 3GPP TS 02.81 (Ph2 to R98): "Line identification supplementary services; Stage 1".
3GPP TS 22.081 (R99 onwards): "Line identification supplementary services; Stage 1".
- [13] 3GPP TS 02.83 (Ph2 to R98): "Call Waiting (CW) and Call Holding (HOLD); Supplementary Services; Stage 1".
3GPP TS 22.083 (R99 onwards): "Call Waiting (CW) and Call Holding (HOLD); Supplementary Services; Stage 1".
- [14] 3GPP TS 02.84 (Ph2 to R98): "MultiParty (MPTY) supplementary services; Stage 1".
3GPP TS 22.084 (R99 onwards): "MultiParty (MPTY) Supplementary Services; Stage 1".
- [15] 3GPP TS 02.86 (Ph2 to R98): "Advice of Charge (AoC) Supplementary Services; Stage 1".
3GPP TS 22.086 (R99 onwards): "Advice of Charge (AoC) Supplementary Services; Stage 1".
- [16] 3GPP TS 02.88 (Ph2 to R98): "Call Barring (CB) Supplementary Services; Stage 1".
3GPP TS 22.088 (R99 onwards): "Call Barring (CB) Supplementary Services; Stage 1".
- [17] 3GPP TS 02.90 (Ph2 to R98): "Unstructured Supplementary Service Data (USSD); Stage 1".
3GPP TS 22.090 (R99 onwards): "Unstructured Supplementary Service Data (USSD); Stage 1".
- [18] 3GPP TS 03.03 (Ph2 to R98): "Numbering, addressing and identification".
3GPP TS 23.003 (R99 onwards): "Numbering, Addressing and Identification".
- [19] 3GPP TS 03.11 (Ph2 to R98): "Technical realization of supplementary services".
3GPP TS 23.011 (R99 onwards): "Technical realization of Supplementary Services".
- [20] 3GPP TS 03.20 (Ph2 to R99): "Security related network functions".
3GPP TS 43.020 (Rel-4 onwards): "Security related network functions".
- [21] 3GPP TS 03.22 (Ph2 to R99): "Functions related to Mobile Station (MS) in idle mode and group receive mode".
3GPP TS 43.022 (Rel-4 onwards): "Functions related to Mobile Station (MS) in idle mode and group receive mode".
- [22] 3GPP TS 03.38 (Ph2 to R98): "Alphabets and language-specific information".
3GPP TS 23.038 (R99 onwards): "Alphabets and language-specific information".
- [23] 3GPP TS 03.40 (Ph2 to R98): "Technical realization of the Short Message Service (SMS); Point-to-Point (PP)".
3GPP TS 23.040 (R99 onwards): "Technical realization of the Short Message Service (SMS)".
- [24] 3GPP TS 03.41 (Ph2 to R98): "Technical realization of Cell Broadcast Service (CBS)".
3GPP TS 23.041 (R99 onwards): "Technical realization of Cell Broadcast Service (CBS)".
- [25] 3GPP TS 03.45 (Ph2 to R99): "Technical realization of facsimile group 3 transparent".
3GPP TS 43.045 (Rel-4 onwards): "Technical realization of facsimile group 3 service - transparent".
- [26] 3GPP TS 03.50 (Ph2 to R99): "Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system".
3GPP TS 43.050 (Rel-4 onwards): "Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system".
- [27] 3GPP TS 03.86 (Ph2 to R98): "Advice of Charge (AoC) supplementary services; Stage 2".
3GPP TS 23.086 (R99 onwards): "Advice of Charge (AoC) supplementary services; Stage 2".
- [28] 3GPP TS 04.04 (Ph2 to R99): "Layer 1; General requirements".
3GPP TS 44.004 (Rel-4 onwards): "Layer 1; General requirements".
- [29] 3GPP TS 04.05 (Ph2 to R99): "Data Link (DL) layer; General aspects".
3GPP TS 44.005 (Rel-4 onwards): "Data Link (DL) layer; General aspects".

- [30] 3GPP TS 04.06 (Ph2 to R99): "Mobile Station - Base Station System (MS-BSS) interface; Data Link (DL) layer specification".
3GPP TS 44.006 (Rel-4 onwards): "Mobile Station - Base Station System (MS-BSS) interface; Data Link (DL) layer specification".
- [31] 3GPP TS 04.07 (Ph2 to R98): "Mobile radio interface signalling layer 3; General aspects".
3GPP TS 24.007 (R99 onwards): "Mobile radio interface signalling layer 3; General aspects".
- [32] 3GPP TS 04.08 (Ph2 to R99): "Mobile radio interface layer 3 specification" (see note 1). 3GPP TS 24.008 (R99 onwards): "Mobile radio interface layer 3 specification; Core network protocols; Stage 3" (see note 1).
3GPP TS 44.008 (Rel-4): "Mobile radio interface layer 3 specification" (see note 1).
- [33] 3GPP TS 04.10 (Ph2 to R98): "Mobile radio interface layer 3; Supplementary services specification; General aspects".
3GPP TS 24.010 (R99 onwards): "Mobile radio Interface Layer 3; Supplementary services specification; General aspects".
- [34] 3GPP TS 04.11 (Ph2 to R98): "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".
3GPP TS 24.011 (R99 onwards): "Point-to-Point (PP) Short Message Service (SMS) Support on mobile radio interface".
- [35] 3GPP TS 04.12 (Ph2 to R99): "Short Message Service Cell Broadcast (SMS-SCB) support on the mobile radio interface".
3GPP TS 44.012 (Rel-4 onwards): "Short Message Service Cell Broadcast (SMS-SCB) Support on the mobile radio interface".
- [36] 3GPP TS 04.13 (Ph2 to R99): "Performance requirements on the mobile radio interface". 3GPP TS 44.013 (Rel-4 onwards): "Performance requirements on the mobile radio interface".
- [37] 3GPP TS 04.21 (Ph2 to R99): "Rate adaption on the Mobile Station - Base Station System (MS - BSS) Interface".
3GPP TS 44.021 (Rel-4 onwards): "Rate adaption on the Mobile Station - Base Station System (MS - BSS) Interface".
- [38] 3GPP TS 04.22 (Ph2 to R98): "Radio Link Protocol (RLP) for data and telematic services on the Mobile Station - Base Station System (MS-BSS) interface and the Base Station System - Mobile-services Switching Centre (BSS-MSC) interface". 3GPP TS 24.022 (R99 onwards): "Radio Link Protocol (RLP) for circuit switched bearer and teleservices".
- [39] 3GPP TS 04.80 (Ph2 to R98): "Mobile radio interface layer 3 supplementary services specification; Formats and coding".
3GPP TS 24.080 (R99 onwards): "Mobile radio layer 3 supplementary services specification; Formats and coding".
- [40] 3GPP TS 04.81 (Ph2 to R98): "Line identification supplementary services; Stage 3".
3GPP TS 24.081 (R99 onwards): "Line identification supplementary services; Stage 3".
- [41] 3GPP TS 04.82 (Ph2 to R98): "Call Forwarding (CF) supplementary services; Stage 3".
3GPP TS 24.082 (R99 onwards): "Call Forwarding (CF) supplementary services; Stage 3".
- [42] 3GPP TS 04.83 (Ph2 to R98): "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".
3GPP TS 24.083 (R99 onwards): "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".
- [43] 3GPP TS 04.84 (Ph2 to R98): "MultiParty (MPTY) supplementary services; Stage 3".
3GPP TS 24.084 (R99 onwards): "Multiparty (MPTY) supplementary services; Stage 3".
- [44] 3GPP TS 04.86 (Ph2 to R98): "Advice of Charge (AoC) supplementary services; Stage 3".
3GPP TS 24.086 (R99 onwards): "Advice of Charge (AoC) supplementary services; Stage 3".
- [45] 3GPP TS 04.88 (Ph2 to R98): "Call Barring (CB) supplementary services; Stage 3".
3GPP TS 24.088 (R99 onwards): "Call Barring (CB) supplementary services; Stage 3".

- [46] 3GPP TS 04.90 (Ph2 to R98): "Unstructured Supplementary Service Data (USSD); Stage 3".
3GPP TS 24.090 (R99 onwards): "Unstructured Supplementary Service Data (USSD); Stage 3".
- [47] 3GPP TS 05.02 (Ph2 to R99): "Multiplexing and multiple access on the radio path".
3GPP TS 45.002 (Rel-4 onwards): "Multiplexing and multiple access on the radio path".
- [48] 3GPP TS 05.03 (Ph2 to R99): "Channel coding".
3GPP TS 45.003 (Rel-4 onwards): "Channel coding".
- [49] 3GPP TS 05.04 (Ph2 to R99): "Modulation".
3GPP TS 45.004 (Rel-4 onwards): "Modulation".
- [50] 3GPP TS 05.05 (Ph2 to R99): "Radio transmission and reception".
3GPP TS 45.005 (Rel-4 onwards): "Radio transmission and reception".
- [51] 3GPP TS 05.08 (Ph2 to R99): "Radio subsystem link control".
3GPP TS 45.008 (Rel-4 onwards): "Radio subsystem link control".
- [52] 3GPP TS 05.09 (Ph2 to R99): "Link Adaptation".
3GPP TS 45.009 (Rel-4 onwards): "Link Adaptation".
- [53] 3GPP TS 05.10 (Ph2 to R99): "Radio subsystem synchronization".
3GPP TS 45.010 (Rel-4 onwards): "Radio subsystem synchronization".
- [54] 3GPP TS 06.01 (Ph2 to R99): "Full rate speech; Processing functions".
3GPP TS 46.001 (Rel-4 onwards): "Full rate speech; Processing functions".
- [55] 3GPP TS 06.02 (Ph2 to R99): "Half rate speech; Half rate speech processing functions".
3GPP TS 46.002 (Rel-4 onwards): "Half rate speech processing functions".
- [56] 3GPP TS 06.07 (Ph2 to R99): "Half rate speech; Test sequences for the GSM half rate speech codec".
3GPP TS 46.007 (Rel-4 onwards): "Half rate speech; Test sequences for the GSM half rate speech codec".
- [57] 3GPP TS 06.10 (Ph2 to R99): "Full rate speech; Transcoding".
3GPP TS 46.010 (Rel-4 onwards): "Full rate speech transcoding".
- [58] 3GPP TS 06.11 (Ph2 to R99): "Full rate speech; Substitution and muting of lost frames for full rate speech channels".
3GPP TS 46.011 (Rel-4 onwards): "Substitution and muting of lost frames for full rate speech channels".
- [59] 3GPP TS 06.12 (Ph2 to R99): "Comfort noise aspect for full rate speech traffic channels".
3GPP TS 46.012 (Rel-4 onwards): "Comfort noise aspect for full rate speech traffic channels".
- [60] 3GPP TS 06.20 (Ph2 to R99): "Half rate speech; Half rate speech transcoding".
3GPP TS 46.020 (Rel-4 onwards): "Half rate speech transcoding".
- [61] 3GPP TS 06.21 (Ph2 to R99): "Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels".
3GPP TS 46.021 (Rel-4 onwards): "Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels".
- [62] 3GPP TS 06.22 (Ph2 to R99): "Half rate speech; Comfort noise aspects for the half rate speech traffic channels".
3GPP TS 46.022 (Rel-4 onwards): "Half rate speech; Comfort noise aspects for the half rate speech traffic channels".
- [63] 3GPP TS 06.31 (Ph2 to R99): "Full rate speech; Discontinuous Transmission (DTX) for full rate speech traffic channels".
3GPP TS 46.031 (Rel-4 onwards): "Full rate speech; Discontinuous Transmission (DTX) for full rate speech traffic channels".

- [64] 3GPP TS 06.32 (Ph2 to R99): "Full rate speech; Voice Activity Detector (VAD) for full rate speech traffic channels".
3GPP TS 46.032 (Rel-4 onwards): "Full rate speech; Voice Activity Detector (VAD) for full rate speech traffic channels".
- [65] 3GPP TS 06.41 (Ph2 to R99): "Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".
3GPP TS 46.041 (Rel-4 onwards): "Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".
- [66] 3GPP TS 06.42 (Ph2 to R99): "Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".
3GPP TS 46.042 (Rel-4 onwards): "Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".
- [67] 3GPP TS 07.01 (Ph2 to R98): "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".
3GPP TS 27.001 (R99 onwards): "General on Terminal Adaptation Functions (TAF) for Mobile stations (MS)".
- [68] 3GPP TS 07.02 (Ph2 to R98): "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".
3GPP TS 27.002 (R99 onwards): "Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".
- [69] 3GPP TS 07.03 (Ph2 to R98): "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".
3GPP TS 27.003 (R99 onwards): "Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".
- [70] 3GPP TS 09.02 (Ph2 to R98): "Mobile Application Part (MAP) specification".
3GPP TS 29.002 (R99 onwards): "Mobile Application Part (MAP) specification".
- [71] 3GPP TS 09.06 (Ph2 to R98): "Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services digital Network (PSPDN/ISDN) for support of packet switched data transmission services".
3GPP TS 29.006 (R99 onwards): "Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services".
- [72] 3GPP TS 09.07 (Ph2 to R98): "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
3GPP TS 29.007 (R99 onwards): "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
- [73] 3GPP TS 11.11 (Ph2 to R99): "Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".
3GPP TS 51.011 (Rel-4 onwards): "Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".
- [74] 3GPP TS 11.12 (Ph2): "Specification of the 3 Volt Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".
- [75] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [76] ITU-T Recommendation G.122: "Influence of national systems on stability and talker echo in international connections".
- [77] ITU-T Recommendation G.223: "Assumptions for the calculation of noise on hypothetical reference circuits for telephony".
- [78] ITU-T Recommendation G.714: "Separate performance characteristics for the encoding and decoding sides of PCM channels applicable to 4-wire voice-frequency interfaces".

- [79] ITU-T Recommendation G.721: "32 kbit/s Adaptive Differential Pulse Code Modulation (ADPCM)".
- [80] ITU-T Recommendation O.131: "Quantizing distortion measuring equipment using a pseudo-random noise test signal".
- [81] ITU-T Recommendation O.132: "Quantizing distortion measuring equipment using a sinusoidal test signal".
- [82] ITU-T Recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".
- [83] ITU-T Recommendation P.340: "Transmission characteristics of hands-free telephones".
- [84] ITU-T Recommendation P.35: "Handset telephones".
- [85] ITU-T Recommendation P.50: "Artificial voices".
- [86] ITU-T Recommendation P.51: "Artificial mouth".
- [87] ITU-T Recommendation P.64: "Determination of sensitivity/frequency characteristics of local telephone systems".
- [88] ITU-T Recommendation P.76: "Determination of loudness ratings; fundamental principles".
- [89] ITU-T Recommendation P.79: "Calculation of loudness ratings for telephone sets".
- [90] ITU-T Recommendation T.4: "Standardization of Group 3 facsimile terminals for document transmission".
- [91] ITU-T Recommendation T.21: "Standardized tests charts for document facsimile transmission".
- [92] ITU-T Recommendation T.30: "Procedures for document facsimile transmission in the general switched telephone network".
- [93] ITU-T Recommendation V.1: "Equivalence between binary notation symbols and the significant conditions of a two-condition code".
- [94] ITU-T Recommendation V.14: "Transmission of start-stop characters over synchronous bearer channels".
- [95] ITU-T Recommendation V.24: "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".
- [96] ITU-T Recommendation V.25bis: "Synchronous and asynchronous automatic dialling procedures on switched networks".
- [97] ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".
- [98] ITU-T Recommendation X.21: "Interface between data terminal equipment and data circuit-terminating equipment for synchronous operation on public data networks".
- [99] ITU-T Recommendation X.208: "Specification of Abstract Syntax Notation One (ASN.1)".
- [100] ITU-T Recommendation X.290: "OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - General concepts".
- [101] ISO 3: "Preferred Numbers - Series of preferred Numbers".
- [102] ISO 2110: "Information technology - Data Communication - 25-Pole DTE/DCE interface connector and contact number assignments".
- [103] ISO/IEC 7816-3: "Information technology - Identification cards - Integrated circuit(s) cards with contacts - Part 3: Electronic signals and transmission protocols".
- [104] IEC publication 6068-2-1: "Environmental Testing - Part 2: Tests - Tests A: Cold".

- [105] IEC publication 6068-2-2: "Environmental Testing - Part 2: Tests - Tests B: Dry heat".
- [106] IEC publication 6068-2-36: "Environmental Testing - Part 2: Tests - Test Fdb: Random vibration wide band - Reproducibility Medium".
- [107] ETSI ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [108] ITU-T Recommendation P.57 (2005): "Artificial ears".
- [109] 3GPP TS 02.43 (R98 to R99): "Support of Localised Service Area (SoLSA); Service description; Stage 1".
- [110] 3GPP TS 03.73 (R98): "Support of Localised Service Area (SoLSA); Stage 2".
3GPP TS 23.073 (R99 onwards): "Support of Localised Service Area (SoLSA); Stage 2".
- [111] 3GPP TS 04.18 (R99): "Mobile radio interface layer 3 specification; Radio Resource Control Protocol" (see note 1).

3GPP TS 44.018 (Rel-4 onwards): "Mobile radio interface layer 3 specification; Radio Resource Control Protocol" (see note 1).
- [112] Void.
- [114] 3GPP TS 02.67 (R96 to R98): "enhanced Multi-Level Precedence and Pre-emption Service (eMLPP); Stage 1".
3GPP TS 22.067 (R99 onwards): "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1".
- [115] 3GPP TS 02.68 (R96 to R99): "Voice Group Call Service (VGCS); Stage 1".
3GPP TS 42.068 (Rel-4 onwards): "Voice Group Call Service (VGCS); Stage 1".
- [116] 3GPP TS 02.69 (R96 to R99): "Voice Broadcast Service (VBS); Stage 1".
3GPP TS 42.069 (Rel-4 onwards): "Voice Broadcast Service (VBS); Stage 1".
- [117] 3GPP TS 02.87 (R98): "User-to-User Signalling (UUS); Service description; Stage 1".
3GPP TS 22.087 (R99 onwards): "User-to-User Signalling (UUS); Service description; Stage 1".
- [118] 3GPP TS 22.094 (R99 onwards): "Follow Me Service description; Stage 1".
- [119] 3GPP TS 03.67 (R96 to R98): "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".
3GPP TS 23.067 (R99 onwards): "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".
- [120] 3GPP TS 03.68 (R96 to R99): "Voice Group Call Service (VGCS); Stage 2".
3GPP TS 43.068 (Rel-4 onwards): "Voice Group Call Service (VGCS); Stage 2".
- [121] 3GPP TS 03.69 (R96 to R99): "Voice Broadcast Service (VBS); Stage 2".
3GPP TS 43.069 (Rel-4 onwards): "Voice Broadcast Service (VBS); Stage 2".
- [122] 3GPP TS 23.094 (R99 onwards): "Follow-Me (FM); Stage 2".
- [123] 3GPP TS 04.67 (R96 to R98): "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 3".
3GPP TS 24.067 (R99 onwards): "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 3".
- [124] 3GPP TS 04.68 (R96 to R98): "Group Call Control (GCC) protocol".
3GPP TS 44.068 (Rel-4 onwards): "Group Call Control (GCC) protocol".
- [125] 3GPP TS 04.69 (R96 to R99): "Broadcast Call Control (BCC) protocol".
3GPP TS 44.069 (Rel-4 onwards): "Broadcast Call Control (BCC) protocol".

- [126] 3GPP TS 04.87 (R98): "User-to-User Signalling (UUS) Supplementary Service; Stage 3".
3GPP TS 24.087 (R99 onwards): "User-to-User Signalling (UUS) Supplementary Service; Stage 3".
- [127] Void
- [128] 3GPP TS 25.331 (R99 onwards): "Radio Resource Control (RRC) protocol specification".
- [129] Void
- [130] 3GPP TS 26.131 (R99 onwards): "Terminal Acoustic Characteristics for Telephony: Requirements".
- [131] 3GPP TS 26.132 (R99 onwards): "Narrow band (3,1 kHz) speech and video telephony terminal acoustic test specification".
- [132] 3GPP TS 04.60 (R97 to R99): "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".
3GPP TS 44.060 (Rel-4 onwards): "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".
- [133] 3GPP TS 04.64 (R97 to R99): "General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".
3GPP TS 44.064 (Rel-4 onwards): "Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".
- [134] 3GPP TS 04.65 (R97 to R99): "General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDTCP)".
3GPP TS 44.065 (Rel-4 onwards): "Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDTCP)". [135] 3GPP TS 03.87 (R98): "User-to-User Signalling (UUS); Stage 2".
3GPP TS 23.087 (R99 onwards): "User-to-User Signalling (UUS) Supplementary Service; Stage 2".
- [136] Council Directive 91/263/EEC of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity".
- [137] 3GPP TS 11.18 (R98): "Specification of the 1.8 Vohr Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".
3GPP TS 31.101 (R99 onwards): "UICC-terminal interface; Physical and logical characteristics".
- [138] ISO 6429: "Information technology - Control functions for coded character sets".
- [139] IS-GPS-200, Revision D, Navstar GPS Space Segment/Navigation User Interfaces, March 7th, 2006
- [140] P. Axelrad, R.G. Brown, "GPS Navigation Algorithms", in Chapter 9 of "Global Positioning System: Theory and Applications", Volume 1, B.W. Parkinson, J.J. Spilker (Ed.), A.M. Inst. of Aeronautics and Astronautics Inc., 1996.
- [141] S.K. Gupta, "Test and Evaluation Procedures for the GPS User Equipment", ION-GPS Red Book, Volume 1, p. 119.
- [142] STANAG 4294 Issue 1, NATO Standard Agreement.
- [143] IS-GPS-705, Navstar GPS Space Segment/User Segment L5 Interfaces, September 22, 2005.
- [144] IS-GPS-800, Navstar GPS Space Segment/User Segment L1C Interfaces, September 4, 2008.
- [145] IS-QZSS, Quasi Zenith Satellite System Navigation Service Interface Specifications for QZSS, Ver. 1.1, July 31, 2009.

- [146] Galileo OS Signal in Space ICD (OS SIS ICD), Draft 0, Galileo Joint Undertaking, May 23rd, 2006.
- [147] Global Navigation Satellite System GLONASS Interface Control Document, Version 5.1, 2008.
- [148] Specification for the Wide Area Augmentation System (WAAS), US Department of Transportation, Federal Aviation Administration, DTFA01-96-C-00025, 2001.
- [149] 3GPP TS 34.108 (R99 onward): " Technical Specification Group Terminals; Common test environments for User Equipment (UE) conformance testing ".
- [150] 3GPP TS 33.102 (R99 onward): " Technical Specification Group Services and System Aspects; 3G Security; Security architecture ".

NOTE 1: From Rel-4 onwards, references to 3GPP TS 04.08 are replaced by references to 3GPP TS 44.018 (for RR) and 3GPP TS 24.008 (for CN).

3 Definitions, conventions and applicability

For the purposes of the present document, the abbreviations and acronyms given in 3GPP TS 01.04 apply.

3.1 Mobile station definition and configurations

In the present document, a MS can be:

- a vehicle mounted station;
- a portable station;
- a handheld station;
- a vehicle mounted/portable station;
- a vehicle mounted/handheld station.

A MS is the complete equipment configuration which may take part in a communication. However, this may not be the MS as it is offered to a test house for conformance testing.

In general, the MS, as it will be presented to a test house for conformance testing, is the station without all the additional Terminal Equipment (TE). Such a piece of hardware is also called a Mobile Termination (MT), but in the present document, the expression MS is used for any form of MS hardware as it is offered to the test house.

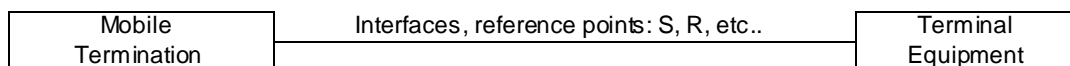


Figure 3-1

During the tests, the interfaces of the MT shall be connected to a System Simulator (SS), which will also emulate the TE. For some tests, it may be necessary to establish a pre-configured setup of the MS.

EXAMPLE: For reception of automatic fax group 3 to a fax machine on the R-interface, the MS needs configuration information about the presence of such a machine on that interface.

As an alternative, the TE may be physically integrated.

For a more detailed description of MS-configurations, see 3GPP TS 02.06.

3.2 Applicability

3.2.1 Applicability of this specification

3.2.1.1 MS equipped with a connector

If a MS is equipped with a connector, to connect terminal equipment on an S or R reference point as defined in 3GPP TS 04.02, then testing of the MS may include testing of appropriate functioning to and from this connector.

The present document does not apply to TE which is to be connected to that connector, even if it is delivered with the MS.

3.2.1.2 GPRS

Several important tests are missing in the present document for the following types of GPRS MS:

- Type 2 MS [3GPP TS 05.02].
- MS with 3 or more TX-slots (included in the test cases are multislot classes 1, 2, 3, 4, 5, 6, 8, 9, 10, 19 and 24) [3GPP TS 05.02].
- GPRS only MS.
- Mobiles that can operate in class A [3GPP TS 03.60], excluding Dual Transfer Mode.
- Mobiles that can operate in class B in Network mode III [3GPP TS 03.60].
- Optional GPRS features.

3.2.2 Applicability of the individual tests

This information has been moved to 3GPP TS 51.010-2, annex B.

3.2.3 Applicability to terminal equipment

If a MS is delivered for conformance testing, and it contains physically integrated TE, then the present document applies to the complete MS including that TE.

The present document also applies to separate TE that is delivered for conformance testing with the MS. The MS is then tested as an MT0. In that case, the specific TE with which the MS is tested is documented in the test report.

3.3 Definitions

For the purposes of the present document, the following terms and definitions apply:

idle updated: MS is defined to be "idle updated" if the following three conditions are fulfilled:

- its update status is U1 UPDATED (see 3GPP TS 04.08 / 3GPP TS 24.008);
- it is in the MM state MM-IDLE (see 3GPP TS 04.08 / 3GPP TS 24.008);
- it is in the RR idle mode (see 3GPP TS 04.08 / 3GPP TS 44.018).

idle not updated: MS is defined to be "idle not updated" if the following three conditions are fulfilled:

- its update status is U2 NOT UPDATED (see 3GPP TS 04.08 / 3GPP TS 24.008);
- it is in the MM state MM-IDLE (see 3GPP TS 04.08 / 3GPP TS 24.008);
- it is in the RR idle mode (see 3GPP TS 04.08 / 3GPP TS 44.018).

arbitrary: if for a test, a test purpose, a test group, or a test suite, which uses a certain parameter the value of that parameter has to be chosen arbitrarily in a certain set of values, this means that:

- for each value in the set the MS is required to fulfil the requirements of the test, test purpose, test group, or test suite, but that
- the test, test purpose, test group, or test suite is only performed for one value in the set, the selection of which is made by the test operator.

3.4 Conventions for mathematical notations

For the purpose of the present document mathematical terms used throughout the present document are given in this subclause.

3.4.1 Mathematical signs

The "plus or minus" sign is expressed by " \pm ".

The sign "multiplied by" is expressed by "*".

The sign "divided by" is expressed by "/", or the common division bar.

The sign "greater than or equal to" is expressed by " \geq ".

The sign "less than or equal to" is expressed by " \leq ".

3.4.2 Powers to the base 10

Powers to the base 10 are expressed by "10Ex", where x is the exponent, e.g. 10E-5, 10E6.

3.5 Conventions on electrical terms

3.5.1 Radio Frequency (RF) input signal level

In general, the RF input signal level to the MS is expressed in terms of the received field strength E in dB μ V/m (assuming a 0 dBi gain antenna). This is related to the power level P in dBm by the following formula (see 3GPP TS 05.05):

GSM 450: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 130.5$ (calculated for a frequency of 460 MHz).

GSM 480: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 130.5$ (calculated for a frequency of 460 MHz).

GSM 710: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 134.9$ (calculated for a frequency of 770 MHz).

GSM 750: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 134.9$ (calculated for a frequency of 770 MHz).

T-GSM 810: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 135.6$ (calculated for a frequency of 831 MHz).

GSM 850: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 135.9$ (calculated for a frequency of 859 MHz).

GSM 900: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 136,5$ (calculated for a frequency of 925 MHz).

DCS 1 800: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 142,3$ (calculated for a frequency of 1 795 MHz).

PCS 1 900: $E \text{ (dB}\mu\text{V/m)} = P \text{ (dBm)} + 142,9$ (calculated for a frequency of 1 920 MHz).

According to annex 1 subclause A.1.1.5.3, in all tests in which a handheld MS normally only equipped with integral antenna is the unit under test, the equivalent input signal level into a temporary test connector is determined from:

$$E_{in} = E_{req} + F;$$

where:

E_{in} = input signal level to a temporary antenna connector (dB μ Vemf);

E_{req} = signal level required by the test (dB μ Vemf);

F = coupling factor (dB) at the respective ARFCN.

Since F has to be determined by each test house individually, E_{in} cannot be given as a figure in test procedures.

If the case of integral antenna is applicable, the input signal level is then expressed in the test procedures as:

$$E_{req} \text{ dB}\mu\text{Vemf}(\);$$

where the empty parenthesis is to be read as E_{in} .

Alternatively, the input signal level to the MS at the antenna connector can be expressed in $\text{dB}\mu\text{Vemf}(\)$. This is related to the power level P in dBm by the following formula, assuming a 50Ω antenna connector:

$$\text{Input signal level (dB}\mu\text{Vemf}(\)) = P(\text{dBm}) + 113.$$

3.5.2 Reference sensitivity level

In the present document the term:

Reference Sensitivity level ()

is used to indicate that the SS establishes reference sensitivity level taking account of any losses associated with the RF connection to the MS.

3.5.3 Power level of fading signal

The power level of a fading signal is defined as the total signal level averaged over time.

3.6 Terms on test conditions

Unless otherwise stated, all Test Cases in this document apply to all the frequency bands mentioned in this section.

The MNC values used in this document have either 2 digits or 3 digits according to Frequency Band – see Table 3.1

Table 3.1: MNC values

Band	MNC value
GSM 450, GSM 480, GSM 900, DCS 1 800	2 digits
Otherwise	3 digits

3.6.1 Radio test conditions

The radio propagation conditions refer to multipath propagation models of 3GPP TS 05.05.

They are expressed by typical profiles:

- static;
- rural area (RA);
- hilly terrain (HT);
- urban area (TU); or for
- equalization test (EQ).

The non-static profiles are also related to typical speeds of movement of the MS expressed in km/h, e.g. TU1,5, TU3, TU50, HT100, EQ50.

In the present document the following conventions are used.

Table 3.2

Term	for GSM 400 represents	for GSM 700 represents	For GSM 850 and GSM 900 represents	for DCS 1800 and PCS 1 900 represents
RA	RA500	RA300	RA250	RA130
HT	HT200	HT120	HT100	HT100
TUhigh	TU100	TU60	TU50	TU50
TUlow	TU6	TU3.6	TU3	TU1,5
EQ	EQ100	EQ60	EQ50	EQ50

For tests using ARFCN ranges the following table 3.3 and shall be used.

Table 3.3

Band	Term		
	Low ARFCN range	Mid ARFCN range	High ARFCN range
GSM 450	259 to 261	275 to 277	291 to 293
GSM 480	306 to 308	322 to 324	338 to 340
GSM 710	438 to 452	472 to 474	507 to 511
GSM 750	438 to 452	472 to 474	507 to 511
T-GSM 810	438 to 452	472 to 474	507 to 511
GSM 850	128 to 132	188 to 192	247 to 251
P-GSM 900	1 to 5	60 to 65	120 to 124
E-GSM 900	975 to 980	60 to 65	120 to 124
R-GSM 900	955 to 960 (R-GSM) and 975 to 980 (E-GSM)	60 to 65	120 to 124
DCS 1800	513 to 523	690 to 710	874 to 884
PCS 1900	513 to 523	650 to 670	799 to 809

NOTE 1: For definitions of GSM 450, GSM 480, GSM 710, GSM 750, T-GSM 810, GSM 850, P-GSM 900, DCS 1 800, PCS 1 900, E-GSM 900 and R-GSM 900 refer to 3GPP TS 05.05.

NOTE 2: In the present document the term "GSM 900" is used to cover the primary GSM band, the extended GSM band and the railway-GSM band.

NOTE3: For R-GSM two low ARFCN ranges are defined. Unless specified otherwise for a specific test the ARFCN range defined for E-GSM900 MS is used for the testing of MS supporting the R-GSM 900 frequency range.

NOTE4: GSM 710 and T-GSM 810 use dynamic ARFCN mapping. The numbering scheme chosen here is the same as that for GSM 750 for ease of specifying default message contents.

4 Test Equipment

4.1 Terms used to describe test equipment in the present document

In order to perform MS conformity testing, the use of test equipment is necessary to provide the MS with stimulus signals and to analyse and record the resulting responses.

Throughout the present document the term "System Simulator" is used to describe the suite of test equipment required to interact with the following MS interfaces:

- antenna;
- acoustic;
- data port;
- power supply;
- DAL.

The term "SIM simulator" is used to describe the test equipment required to interact with the SIM/ME interface.

A "test SIM" has the physical characteristics of a standard SIM card, (see 3GPP TS 11.11) with specific parameters defined in annex 4.

4.2 Functional requirements of test equipment

The present document does not include a functional description of the test equipment required to perform the tests. These requirements should be deduced from the test descriptions and the information in annex 5.

Annex 5 describes the requirements for the test equipment which cannot be derived from, and which are assumed in, the conformance test descriptions described in the present document. Specifically, stimulus setting and measurement uncertainty requirements are defined in annex 5.

5 Testing methodology in general (layers 1, 2, and 3)

5.1 Testing of optional functions and procedures

Any function or procedure which is optional, as indicated in the present document, may be subject to a conformance test if it is implemented in the MS.

A declaration by the apparatus supplier (PICS/PIXIT) is used to determine whether an optional function/procedure has been implemented.

5.2 Test interfaces and facilities

The air interface (Um reference point) provides the main test interface for the purpose of performing conformance tests.

The SS layer 2 and layer 3 shall react with the MS on the air interface in accordance with the BSS requirements in the 3GPP TS 04.xx and 05.xx series recommendations, except where the description defines otherwise.

The provision of the following special conformance test facilities is mandatory where applicable:

- support of special conformance test functions, which are enabled by the insertion of a dedicated SIM for testing (test-SIM);
- provision of a Digital Audio Interface (only for MS which support speech services, or alternate speech/data services);
- for equipment which does not have a permanent external 50 Ω connector, a temporary 50 Ω antenna connector shall be provided in accordance with the requirements of annex 1 GC7;
- for MS supporting diversity, or for any other reason having more than one RF connector (or temporary connector in the case of integral antenna MS) the manufacturer shall supply coupling and / or terminating devices so that the tests can be performed via a single transmit / receive RF connection.

Furthermore, an optional Electrical Man Machine Interface (EMMI), is specified.

These special conformance test facilities, with the exception of the temporary antenna connector, are described in subclause 36.1.

Actions at the user side of the equipment under test (i.e. at the man-machine Interface, at the S- or R- interface, at the SIM-interface, execution of higher layer processes in the case of data services) are used to invoke actions at layers 1, 2 and 3 of the Dm-channel protocol within the equipment under test.

5.3 Different protocol layers

The conformance tests for each layer of the Dm-channel protocol are specified separately and the test configuration(s) to be used in testing each layer is specified in the subclause of the present document relating to the conformance tests for that layer.

5.4 Information to be provided by the apparatus supplier

The apparatus supplier shall provide two kinds of information:

- information with respect to the protocol: Protocol Implementation Conformance Statement (PICS);
- information with respect to the man machine interface: Protocol Implementation Extra Information required for Testing (PIXIT).

The complete list of the information to be provided by the apparatus supplier is a matter between the apparatus supplier and the test house but an example of the information to be supplied is given in informative annex 3 of the present document.

5.5 Definitions of transmit and receive times

The time a burst is received or transmitted is defined to be in the middle of the burst, i.e. transition from Bit Number BN74 to BN75 for all bursts except random access bursts, the middle of which is the transition from BN48 to BN49.

The reception/transmission time of speech or data blocks or a signalling frame (layer 2 and layer 3) is defined to be the reception/transmission time of the last burst containing part of the block or frame.

The start of a layer 2 or 3 frame is defined to be the time of the first burst containing part of the layer 2 or 3 frame. (The time of a burst is defined to be in the middle of the burst.)

The end of a layer 2 or 3 frame is defined to be the time of the last burst containing part of the layer 2 or 3 frame.

6 Reference test methods

6.1 General

Annex 1 gives reference test conditions to be used throughout the present document, unless otherwise specified. It consists of a part on general conditions, and a part on normal and extreme test conditions.

Unless otherwise specified, tests are run using the normal test conditions.

If a test is to be run using the extreme test conditions then this is identified in the test description.

For all tests, the MS is connected to the SS. This connection, unless otherwise specified, is to the permanent antenna connector for a MS which is equipped with one, or via the temporary antenna connector defined in annex 1, GC7, for a MS with an integral antenna, and not normally having a means of connecting an external antenna.

6.2 Choice of frequencies in the frequency hopping mode

For the tests using frequency hopping, 38 frequencies are used over:

- GSM 850: a 21 MHz band;
- P-GSM 900: a 21 MHz band;
- E-GSM 900: a [21] MHz band;
- R-GSM 900: a 23 MHz band;
- DCS 1 800: a 75 MHz band;
- PCS 1 900: a 60 MHz band.

For the tests using frequency hopping, 14 frequencies are used over:

- GSM 450: a 6.4 MHz band;
- GSM 480: a 6.4 MHz band.

For the tests using frequency hopping, 24 frequencies are used over:

- GSM 710: a 12.4 MHz band.
 GSM 750: a 12.4 MHz band.
 T-GSM 810: a 12.4 MHz band.

Table 6.1: Hopping frequencies

	ARFCN
GSM 450	260, 262, 265, 267, 269, 272, 274, 278, 280, 282, 285, 287, 290, 292
GSM 480	307, 309, 312, 314, 316, 319, 321, 325, 327, 329, 332, 334, 337, 339
GSM 710, GSM 750, T-GSM 810	444, 447, 450, 451, 455, 457, 459, 463, 464, 467, 471, 475, 479, 482, 483, 486, 489, 490, 494, 496, 498, 502, 503, 505
GSM 850	137, 141, 144, 145, 149, 151, 153, 157, 158, 161, 165, 169, 172, 173, 177, 179, 181, 185, 186, 189, 193, 197, 200, 201, 205, 207, 209, 213, 214, 217, 221, 225, 228, 229, 233, 235, 237, 241
P-GSM900	10, 14, 17, 18, 22, 24, 26, 30, 31, 34, 38, 42, 45, 46, 50, 52, 54, 58, 59, 62, 66, 70, 73, 74, 78, 80, 82, 86, 87, 90, 94, 98, 101, 102, 106, 108, 110, 114
E-GSM900	984, 988, 991, 992, 996, 998, 1 000, 1 004, 1 005, 1 008, 1 012, 1 016, 1 019, 1 020, 1 022, 2, 6, 10, 14, 17, 18, 22, 24, 26, 30, 31, 34, 38, 42, 45, 46, 50, 52, 54, 58, 59, 62, 64
R-GSM 900	955, 963, 966, 967, 971, 974, 984, 988, 991, 992, 996, 998, 1 000, 1 004, 1 005, 1 008, 1 012, 1016, 1019, 1020, 1022, 2, 6, 10, 14, 17, 18, 22, 24, 26, 30, 31, 34, 36, 38, 42, 43, 45
DCS 1 800	522, 539, 543, 556, 564, 573, 585, 590, 606, 607, 624, 627, 641, 648, 658, 669, 675, 690, 692, 709, 711, 726, 732, 743, 753, 760, 774, 777, 794, 795, 811, 816, 828, 837, 845, 858, 862, 879
PCS 1 900	522, 539, 543, 547, 556, 564, 573, 585, 590, 596, 606, 607, 615, 624, 627, 633, 641, 648, 658, 669, 675, 684, 690, 692, 703, 709, 711, 726, 732, 743, 753, 760, 774, 777, 789, 794, 795, 803

NOTE: The range of frequencies available during tests under simulated fading conditions is restricted by the fading simulator bandwidth.

For the tests using frequency hopping on packet data channels a reduced number of frequencies shall be used for certain bands.

Table 6.2: Packet Data Channel Hopping frequencies

	ARFCN
E-GSM900	2, 14, 22, 30, 38, 46, 54, 62, 988, 996, 998, 1004, 1012, 1016, 1020, 1022
DCS 1 800	522, 564, 585, 606, 625, 648, 669, 690, 709, 726, 743, 760, 777, 795, 816, 837, 858, 879
PCS 1 900	522, 547, 573, 596, 606, 624, 641, 669, 675, 692, 711, 743, 753, 777, 789, 794, 795, 803

6.3 "Ideal" radio conditions

In the present document the following conditions are referenced by the term "ideal" radio conditions:

- No multipath conditions.

MS power control level:

DCS 1 800, PCS 1 900:		3
All other bands		7
RF level to MS:	63 dB μ Vemf()	(not tests in subclauses 14.4, 14.5 or 18.1.4)
RF level to MS:	20 dB above reference sensitivity level ()	(subclauses 14.4 and 14.5)
RF level to MS:	28 dB μ Vemf()	(tests in subclause 18.1.4)

6.4 Standard test signals

The standard test signals C0, C1, I0, I1 and I2 as used in the present document, are defined in annex 5.

6.5 Power (control) levels

In the present document, except where explicitly stated otherwise, if the MS is commanded to its minimum power (control) level, the SS is allowed to signal power control level 15 for DCS 1 800 and PCS 1 900 and 19 for all other bands. Furthermore, except where explicitly stated otherwise, if the MS is commanded to its maximum power (control) level, and if MS_TXPWR_MAX_CCH is set to the maximum output power of the MS, the SS is allowed to signal the power control level corresponding to the maximum output power for the power class of the MS. For a GSM 450, GSM 480 or GSM 900 power class 2 MS, the SS is allowed to signal power control level 2.

7 Implicit testing

For some GSM features conformance is not verified explicitly in the present document. This does not imply that correct functioning of these features is not essential, but that these are implicitly tested to a sufficient degree in other tests. Examples for implicitly tested features are frequency hopping and encryption.

It should be noted that for these features some aspects have to be and are explicitly tested, e.g. the ability to switch to frequency hopping or non-hopping, and the ability to change the encryption mode setting.

8 Measurement uncertainty

The measured value relating to the corresponding limit shall be used to determine whether or not a terminal equipment meets the requirement. (ETR 028 annex B).

This process is often referred to as "shared risk".

9 Format of tests

For lower layer tests the following basic format for tests is used:

..* Title

..*.1 Definition

This subclause provides, if necessary, a definition of the feature/function being tested and the applicability of the test to different MS (e.g. speech only, data only etc.). The applicability information in this clause is informative. The normative applicability information is in 51.010-2.

..*.2 Conformance requirement

This subclause details the core specification requirements being tested and includes any necessary core specification references.

..*.3 Test purpose

This subclause details the purpose of the test.

..*.4 Method of test

..*.4.1 Initial conditions

If present this subclause defines the initial conditions to be established before running the test.

..*.4.2 Procedure

This subclause details the test procedure.

..*.5 Test requirements

This subclause details the conditions to be met for successful completion of the test.

However for the higher layer tests, in general, a slightly modified format, as described below, is used:

..* Title

Definition

This subclause provides, if necessary, a definition of the feature/function being tested and optionally the applicability of the test to different MS (e.g. speech only, data only etc.). The applicability information in this clause is informative. The normative applicability information is in 51.010-2.

..*.1 Conformance requirement

This subclause details the core specification requirements being tested. Normally this is a direct quote from the core specification. In some cases due to the core specification structure it is hard to find a direct quote, then the conformance requirement can be a summary of the core specification requirements.

References

This subclause gives the core specification number and subclause of the conformance requirement.

..*.2 Test purpose

The test purpose describes the purpose of the test i.e. what shall be tested. The test purpose must be justified by the conformance requirement. The complete conformance requirement needs not to be tested i.e. the test purpose can be a subset of the conformance requirement but not vice versa.

..*.3 Method of test

Initial conditions

For every test initial conditions for both the System Simulator and the Mobile Station are given. Normally the System Simulator simulates a network with one or several cells and all necessary channels to set up a network. The network set-up that is used in different sections of this specification varies but is normally defined in a default section that applies for a certain test. In each test is only specified the deviations from the default network set-up.

If a test contains several test procedures or if a test sequence is repeated with an execution counter then the initial conditions shall be re-established before each execution.

Related PICS/PIXIT statement

For every test the related PICS/PIXIT statements that are necessary for performing the test are given.

Foreseen final state of the MS

This subclause is optional. If included the text is informative i.e. non-normative and does not contain a description of verifications to be performed.

Test Procedure

This subclause describes the test procedure. The text is non-normative.

Maximum duration of the test

This is a rough estimate of the time to run the test sequence. If the last step of the test sequence is not passed within this time the test has failed. The time shall be long enough to guarantee that all correctly implemented MS will pass the test but not unnecessarily long since this would increase testing time if the test fails.

Expected sequence

This subclause defines the exact test steps and the verifications to be performed in the test. The subclause is normative and gives requirements for the MS behaviour.

The expected sequence specifies the actions in numbered steps in a tabular form. In the column "direction", "SS -> MS" denotes a message sent from the SS to the MS, i.e. downlink. "MS -> SS" denotes a message sent from the MS to the SS i.e. uplink. "SS" denotes an action at the SS and "MS" denotes an action at the MS (e.g. interaction with the user or higher layers). The column "message" defines the messages to be sent from the SS or expected by the SS. The "comments" column contains further normative information e.g. message parameters or timing requirements.

In some cases, different alternative behaviours are possible in a test. Then test steps in alternative sequences are numbered as:

"A n", "A n + 1", ..., "A n + k";

"B n", "B n + 1", ..., "B n + l";

"C n", "C n + 1", ..., "C n + m";

etc. (n, m, l, k integers > 0).

In some cases the complete set of test steps is to be repeated with minor variations. In this case an execution counter is used and the following text is included "The test sequence is repeated for k = 1 ... n."

Unless specified in the test sequence there are no timing requirements on the uplink messages except maximum duration of the test. The System Simulator shall send the next downlink message "immediately" after the previous message unless something else is specified in the test sequence. "Immediately" means as fast as the performance of the System Simulator allows, i.e. without any delays.

The Message Type of all uplink messages shall be checked. If the value of a parameter of an uplink message is specified in a test, the SS shall check the value. If the value is not specified, the SS shall not check the parameter unless stated otherwise. If an optional field or Information Element is not indicated for the uplink - unless specified otherwise - , it may be included or not.

Specific message contents

This subclause specifies the content of all downlink messages unless they are specified in a referenced default section. Then only the deviations from the default messages are specified. All optional fields or optional Information Elements of a downlink message that shall be included have to be specified otherwise they shall not be included.

Content of uplink messages that shall be checked can also be specified in this subclause.

10 Generic call set up procedures

10.1 Generic call set-up procedure for mobile terminating speech calls

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Terminating Speech call set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.1.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.1.2 Definition of system information messages

The following parameters shall be coded into the system information messages. Parameters shall be coded according to 3GPP TS 04.08 / 3GPP TS 44.018.

The RACH Control Parameters IE shall be the same in SYSTEM INFORMATION TYPE 1, TYPE 2, TYPE 3 and TYPE 4 messages.

The Location Area Identification IE, Cell Selection Parameters IE, and P1 bit shall be the same in SYSTEM INFORMATION TYPE 3 and TYPE 4 messages.

SYSTEM INFORMATION TYPE 1

Information Element	Value/remark
Cell channel description	Includes the hopping sequence ARFCNs, if hopping is used
RACH control parameters	
MAX RETRANS	Any Value
TX-INTEGER	Any Value
CELL BAR ACCESS	Not barred
CALL RE-ESTABLISHMENT	Not Allowed
EMERGENCY CALL	Allowed
ACCESS CONTROL CLASS (0...9, 11...15)	None Barred
S11 rest octets	Spare Octets

SYSTEM INFORMATION TYPE 2

Information Element	Value/remark
BCCH Frequency list	Indicates seven surrounding cells on any ARFCN of the supported band, excluding ARFCNs in or immediately adjacent to those specified in subclause 6.2
NCC permitted	
NCC PERMITTED	e.g. all NCCs permitted
RACH control parameters	Any Value
MAX RETRANS	
TX-INTEGER	
CELL BAR ACCESS	
CALL RE-ESTABLISHMENT	
EMERGENCY CALL	
ACCESS CONTROL CLASS (0...9, 11...15)	None Barred

SYSTEM INFORMATION TYPE 3

Information Element	Value/remark
Cell identity	
CI VALUE	0001 hex (not relevant)
Location Area Identification	
MCC	001 decimal (not relevant)
MNC	01 or 011 (see Table 3.1) decimal (not relevant)
LAC	0001 hex (not relevant)
Control Channel Description	
MSCR	1 MSC is Release '99 onwards
ATT (IMSI att/det)	MS shall not apply (not relevant)
BS-AG-BLKS-RES	0 blocks reserved (not relevant)
CCCH-CONF	Combined CCCH/SDCCH (not relevant)
BS-PA-MFRMS	5 multiframes (not relevant)
T3212	Infinite
Cell options	
PWRC	power control not set
DTX	MS must not use DTX
RADIO LINK TIME-OUT	8
Cell selection parameters	
CELL RESELECT HYSTERESIS	0 dB
MS-TXPWR-MAX-CCH	Max. output power of MS
RXLEV-ACCESS-MIN	-90 dBm
ACS	There are no additional cell parameters included in SI7 and SI8
NECI	New establishment cause not supported
RACH control parameters	
MAX RETRANS	Any Value
TX-INTEG	Any Value
CELL BAR ACCESS	Not barred
CALL RE-ESTABLISHMENT	Not Allowed
EMERGENCY CALL	Allowed
ACCESS CONTROL CLASS (0...9, 11...15)	None Barred
SI3 rest octets	
P1	C2 parameters not present

SYSTEM INFORMATION TYPE 4

Information Element	Value/remark
Location Area Identification	
MCC	001 decimal (not relevant)
MNC	01 or 011 (see Table 3.1) decimal (not relevant)
LAC	0001 hex (not relevant)
Cell selection parameters	
CELL RESELECT HYSTERESIS	0 dB
MS-TXPWR-MAX-CCH	Max. output power of MS
RXLEV-ACCESS-MIN	-90 dBm
RACH control parameters	
MAX RETRANS	Any Value
TX-INTEG	Any Value
CELL BAR ACCESS	Not barred
CALL RE-ESTABLISHMENT	Not Allowed
EMERGENCY CALL	Allowed
ACCESS CONTROL CLASS (0...9, 11...15)	None Barred
CBCH Channel Description	Omitted
CBCH Mobile Allocation	Omitted
SI4 rest octets	
P1	C2 parameters not present

SYSTEM INFORMATION TYPE 5

Information Element	Value/remark
Neighbour cell description	As BCCH Frequency list in SI 2

SYSTEM INFORMATION TYPE 6

Information Element	Value/remark
Cell identity	
CI VALUE	0001 hex (not relevant)
Location Area Identification	
MCC	001 decimal (not relevant)
MNC	01 or 011 (see Table 3.1) decimal (not relevant)
LAC	0001 hex (not relevant)
Cell options	
PWRC	power control not set
DTX	MS must not use DTX
RADIO LINK TIME-OUT	8
NCC permitted	
NCC PERMITTED	e.g. all NCCs permitted

10.1.3 Procedure

An MS terminating call on a TCH/FS shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	SS -> MS	PAGING REQUEST TYPE 1	Sent on the correct paging subchannel
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "answer to paging"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	PAGING RESPONSE	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
9	SS		SS starts ciphering
10	SS -> MS	SETUP	Message contains the signal IE
11	MS -> SS	CALL CONFIRMED	
A12	MS -> SS	CONNECT	
B12	MS -> SS	ALERTING	
B13	MS		An alerting indication as defined in a PICS/PIXIT statement given by the MS
B14	MS		The MS is made to accept the call in a way described in a PICS/PIXIT statement
B15	MS -> SS	CONNECT	
16	SS -> MS	ASSIGNMENT COMMAND	
17	MS -> SS	ASSIGNMENT COMPLETE	
18	MS		The TCH is through connected in both directions
19	SS -> MS	CONNECT ACKNOWLEDGE	

10.1.4 Specific message contents

PAGING REQUEST TYPE 1 (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.22) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal Paging
Channel Needed	spare, any channel
Mobile Identity 1	
Odd/even no of digits	As applicable for TMSI
Type of Identity	TMSI
Identity digits	As applicable
Mobile Identity 2	Omitted
P1 rest octets	Spare octets

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH/SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrary

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IMEISV shall not be included

SETUP (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.23) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	
Signal	any non-reserved value
Bearer capability 1	Appropriate for the basic service selected for the test or omitted

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Channel Description	
Channel type	Bm + ACCHs
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
ARFCN	Default
Power level	Power control level 7
Channel mode	Speech full rate

CONNECT ACKNOWLEDGE (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.6) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	

10.1a Generic call set-up procedure for mobile terminating signalling only connection

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.1a.1 Initial conditions

See subclause 10.1.1

PIXIT Statements

- Way in the MS to avoid the disconnect of the RR connection due to MM or higher layer timers.

10.1a.2 Definition of system information messages

See subclause 10.1.2

10.1a.3 Procedure

An RR connection on TCH in signalling only mode shall be established under ideal radio conditions with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	SS -> MS	PAGING REQUEST TYPE 1	Sent on the correct paging subchannel
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "answer to paging"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	PAGING RESPONSE	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
<p>Note: To allow testing on TCH (signalling only) during a long period the MS manufacturer has to provide a way to avoid the disconnect of the RR connection due to MM or higher layer timers. As an option at least after every 8 seconds a message has to be sent to the MS to avoid the release of the RR connection by the MS. Messages appropriate or required for the test case can be foreseen or the authentication procedure in steps 5 and 6 is repeated at least after every 8 seconds.</p>			

10.1a.4 Specific message contents

PAGING REQUEST TYPE 1 (3GPP TS 44.018, subclause 9.1.22) to the MS

Same as section 10.1.4

IMMEDIATE ASSIGNMENT (3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	TCH/F + ACCHs (Note 1)
Time slot number	Default or as defined by the test case
Training seq. code	same as BCCH
Hopping	No
ARFCN	Default or as defined by the test case
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

NOTE 1: Channel mode is 'signalling only' after Immediate Assignment.

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Same as section 10.1.4

10.2 Generic call set-up procedure for mobile originating speech calls

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Originating Speech (MOC) call set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.2.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.2.2 Definition of system information messages

See subclause 10.1.2.

10.2.3 Procedure

An MS originating call on a TCH/FS shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	MS		"called number" entered
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "originating call, NECI <> 1"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	CM SERVICE REQUEST	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
9	SS		SS starts ciphering
10	MS -> SS	SETUP	
11	SS -> MS	CALL PROCEEDING	
12	SS -> MS	ALERTING	
13	MS		An alerting indication as defined in an PICS/PIXIT statement is given by the MS
14	SS -> MS	ASSIGNMENT COMMAND	
15	MS -> SS	ASSIGNMENT COMPLETE	
16	SS -> MS	CONNECT	
17	MS -> SS	CONNECT ACKNOWLEDGE	
18	MS		The TCH is through connected in both directions

10.2.4 Specific message contents

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH/SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrary

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IME ISV shall not be included

CALL PROCEEDING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.3) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Repeat Indicator	Omitted
Bearer Capability 1	Omitted
Bearer Capability 2	Omitted
Facility	Omitted
Progress Indicator	Omitted

ALERTING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.1) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
User-user	Omitted

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Channel Description	
Channel type	Bm + ACCHs
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
ARFCN	Default
Power level	Power control level 7
Channel mode	Speech full rate

CONNECT (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.5) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
Connected number	Omitted
Connected Subaddress	Omitted
User-user	Omitted

10.2a Generic call set-up procedure for mobile originating signalling only connection

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.2a.1 Initial conditions

See subclause 10.1.1

PIXIT Statements

- Description of the procedure how to initiate a mobile originated connection.
- Way in the MS to avoid the disconnect of the RR connection due to MM or higher layer timers.

10.2a.2 Definition of system information messages

See subclause 10.1.2

10.2a.3 Procedure

An RR connection on TCH in signalling only mode shall be established under ideal radio conditions with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
	MS		A connection is initiated according to the PIXIT statement
2	MS -> SS	CHANNEL REQUEST	
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	CM SERVICE REQUEST	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
Note:	To allow testing on TCH (signalling only) during a long period the MS manufacturer has to provide a way to avoid the disconnect of the RR connection due to MM or higher layer timers. As an option at least after every 8 seconds a message has to be sent to the MS to avoid the release of the RR connection by the MS. Messages appropriate or required for the test case can be foreseen or the authentication procedure in steps 5 and 6 is repeated at least after every 8 seconds.		

10.2a.4 Specific message contents

PAGING REQUEST TYPE 1 (3GPP TS 44.018, subclause 9.1.22) to the MS

Same as section 10.1.4

IMMEDIATE ASSIGNMENT (3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	TCH/F + ACCHs (Note 1)
Time slot number	Default or as defined by the test case
Training seq. code	same as BCCH
Hopping	No
ARFCN	Default or as defined by the test case
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

NOTE 1: Channel mode is 'signalling only' after Immediate Assignment.

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Same as section 10.1.4

10.3 Generic call set-up procedure for mobile terminating data calls

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Terminating Data call set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.3.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1).
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.3.2 Definition of system information messages

See subclause 10.1.2.

10.3.3 Procedure

An MS terminating call on a TCH shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	SS -> MS	PAGING REQUEST TYPE 1	Sent on the correct paging subchannel
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "answer to paging"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	PAGING RESPONSE	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
9	SS		SS starts ciphering
10	SS -> MS	SETUP	A call is set up according to the required characteristics of the test procedure. Bearer Capability and Signal IEs included
11	MS -> SS	CALL CONFIRMED	Bearer Capability shall or shall not be included according to the rules given in 3GPP TS 04.08 / 3GPP TS 24.008 and 3GPP TS 07.01
A12	MS -> SS	CONNECT	
B12	MS -> SS	ALERTING	
B13	MS		An alerting indication as defined in a PICS/PIXIT statement given by the MS
B14	MS		The MS is made to accept the call in a way described in a PICS/PIXIT statement
B15	MS -> SS	CONNECT	
16	SS -> MS	ASSIGNMENT COMMAND	
17	MS -> SS	ASSIGNMENT COMPLETE	
18	MS		The TCH is through connected in both directions
19	SS -> MS	CONNECT ACKNOWLEDGE	

10.3.4 Specific message contents

PAGING REQUEST TYPE 1 (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.22) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal Paging
Channel Needed	spare, any channel
Mobile Identity 1	
Odd/even no of digits	As applicable for TMSI
Type of Identity	TMSI
Identity digits	As applicable
Mobile Identity 2	Omitted
P1 rest octets	Spare octets

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH/SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrarily selected

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IME ISV shall not be included

SETUP (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.23) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	
Bearer Capability	
Radio Channel Requirement	
Connection Element	T or NT and declared as supported by the MS (Not "Both ...")
NIRR	No meaning
Other parameters	Declared as supported by the MS
Signal	any non-reserved value

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Channel Description	
Channel type	Bm + ACCHs
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
ARFCN	Default
Power level	Power control level 7
Channel mode	Proper data rate, according to BC-IE included in the Set-Up and to the following table

Table 10-1: Correspondence between User rate (UR) and Channel Mode (CM) for transparent (T) and non transparent (NT) connections

UR	9,6kbit/s	4,8kbit/s	2,4kbit/s	1,2kbit/s	1,2/0,075kbit/s	0,3kbit/s
CM T FR	12 FR	6 FR	3,6 FR	3,6 FR	3,6 FR	3,6 FR
CM T HR	n.a	6 HR	3,6 HR	3,6 HR	3,6 HR	3,6 HR
CM NT FR	12 FR	12 FR	12 FR	12 FR	12 FR	12 FR
CM NT HR	n.a	6 HR	6 HR	6 HR	6 HR	6 HR

CONNECT ACKNOWLEDGE (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.6) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	

10.4 Generic call set-up procedure for mobile originating data calls

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Originating Data call set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.4.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.4.2 Definition of system information messages

See subclause 10.1.2.

10.4.3 Procedure

An MS originating call on a TCH shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	MS		"called number" entered
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "originating call, NECI <> 1"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	CM SERVICE REQUEST	Message is contained in SABM
5	SS -> MS	AUTHENTICATION REQUEST	
6	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
7	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
8	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
9	SS		SS starts ciphering
10	MS -> SS	SETUP	
11	SS -> MS	CALL PROCEEDING	
12	SS -> MS	ALERTING	
13	MS		An alerting indication as defined in an PICS/PIXIT statement is given by the MS
14	SS -> MS	ASSIGNMENT COMMAND	
15	MS -> SS	ASSIGNMENT COMPLETE	
16	SS -> MS	CONNECT	
17	MS -> SS	CONNECT ACKNOWLEDGE	
18	MS		The TCH is through connected in both directions

10.4.4 Specific message contents

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH/SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrarily selected

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IMEISV shall not be included

CALL PROCEEDING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.3) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Repeat Indicator	Present if and only if Bearer Capability 1 and Bearer Capability 2 are present in this message
Bearer Capability 1	Present if negotiation of BC 1 or BC 2 necessary (e.g. reception of "Both" for CE parameter in SETUP), else omitted
Radio Channel Requirement	spare
Connection element	T (in case of "Both T (NT) preferred" received)
NIRR	No meaning
Other parameters	Same as sent by the MS in the SETUP, where applicable
Bearer Capability 2	Present if dual BC-IE received and negotiation of either BC 1 or BC 2 necessary, else omitted
Radio Channel Requirement	spare
Connection element	T in case of "Both, T (NT) preferred" in the SETUP message else same as in the SETUP message
NIRR	No meaning
Other parameters	Same as sent by the MS in the SETUP, where applicable
NOTE:	If both BC 1 and BC 2 are present, then one and only one of them shall indicate speech.
Facility	Omitted
Progress Indicator	Omitted

ALERTING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.1) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
User-user	Omitted

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Transaction Identifier	Not used
Message Type	
Channel Description	
Channel type	Bm + ACCHs
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
FB no	Band no 0
ARFCN	Default
Power level	Power control level 7
Channel mode	If no negotiation took place: - Speech FR (resp. HR) if first BC IE in the SETUP indicated speech FR (resp. HR); - Set according to the table below if first BC - IE in the SETUP indicates data or fax If negotiation took place; - Speech FR (resp. HR) if first BC-IE in the CALL PROCEEDING indicated speech FR (resp. HR); - Set according to the table below if first BC - IE in the CALL PROCEEDING indicates data or fax

Table 10-2: Correspondence between User rate (UR) and Channel Mode (CM) for transparent (T) and non transparent (NT) connections

UR	9,6kbit/s	4,8kbit/s	2,4kbit/s	1,2kbit/s	1,2/0,075kbit/s	0,3kbit/s
CMT FR	12FR	6 FR	3,6 FR	3,6 FR	3,6 FR	3,6 FR
CMT HR	n.a	6 HR	3,6 HR	3,6 HR	3,6 HR	3,6 HR
CMNT FR	12 FR	12 FR	12 FR	12 FR	12 FR	12 FR
CMNT HR	n.a	6 HR	6 HR	6 HR	6 HR	6 HR

CONNECT (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.5) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
Connected number	Omitted
Connected Subaddress	Omitted
User-user	Omitted

10.5 Generic call set-up procedure for mobile terminating multislot configuration, minimum number of timeslots allocated

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Terminating multislot connection set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.5.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.5.2 Definition of system information messages

See subclause 10.1.2.

10.5.3 Procedure

An MS terminating multislot connection shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	SS -> MS	PAGING REQUEST TYPE 1	Sent on the correct paging subchannel
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "answer to paging"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	PAGING RESPONSE	Message is contained in SABM
5	MS -> SS	CLASSMARK CHANGE	Multislot class
6	SS -> MS	AUTHENTICATION REQUEST	
7	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
8	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
9	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
10	SS		SS starts ciphering
11	SS -> MS	SETUP	A multislot connection is set up according to the required characteristics of the test procedure. Bearer Capability and Signal IEs included
12	MS -> SS	CALL CONFIRMED	Bearer Capability shall or shall not be included according to the rules given in 3GPP TS 04.08 / 3GPP TS 24.008 and 3GPP TS 07.01
A12	MS -> SS	CONNECT	
B13	MS -> SS	ALERTING	
B14	MS		An alerting indication as defined in a PICS/PIXIT statement given by the MS
B15	MS		The MS is made to accept the call in a way described in a PICS/PIXIT statement
B16	MS -> SS	CONNECT	
17	SS -> MS	ASSIGNMENT COMMAND	In multislot allocation only one timeslot is allocated.
18	MS -> SS	ASSIGNMENT COMPLETE	Sent on the TCH/Sm channel
19	MS		The TCH(s) is through connected in both directions
20	SS -> MS	CONNECT ACKNOWLEDGE	

10.5.4 Specific message contents

PAGING REQUEST TYPE 1 (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.22) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal Paging
Channel Needed	spare, any channel
Mobile Identity 1	
Odd/even no of digits	As applicable for TMSI
Type of Identity	TMSI
Identity digits	As applicable
Mobile Identity 2	Omitted
P1 rest octets	Spare octets

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH/SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrarily selected

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IMEISV shall not be included

SETUP (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.23) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	
Bearer Capability	
Radio Channel Requirement	
Connection Element	T or NT and declared as supported by the MS (Not "Both ...")
NIRR	No meaning
Other parameters	Declared as supported by the MS
Signal	any non-reserved value

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Channel Description 2	
Channel type	TCH/F + FACCH/F and SACCH/M
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
ARFCN	Default
Power level	Power control level 7
Multislot allocation	
- Downlink assignment	Only one timeslot is assigned in downlink direction.
- Uplink assignment	Only one timeslot is assigned in uplink direction.

CONNECT ACKNOWLEDGE (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.6) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	SS orig.
Message Type	

10.6 Generic call set-up procedure for mobile originating multislot configuration, minimum number of timeslots allocated

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Originating multislot connection set-up procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.6.1 Initial conditions

System Simulator:

1 cell, default parameters.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is "idle, updated", with a TMSI assigned and listening to the BCCH/CCCH of the active cell.

10.6.2 Definition of system information messages

See subclause 10.1.2.

10.6.3 Procedure

An MS originating multislot connection shall be established under ideal radio conditions and with Timing advance set to 0, as follows:

Step	Direction	Message	Comments
1	MS		"called number" entered
2	MS -> SS	CHANNEL REQUEST	Establishment cause indicates "originating call, NECI <> 1"
3	SS -> MS	IMMEDIATE ASSIGNMENT	
4	MS -> SS	CM SERVICE REQUEST	Message is contained in SABM
5	MS -> SS	CLASSMARK CHANGE	Multislot class
6	SS -> MS	AUTHENTICATION REQUEST	
7	MS -> SS	AUTHENTICATION RESPONSE	SRES specifies correct value
8	SS -> MS	CIPHERING MODE COMMAND	SS starts deciphering after sending the message
9	MS -> SS	CIPHERING MODE COMPLETE	Shall be sent enciphered. All following messages shall be sent enciphered
10	SS		SS starts ciphering
11	MS -> SS	SETUP	A multislot connection is set up according to the required characteristics of the test procedure.
12	SS -> MS	CALL PROCEEDING	
13	SS -> MS	ALERTING	
14	MS		An alerting indication as defined in an PICS/PIXIT statement is given by the MS
15	SS -> MS	ASSIGNMENT COMMAND	In multislot allocation only one timeslot is allocated.
16	MS -> SS	ASSIGNMENT COMPLETE	Sent on TCH/Sm channel.
17	SS -> MS	CONNECT	
18	MS -> SS	CONNECT ACKNOWLEDGE	
19	MS		The TCH(s) is through connected in both directions

10.6.4 Specific message contents

IMMEDIATE ASSIGNMENT (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.18) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Page Mode	Normal
Channel Description	
Channel Type	SDCCH / SACCH 1(4)
Time slot number	zero
Training seq. code	same as BCCH
Hopping	No
ARFCN	ARFCN of the BCCH
Random Reference	
Random access info	As in CHAN REQ
N51, N32, N26	As applicable
Timing Advance	0
Mobile allocation	length 0 due to hopping
IA rest octets	Spare octets

AUTHENTICATION REQUEST (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.2.2) to the MS

Information Element	Value/remark
Protocol Discriminator	MM
Skip Indicator	0000
Message Type	
Ciphering key seq. number	Arbitrary
Authent. parameter RAND	Arbitrarily selected

CIPHERING MODE COMMAND (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.1.9) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Skip Indicator	0000
Message Type	
Ciphering mode setting	Start ciphering
Algorithm Identifier	Supported by the MS
Cipher Response	IME ISV shall not be included

CALL PROCEEDING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.3) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Repeat Indicator	Present if and only if Bearer Capability 1 and Bearer Capability 2 are present in this message
Bearer Capability 1	Present if negotiation of BC 1 necessary (e.g. reception of "Both" for CE parameter in SETUP), else omitted
Radio Channel Requirement	spare
Connection element	T (in case of "Both T (NT) preferred" received)
NIRR	No meaning
Other parameters	Same as sent by the MS in the SETUP, where applicable
Facility	Omitted
Progress Indicator	Omitted

ALERTING (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.1) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
User-user	Omitted

ASSIGNMENT COMMAND (3GPP TS 04.08 / 3GPP TS 44.018, subclause 9.1.2) to the MS

Information Element	Value/remark
Protocol Discriminator	RR
Transaction Identifier	Not used
Message Type	
Channel Description 2	
Channel type	TCH/F + FACCH/F + SACCH/M
Time slot number	Arbitrary
Training seq. code	Default
Hopping	No
FB no	Band no 0
ARFCN	Default
Power level	Power control level 7
Multislot allocation	
- Downlink assignment	Only one timeslot is assigned in downlink direction.
- Uplink assignment	Only one timeslot is assigned in uplink direction.

CONNECT (3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.5) to the MS

Information Element	Value/remark
Protocol Discriminator	CC
Transaction Identifier	As derived from SETUP
Message Type	
Facility	Omitted
Progress Indicator	Omitted
Connected number	Omitted
Connected Subaddress	Omitted
User-user	Omitted

10.7 Generic procedure for GPRS downlink data transfer

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Terminating Data transfer procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.7.1 Initial conditions

System Simulator:

- 1 cell, default parameters as specified in clause 40;
- ideal radio conditions and Timing advance set to 0.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is GPRS attached with a P-TMSI allocated and the test PDP context 2 activated.

10.7.2 Definition of system information messages

See clause 40.

10.7.3 Procedure

Step	Direction	Message	Comments
1			Start an application in the MS that continually reads all received data
2	SS -> MS	PAGING REQUEST	Contains P-TMSI of the MS. Sent on PCH.
3	MS -> SS	CHANNEL REQUEST	ACCESS TYPE = " Page Response ". Received on RACH.
4	SS -> MS	IMMEDIATE ASSIGNMENT	Random Reference = pertaining to the message received in step 3. Sent on AGCH. Single block assignment.
5	MS -> SS	UPLINK RLC DATA BLOCK	LLC PDU implicitly indicating paging response, containing TLLI in the RLC/MAC header. .
6	SS -> MS	PACKET UPLINK ACK/NACK	Acknowledge the received RLC data block. Sent on PACCH. Poll bit in the MAC header is set to indicate a valid RRBP.
7	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	As RLC/MAC control block. Received on PACCH.
8	SS -> MS	IMMEDIATE ASSIGNMENT	Poll bit in the MAC header is set to indicate a valid RRBP. Sent on PCH.
9	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	TIMESLOT_ALLOCATION arbitrarily chosen but shall not exceed the multislot capabilities of the MS. Other parameters as specified in each test case. Received on PACCH.

NOTE: The MS is always granted a USF whenever the MS is expected to send.

10.7.4 Specific message contents

See clause 40.

10.8 Generic procedure for GPRS uplink data transfer

In the test procedures described in the present document, unless otherwise stated in the test description, the Mobile Originated Data transfer procedure shall be as described in this subclause.

NOTE: In test cases where a fading profile is required, a different and appropriate ARFCN may be selected, for instance if the fading simulator bandwidth does not allow use of the default ARFCN.

10.8.1 Initial conditions

System Simulator:

- 1 cell, default parameters as specified in clause 40;
- ideal radio conditions and Timing advance set to 0.

Mobile Station:

- the MS shall be operated under normal test conditions (see annex 1 TC.2.1);
- the special Test-SIM (see annex 4) shall be inserted;
- the MS is GPRS attached with a P-TMSI allocated and the test PDP context3 activated.

10.8.2 Definition of system information messages

See clause 40.

10.8.3 Procedure

Step	Direction	Message	Comments
1			Start an application in the MS that continually sends data
2	MS -> SS	CHANNEL REQUEST	Received on RACH.
3	SS -> MS	IMMEDIATE ASSIGNMENT	Single block assignment, to order the MS to follow the two phase access procedure. Sent on AGCH.
4	MS -> SS	PACKET RESOURCE REQUEST	Two phase access procedure. Received on the single block assigned in step 3.
5	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on PACCH of the same PDCH assigned in step 2. TIMESLOT_ALLOCATION arbitrarily chosen but shall not exceed the multislot capabilities of the MS. Open ended assignment.
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH containing USF assigned to the MS.

NOTE: The MS is always granted a USF whenever the MS is expected to send.

10.8.4 Specific message contents

PACKET UPLINK ACK/NACK message:

MESSAGE_TYPE	001001
PAGE_MODE	Normal Paging
UPLINK_TFI	00, same as the TFI value of the TBF which the message applies
CHANNEL_CODING_COMMAND	0, message escape Same coding scheme as in the assigned TBF which the message applies to
Ack/Nack Description	
- FINAL_ACK_INDICATION	0 (not a final ACK)
- STARTING_SEQUENCE_NUMBER	V(R)
- RECEIVED_BLOCK_BITMAP	Acknowledge the all data blocks transmitted by the MS
{0 1<CONTENTION_RESOLUTION_TLLI>}	0 (no contention resolution TLLI)
{0 1<Packet Timing Advance>}	0 (no packet timing advance)
{0 1<Power Control Parameters>}	0 (no power control parameters)
{0 1<Extension bits>}	0 (no extension bits present)
{0 1<Fixed Allocation parameters>}	0 (no fixed allocation parameters present)
spare padding	Spare Padding

PACKET UPLINK ASSIGNMENT message (two-phase dynamic allocation assigning a TBF):

MESSAGE_TYPE	001010
PAGE_MODE	Normal Paging
{0 1<PERSISTENCE_LEVEL>}	0 (no persistence level present)
- Address information	10 (TLLI)
- TLLI	The value received from the MS
CHANNEL_CODING_COMMAND	0, message escape
TLLI_BLOCK_CHANNEL_CODING	Arbitrarily chosen from the valid values (default CS-1)
Packet Timing Advance	'0'B, cs-1
- {0 1<TIMING_ADVANCE_VALUE>}	1 (timing advance value)
- TIMING_ADVANCE_VALUE	0 bit periods
- {0 1<TIMING_ADVANCE_INDEX>	0 (no timing advance index)
<TIMING_ADVANCE_TIMESLOT_NUMBER >}	
{0 1<Frequency Parameters>}	1 (Frequency Parameters present)
- Frequency Parameters	
< TSC >	Arbitrarily chosen
{ 00< ARFCN >}	00 (ARFCN no hopping)
- ARFCN }	As for "Serving cell, PDTCH, SDCCH " in section 40.1.1 for the current cell
Dynamic allocation	01
- Extended Dynamic Allocation	0 (Dynamic allocation)
- {0 1<P0><PR_MODE>}	0
- USF_GRANULARITY	0, one block
- {0 1<UPLINK_TFI_ASSIGNMENT>}	1 (uplink TFI assignment)
- UPLINK_TFI_ASSIGNMENT	Arbitrarily chosen (default 00101)
- {0 1<RLC_DATA_BLOCKS_GRANTED>}	0 (no RLC_DATA_BLOCKS_GRANTED, open-ended TBF)
- {0 1<TBF_STARTING_TIME>}	0 (no starting time)
-	1 (Timeslot Allocation with Power Control Parameters)
	one slot arbitrarily chosen and the following USF_TNx and GAMMA_TNx shall be corresponding to the chosen value, default timeslot 2 assigned)
- ALPHA	0.5
- {0 1<USF_TN0><GAMMA_TN0>}	0 (timeslot 0 not assigned)
- {0 1<USF_TN1><GAMMA_TN1>}	0 (timeslot 1 not assigned)
- {0 1<USF_TN2><GAMMA_TN2>}	1 (timeslot 2 assigned)
- USF_TN2	Arbitrarily chosen (default 101)
- GAMMA_TN2	For DCS 1800, +6 dBm PCS 1 900, +6 dBm
	For other bands +9 dBm
- {0 1<USF_TN3><GAMMA_TN3>}	0 (timeslot 3 not assigned)
- {0 1<USF_TN4><GAMMA_TN4>}	0 (timeslot 4 not assigned)
- {0 1<USF_TN5><GAMMA_TN5>}	0 (timeslot 5 not assigned)
- {0 1<USF_TN6><GAMMA_TN6>}	0 (timeslot 6 not assigned)
- {0 1<USF_TN7><GAMMA_TN7>}	0 (timeslot 7 not assigned)
spare padding	Spare Padding

See also clause 40.

10.9 Void

10.10 Void

11 General tests

11.1 Verification of support and non-support of services (multiple numbering scheme or ISDN)

11.1.1 Mobile Terminated (MT) calls

11.1.1.1 Definition

This test is repeated for all Mobile Terminated Bearer Services / Teleservices according to 3GPP TS 02.02 and 3GPP TS 02.03 except Teleservices 21, 22 and 23.

11.1.1.2 Conformance requirement

1. The MS shall check the Information Elements for Bearer Capability in a received SETUP message, and if it agrees to the proposed set, it shall respond with a CALL CONFIRMED message.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.2; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.3.

2. The MS in the "Null" state, U0, ready to receive a SETUP shall reject a SETUP with Information Elements for Bearer Capability which are incompatible with the Bearer Services / Teleservices supported by the MS, and shall send a RELEASE COMPLETE message.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.2; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.3.1; 3GPP TS 07.01, subclause 8.3.1; 3GPP TS 04.08 / 3GPP TS 24.008, subclause B.3.2.

11.1.1.3 Test purpose

1. To verify that the MS, for the case of the Multinumbering scheme or ISDN, accepts a SETUP message, where the Information Elements for Bearer Capability are compatible with the Bearer Services / Teleservices declared as supported by the MS, by sending a CALL CONFIRMED message.

This is verified for all Mobile Terminated Bearer Services / Teleservices declared as supported by the MS.

2. To verify that the MS in the "Null" state, U0, when receiving a SETUP message containing incompatible Information Elements for Bearer Capability will respond with a RELEASE COMPLETE message.

This is verified for all Mobile Terminated Bearer Services / Teleservices not declared as supported by the MS.

11.1.1.4 Method of test

11.1.1.4.1 Initial conditions

For an MS with an external interface the interface shall be setup in such a way that the MS is able to successfully receive the call for the service in question. The manufacturer shall state how this is done in a PIXIT statement. The same applies to features which must be activated by MMI before an incoming call can be accepted.

The PIXIT statement for the service in question shall be consistent with the PICS statement made by the manufacturer and will result for this tests in one or several valid BC codings as presented in subclause 11.8.

The generic call set-up procedure shall be followed up to and including the reception of the CIPHERING MODE COMPLETE message from the MS.

11.1.1.4.2 Procedure

- a) For a Mobile Terminated Bearer Service / Teleservice declared as supported by the MS. The SS transmits a SETUP message.

The SETUP shall contain a single or dual BC-IE where the parameter values are arbitrarily selected among those declared as supported by the MS in PIXIT statements and corresponding to the Bearer Service / Teleservice being tested.

- b) If more than one BC-IE (or pair of) correspond to the Bearer Service / Teleservice being tested, step a) is repeated once (and only once) with another single or dual BC-IE. The BC-IE shall be chosen in such a way that as many parameters as possible are different from the previous BC-IE. In particular, if more than one value for the "Connection Element" parameter is possible, the new BC-IE shall contain a different value from the previous one for this parameter.
- c) Step a) and b) are repeated for all Bearer Services / Teleservices declared as supported by the MS.
- d) For an Mobile Terminated Bearer Service / Teleservice not declared as supported by the MS. The SS transmits SETUP. If the MS supports TS62 but not TS61, then TS61 is not tested.

The SETUP shall contain a single or dual BC-IE where the parameter values are arbitrarily selected among those defined in 3GPP TS 07.01 Annex II and corresponding to the Bearer Service / Teleservice being tested. The complete coding of the corresponding BC-IE(s) can be found in subclause 11.8.

- e) Step d) is repeated for all Bearer Services / Teleservices not declared as supported by the MS.

11.1.1.5 Test requirement

- 1) After steps a), b) and c), the MS shall send a CALL CONFIRMED message. The MS may contain a single or dual BC-IE. If present these IEs are not checked.
- 2) After steps d) and e), the MS shall send a RELEASE COMPLETE message with cause value 88 - incompatible destination.

11.1.2 Mobile Originated (MO) calls

11.1.2.1 Definition

This test is repeated for all Mobile Originated Bearer Services / Teleservices according to 3GPP TS 02.02 and 3GPP TS 02.03 except Teleservices 21, 22 and 23, which are supported by the MS.

11.1.2.2 Conformance requirement

- 1. The MS shall set up a call with a SETUP message containing a single or multiple BC-IE and if required by the service, a single or multiple LLC according to the actual configuration of the MS. Two bearer capabilities can be present only in the cases described in 3GPP TS 07.01.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.2; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.3.1; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.2; 3GPP TS 07.01, subclause 8.3.3.

- 2. The Repeat Indicator Information Element shall be included in the SETUP message, when the in-call modification procedure is used.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.2.

11.1.2.3 Test purpose

- 1. To verify that the MS generates a SETUP message which includes a single or multiple Bearer Capability and if required by the service, a single or multiple LLC, according to the actual configuration on the MS.

This is verified for all Mobile Originated Bearer Services / Teleservices described in 3GPP TS 07.01 and declared as supported by the MS.

- 2. To verify that the MS includes a correctly encoded Repeat Indicator if it includes multiple Bearer Capabilities in the SETUP message.

11.1.2.4 Method of test

11.1.2.4.1 Initial conditions

If possible, the MS shall be configured to initiate an outgoing call with a specified BC and with the corresponding LLC when the ITC value is "unrestricted digital" in the SETUP message. The manufacturer must state how this is done in a PIXIT statement. The same applies to features which must be activated by MMI before an outgoing call can be initiated.

The PIXIT statement for the service in question shall be consistent with the PICS statement made by the manufacturer and will result for this test in one valid BC coding as presented in subclause 11.8.

11.1.2.4.2 Procedure

- a) The MS shall be made to initiate a call.
- b) If the MS can be configured to send a specific BC, the test is repeated with the MS configured for all possible preferred Bearer Services and Teleservices declared as supported by the MS. The complete coding of the corresponding BC-IE(s) can be found in subclause 11.8.

11.1.2.5 Test requirement

The MS shall send a SETUP message, which shall contain the BC among those declared as supported by the MS. If the MS is configured to send a specific BC, the SETUP message shall contain this particular BC. The BC-IE(s) shall be set according to 3GPP TS 07.01. When an ITC value is set to "unrestricted digital" the MS shall include the corresponding LLC information element.

Where two BCs are contained in the SETUP message, it shall be checked that the combination is allowed, according to 3GPP TS 07.01 and that a Repeat Indicator is also included.

11.2 Verification of support of the single numbering scheme

11.2.1 Definition

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11.2.2 Conformance requirement

1. The MS shall respond to a SETUP message containing no BC-IE with a CALL CONFIRMED message including the single or multiple Bearer Capability, according to the actual configuration of the MS. Two bearer capabilities can be present only in the cases described in 3GPP TS 07.01.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.2; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 5.2.2.3.1; 3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.2; 3GPP TS 07.01, subclause 8.3.3.

2. The Repeat Indicator Information Element shall be included in the CALL CONFIRMED message, when the in-call modification procedure is used, and no Bearer Capability Information Element is included in the received SETUP message.

3GPP TS 04.08 / 3GPP TS 24.008, subclause 9.3.2.

11.2.3 Test purpose

1. To verify that the MS, for the case of the Single Numbering Scheme, accepts a SETUP message, where the Information Elements for Bearer Capability and Lower and Higher Layer Compatibility are not present by sending a CALL CONFIRMED message, which includes the single or multiple Bearer Capabilities, according to the actual configuration on the MS.

This is verified for one Mobile Terminated Bearer Service / Teleservice described in 3GPP TS 07.01 and declared as supported by the MS.

2. To verify that the MS includes a correctly encoded Repeat Indicator if it includes multiple Bearer Capabilities in the CALL CONFIRMED message.

11.2.4 Method of test

11.2.4.1 Initial conditions

The MS is setup to receive a call. If possible, the MS shall be configured to respond to an incoming call with a specified BC selected arbitrarily from those declared as supported by the MS, in the CALL CONFIRMED message, in reply to a SETUP message with no BC, LLC or HLC elements. The manufacturer must state how this is done in a PIXIT statement. The same applies to features which must be activated by MMI before an incoming call can be accepted.

The generic call set-up procedure shall be followed up to and including the reception of the CIPHERING MODE COMPLETE message from the MS.

The PIXIT statement for the service in question shall be consistent with the PICS statement made by the manufacturer and will result for this tests in one or several valid BC codings as presented in subclause 11.8.

11.2.4.2 Procedure

The SS transmits a SETUP message with no BC, LLC or HLC elements.

11.2.5 Test requirement

The MS shall send a CALL CONFIRMED message, which shall contain the BC among those declared as supported by the MS. If the MS is configured to respond with a specific BC, the CALL CONFIRMED message shall contain this particular BC. The BC-IE shall be coded according to 3GPP TS 07.01.

Where two BCs are contained in the CALL CONFIRMED message, it shall be checked that the combination is allowed, according to 3GPP TS 07.01 and that a Repeat Indicator is also included.

11.3 Verification of non-support of services (Advice of Charge Charging (AoCC))

11.3.1 Definition

Test procedures (a) and (b) apply to MS which support MT calls.

Test procedure (c) applies to MS which support MO calls.

Test procedure (d) applies to MS which support at least one circuit switched basic service.

11.3.2 Conformance requirement

1. An MS claiming to **not** support AoCC and in the outgoing call / U4 call delivered state, on receipt of a CONNECT message containing AoCC information shall acknowledge the CONNECT message but ignore and not acknowledge the AoCC information sent within the CONNECT.
2. An MS claiming to **not** support AoCC and in the outgoing call / U4 call delivered state, on receipt of a FACILITY message containing AoCC information shall ignore and not acknowledge the AoCC information contained within the FACILITY.
3. An MS claiming to **not** support AoCC and in the incoming call / U9 call confirmed state, on receipt of a FACILITY message containing AoCC information shall ignore and not acknowledge the AoCC information contained within the FACILITY.
4. An MS claiming to **not** support AoCC and in the U10 call active state, on receipt of a FACILITY message containing AoCC information shall ignore and not acknowledge the AoCC information contained within the FACILITY.

3GPP TS 03.86 subclauses 1.2, 1.3, 2.2 and 2.3; 3GPP TS 04.86 clause 2.

11.3.3 Test purpose

1. To verify that an MS claiming to **not** support AoCC and in the outgoing call / U4 call delivered state, on receipt of a CONNECT message containing AoCC information acknowledges the CONNECT message but ignores and does not acknowledge the AoCC information sent within the CONNECT.

2. To verify that an MS claiming to **not** support AoCC and in the outgoing call / U4 call delivered state, on receipt of a FACILITY message containing AoCC information ignores and does not acknowledge the AoCC information contained within the FACILITY.
3. To verify that an MS claiming to not support AoCC and in the incoming call / U9 call confirmed state, on receipt of a FACILITY message containing AoCC information ignores and does not acknowledge the AoCC information contained within the FACILITY.
4. To verify that an MS claiming to **not** support AoCC and in the U10 call active state, on receipt of a FACILITY message containing AoCC information ignores and does not acknowledge the AoCC information contained within the FACILITY.

11.3.4 Method of test

11.3.4.1 Initial conditions

The generic call set up procedures are followed up to and including the reception, or transmission, of the ALERTING message by the MS.

Specific PICS statements:

- Support of at least one MT circuit switched basic service (TSPC_Addinfo_MTsvc)
- Support of at least one MO circuit switched basic service (TSPC_Addinfo_MOsvc)

PIXIT Statements:

-

11.3.4.2 Procedure

- a) For an Mobile Originated call in the U4 state the SS transmits CONNECT containing AoCC information.
- b) For an Mobile Originated call in the U4 state the SS transmits FACILITY containing AoCC information.
- c) For an Mobile Terminated call in the U9 state the SS transmits a FACILITY containing AoCC information.
- d) For a call in the U10 state the SS transmits a FACILITY containing AoCC information

11.3.5 Test requirement

The MS shall ignore the AoCC information sent to it in the Facility information elements as part of the CONNECT/FACILITY messages and not send any AoCC information acknowledgement. It shall be checked for 15 s that the MS does not transmit any AoCC information acknowledgement after the receipt of AoCC information.

11.4 Verification of non-support of services (call hold)

11.4.1 Definition

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11.4.2 Conformance requirement

An MS claiming to **not** support the Call Hold supplementary service and in the U10 call active state shall, when the appropriate Call Hold MMI command is entered:

- Fail to put the first call on hold.
- Fail to place the second call.
- Optionally provide some indication to the user of an error.

3GPP TS 02.83; 3GPP TS 04.83.

11.4.3 Test purpose

To verify that an MS claiming to **not** support the Call Hold supplementary service and in the U10 call active state, reacts in the following manner when the appropriate call hold MMI command is entered:

- MS fails to put the first call on hold.
- MS fails to place the second call.
- Optionally provides some indication to the user of an error.

11.4.4 Method of test

11.4.4.1 Initial conditions

The mobile originating generic call set up procedures shall be followed up to and including the transmission by the MS of the CONNECT ACKNOWLEDGE to place the call in the U10 call active state.

11.4.4.2 Procedure

A second directory number is entered followed by "SEND" via the MMI.

11.4.5 Test requirement

The MS shall not send any HOLD messages on the dedicated channel. This is checked for 3 s.

The MS may however send other messages.

The MS may also give the user an indication of the error that has occurred.

11.5 Verification of non-support of services (multiparty)

11.5.1 Definition

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11.5.2 Conformance requirement

An MS claiming to not support the MultiParty supplementary service and in the U10 call active state with one call and in the held state with another call shall, when the appropriate MultiParty MMI command is entered:

- Fail to combine the three parties in a MultiParty call.
- Optionally provide some indication to the user of an error.

3GPP TS 02.83, 3GPP TS 02.84, 3GPP TS 04.83, 3GPP TS 04.84.

11.5.3 Test purpose

To verify that an MS claiming to not support the MultiParty supplementary service and in the U10 call active state with one call and another call on hold, reacts in the following manner when the appropriate MultiParty MMI command is entered:

- Fails to combine the three parties in a MultiParty call.
- Optionally provides some indication to the user of an error.

11.5.4 Method of test

11.5.4.1 Initial conditions

The mobile originating generic call set up procedures shall be followed up to and including the transmission by the MS of the CONNECT ACKNOWLEDGE to place the call in the U10 call active state. A second directory number is then entered followed by send to put the first call on hold and place a second call.

11.5.4.2 Procedure

"3" followed by "SEND" is entered via the MMI.

11.5.5 Test requirement

The MS shall not send a FACILITY message, containing the build multiparty request, on the dedicated channel. This is checked for 3 s.

The MS may however send other messages.

The MS may also give the user an indication of the error that has occurred.

11.6 Verification of non-support of feature (Fixed Dialling Number (FDN))

11.6.1 Definition

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11.6.2 Conformance requirement

1. An MS claiming to **not** support FDN that has a SIM with FDN allocated and activated in its SIM Service Table (Service Number 3) and has FDN "enabled" shall refuse a request from the user to attempt an outgoing call.
2. An MS claiming to **not** support FDN that has a SIM with FDN allocated and activated in its SIM Service Table (Service Number 3) and has FDN "enabled" shall not respond to paging.
3. An MS claiming **not** to support FDN that has a SIM with FDN allocated and activated shall not attempt to rehabilitate the IMSI and Location Information Elementary Files of the SIM.

3GPP TS 02.07 subclause B3.2, 3GPP TS 11.11 subclause 11.2.1.

11.6.3 Test purpose

1. To verify that an MS claiming to **not** support FDN and that has a SIM with FDN allocated and activated in its SIM Service Table and has FDN "enabled". i.e. AND, IMSI and Location Information Elementary Files are Invalidated inserted, it refuses an attempt to make an outgoing call made by the user.
2. To verify that an MS claiming to **not** support FDN and that has a SIM with FDN allocated and activated in its SIM Service Table and has FDN "enabled". i.e. AND, IMSI and Location Information Elementary Files are Invalidated inserted, it does not answer to paging.
3. To verify that an MS claiming **not** to support FDN and that has a SIM with FDN allocated and activated in its SIM Service Table and has FDN "enabled". i.e. AND, IMSI and Location Information Elementary Files are Invalidated inserted, does not attempt to rehabilitate IMSI and Location Information.

11.6.4 Method of test

11.6.4.1 Initial conditions

The ME is powered off. No SIM is inserted in the ME.

11.6.4.2 Procedure

- a) A SIM with FDN allocated and activated in its SIM Service Table and has FDN "enabled" is inserted in the ME and the MS is powered on.
- b) An outgoing CM connection is attempted by the user.
- c) The MS paged with its IMSI.
- d) The MS is powered off and the SIM is examined using a suitable tool to determine if the IMSI and Location Information Elementary Files have been Rehabilitated.

11.6.5 Test requirement

- 1) in step b), the MS shall not send a CHANNEL REQUEST message.
- 2) in step c), the MS shall not send a CHANNEL REQUEST message.

3) in step d), the IMSI and Location Information Elementary Files shall be Invalidated.

11.7 IMEI Security

11.7.1 Conformance requirements

The IMEI shall not be changed after the ME's final production process. It shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software).

NOTE: This requirement is valid for new GSM Phase 2 and Release 96, 97, 98 and 99 MEs type approved after 1st June 2002.

3GPP TS 02.09, 3GPP TS 02.16, 3GPP TS 03.03.

11.7.2 Test purpose

To verify the conformance requirement.

11.7.3 Method of test

Not available.

11.7.4 Declaration

The manufacturer shall declare that:

- he has taken necessary and sufficient steps to ensure that any individual or organisation cannot economically change the IMEI after the ME's final production process; and
- that the IMEI resists tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software).

11.8 Coding of the Bearer Capability information element

This subclause describes the coding of the bearer capability IE in a SETUP and in a CALL CONFIRMED message according to 3GPP TS 07.01 and 3GPP TS 04.08 / 3GPP TS 24.008.

More precisely, the matter of subclause 11.8.1 is the coding of the bearer capability IE in a mobile terminating SETUP and subclause 11.8.2 deals with the coding of the bearer capability IE in a mobile originating SETUP and in a CALL CONFIRMED message.

In the whole section "x", "y" and "X" have the following meanings:

- when a field is coded with values of "x", it means that several bit combinations are authorized and the allowable ones are described in the relevant paragraph or section;
- "y" means that the value of the spare bit can be set to either 0 or 1 at the sending side and that the receiving side shall accept either of these values;
- "X" in the hexadecimal coding of the Bearer Capability IE reflects all the possible values taken by an octet taking account of the number of bits coded as "x" or "y" and their place in the octet.

11.8.1 Network to MS Direction

11.8.1.1 BS 21 to 26 - Asynchronous Service

11.8.1.1.1 BS 21

11.8.1.1.1.1 3,1 kHz Audio, Transparent

BC GSM = 04 07 AX X8 81 21 X1 4X 81

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement: Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	0	0	0	x	x	x	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	0	0	0	0	0	1	Extension Connection Element: Transparent Modem Type: V.21

The following configuration is also authorized:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

11.8.1.1.1.2 3,1 kHz Audio, Non Transparent

BC GSM = 04 0X X2 XX 81 21 X1 6X A1 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement: Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	1	0	0	0	0	1	Extension Connection Element: Non transparent Modem Type: V.21
Octet 7 (note)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending on the TE Configuration
NOTE: Because Modem Type is V.21, Octet7 shall be present.									

Depending of the type of flow control supported by the TE, the coding of octet 7 is different. The value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control".

The following configuration is also authorized:

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
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11.8.1.1.1.3 UDI, Transparent

BC GSM = 04 07 X1 X8 89 21 X1 4X 80

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	0	1	Extension Radio Channel Requirement: Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	1	0	0	1	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	0	0	0	x	x	x	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	0	0	0	0	0	0	Extension Connection Element: Transparent Modem Type: None

The following configuration is also authorized :

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

11.8.1.1.4 UDI, Non Transparent

BC GSM = 04 0X X1 XX 89 21 X1 6X A0 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	y	y	0	0	0	0	1	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	1	0	0	1	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	1	0	0	0	0	0	Extension Connection Element: Non Transparent Modem Type: None
Octet 7 (need not be present)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending of the TE Configuration

Depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control". If octet 7 is present, the value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control".

The following configuration is also authorized:

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
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11.8.1.1.2 BS 22

Same as BS 21 except:

User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
If different from "none", Modem Type Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

In case of 3,1 kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.1.1.3 BS 24

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis

In case of 3,1 kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.1.1.4 BS 25

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

In case of 3,1 kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.1.1.5 BS 26

Same as BS 21 except:

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

In case of 3,1kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.1.1.6 BS 23

For MOC only.

11.8.1.2 BS 31 to 34 - Synchronous Service

11.8.1.2.1 BS 32

11.8.1.2.1.1 3,1 kHz Audio, Transparent, non-X.32 case

BC GSM = 04 07 X2 X8 81 20 13 43 83

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	0	0	0	0	1	1	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	1	1	Extension Connection Element: Transparent Modem Type: V.22 bis

11.8.1.2.1.2 UDI, Transparent mode, non-X.32 case

BC GSM = 04 07 X1 X8 8X 20 13 43 80

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	0	1	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	1	0	x	x	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	0	0	0	0	1	1	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	0	0	Extension Connection Element: Transparent Modem Type: none

If the mobile station supports only SAP I.440/450, the System Simulator sets SAP field value to::

SAP in Octet 5:	-	-	-	-	-	0	0	1	I.440/I.450
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If the MS supports only SAP X.21, SAP field is set to:

SAP in Octet 5:	-	-	-	-	-	0	1	0	X.21
-----------------	---	---	---	---	---	---	---	---	------

Else, the MS supports both values and SAP is set to:

either:

SAP in Octet 5:	-	-	-	-	-	0	0	1	I.440/I.450
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or:

SAP in Octet 5:	-	-	-	-	-	0	1	0	X.21
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11.8.1.2.1.3 3,1 kHz Audio, Transparent mode, X.32 case (Packet Service)

BC GSM = 04 07 X2 X8 86 20 13 43 83

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	1	1	0	Extension Access Id Rate Adaptation: No Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	0	0	0	0	1	1	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	1	1	Extension Connection Element: Transparent Modem Type: V.22 bis

The following configuration is also authorized:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
UIL2P in Octet 7	-	-	-	0	0	1	1	0	X.25

11.8.1.2.1.4 3,1 kHz Audio, Non Transparent mode, X.32 case (Packet Service)

BC GSM = 04 07 X2 XX 86 20 13 63 A3 C6

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	1	1	0	Extension Access Id Rate Adaptation: No Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	1	0	0	0	1	1	Extension Connection Element: Non Transparent Modem Type: V.22 bis
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id. X.25

The following configuration is also authorized:

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
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11.8.1.2.1.5 UDI, Non Transparent mode, X.32 case (Packet Service)

BC GSM = 04 08 X1 XX 96 20 13 63 A0 C6

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length
Octet 3	1	y	y	0	0	0	0	1	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	1	0	1	1	0	Extension Access Id Rate Adaptation: X.31 flagstuffing Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	1	0	0	0	0	0	Extension Connection Element: Non Transparent Modem Type: None
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id. X.25

11.8.1.2.2 BS 31

For non X.32 case only, same as BS 32 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

BS31 for Packet Service does not exist.

11.8.1.2.3 BS 33

Same as BS 32 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.1.2.4 BS 34

Same as BS 32 except:

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.1.3 BS 61 - Alternate Speech / Data

The first BC in the Setup message is coded "Speech": 04 01 A0.

The repeat Indicator in the Setup message is coded "Circular for successive selection (alternate)": D1.

The second BC in the Setup message is coded as described below.

11.8.1.3.1 Speech/Asynchronous Data, Transparent

BC GSM = 04 07 X2 X8 81 21 XX XX 8X

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	x	x	x	x	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate
Octet 6b	0	1	x	0	0	x	x	x	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	0	0	x	x	x	x	Extension Connection Element: Transparent Modem Type

Depending of the user rate supported by the MS, the user rate, the modem type and the intermediate rate change:

User Rate in Octet 6a:	-	-	-	-	0	0	0	1	0,3 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	0	1	Modem V.21

User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis

User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

The following configuration is also authorized:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

User Information L2 Protocol (see Non Transparent service).

11.8.1.3.2 Speech/Asynchronous Data, Non Transparent

BC GSM = 04 0X X2 XX 81 21 XX 6X AX (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	x	x	x	x	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	0	1	0	x	x	x	x	Extension Connection Element: Non transparent Modem Type
Octet 7 (may not be present)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending of the TE Configuration

Depending of the type of flow control supported by the TE, the coding of octet 7 is different. The value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control". The "Outband Flow control is not allowed with V.21 modem).

Depending of the user rate supported by the MS, the user rate and the modem type change:

User Rate in Octet 6a:	-	-	-	-	0	0	0	1	0,3 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	0	1	Modem V.21

User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

The following configuration is also authorized :

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	-	Both T or NT preferred
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11.8.1.3.3 Speech/Synchronous Data

BC GSM = 04 07 X2 X8 8I 20 1X X3 8X

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	x	0	0	0	1	1	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	x	x	x	x	Extension Connection Element: Transparent Modem Type

Depending of the user rate supported by the MS, the user rate, the modem type and the intermediate rate change:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
	Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
	Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
	Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.1.4 BS 81 - Speech followed by Data

The first BC in the Setup message is coded "Speech": 04 01 A0.

The repeat Indicator in the Setup message is coded "Circular for successive selection "mode 1 alternate mode 2": D1".

The second BC in the Setup message is coded as described below.

11.8.1.4.1 Speech followed by Asynchronous Data

See subclauses 11.8.1.3.1 and 11.8.1.3.2.

11.8.1.4.2 Speech followed by Synchronous Data

See subclause 11.8.1.3.3.

11.8.1.5 TS 61 - Alternate Speech / Facsimile group 3

The first BC in the Setup message is coded "Speech": 04 01 A0.

The repeat Indicator in the Setup message is coded "Circular for successive selection (alternate)": D1.

The second BC in the Setup message is coded as described below.

11.8.1.5.1 TS 61 - Alternate Speech / Facsimile group 3, Transparent

BC GSM = 04 07 X3 X8 81 20 1X X3 80

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	1	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: FAX3
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: NA
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	x	0	0	0	1	1	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	0	0	Extension Connection Element: Transparent Modem Type: None

Depending of the user rate supported by the MS, the user rate and the intermediate rate change:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
	Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
	Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s

11.8.1.5.2 TS 61 - Alternate Speech / Facsimile group 3, Non-Transparent

BC GSM = 04 07 X3 XX 81 20 1X 63 X0

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	1	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: FAX3
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: NA
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16 kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element Modem Type: None

Depending of the user rate supported by the MS, the MS may have the following values:

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
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User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
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User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
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Depending on the support or not of both modes, Non Transparent and Transparent, the connection element field may have the following values:

Connection element in Octet 6c:	-	0	1	-	-	-	-	-	Non transparent
---------------------------------	---	---	---	---	---	---	---	---	-----------------

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
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If present, Octet 7 shall have the following value:

Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 id X.25
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11.8.1.6 TS 62 - Automatic Facsimile group 3

The repeat Indicator in the Setup message is not available.

The BC GSM is coded as described in subclause 11.8.1.5.

11.8.2 MS to SS direction

In the whole subclause 11.8.2, "1)" and "2)" stand for:

- 1) Not applicable in a CALL CONFIRMED message.
- 2) Not applicable in a CALL CONFIRMED message responding to a SETUP message with no BC-IE (PSTN-originated call with single numbering scheme).

If the MS supports only Full Rate:

Radio Channel Requirement in Octet 3:	-	0	1	-	-	-	-	-	-	Full rate support only mobile station
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Else

Radio Channel Requirement in Octet 3:	-	1	x	-	-	-	-	-	-	Dual rate mobile station
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11.8.2.1 BS 21 to 26 - Asynchronous Service

If the MS supports only SAP I.440/I.450:

SAP in Octet 5:	-	-	-	-	-	0	0	1	I.440/I.450
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If the MS supports only SAP X.28 non dedicated PAD:

SAP in Octet 5:	-	-	-	-	-	1	0	1	X.28 nond
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Else:

SAP in Octet 5:	-	-	-	-	-	x	0	1	I.440/I.450 or X.28 nond
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The use of the alternative configuration "Autobauding modem type 1" in BS 22 to BS 26 is the same as indicated for BS 21 in subclauses 11.8.2.1.1.1 and 11.8.2.1.1.2.

11.8.2.1.1 BS 21

11.8.2.1.1.1 3,1 kHz Audio, Transparent

BC GSM = 04 0X X2 X8 8X 21 X1 XX X1 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on the presence of octet 7.
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	x	x	1	0	0	0	Extension Spare Structure Duplex Mode Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	x	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	x	0	0	x	x	x	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	1	Extension Connection Element Modem Type: V.21

If the mobile station supports only Transparent mode or responds with a CALL CONFIRMED message:

Structure in Octet 4:	-	1	1	-	-	-	-	-	Unstructured
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Connection element in Octet 6c:	-	0	0	-	-	-	-	-	Transparent

1) If the mobile station supports both Transparent and Non Transparent modes:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

User Information L2 protocol in Octet 7 (see Non Transparent service)

2) The following configuration is also authorised in the SETUP message:

Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
Modem type in Octet 6c (if CE = "both"):	-	-	-	0	1	0	0	0	Autobauding Type 1

11.8.2.1.1.2 3,1 kHz Audio, Non Transparent

BC GSM = 04 0X X2 XX 8X 21 X1 6X X1 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	x	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	1	Extension Connection Element: NT, (Both T or Both NT) ¹⁾ Modem Type: V.21
Octet 7 (need not be present)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending on the TE Configuration

The following configuration is also authorised:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
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Depending of the type of flow control supported by the TE, the coding of octet 7 is different. The value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control".

11.8.2.1.1.3 2) UDI, Transparent

BC GSM = 04 0X X1 X8 8X 21 X1 XX X0

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on the presence of octet 7
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	x	x	1	0	0	0	Extension Spare Structure Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	1	x	0	1	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	x	0	0	x	x	x	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element Modem Type: None

If the mobile station supports only Transparent mode or responds with a CALL CONFIRMED message:

Structure in Octet 4:	-	1	1	-	-	-	-	-	Unstructured
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Connection element in Octet 6c:	-	0	0	-	-	-	-	-	Transparent

1) If the mobile station supports both Transparent and Non Transparent modes:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

User Information L2 protocol in Octet 7 (see Non Transparent service).

11.8.2.1.1.4 ²⁾ UDI, Non Transparent

BC GSM = 04 0X X1 XX 8X 21 X1 6X X0 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	1	x	0	1	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element: NT, (Both T or Both NT) ¹⁾ Modem Type: None
Octet 7 (need not be present)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending of the TE Configuration

Depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control". If octet 7 is present, the value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control".

11.8.2.1.2 BS 22

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

In case of 3,1 kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.2.1.3 BS 24

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis
							1	0	1	Modem V.26ter

In case of 3,1kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.2.1.4 BS 25

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

In case of 3,1 kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.2.1.5 BS 26

Same as BS 21 except:

	NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

In case of 3,1kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.2.1.6 BS 23

Same as BS 21 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	1	1	1,2 kbit/s/75 bit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	0	0	Modem V.23

In case of 3,1kHz Audio non transparent service, depending of the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control".

11.8.2.2 BS 31 to 34 - Synchronous Service

11.8.2.2.1 BS 32

11.8.2.2.1.1 3,1 kHz Audio, Transparent, non-X.32 case

BC GSM = 04 07 X2 X8 81 20 13 43 83

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement : Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	0	0	0	0	1	1	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	x	x	1	Extension Connection Element: Transparent Modem Type: V.22 bis or V.26 ter

11.8.2.2.1.2 ²⁾ UDI, Transparent mode, non-X.32 case

BC GSM = 04 07 X1 X8 8X 20 13 43 80

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	1	0	x	x	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	0	0	0	0	1	1	Extension Intermediate Rate: 8kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	0	0	Extension Connection Element: Transparent Modem Type: none

If the mobile station supports only SAP I.440/450

SAP in Octet 5:	-	-	-	-	-	0	0	1	I.440/I.450
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If the MS supports only SAP X.21

SAP in Octet 5:	-	-	-	-	-	0	1	0	X.21
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Else

SAP in Octet 5:	-	-	-	-	-	0	x	x	I.440/I.450 or X.21
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11.8.2.2.1.3 3,1 kHz Audio, Transparent mode, X.32 case (Packet Service)

BC GSM = 04 0X X2 X8 86 20 13 X3 X3 (C6)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	x	x	1	0	0	0	Extension Spare Structure Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	1	1	0	Extension Access Id Rate Adaptation: No Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	x	0	0	0	1	1	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	x	x	0	0	x	x	1	Extension Connection Element: Transparent Modem Type: V.22 bis or V.26 ter

If the mobile station supports only Transparent mode or responds with a CALL CONFIRMED message:

Structure in Octet 4:	-	1	1	-	-	-	-	-	Unstructured
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Connection element in Octet 6c:	-	0	0	-	-	-	-	-	Transparent

1) If the mobile station supports both Transparent and Non Transparent modes:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred
UIL2P in Octet 7	-	-	-	0	0	1	1	0	X.25

11.8.2.2.1.4 3,1 kHz Audio, Non Transparent mode, X.32 case (Packet Service)

BC GSM = 04 08 A2 XX 86 20 13 63 X3 C6

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	1	1	0	Extension Access Id Rate Adaptation: No Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	x	x	0	0	x	x	1	Extension Connection Element: NT, (Both T or Both NT) ¹⁾ Modem Type: V.22 bis or V.26 ter
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id. X.25

11.8.2.2.1.5 2) UDI, Non Transparent mode, X.32 case (Packet Service)

BC GSM = 04 08 X1 XX 96 20 13 63 A0 C6

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	1	0	1	1	0	Extension Access Id Rate Adaptation: X.31 flagstuffing Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	1	0	0	0	0	0	Extension Connection Element: Non Transparent Modem Type: None
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id. X.25

11.8.2.2.2 BS 31

For non X.32 case only, same as BS 32 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

BS31 for Packet Service does not exist.

11.8.2.2.3 BS 33

Same as BS 32 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.2.2.4 BS 34

Same as BS 32 except:

	NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
If different from "none",	Modem Type Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.2.3 BS 41 to 46 - PAD Access Asynchronous

11.8.2.3.1 ²⁾ BS 4111.8.2.3.1.1 ²⁾ UDI, Transparent

BC GSM = 04 0X X1 X8 8C 21 X1 XX X0 (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	x	x	1	0	0	0	Extension Spare Structure Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	1	1	0	0	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol: X.28 dedicated universal NUI
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	x	0	0	x	x	x	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element Modem Type: None

If the mobile station supports only Transparent mode or responds with a CALL CONFIRMED message:

Structure in Octet 4:	-	1	1	-	-	-	-	-	Unstructured
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Connection element in Octet 6c:	-	0	0	-	-	-	-	-	Transparent

1) If the mobile station supports both Transparent and Non Transparent modes:

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

User Information L2 Protocol (see Non Transparent service).

11.8.2.3.1.2 2) UDI, Non transparent

BC GSM = 04 08 X1 XX 8C 21 X1 6X X0 CX

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length.
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	1	1	0	0	Extension Access Id Rate Adaptation: V.110 Signalling Access Protocol: X.28 dedicated PAD, universal NUI
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	0	0	0	1	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate: 0,3 kbit/s
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element: NT, (Both T or Both NT) ¹⁾ Modem Type: None
Octet 7	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol: Depending on the TE Configuration

Depending on the type of flow control supported by the TE, octet 7 is present or not. If not present, it means "outband flow control". If octet 7 is present, the value COPnoFLCT (01100) means "No flow control".

11.8.2.3.2 BS 42

Same as BS 41 except:

User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
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11.8.2.3.3 BS 44

Same as BS 41 except:

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
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11.8.2.3.4 BS 45

Same as BS 41 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
--	------------------------	---	---	---	---	---	---	---	---	------------

11.8.2.3.5 BS 46

Same as BS 41 except:

	NIRR in Octet 4	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s

11.8.2.3.6 BS 43

Same as BS 41 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	1	1	1,2 kbit/s 75bit/s
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11.8.2.4 BS 51 to 53 - Packet Service Synchronous

11.8.2.4.1 2) BS 51

BC GSM = 04 08 X1 X8 96 20 13 63 A0 C6

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	1	0	0	0	Length
Octet 3	1	x	x	0	0	0	0	1	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: UDI
Octet 4	1	y	0	0	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	1	0	1	1	0	Extension Access Id Rate Adaptation: X.31 flag. Signalling Access Protocol: X.32
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	0	0	1	1	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate: 2,4 kbit/s
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	1	0	0	0	0	0	Extension Connection Element: Non Transparent Modem Type: None
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id. X.25

11.8.2.4.2 BS 52

Same as BS 51 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
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11.8.2.4.3 BS 53

Same as BS 51 except:

	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
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11.8.2.5 BS 61 - Alternate Speech / Data

The first BC is coded as follows:

IF: speech full rate version 2 is supported by the mobile, see subclause 11.8.2.9.2;

ELSE: see subclause 11.8.2.9.1.

The repeat Indicator in the Setup message is coded "Circular for successive selection (alternate)": D1.

The second BC in the Setup message is coded as described below.

11.8.2.5.1 Speech/Asynchronous Data, Transparent

BC GSM = 04 0X X2 X8 81 21 XX XX XX (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	x	x	1	0	0	0	Extension Spare Structure Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	x	x	x	x	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate
Octet 6b	0	1	x	0	0	x	x	x	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	x	x	x	x	Extension Connection Element Modem Type

If the mobile station supports only Transparent mode or responds with a CALL CONFIRMED message:

Structure in Octet 4:	-	1	1	-	-	-	-	-	Unstructured
Intermediate rate in Octet 6b:	-	1	x	-	-	-	-	-	Depending on the user rate
Connection element in Octet 6c:	-	0	0	-	-	-	-	-	Transparent

1) If the mobile station supports both Transparent and Non Transparent modes

Structure in Octet 4:	-	0	0	-	-	-	-	-	SDU Integrity
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Connection element in Octet 6c:	-	1	x	-	-	-	-	-	Both T or NT preferred

User Information L2 protocol in Octet 7 (see Non Transparent service)

Depending of the user rate supported by the MS, the user rate, the modem type and the intermediate rate change:

User Rate in Octet 6a:	-	-	-	-	0	0	0	1	0,3 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	0	0	1	Modem V.21

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
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User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
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User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis
						1	0	1	Modem V.26ter

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
-------------------------	---	---	---	---	---	---	---	---	--------------------

User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
-------------------------	---	---	---	---	---	---	---	---	--------------------

NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
User Rate in Octet 6a:	-	-	-	-	0	1	1	1	1,2 kbits/s 75bit/2
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s in Transparent mode
Modem type in Octet 6c:	-	-	-	0	0	1	0	0	Modem V.23

1) The following configuration is also authorised if CE = Both:

Modem type in Octet 6c:	-	-	-	0	1	0	0	0	Autobauding Type 1
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11.8.2.5.2 Speech/Asynchronous Data, Non Transparent

BC GSM = 04 0X X2 XX 81 21 XX 6X XX (CX)

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	x	x	x	x	Length (7 or 8) depending on presence of octet 7.
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	1	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Asynchronous
Octet 6a	0	x	0	x	x	x	x	x	Extension Number of Stop Bits, Depending of the TE Configuration Negotiation: In band Negotiation not possible Number of Data Bits, Depending of the TE Configuration User Rate
Octet 6b	0	1	1	0	0	x	x	x	Extension Intermediate Rate: 16kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity, Depending of the TE Configuration
Octet 6c	1	x	x	0	x	x	x	x	Extension Connection Element: NT, (Both T or Both NT) ¹⁾ Modem Type
Octet 7 (may not be present)	1	1	0	0	1	x	0	0	Extension Layer 2 Id. User Inform. layer 2 protocol, Depending of the TE Configuration

Depending of the type of flow control supported by the TE, the coding of octet 7 is different. The value ISO 6429 (0 1000) means "Inband flow control" and the value COPnoFLCT (0 1100) means "No flow control". The "Outband Flow control is not allowed with V.21 modem).

Depending of the user rate supported by the MS, the user rate and the modem type change:

	User Rate in Octet 6a:	-	-	-	-	0	0	0	1	0,3 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	0	0	1	Modem V.21
		-	-	-	0	1	0	0	0	Autobauding Type 1

	User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22
		-	-	-	0	1	0	0	0	Autobauding Type 1

	User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis
		-	-	-	-	-	1	0	1	Modem V.26ter
		-	-	-	0	1	0	0	0	Autobauding Type 1

	User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32
		-	-	-	0	1	0	0	0	Autobauding Type 1

	NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
	User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32
		-	-	-	0	1	0	0	0	Autobauding Type 1

	User Rate in Octet 6a:	-	-	-	-	0	1	1	1	1,2 kbit/s 75bit/s
	Modem type in Octet 6c:	-	-	-	0	0	1	0	0	Modem V.23
		-	-	-	0	1	0	0	0	Autobauding Type 1

11.8.2.5.3 Speech/Synchronous Data

BC GSM = 04 07 X2 X8 81 20 1X X3 8X

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	x	x	0	0	0	1	0	Extension Radio Channel Requirement Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: 3,1 kHz Audio
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: I.440 / I.450
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: Synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	x	0	0	0	1	1	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	x	x	x	x	Extension Connection Element: Transparent Modem Type

Depending of the user rate supported by the MS, the user rate, the modem type and the intermediate rate change:

User Rate in Octet 6a:	-	-	-	-	0	0	1	0	1,2 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	0	Modem V.22

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	0	1	1	Modem V.22bis
						1	0	1	Modem V.26ter

User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
Intermediate rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
Intermediate rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s
Modem type in Octet 6c:	-	-	-	0	0	1	1	0	Modem V.32

11.8.2.6 BS 81 - Speech followed by Data

The first BC is coded as follows:

IF: speech full rate version 2 is supported by the mobile, see subclause 11.8.2.9.2.

ELSE: see subclause 11.8.2.9.1.

The repeat Indicator in the Setup message is coded "Circular for successive selection 'mode 1 alternate mode 2' : D1".

The second BC in the Setup message is coded as described below.

11.8.2.6.1 Speech followed by Asynchronous Data

See subclauses 11.8.2.5.1 and 11.8.2.5.2.

11.8.2.6.2 Speech followed by Synchronous Data

See subclause 11.8.2.5.3.

11.8.2.7 TS 61 - Alternate Speech / Facsimile group 3

The first BC is coded as follows:

IF: speech full rate version 2 is supported by the mobile, see subclause 11.8.2.9.2.

ELSE: see subclause 11.8.2.9.1.

The repeat Indicator in the Setup message is coded "Circular for successive selection (alternate)": D1.

The second BC in the Setup message is coded as described below.

11.8.2.7.1 TS 61 - Alternate Speech / Facsimile group 3, Transparent

BC GSM = 04 07 X3 X8 81 20 1X X3 80

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	1	Extension Radio Channel Requirement: Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: FAX3
Octet 4	1	y	1	1	1	0	0	0	Extension Spare Structure: Unstructured Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested: No meaning Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: NA
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	x	0	0	0	1	1	Extension Intermediate Rate NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	0	0	0	0	0	0	0	Extension Connection Element: Transparent Modem Type: None

Depending of the user rate supported by the MS, the user rate and the intermediate rate change:

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
Interm. Rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s

User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
Interm. Rate in Octet 6b:	-	1	0	-	-	-	-	-	8 kbit/s

NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s
Interm. Rate in Octet 6b:	-	1	1	-	-	-	-	-	16 kbit/s

11.8.2.7.2 TS 61 - Alternate Speech / Facsimile group 3, Non Transparent

BC GSM = 04 07 X3 XX 81 20 1X 63 X0 66

Octet 1	0	0	0	0	0	1	0	0	Information Element: Bearer Capability
Octet 2	0	0	0	0	0	1	1	1	Length
Octet 3	1	y	y	0	0	0	1	1	Extension Radio Channel Requirement: Spare Coding Standard: GSM Transfer Mode: Circuit Info. Transfer Cap.: FAX3
Octet 4	1	y	0	0	1	0	x	0	Extension Spare Structure: SDU Integrity Duplex Mode: Full duplex Configuration: Point to Point Negotiation of Intermediate Rate Requested Establishment: Demand
Octet 5	1	0	0	0	0	0	0	1	Extension Access Id Rate Adaptation: No Signalling Access Protocol: NA
Octet 6	0	0	1	0	0	0	0	0	Extension Layer 1 Id: Default User Information Layer 1 Protocol Synchronous / Asynchronous: synchronous
Octet 6a	0	0	0	1	x	x	x	x	Extension Number of Stop Bits: NA Negotiation: In band Negotiation not possible Number of Data Bits: NA User Rate
Octet 6b	0	1	1	0	0	0	1	1	Extension Intermediate Rate: 16 kbit/s NIC on TX: Not Required NIC on RX: Not Supported Parity: NA
Octet 6c	1	x	x	0	0	0	0	0	Extension Connection Element Modem Type: None
Octet 7	1	1	0	0	0	1	1	0	Extension Layer 2 Id X.25

The user rate supported by the MS may have the following values:

User Rate in Octet 6a:	-	-	-	-	0	0	1	1	2,4 kbit/s
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User Rate in Octet 6a:	-	-	-	-	0	1	0	0	4,8 kbit/s
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NIRR in Octet 4:	-	-	-	-	-	-	0	-	no meaning
User Rate in Octet 6a:	-	-	-	-	0	1	0	1	9,6 kbit/s

If present, Octet 7 shall have the following value:

UI2LP in Octet 7	-	-	-	0	0	1	1	0	X.25
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11.8.2.8 TS 62 - Automatic Facsimile group 3

The repeat Indicator in the Setup message is not available.

The BC GSM is coded as described in subclause 11.8.2.7.

11.8.2.9 TS 11 and TS 12 - Speech

11.8.2.9.1 Support of only full/half rate speech version 1

The BC in the Setup message is coded as described below.

BC GSM = 04 01 X0

Octet 1	0	0	0	0	0	1	0	0	Information Element : Bearer Capability
Octet 2	0	0	0	0	0	0	0	1	Length
Octet 3	1	x	x	0	0	0	0	0	Extension Radio Channel Requirement Coding Standard : GSM Transfer Mode : Circuit Info. Transfer Cap. : speech

11.8.2.9.2 Support of speech full rate version 2 (Enhanced Full Rate)

This BC will be used by MS supporting EFR as the most advanced speech version. Those supporting EFR and newer codec speech version such as speech version 3, half rate speech version 2 will not use this BC.

The BC is coded as described below.

BC GSM = 04 0X X0 0X XX (8X)

Octet 1	0	0	0	0	0	1	0	0	Information Element : Bearer Capability
Octet 2	0	0	0	0	0	x	x	x	Length
Octet 3	0	x	x	0	0	0	0	0	Extension Radio Channel Requirement Coding Standard : GSM Transfer Mode : Circuit Info. Transfer Cap. : speech
Octet_3a_1	0	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_2	x	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_3	1	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication

IF the MS supports only Full Rate:

Octet 2	0	0	0	0	0	0	1	1	Length
Radio Channel Requirement in Octet 3:	-	0	1	-	-	-	-	-	Full rate support only mobile station/preference as in octets3a_etc

Octet_3a_1	-	-	-	-	-	0	x	0	x=0 : full rate speech version 1 x=1 : full rate speech version 2
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Octet_3a_2	1	-	-	-	-	0	x	0	x=0 : full rate speech version 1 x=1 : full rate speech version 2
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The speech indication in Octet_3a_1 shall be different from the one in Octet_3a_2.

Octet_3a_3 is not present.

ELSE

Octet 2 Radio Channel Requirement in Octet 3:	0 -	0 1	0 x	0 -	0 -	1 -	0 -	0 -	Length x=0 or 1 :Dual rate mobile station/ preference as in octets3a_etc
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Octet_3a_1	-	-	-	-	-	0	x	x	(0,0) :full rate speech version 1 (1,0) : full rate speech version 2 (0,1) : half rate speech version 1
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Octet_3a_2	0	-	-	-	-	0	x	x	(0,0) :full rate speech version 1 (1,0) : full rate speech version 2 (0,1) : half rate speech version 1
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Octet_3a_3	1	-	-	-	-	0	x	x	(0,0) :full rate speech version 1 (1,0) : full rate speech version 2 (0,1) : half rate speech version 1
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Each speech indication in Octet_3a_i shall be different from the one in Octet_3a_j, i≠j.

11.8.2.9.3 Support of full rate speech version 2 (EFR) and full and/or half rate speech version 3 (AMR)

The BC is coded as described below.

BC GSM: 04 0X X0 0X 0X XX (XX) (8X)

Octet 1	0	0	0	0	0	1	0	0	Information Element : Bearer Capability
Octet 2	0	0	0	0	0	x	x	x	Length
Octet 3	0	x	x	0	0	0	0	0	Extension Radio Channel Requirement Coding Standard : GSM Transfer Mode : Circuit Info. Transfer Cap. : speech
Octet_3a_1	0	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_2	0	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_3	x	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_4	x	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication
Octet_3a_5	1	0	0	0	0	x	x	x	Extension Coding Spare Speech version indication

IF the MS supports only Full Rate speech version 1 and full rate speech version 2 and full rate speech version 3:

Octet 2	0	0	0	0	0	1	0	0	Length
Radio Channel Requirement in Octet 3:	-	0	1	-	-	-	-	-	Full rate support only mobile station/preference as in octets3a_etc

Octet_3a_1	-	-	-	-	-	x	x	0	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3
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Octet_3a_2	-	-	-	-	-	x	x	0	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3
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Octet_3a_3	1	-	-	-	-	x	x	0	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3
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Each speech indication in Octet_3a_i shall be different from the one in Octet_3a_j, i≠j.

ELSE IF the MS supports Full Rate speech version 1 and full rate speech version 2 and full rate speech version 3 and half rate speech version 1

Octet 2	0	0	0	0	0	1	0	1	Length
Radio Channel Requirement in Octet 3:	-	1	x	-	-	-	-	-	x=0 or 1 :Dual rate mobile station/preference as in octets3a_etc

Octet_3a_1	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1
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Octet_3a_2	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1
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Octet_3a_3	0	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1
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Octet_3a_4	1	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1
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Each speech indication in Octet_3a_i shall be different from the one in Octet_3a_j, i≠j.

ELSE IF the MS supports Full Rate speech version 1 and full rate speech version 2 and full rate speech version 3 and half rate speech version 3

Octet 2	0	0	0	0	0	1	0	1	Length
Radio Channel Requirement in Octet 3:	-	0	1	-	-	-	-	-	Dual rate mobile station/ preference as in octets3a_etc

Octet_3a_1	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (1,0,1): half rate speech version 3
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Octet_3a_2	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (1,0,1): half rate speech version 3
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Octet_3a_3	0	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (1,0,1): half rate speech version 3
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Octet_3a_4	1	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (1,0,1): half rate speech version 3
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Each speech indication in Octet_3a_i shall be different from the one in Octet_3a_j, i≠j.

ELSE IF the MS supports Full Rate speech version 1 and full rate speech version 2 and full rate speech version 3 and half rate speech version 1 and half rate speech version 3

Octet 2	0	0	0	0	0	1	1	0	Length
Radio Channel Requirement in Octet 3:	-	1	x	-	-	-	-	-	x=0 or 1 :Dual rate mobile station/ preference as in octets3a_etc
Octet_3a_1	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1 (1,0,1) half rate speech version 3
Octet_3a_2	-	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1 (1,0,1) half rate speech version 3
Octet_3a_3	0	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1 (1,0,1) half rate speech version 3
Octet_3a_4	0	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1 (1,0,1) half rate speech version 3
Octet_3a_5	1	-	-	-	-	x	x	x	(0,0,0): full rate speech version 1 (0,1,0): full rate speech version 2 (1,0,0): full rate speech version 3 (0,0,1): half rate speech version 1 (1,0,1) half rate speech version 3

Each speech indication in Octet_3a_i shall be different from the one in Octet_3a_j, $i \neq j$.