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Digital European Cordless Telecommunications/  
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(DECT/GSM) inter-working profile  
Access and mapping  
(Protocol/procedure description for 3,1 kHz speech service)**

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## Contents

Foreword .....	9
Introduction .....	9
1 Scope .....	11
2 Normative references .....	11
3 Definitions, abbreviations and symbols .....	13
3.1 DECT definitions .....	13
3.2 Abbreviations .....	15
3.3 GSM abbreviations and definitions .....	17
3.4 Symbols for status columns .....	17
4 General .....	17
5 Inter-working requirements .....	18
5.1 General .....	18
5.2 Reference configurations .....	18
5.2.1 FP functional attachment to the GSM PLMN .....	18
5.3 General inter-working model for FP GSM PLMN attachment .....	19
5.4 Inter-working context .....	19
5.4.1 General .....	19
5.4.2 Basic inter-working rules .....	20
5.4.3 Location area mapping .....	21
5.4.4 Interpretation of broadcast attributes .....	21
6 Inter-working mappings, FP attached to the GSM PLMN .....	23
6.1 FP C-plane IWU procedures .....	23
6.1.1 CC IWU procedures .....	23
6.1.1.1 Normal outgoing call .....	23
6.1.1.2 Emergency call .....	26
6.1.1.3 Incoming call .....	26
6.1.1.4 Normal call release initiated by the PP .....	27
6.1.1.5 Normal call release initiated by the GSM PLMN .....	27
6.1.1.6 Abnormal call release initiated by the PP .....	28
6.1.1.7 Abnormal call release initiated by the GSM network .....	29
6.1.1.8 Exceptional cases .....	29
6.1.1.9 Other .....	30
6.1.2 MM IWU procedures .....	30
6.1.2.1 Authentication procedure .....	31
6.1.2.2 Identity procedure .....	32
6.1.2.3 Location registration related procedures .....	32
6.1.2.4 Detach procedure .....	35
6.1.2.5 Temporary identity assignment procedures .....	35
6.1.2.6 Ciphering procedure .....	37
6.1.2.7 CM service procedure .....	38
6.1.2.8 CM service procedure abnormal cases .....	39
6.1.2.9 External handover procedure .....	40
6.1.3 Paging related IWU procedure .....	40
6.1.4 Other specific IWU procedures .....	41
6.1.5 Exception handling .....	41
6.1.5.1 General .....	41
6.1.5.2 Timers .....	41
6.1.5.2.1 Mobility Management (MM) .....	41
6.1.5.2.2 Call Control (CC) .....	41
6.1.6 Message mappings .....	41

6.1.6.1	GSM to DECT .....	41
6.1.6.1.1	AUTHENTICATION REQUEST- AUTHENTICATION REQUEST .....	42
6.1.6.1.2	AUTHENTICATION REJECT- AUTHENTICATION-REJECT .....	42
6.1.6.1.3	IDENTITY-REQUEST - IDENTITY- REQUEST .....	42
6.1.6.1.4	TMSI REALLOCATION COMMAND - TEMPORARY-IDENTITY-ASSIGN .....	43
6.1.6.1.5	CIPHERING MODE COMMAND - CIPHER-REQUEST .....	43
6.1.6.1.6	LOCATION UPDATING ACCEPT - LOCATE-ACCEPT .....	43
6.1.6.1.7	LOCATION UPDATING REJECT - LOCATE-REJECT.....	44
6.1.6.1.8	ALERTING - CC-ALERTING.....	44
6.1.6.1.9	CALL-PROC - CC-CALL-PROC .....	44
6.1.6.1.10	CONNECT - CC-CONNECT .....	44
6.1.6.1.11	SETUP - CC-SETUP.....	45
6.1.6.1.12	DISCONNECT - CC-RELEASE .....	45
6.1.6.1.13	RELEASE - CC-RELEASE-COM.....	45
6.1.6.1.14	RELEASE COMPLETE - CC- RELEASE-COM .....	46
6.1.6.1.15	CM SERVICE REJECT - CC- RELEASE-COM .....	46
6.1.6.1.16	ABORT - CC-RELEASE-COM .....	46
6.1.6.2	DECT to GSM .....	46
6.1.6.2.1	LOCATE-REQUEST - LOCATION- UPDATING-REQUEST .....	47
6.1.6.2.2	LCE-PAGE-RESPONSE - PAGING RESPONSE .....	48
6.1.6.2.3	AUTHENTICATION-REPLY - AUTHENTICATION RESPONSE.....	48
6.1.6.2.4	DETACH - IMSI DETACH INDICATION .....	48
6.1.6.2.5	TEMPORARY-IDENTITY-ASSIGN- ACK - TMSI REALLOCATION COMPLETE .....	49
6.1.6.2.6	CC-SETUP - CM SERVICE REQUEST .....	49
6.1.6.2.7	IDENTITY-REPLY - IDENTITY RESPONSE .....	49
6.1.6.2.8	CC-ALERTING - ALERTING.....	50
6.1.6.2.9	CC-CONNECT - CONNECT .....	50
6.1.6.2.10	CC-INFO (F-02) - SETUP .....	51
6.1.6.2.11	CC-RELEASE - DISCONNECT .....	51
6.1.6.2.12	CC-RELEASE - RELEASE.....	52
6.1.6.2.13	CC-RELEASE-COM - RELEASE .....	52
6.1.6.2.14	CC-RELEASE-COM - RELEASE- COMPLETE .....	52
6.1.6.2.15	CC-SETUP - SETUP.....	53
6.1.6.2.16	CC-SETUP - EMERGENCY-SETUP ...	54
6.1.6.2.17	CC-RELEASE - CM SERVICE ABORT .....	54
6.1.6.2.18	CC-RELEASE-COM - CM SERVICE REJECT .....	55
6.1.7	Information element mappings .....	55
6.1.7.1	GSM to DECT .....	55
6.1.7.1.1	Mobile identity - NWK assigned identity .....	55
6.1.7.1.2	Authentication parameter RAND - RAND .....	55

	6.1.7.1.3	Cipher key sequence number - Auth type .....	56
	6.1.7.1.4	Location area identification - Location area.....	56
	6.1.7.1.5	Identity type - Identity type .....	57
	6.1.7.1.6	Reject cause - Reject reason.....	57
	6.1.7.1.7	Bearer capabilities 1 - Basic service.....	57
	6.1.7.1.8	Progress indicator - Progress indicator.....	57
	6.1.7.1.9	Cause - Release reason .....	58
	6.1.7.1.10	Reject cause - Release reason.....	58
	6.1.7.1.11	Signal - Signal.....	58
6.1.7.2	DECT to GSM.....		58
	6.1.7.2.1	Portable identity - Mobile identity .....	58
	6.1.7.2.2	Network assigned identity- Mobile identity.....	59
	6.1.7.2.3	Location area - Location area identification .....	59
	6.1.7.2.4	Cipher info - Cipher key sequence number.....	59
	6.1.7.2.5	RES - Auth. parameter SRES.....	60
	6.1.7.2.6	Portable identity- Mobile identity .....	60
	6.1.7.2.7	Basic service - CM service type.....	60
	6.1.7.2.8	Setup capability- Mobile station classmark 1.....	60
	6.1.7.2.9	Basic service - Mobile station classmark 2.....	61
	6.1.7.2.10	Basic service - Bearer capabilities .....	61
	6.1.7.2.11	Called-party-number - Called-party-number.....	61
	6.1.7.2.12	Multi keypad - Called-party-number.....	62
	6.1.7.2.13	Multi keypad - Keypad facility (F-10).....	62
	6.1.7.2.14	Release reason - Cause .....	62
6.1.8	Fields in information element coding.....		62
	6.1.8.1	GSM to DECT.....	63
	6.1.8.1.1	Protocol discriminator - Protocol discriminator .....	63
	6.1.8.1.2	Transaction identifier - Transaction identifier .....	63
	6.1.8.1.3	Message type - Message type .....	63
	6.1.8.1.4	Id for info element (IEI) - id for info element .....	63
	6.1.8.1.5	Length of contents - length of contents.....	63
	6.1.8.1.6	Type, (Mobile identity, NWK assigned identity) .....	63
	6.1.8.1.7	Identity value, (Mobile identity, NWK assigned identity) .....	64
	6.1.8.1.8	Y/N bit (Encryption information - Cipher info) .....	64
	6.1.8.1.9	RAND field (RAND - RAND) .....	64
	6.1.8.1.10	Cipher key number (Key sequence - Cipher key number) .....	64
	6.1.8.1.11	Extended location information (Location area identification - Location Area) .....	65
	6.1.8.1.12	Identity group (Identity type - Identity type) .....	65
	6.1.8.1.13	Type (Identity type - Identity type) .....	65
	6.1.8.1.14	Type, (Mobile identity, Portable identity) .....	65
	6.1.8.1.15	Portable user type, (Mobile identity, Portable identity) .....	66
	6.1.8.1.16	Identity value, ( Mobile identity - Portable identity) .....	66

	6.1.8.1.17	Reject cause value - Reject reason code.....	66
	6.1.8.1.18	Coding-standard - coding-standard.....	66
	6.1.8.1.19	Information transfer capability - Call Class .....	67
	6.1.8.1.20	Information transfer capability - basic service .....	67
	6.1.8.1.21	Location - location .....	67
	6.1.8.1.22	Progress-description - progress-description.....	68
	6.1.8.1.23	Cause-value - release-reason-code.....	68
	6.1.8.1.24	Signal value - signal value.....	68
	6.1.8.1.25	Skip Indicator - Transaction identifier...	69
	6.1.8.1.26	Reject cause value - Release reason code.....	69
6.1.8.2	DECT to GSM .....		69
	6.1.8.2.1	Protocol discriminator -Protocol discriminator .....	69
	6.1.8.2.2	Transaction identifier - Transaction identifier.....	69
	6.1.8.2.3	Message type - Message type .....	69
	6.1.8.2.4	Id for info element - id for info element (IEI).....	69
	6.1.8.2.5	Length of contents - length of contents	69
	6.1.8.2.6	Length of identity value (Portable identity - Mobile identity).....	70
	6.1.8.2.7	Type, (Portable identity - Mobile identity).....	70
	6.1.8.2.8	Portable user type, (Portable identity - Mobile identity) .....	70
	6.1.8.2.9	Identity value, (Portable identity - Mobile identity) .....	70
	6.1.8.2.10	Type, (NWK assigned identity - Mobile identity).....	70
	6.1.8.2.11	Identity value, (NWK assigned identity - Mobile identity) .....	70
	6.1.8.2.12	Extended location information, (Location area - Location area identification) .....	71
	6.1.8.2.13	Cipher key number, (Cipher info - Cipher key sequence number) .....	71
	6.1.8.2.14	RES field (RES - Auth. parameter SRES) .....	71
	6.1.8.2.15	Type, (Portable identity - Mobile identity).....	71
	6.1.8.2.16	Call class, (Basic service - CM service type) .....	72
	6.1.8.2.17	Profile indicator, (Profile indicator - Mobile station classmark 1).....	72
	6.1.8.2.18	Basic service, (Basic service - Mobile station classmark 2) .....	72
	6.1.8.2.19	Call Class - Information transfer capability .....	72
	6.1.8.2.20	Basic service - Information transfer capability .....	72
	6.1.8.2.21	Number-type - type-of-number.....	73
	6.1.8.2.22	Numbering-plan identification - numbering-plan identification .....	73
	6.1.8.2.23	Release-reason-code - cause-value ....	73
	6.1.8.2.24	Transaction identifier - Skip indicator ...	74
6.2	FP U-Plane IWU procedures .....		74
	6.2.1	Service activation.....	74
6.3	PP C-plane IWU mappings .....		74

6.3.1	CC IWU procedures .....	74
6.3.1.1	Call establishment procedure .....	74
6.3.1.2	Call release/reject procedures .....	74
6.3.2	MM IWU procedures .....	75
6.3.2.1	Authentication procedure .....	76
6.3.2.2	Identity procedure .....	76
6.3.2.3	Location registration procedure .....	77
6.3.2.4	Detach procedure .....	79
6.3.2.5	Temporary identity assignment procedure .....	79
6.3.2.6	Ciphering related procedure .....	80
6.3.2.7	External handover procedure .....	81
6.3.3	Paging related IWU procedure .....	81
6.3.4	Message mappings .....	81
6.3.5	Information element mappings .....	81
7	Inter-working connection types .....	82
7.1	Connection type definitions .....	82
Annex A (normative):	Derivation of the DECT ciphering key CK .....	83
A.1	Introduction .....	83
A.2	Algorithm to calculate the DECT CK from Kc .....	83
Annex B (normative):	Deletion of the GSM Kc, CKSN, TMSI and LAI .....	84
Annex C (informative):	Physical attachment models for the FP .....	85
C.1	Introduction .....	85
C.2	Physical attachment to the MSC .....	85
C.3	Physical attachment to the BSC .....	85
C.4	Physical attachment to the BTS .....	85
Annex D (informative):	References to not yet approved standards .....	86
History	.....	87

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	31 Octobre 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 April 1996
Date of withdrawal of any conflicting National Standard (dow):	30 April 1996

## Introduction

This ETS is a part of a set of standards for the DECT/GSM IWP concept that includes:

- General description of service requirements, functional capabilities and information flows;
- Access and mapping (protocol/procedure description for 3,1 kHz speech service), (this ETS);
- Support of GSM Phase 2 supplementary services (for further study);
- Fixed Interconnection (for further study).

This ETS is based on Digital European Cordless Telecommunications (DECT) Common Interface specification ETS 300 175 [1] to [8] to enable DECT terminals to inter-work in the public and private environment with DECT systems which are connected to a Global System for Mobile communications (GSM) core infrastructure.

In addition, this ETS is based on the DECT Generic Access Profile (GAP) [9] to enable the same DECT/GSM terminal to inter-work with a DECT Fixed Part (FP) complying to the GAP requirements, irrespective of whether this FP provides residential, business or public access services.

This ETS utilises in addition to the only GAP related features and procedures the following:

- GSM authentication;
- derivation of the DECT ciphering key from the respective GSM cipher key;
- the GSM International Mobile Subscriber Identity (IMSI) and Temporary Mobile Subscriber Identity (TMSI); and
- the GSM Location Area Identity (LAI).

This ETS defines a general purpose, but strict, mobility profile in terms of features, procedures, data structures, information elements and fields within the information elements at the DECT air interface in order to achieve full inter-operability between equipment i.e. DECT systems and terminals, which fulfil the requirements of this ETS. This ETS also fulfils the minimum requirements of the GAP enabling backwards compatibility with the respective equipment.

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## 1 Scope

This ETS specifies the DECT access protocols and FP and Portable Part (PP) inter-working/mappings necessary to ensure that the Global System for Mobile communications (GSM) basic voice telephony service can be provided over DECT. To enable DECT terminals to inter-work with DECT systems which are connected to the GSM infrastructure, from the DECT side this ETS is based on the GAP [9] and on the DECT Common Interface specification ETS 300 175 [1] to [8] (for the cases not covered by GAP), from GSM side this ETS assumes inter-working with GSM Public Land Mobile Network (PLMN) phase 2.

An air-interface profile is specified for a particular set of GSM services so that inter-operability of DECT equipment for these services can be achieved. Inter-working functions/mappings are specified for Mobile Switching Centre (MSC) attachment for the DECT FP as the FP is using the A-interface towards the GSM MSC in the respect that the FP emulates a GSM Base Station Controller (BSC) with regards to the GSM messages which are relevant to this ETS. Inter-working functions/mappings for the PP are specified for MSC environment.

The provision of the GSM Subscriber Identity Module (SIM) and DECT Authentication Module (DAM) with the GSM Application (GA) within the DECT portable are also considered.

Mobility Management (MM) and circuit-switched Call Control (CC) functionality are covered.

The RR-Management and other GSM specific functionality at the GSM A-interface, interfaces to non GSM-networks, supplementary services, and other GSM data services are outside the scope of this ETS.

A PP conforming to this ETS should be capable of distinguishing a FP conforming to this ETS from a FP conforming to the GAP and to access and to react upon accordingly.

## 2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 175-1: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 1: Overview".
- [2] ETS 300 175-2: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 2: Physical layer".
- [3] ETS 300 175-3: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 3: Medium access control layer".
- [4] ETS 300 175-4: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 4: Data link control layer".
- [5] ETS 300 175-5: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 5: Network layer".
- [6] ETS 300 175-6: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 6: Identities and addressing".
- [7] ETS 300 175-7: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 7: Security features".

- [8] ETS 300 175-8: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Part 8: Speech coding and transmission".
- [9] prETS 300 444: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT): Generic Access Profile (GAP)".
- [10] prETS 300 331: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface: DECT Authentication Module".
- [11] I-ETS 300 176: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Approval test specification".
- [12] 91/263/EEC: "Council Directive 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". (Terminal Directive).
- [13] ETR 015: "Digital European Cordless Telecommunications Reference document".
- [14] ETR 043: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT) Common Interface Services and Facilities requirements specification".
- [15] ETR 056: "Digital European Cordless Telecommunications System description document".
- [16] prETS 300 466: "Digital European Cordless Telecommunications/Global System for Mobile Communications (DECT/GSM) Inter-working profile: General Description of Service Requirements, Functional Capabilities and Information flows".
- [17] Reserved.
- [18] ECMA TR/44 (1989): "An architectural framework for private networks".
- [19] GSM 01.02: "European digital cellular telecommunication system (Phase 2); General Description of a GSM PLMN".
- [20] GSM 01.04: "European digital cellular telecommunication system (Phase 2); Abbreviations and acronyms".
- [21] ETS 300 522: "European digital cellular telecommunication system; Network architecture GSM 03.02 - phase 2".
- [22] ETS 300 551: "European digital cellular telecommunication system; GSM PLMN Access Reference Configuration GSM 04.02 - phase 2".
- [23] PH2 GSM 04.08 (v4.8.0): "European digital cellular telecommunication system; Mobile Radio Interface - Layer 3 Specification GSM 04.08 - phase 2".
- [24] ETS 300 580-1: "European digital cellular telecommunication system; Speech Processing Functions: General Description GSM 06.01 - phase 2".
- [25] ETS 300 590: "European digital cellular telecommunication system; BSS-MSC Layer 3 Specification GSM 08.08 - phase 2".
- [26] PH2 GSM 11.11: "European digital cellular telecommunication system; Specifications of the SIM/ME interface GSM 11.11 - phase 2".

- [27] ISO IS 9646-1: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 1: General Concepts".
- [28] ISO IS 9646-6: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 6: Protocol Profile Test Specification".
- [29] ISO/IEC 9646-7 (1992): "Information Technology - OSI Conformance Testing Methodology and Framework, Part 7: Implementation Conformance Statements" (working draft for CD 9646-7).

### 3 Definitions, abbreviations and symbols

#### 3.1 DECT definitions

For the purposes of this ETS, the following DECT definitions apply:

**attach:** The process whereby a PP within the coverage area of a FP to which it has access rights, notifies this FP that it is operative. The reverse process is detach, which reports the PP as inoperative.

NOTE 1: An operative PP is assumed to be ready to receive calls.

**authentication:** The process whereby a DECT subscriber is positively verified to be a legitimate user of a particular FP.

NOTE 2: Authentication is generally performed at call set-up, but may also be done at any other time (e.g. during a call).

**bearer service:** A type of telecommunication service that provides a defined capability for the transmission of signals between user-network interfaces.

NOTE 3: The DECT user-network interface corresponds to the top of the network layer (layer 3).

**C-plane:** The control plane of the DECT protocol stacks, which contains all of the internal DECT protocol control, but may also include some external user information.

NOTE 4: The C-plane stack always contains protocol entities up to and including the network layer.

**call:** All of the NetWoRK (NWK) layer processes involved in one network layer peer-to-peer association.

NOTE 5: Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

**DECT NetWoRK (DNW):** A network that uses the DECT air interface to interconnect a local network to one or more portable applications. The logical boundaries of the DECT network are defined to be at the top of the DECT network layer.

NOTE 6: A DECT NetWoRK (DNW) is a logical grouping that contains one or more fixed radio termination plus their associated portable radio termination. The boundaries of the DECT network are not physical boundaries.

**Fixed Part (DECT Fixed Part) (FP):** A physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface.

NOTE 7: A DECT FP contains the logical elements of at least one fixed radio termination, plus additional implementation specific elements.

**Fixed Part GSM PLMN Attachment (DECT Fixed Part attached to a GSM MSC):** A definition of a functional environment where a DECT system (FP) is attached to an GSM MSC. The MSC in this case refers to a functional entity providing the required MM and CC functionality defined in this ETS in order to communicate with the FP.

**Fixed radio Termination (FT):** A logical group of functions that contains all of the DECT processes and procedures on the fixed side of the DECT air interface.

NOTE 8: A fixed radio termination only includes elements that are defined in the DECT CI standard. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

**Generic Access Profile (GAP):** A defined part of the DECT Common Interface standard (DECT CI) that ensures inter-operability between FPs and PPs for public business and residential access services.

**geographically unique identity:** This term relates to FP identities, Primary Access Rights Identities (PARIs) and Radio Fixed Part Identities (RFPIs). It indicates that two systems with the same PARI, or respectively two RFPs with the same RFPI, can not be reached or listened to at the same geographical position.

**Global NetWork (GNW):** A telecommunication network capable of offering a long distance telecommunication service.

NOTE 9: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public or a private network.

**globally unique identity:** The identity is unique within DECT (without geographical or other restrictions).

**handover:** The process of switching a call in progress from one physical channel to another physical channel. These processes can be internal (see internal handover) or external (see external handover).

NOTE 10: There are two physical forms of handover, intra-cell handover and inter-cell handover. Intra-cell handover is always internal. Inter-cell handover can be internal or external.

**incoming call:** A call received at a PP.

**inter-cell handover:** The switching of a call in progress from one cell to another cell.

**internal handover:** Handover processes that are completely internal to one Fixed radio Termination (FT). Internal handover re-connects the call at the lower layers, while maintaining the call at the NWK layer.

NOTE 11: The lower layer reconnection can either be at the Data Link Control (DLC) layer (connection handover) or at the MAC layer (bearer handover).

**inter-operability:** The capability of FPs and PPs, that enable a PP to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider).

**inter-operator roaming:** Roaming between FP coverage areas of different operators (different service providers).

**Inter-Working Unit (IWU):** A unit that is used to interconnect sub-networks.

NOTE 12: The IWU will contain the inter-working functions necessary to support the required sub-network inter-working.

**intra-cell handover:** The switching of a call in progress from one physical channel of one cell to another physical channel of the same cell.

**intra-operator roaming:** Roaming between different FP coverage areas of the same operator (same service provider).

**Local NetWork (LNW):** A telecommunication network capable of offering local telecommunication services.

NOTE 13: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public network or a private network.

**locally unique identity:** The identity is unique within one FP or location area, depending on application.

**location area:** The domain in which a PP may receive (and/or make) calls as a result of a single location registration.

**location registration:** The process whereby the position of a DECT portable termination is determined to the level of one location area, and this position is updated in one or more databases.

NOTE 14: These databases are not included within the DECT FT.

**Medium Access Control (MAC) Connection:** An association between one source MAC Multi-Bearer Control (MBC) entity and one destination MAC MBC entity. This provides a set of related MAC services (a set of logical channels), and it can involve one or more underlying MAC bearers.

**outgoing call:** A call originating from a PP.

**Portable Application (PA):** A logical grouping that contains all the elements that lie beyond the DECT network boundary on the portable side.

NOTE 15: The functions contained in the portable application may be physically distributed, but any such distribution is invisible to the DECT network.

**Portable Part (DECT Portable Part) (PP):** A physical grouping that contains all elements between the user and the DECT air interface. PP is a generic term that may describe one or several physical pieces.

NOTE 16: A DECT PP is logically divided into one portable termination plus one or more portable applications.

**Portable radio Termination (PT):** A logical group of functions that contains all of the DECT processes and procedures on the portable side of the DECT air interface.

NOTE 17: A PT only includes elements that are defined in the DECT CI standard. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

**Radio Fixed Part (RFP):** One physical sub-group of an FP that contains all the radio end points (one or more) that are connected to a single system of antennas.

**registration:** An ambiguous term, that should always be qualified. See either location registration or subscription registration.

**roaming:** The movement of a PP from one FP coverage area to another FP coverage area, where the capabilities of the FPs enable the PP to make or receive calls in both areas.

NOTE 18: Roaming requires the relevant FPs and PP to be inter-operable.

**subscription registration:** The infrequent process whereby a subscriber obtains access rights to one or more FPs.

NOTE 19: Subscription registration is usually required before a user can make or receive calls.

### 3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ARI	Access Rights Identity (see SARI and TARI)
BCD	Binary Coded Decimal
BSC	GSM Base Station Controller
CC	Call Control
CCITT	(The) International Telegraph and Telephone Consultative Committee
CI	Common Interface
CISS	Call Independent Supplementary Services

CK	Cipher Key.
CLMS	ConnectionLess Message Service
COMS	Connection Oriented Message Service
CRSS	Call Related Supplementary Services
DAM	DECT Authentication Module
DAM DA	DECT Authentication Module DECT Application
DAM GA	DECT Authentication Module, GSM Application
DECT	Digital European Cordless Telecommunications
DLC	Data Link Control Layer
DSAA	DECT Standard Authentication Algorithm
DTMF	Dual Tone Multi-Frequency
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPEI	International Portable Equipment Identity
IPII	International Portable User Identity
ISDN	Integrated Services Digital Network
ISO	International Organisation for Standardisation
ISUP	Integrated Services Digital Network User Part
IWU	Inter-Working Unit
K	authentication Key
LCE	Link Control Entity
LLME	Lower Layer Management Entity
MAC	Medium Access Control Layer
MAP	GSM Mobile Application Part
MM	Mobility Management
MSB	Most Significant Bit
MS	Mobile Station
MSC	Mobile Switching Centre
NWK	NetWork Layer
OSI	Open Systems Interconnection
PA	Portable Application
PARI	Primary Access Rights Identity
PARK	Portable Access Rights Key
PCM	Pulse Coded Modulation
PE	Portable Equipment
PLMN	Public Land Mobile Network
PP	Portable Part
PSTN	Public Switched Telephone Network
PT	Portable radio Termination
PTNX	Private Telecommunications Network eXchange
PUN	Portable User Number
PUT	Portable User Type
RAND	A RANDdom challenge issued by a FP
RES	A RESponse calculated by a PP
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
RS	A value used to establish authentication session keys
SARI	Secondary Access Rights Identity
SS	Supplementary Services
SRES	A GSM specific authentication response calculated by the GSM SIM or the DAM
TARI	Tertiary Access Rights Identity
TMSI	Temporary Mobile Subscriber Identity
TPUI	Temporary Portable User Identity
TUP	Telephony User Part
UPI	User Personal Identification



### 3.3 GSM abbreviations and definitions

Definition and specific GSM abbreviations may be found in GSM 01.04 [20].

### 3.4 Symbols for status columns

The symbols defined in this subclause are applied for procedures, features, messages, information elements, fields and field codings in this ETS if not explicitly otherwise stated. The interpretation of status columns in all tables is as follows:

- M for mandatory to map/support/use;
- O for optional to map/support/use;
- I for out-of-scope (not subject for testing);
- X for prohibited or excluded to map/support/use (the message, information element may be allowed to be used in the standard/standards but it is not allowed to be mapped/used depending on the environment/dynamic conditions etc.);
- N/A or -(dash) for not applicable to map/support/use;
- C for conditional to map/support/use (the message, information element mapping depends on the selection of other optional or/and conditional items).

NOTE: The symbol "-" in the mapping section of this ETS means that there is no message, information element or coding specified in this column.

## 4 General

This ETS specifies how GSM services are provided over the DECT air interface.

One of the main objectives is to describe how the GSM services are mapped across the DECT air interface in a formal way, so that inter-operability of different manufacturer's equipment can be achieved. This is done by describing the inter-working unit procedures and mappings loosely following CCITT Recommendations Q.601 - Q.699 and by describing an air interface profile following ISO 9646-6 [28]. The later document enables the subsequent generation of tests cases, if required.

This ETS is made up of 3 main clauses:

- clause 5: Inter-working requirements - includes reference configurations and the protocol architecture models. Also describes the main service requirements. The context of the inter-working profile is also required e.g. backwards compatible with GAP etc.
- clause 6: Inter-Working Unit (IWU) mappings - shows the C-plane and U-plane mappings for the FP GSM PLMN attachment in respective order. Two IWUs are considered; the FP IWU and the PP IWU, although the FP IWU is expected to be the largest. The signalling mappings are described in terms of IWU procedures with informative data flow diagrams. Detailed descriptions follow using tables of what is mapped, what is ignored, and what is transferred transparently. These clauses also include other profile specific information such as security matters.
- clause 7: Connection types - this clause identifies the main DECT connection types (U-plane + C-plane) at the air interface supporting optimised groups of services, from the IWU mappings for different configurations/models.

## 5 Inter-working requirements

### 5.1 General

This ETS defines the mandatory requirements for the FP in terms of inter-working functions between the air interface and the external network as well as minimum requirements at the DECT air interface. It also defines the mandatory requirements for the PP in terms of inter-working functions between the air interface and the PA as well as the minimum requirements for the PP at the DECT air interface.

The inter-working mappings shall be based on the Phase 2 GSM Standards.

The basis for inter-working shall be the GSM Call Control (CC) and Mobility Management (MM) protocols defined in GSM 04.08 [23] and the Paging procedures defined in ETS 300 590 [25].

The procedures which are used depend on which Access Rights Identifier (ARI) type is chosen by the PP; either according to the minimum requirements of the GAP or the MM procedures as described in this ETS i.e. the PPs, which are based on this ETS shall always be capable of inter-working with FP which fulfil the minimum requirements of the GAP. The FPs, which fulfil the requirements of this ETS, and which support also non-GSM ARIs (classes A, B or C) shall also support the minimum requirements of the GAP.

The CC entity in both cases (GSM and non-GSM) in the FT and the PT shall also fulfil the minimum requirements defined in GAP.

This ETS defines inter-working environments for the FP and the PP in the case when DECT FPs are functionally attached to the GSM MSC i.e. broadcast attribute a39 "SIM services available" set to "1"B in all environments (public, business and residential). The PP shall be in alignment with the requirements as defined in this ETS.

General description of service requirements, functional capabilities and information flows are specified in ETS 300 466 [16].

### 5.2 Reference configurations

Reference configurations describe the functional groupings of DECT and GSM and their relationships via reference points. In general, reference points may or may not correspond to a physical interface. The functional groupings and reference points for GSM access are described in ETS 300 551 [22]. The GSM network entities and physical interfaces are described in ETS 300 522 [21]. The functional (logical) groupings and reference points for DECT are described below.

#### 5.2.1 FP functional attachment to the GSM PLMN

Reference point "a" in figure 1 is the interface which supports the functional structure of the GSM A-interface at the network layer reflecting the associated ISDN User Part (ISUP)/Telephony User Part (TUP) and GSM Mobile Application Part (MAP) functions in terms of CC and MM needed to support the basic speech service, i.e. protocols at this reference point are a subset of the standard MM and CC functions of the standard GSM A-interface. GSM Radio Resource (RR) management and other GSM specific functionality is explicitly outside the scope of this ETS. Further details are to be described in Fixed Interconnection (see Introduction).

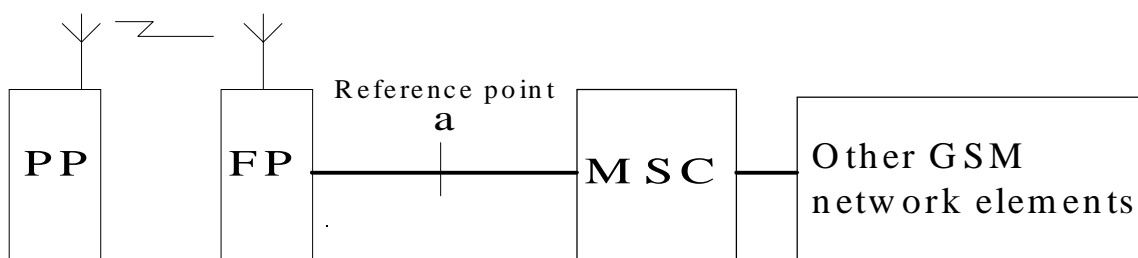


Figure 1: Attachment to the GSM PLMN

### 5.3 General inter-working model for FP GSM PLMN attachment

Inter-working models shown below are used to describe the protocol interactions at control plane (C-plane) and of the FP and PP. The protocol architecture model also shows the location of the IWUs.

The IWU (figure 2) in the FP provides the mapping of the GSM MM sub-layer (a subset of the GSM Layer 3) to the respective DECT layer 3 protocols (NWL/MM) and vice versa. The CC entity is composed of a similar inter-working model. The IWU in the PP provides the mapping of a subset of the DECT layer 3 protocols to the DAM GA/DA.

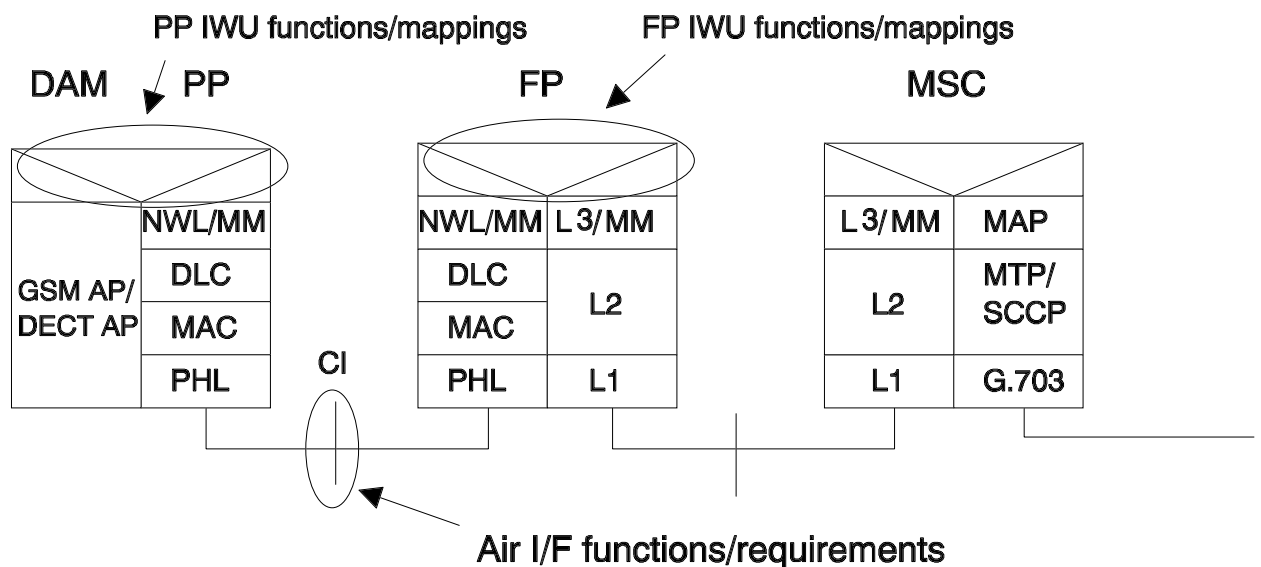


Figure 2: Inter-working model for MM for FP GSM PLMN attachment

### 5.4 Inter-working context

#### 5.4.1 General

This subclause concentrates on MM issues, since no special requirements are related to CC procedures (all CC limitation shall be stated in the Profile ICS proforma due to further standardisation).

The PP shall be backwards compatible with the minimum requirements of GAP. This means that all mandatory parts of GAP remain mandatory. The FP is based on GAP, but not all the mandatory provisions are required in all environments.

The FPs can be divided in two categories:

- a) the FPs which support ARI class D only. These FPs are "transparent" in terms of procedures and are normally initiated either by the PP or the GSM PLMN. These FPs shall support the procedures as defined in the relative subclause of clause 6 of this ETS;
- b) the FPs which support ARI classes A, B or C shall support, in addition to the procedures defined in clause 6 of this ETS, the mandatory procedures as defined in GAP.

**5.4.2 Basic inter-working rules**

In the context of this ETS, the broadcast attribute a39 (SIM services available) shall uniquely determine if the FP is attached to the GSM PLMN. The interpretation of the broadcast attribute a39, when set to value "1", is as follows:

- a) a PP shall always use IPUI type R if it wants to access a GSM PLMN;
- b) the FP belonging to ARI class A, B or C shall support the DECT/GSM profile (this ETS) in addition to the minimum requirements of the GAP. An FP belonging to ARI class D shall support the DECT/GSM profile (this ETS);
- c) the profile as defined in this ETS may be used in association with FPs belonging to any of the ARI classes A, B, C or D;
- d) a PP accessing an FP of ARI class D may attempt to access the FP/GSM PLMN regardless of the GSM Operator Code (GOP) value. If, however, the ARI class D is stored in the forbidden PLMNs list in the DAM GA, the PP shall not attempt to access the system except using manual intervention by the user;

NOTE: A standard GSM subscriber (using MS) is allowed to roam between different GSM PLMNs. No restrictions, but only a possible list of forbidden PLMNs in terms of accessing a visited PLMN, is applied.

- e) PP accessing a FP belonging to ARI class A, B or C shall have a correct Portable Access Rights Key (PARK) K value;
- f) IPUI R in the DAM DA shall have the same value as the IMSI in the DAM GA;
- g) the FP shall broadcast the ARI class D as a primary or a secondary ARI (PARI, SARI);
- h) if broadcast attribute a44 (access rights request supported) is set to value "1" the PP may perform the access rights request procedure to FPs belonging to ARI classes A, B or C using the existing IPUI type R value. If a44 is set to value "0", the access rights procedures shall not be initiated by the PP;
- i) in association with ARI class D the PP shall not initiate the following procedures: authentication of FP (using DSAA or GSM algorithm), obtaining access rights or access rights terminate procedures;
- k) in association with ARI class D the FP shall not initiate the following procedures: authentication of PP (using DSAA), authentication of user (using DSAA), key allocation, FT terminating access rights, incrementing the ZAP value.

Table 1 shows the inter-working requirements for the PP relating to different ARI classes. It is assumed that the system broadcasts "SIM services available", a39, as "1"B.

**Table 1: Inter-working matrix for the PP**

Requirements\ARI class	ARI class D	ARI class A, B or C
Access to system	Direct, no PARK required	PARK required
Subscription	IPUI type R (IMSI) only	IPUI type R (IMSI) in association with PARK

Table 2 defines the associated GSM and DECT procedures required in the FP and the PP. If a status column includes a condition, the implementation of the procedure as described in this ETS is mandatory.

**Table 2: Implementation/support requirements of DECT and GSM procedures in the FP and the PP**

GSM procedure	DECT procedure	PP	FP
Authentication procedure	Authentication of PT	M	M
Identity procedure	Identification of PT	M	M
Attach procedure	Attach (= Location registration)	M	M
Detach procedure	Detach	M	M
Location updating procedure	Location registration	M	M
TMSI re-allocation procedure	Temporary identity assignment	M	M
Ciphering procedure	Cipher-switching initiated by FT	M	M
	Cipher-switching initiated by PT	M	M
MSC associated handover	External handover	note	note
CM service procedure	Outgoing call request	M	M
MM status procedure	-	-	I
-	Authentication of user	M	C1
-	Key allocation	M	C1
-	Authentication of FT	M	C1
-	Obtaining access rights	M	C1
-	FT terminating access rights	M	C1
	PT terminating access rights	M	C2
-	Parameter retrieval (Location update)	M	M
C1: IF ARI class D THEN X ELSE O			
C2: IF ARI class D THEN X ELSE I			
NOTE: External handover is for further study.			

#### 5.4.3 Location area mapping

The following rules are applied for the functional FP to MSC attachment:

- a) RFPs belonging to the same DECT location area shall always be associated to the same GSM location area;
- b) the association of RFPs to GSM location areas (i.e. how the MSC addresses the RFPs/FPs associated to a certain GSM location area) is a implementation specific matter in the MSC and the FP.

#### 5.4.4 Interpretation of broadcast attributes

This subclause refers to annex F of ETS 300 175-5 [5] (Broadcast attributes coding). It is assumed that the DECT system is attached to a GSM PLMN.

The broadcast attributes are a small set of network layer and DLC layer capabilities (jointly known as "higher layer capabilities") that shall be broadcast regularly as part of the Medium Access Control (MAC) layer broadcast service.

**a32 ADPCM/G.721 Voice service:** shall always be set to value "1";

**a33 PAP/GAP basic voice supported:** shall always be set to value "1";

**a34 Non-voice circuit switched service:** outside the scope of this ETS;

- a35 **Non-voice packet switched service:** outside the scope of this ETS;
- a36 **Standard authentication required:** outside the scope of this ETS;
- a37 **Standard ciphering supported:** shall always be set to value "1";
- a38 **Location registration supported:** shall always be set to value "1";
- a39 **SIM services available:** this broadcast attribute is always set to the value "1" for FPs attached to GSM (PLMN);
- a40 **Non-static Fixed Part:** indicates that the FP is attached to a MS (in the case a39 is set to value "1". The procedures are for further study;
- a41 **CISS services available:** outside the scope of this ETS;
- a42 **CLMS service available:** outside the scope of this ETS;
- a43 **COMS service available:** outside the scope of this ETS;
- a44 **Access Rights requests supported:** indicates that the PP may perform the access rights procedure to systems associated to the non ARI class D systems. The PP shall not attempt to perform the Access Rights procedure associated to a system broadcasting ARI class D only;
- a45 **External handover supported:** indicates that the FP supports the external hand over procedure;
- a46 **Connection handover supported:** if the value is set to "0", the FP supports only bearer handover. If it is set to value "1" at least connection handover is being supported;
- a47 **Reserved:** outside the scope of this ETS.

## 6 Inter-working mappings, FP attached to the GSM PLMN

### 6.1 FP C-plane IWU procedures

#### 6.1.1 CC IWU procedures

##### 6.1.1.1 Normal outgoing call

Prior to a reception of a MNCC-SETUP-ind primitive from the FT, a ciphering related procedure should have been taken place.

Upon receipt of a MNCC-SETUP-ind primitive from the FT as a result of a received {CC-SETUP} message from the PT one of the following events shall occur in the FP IWU (a or b):

- a) <<CALLED-PARTY-NUMBER>> included in the {CC-SETUP} (possible only if ARI class D otherwise prohibited):
  - in the case of the {CC-SETUP} contains <<CALLED-PARTY-NUMBER>> with or without the <<SENDING-COMPLETE>> information element, the FP IWU shall interpret the dialling as finished and therefore map the DECT {CC-SETUP} to the GSM {Setup} as described in subclause 6.1.6.2.15. Prior to this the IWU shall initiate the CM service procedure as described in subclause 6.1.2.7;
  - if the MSC replies with {Call proceeding}, {Alerting} and/or {Connect} messages as responses to the {Setup} message, the mapping to corresponding DECT messages shall be done as described in subclauses 6.1.6.1.9, 6.1.6.1.8, and 6.1.6.1.10. Upon receipt of a {Connect} from the MSC, in addition to the mapping function to the FP, the FP IWU shall send a {Connect-ack} message to the MSC. MNCC-CALL-PROC-req, MNCC-ALERT-req and MNCC-CONNECT-req shall never be issued to the FT before their peer GSM messages have been received by the FP IWU;
  - if the MSC replies with a {Release} or a {Release complete} message as a response to the sent {Setup} message to the MSC, the FP IWU shall apply the appropriate release procedure defined in subclause 6.1.1.7.

NOTE 1: When the FT is in state F-03 or F-04 the FP IWU may map all received {CC-INFO} messages to GSM, but how it is done is outside the scope of this ETS (normally related to supplementary services).

The outgoing call procedure with a <<CALLED-PARTY-NUMBER>> information element included in the {CC-SETUP} message is shown in figure 3.

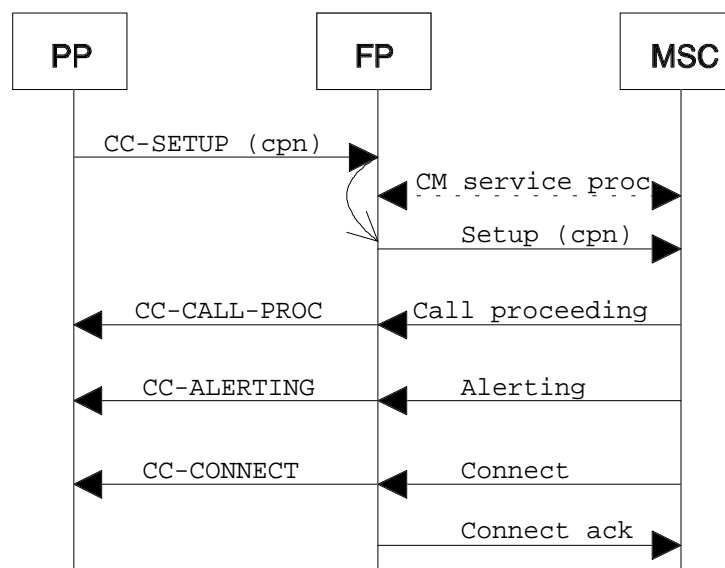


Figure 3: FP receives the dialling information (cpn) in {CC-SETUP} message

The CM service procedure (as defined in subclause 6.1.2.7) shall occur prior to the {SETUP} message being sent to the MSC. Also other GSM network initiated MM procedures may occur prior to sending the {SETUP} message.

- b) No <<CALLED-PARTY-NUMBER>> included in the {CC-SETUP}. Dialling in {CC-INFO} in DECT OVERLAP SENDING state.
- in the case of the {CC-SETUP} does not contain <<CALLED-PARTY-NUMBER>>, then the IWU shall issue a MNCC-SETUP-ACK-req primitive and this shall result in a {CC-SETUP-ACK} message being sent back to the PT. The {CC-SETUP-ACK} message shall include the <<DELIMITER-REQUEST>> information element;
  - in the error condition case, when the {CC-SETUP} does not contain <<CALLED-PARTY-NUMBER>>, but does contain <<SENDING-COMPLETE>>, then the FP IWU shall reject the {CC-SETUP} by responding with MNCC-REJECT-req primitive and this shall result in a {CC-RELEASE-COM} message being sent back to the PT;
  - after {CC-SETUP-ACK} has been sent to the PT, the IWU has to wait for dialling information in one or more <<MULTI-KEYPAD>> or in one <<CALLED-PARTY-NUMBER>> information elements in the {CC-INFO} message(s);
  - if <<CALLED-PARTY-NUMBER>> information element is used for dialling information (possible only if ARI class D otherwise prohibited.), it shall be mapped to GSM <<CALLED-PARTY-BCD-NUMBER>> information element in the {Setup} message. The mapping from {CC-INFO} to {Setup} shall be carried out as described in subclause 6.1.6.2.10;
  - if <<MULTI-KEYPAD>> information elements have been received prior to a receipt of a <<CALLED-PARTY-NUMBER>>, then the <<MULTI-KEYPAD>> information elements shall be interpreted as non-dialling information and therefore not be mapped to <<CALLED-PARTY-BCD-NUMBER>> in the GSM {Setup} message;
  - if the <<MULTI-KEYPAD>> information element is used for dialling information, then the IWU shall not send a {Setup} message to the MSC before it receives a <<SENDING-COMPLETE>> information element. Alternatively a timer can be implemented in the FP IWU. Upon receipt of the <<SENDING-COMPLETE>> information element or expiry of this timer the FP IWU shall send {Setup} to the MSC with all the stored digits received in previous {CC-INFO} messages mapped into the GSM <<CALLED-PARTY-BCD-NUMBER>> information element. The mapping from {CC-INFO} to {Setup} shall be carried out as described in subclause 6.1.6.2.10;
  - prior to sending the {Setup} message to the MSC the FP IWU shall initiate the CM service procedure as described in subclause 6.1.2.7. The CM-service procedure shall not be initiated prior to when the FP has received all dialling information;
  - if the MSC replies with {Call proceeding}, {Alerting} and/or {Connect} messages as responses to the received {Setup} message, the mapping to corresponding DECT messages shall be done as described in subclauses 6.1.6.1.9, 6.1.6.1.8, and 6.1.6.1.10. Upon receipt of a {Connect} from the MSC, in addition to the mapping function to the FP, the FP IWU shall send a {Connect-ack} message to the MSC. MNCC-CALL-PROC-req, MNCC-ALERT-req and MNCC-CONNECT-req shall never be issued to the FT before their peer GSM messages have been received by the FP IWU;
  - if the MSC replies with a {Release} message as a response to the sent {Setup} message to the MSC, the FP IWU shall apply the appropriate release procedure defined in subclause 6.1.1.7.

NOTE 2: When the FT is in state F-03 or F-04 the FP IWU may map all received {CC-INFO} messages to GSM, but how it is done is outside the scope of this ETS (normally related to supplementary services).



The outgoing call procedure with a <<CALLED-PARTY-NUMBER>> information element included in the {CC-INFO} message is shown in figure 4.

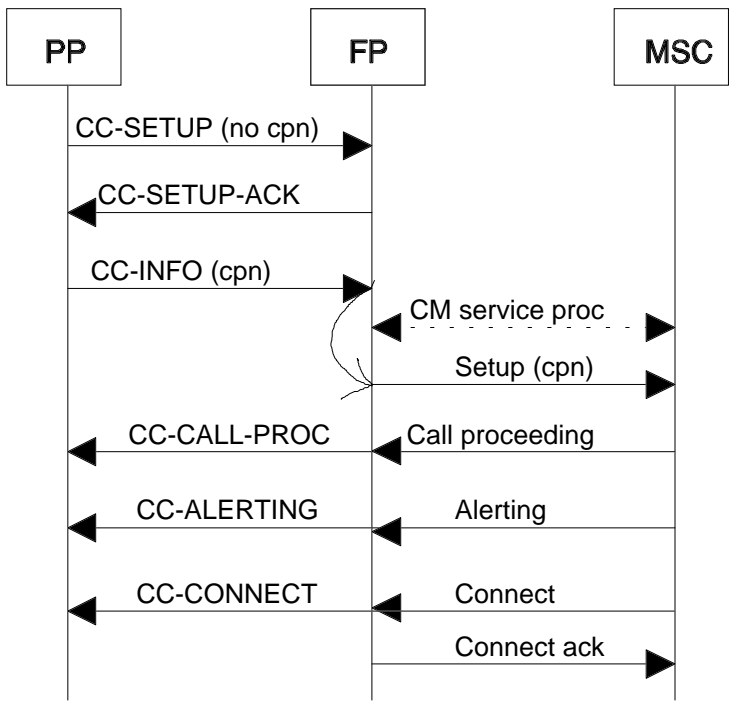


Figure 4: FP receives the dialling information (CPN) in {CC-INFO} message

The outgoing call procedure with a <<MULTI-KEYPAD>> information element included in the {CC-INFO} messages for called party addressing is shown in figure 5.

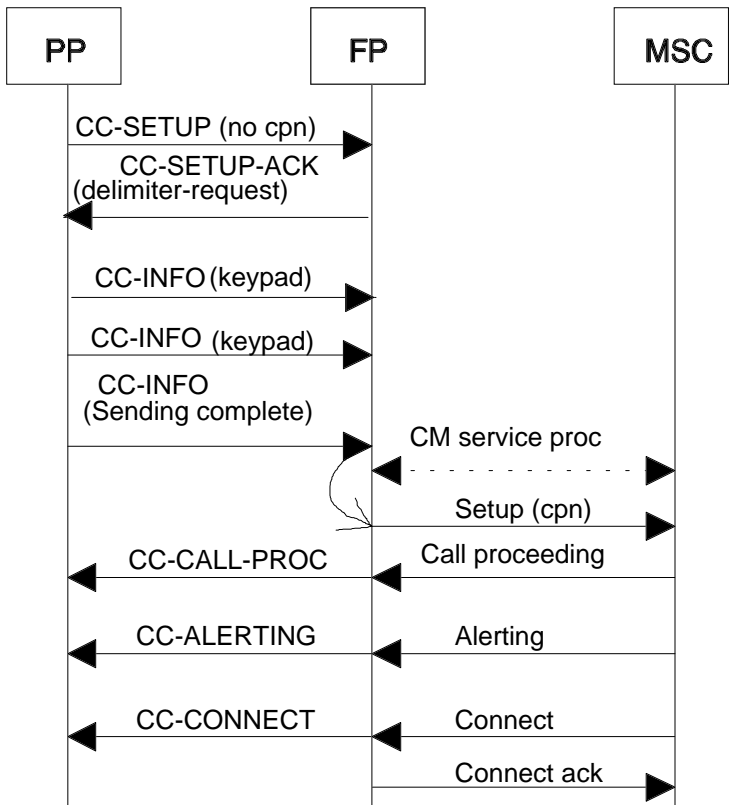


Figure 5: FP receives the dialling information (Multi keypad) in {CC-INFO} message

### 6.1.1.2 Emergency call

If the <<BASIC-SERVICE>> information element in a received {CC-SETUP} message is set to value "Emergency call set-up", then the {CC-SETUP} message shall be mapped to a {Emergency setup} message as described in subclause 6.1.6.2.16. Prior to this a CM-service procedure as described in subclause 6.1.2.7 shall take place. The value of the <<CM service type>> information element shall in this case be set to value "Emergency call establishment".

All further action in the IWU shall be the same as for a normal outgoing call.

### 6.1.1.3 Incoming call

Upon receipt of a {SETUP} message from the MSC as a result of the GSM mobile terminating call establishment procedure, the FP IWU shall issue a MNCC-SETUP-req primitive to the FT. The GSM {Setup} message shall be mapped into DECT {CC-SETUP} message as described in subclause 6.1.6.1.11.

NOTE 1: Prior to the GSM {Setup} being received at the IWU, MM-connection establishment has been achieved from the MSC to the PP using the paging procedure as described in subclause 6.1.3.

In the case that the destination PP is determined to be busy, the FP IWU shall return either a {Call confirmed} or {Release complete} to the MSC, both with cause #17 "user busy". After sending {Release complete} the FP IWU shall consider the MM-connection with the MSC as released.

The IWU shall then wait to receive MNCC-ALERT-ind or MNCC-CONNECT-ind from the FT.

In the case, where the IWU receives MNCC-ALERT-ind prior to MNCC-CONNECT-ind (figure 6), the IWU shall issue a {Call confirm} with no information elements to the MSC. Then the FP IWU shall map the {CC-ALERTING} and possible subsequent {CC-CONNECT} into the corresponding GSM messages according to subclauses 6.1.6.2.8 and 6.1.6.2.9 respectively.

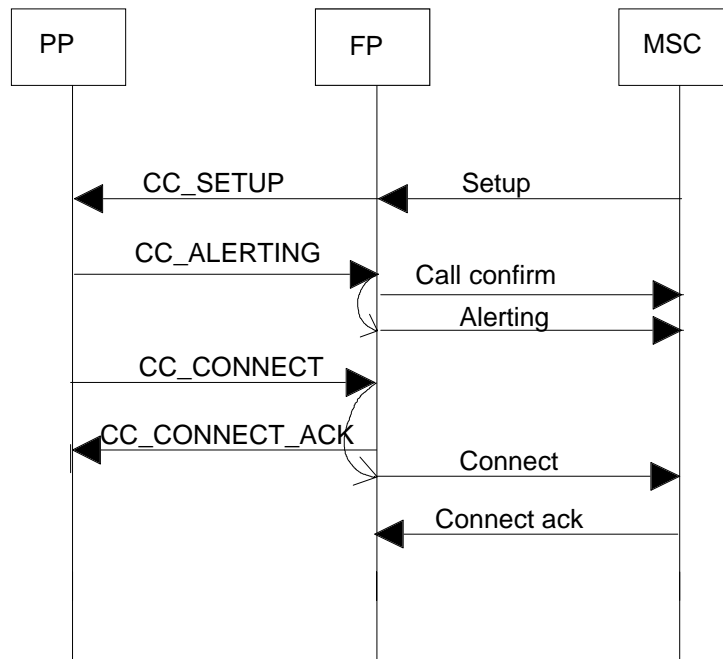


Figure 6: Incoming call where the IWU receives MNCC-ALERT-ind prior to MNCC-CONNECT-ind

In the case, where the IWU receives MNCC-CONNECT-ind without MNCC-ALERT-ind (possible only if ARI class D otherwise prohibited.) see figure 7, the IWU shall issue a {Call confirm} message with no information elements to the MSC. After this the FP IWU shall map the {CC-CONNECT} into the corresponding GSM message according to subclause 6.1.6.2.9. When the {CC-CONNECT} message is received from the PT the FT sends {CC-CONNECT-ACK} message to the PT.

NOTE 2: In both cases above, if the {Setup} message received from the MSC does not include a <<SIGNAL>> element, there is no need to await assignment of a GSM traffic channel before responding with the {Alerting} message to the MSC.

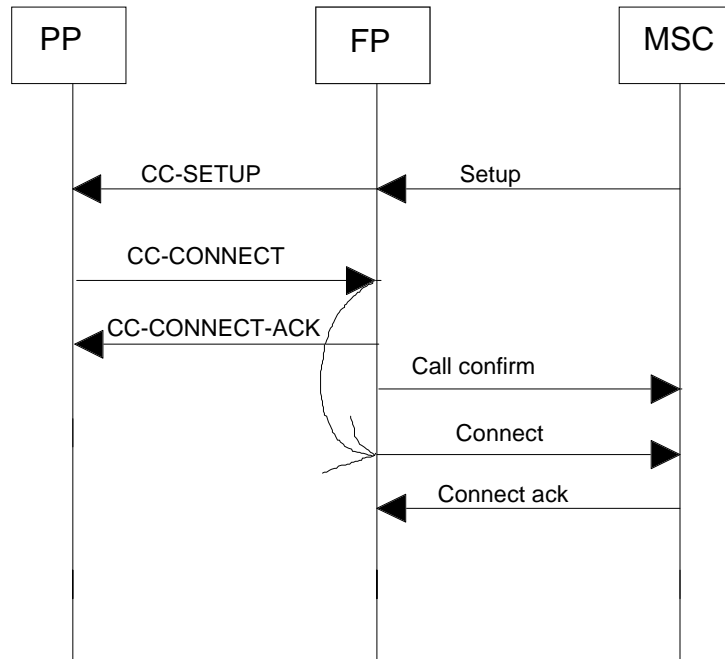


Figure 7: Incoming call where the IWU receives MNCC-CONNECT-ind without MNCC-ALERT-ind

#### 6.1.1.4 Normal call release initiated by the PP

Upon receipt of a MNCC-RELEASE-ind primitive as a result of a received {CC-RELEASE} message from the PT the FP IWU shall send a {Disconnect} message to the MSC. The mapping of the DECT {CC-RELEASE} message to the GSM {Disconnect} message is described in subclause 6.1.6.2.11.

Upon receipt of a {Release} message from the MSC, the IWU shall issue a MNCC-RELEASE-res primitive to the FT. The mapping of the GSM {Release} message to DECT {CC-RELEASE-COM} message is described in subclause 6.1.6.1.13. The FP shall also send a {Release complete} message to the MSC.

The normal call release initiated by the PP is shown in the figure 8.

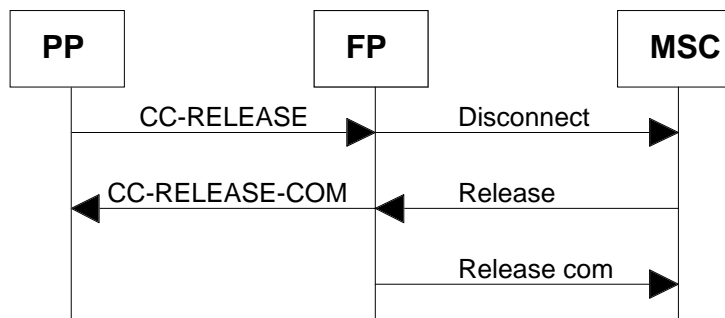


Figure 8: Normal release initiated by the PP

#### 6.1.1.5 Normal call release initiated by the GSM PLMN

The normal call release initiated by the GSM network shall be carried out by using the {Disconnect} message.

Upon receipt of a {Disconnect} message from the MSC the FP IWU shall issue a MNCC-RELEASE-req and this shall result in the {CC-RELEASE} message being sent to the PT. The mapping of the GSM {Disconnect} message to the DECT {CC-RELEASE} message is described in subclause 6.1.6.1.12.

If the FP IWU receives a MNCC-RELEASE-cfm from the FT, the DECT {CC-RELEASE-COM} message (figure 9) is mapped into the GSM {Release} as described in subclause 6.1.6.2.12 The reception of a {Release complete} message from the MSC shall terminate at the FP IWU.

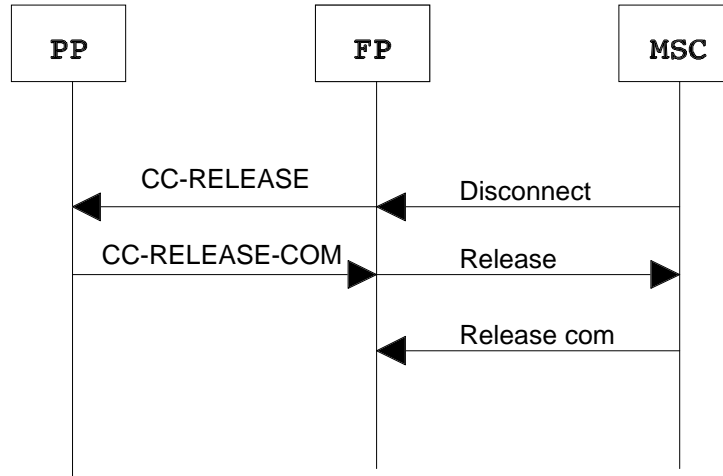


Figure 9: The MSC initiates normal call release with {DISCONNECT}

6.1.1.6 Abnormal call release initiated by the PP

Abnormal release is indicated by the unexpected receipt (without a prior transmission of a {CC-RELEASE} message) of a {CC-RELEASE-COM} message.

Case A) {CC-RELEASE-COM} received by the FT:

- upon receipt of a MNCC-REJECT-ind primitive from the FT as a {CC-RELEASE-COM} message received from the PT the FP IWU shall send a {Release} message to the MSC. The mapping of the DECT {CC-RELEASE-COM} message to the GSM {Release} message is described in subclause 6.1.6.2.12. The reception of a {Release complete} message from the MSC shall terminate at the FP IWU.

The abnormal call release initiated by the PT in this case is shown in figure 10.

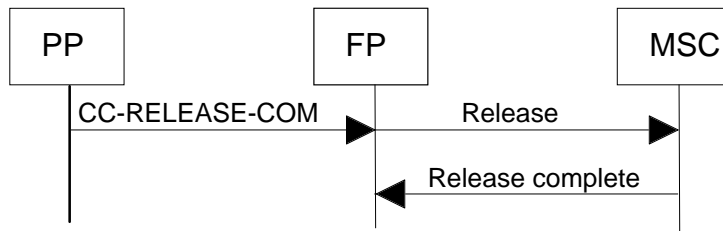


Figure 10: Abnormal call release initiated by the PT

Case B) if the {CC-RELEASE-COM} is the response to a {CC-SETUP} message triggered by a {Setup} message from the MSC:

- upon receipt of a MNCC-REJECT-ind primitive from the FT as a {CC-RELEASE-COM} message received from the PT the IWU shall send a {Release complete} message to the MSC. The mapping of the DECT {CC-RELEASE-COM} message to the GSM {Release complete} message is described in subclause 6.1.6.2.14.

The abnormal call release initiated by the PT in this case is shown in figure 11.

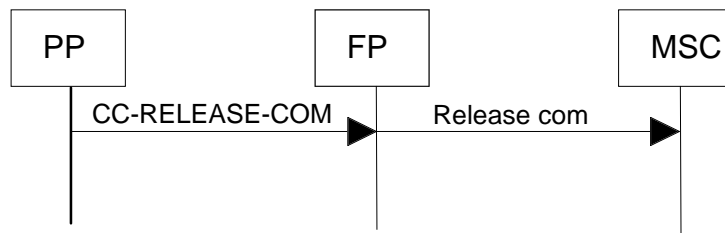


Figure 11: Abnormal call release initiated by the PT

6.1.1.7 Abnormal call release initiated by the GSM network

Abnormal call release in the sense of this subclause means that the GSM network sends a {Release} or a {Release complete} message but not as a part of the procedure described in subclause 6.1.1.6.

Upon receipt of a {Release} message from the MSC the IWU shall send {Release complete} back to the MSC and map the GSM {Release} into the DECT {CC-RELEASE-COM} message as described in subclause 6.1.6.1.13.

The abnormal call release using {Release} initiated by the MSC is shown in figure 12.

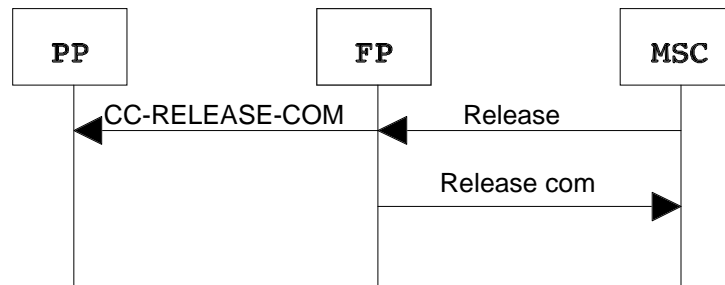


Figure 12: MSC initiates a call release with the {RELEASE} message

The MSC may send directly RELEASE COMPLETE message in this case the FP IWU shall send a MNCC-REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT.

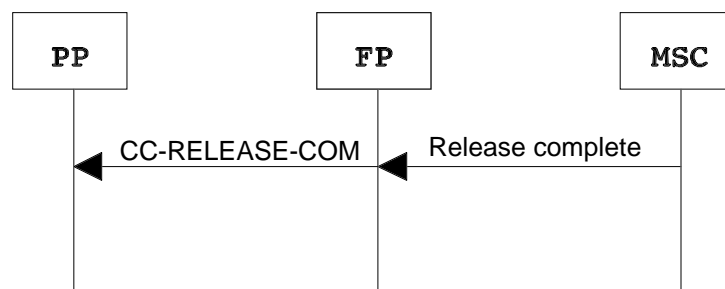


Figure 13: MSC initiates a call release with the {RELEASE COMPLETE} message

6.1.1.8 Exceptional cases

Anytime MSC may send an {Abort} message see GSM 04.08 [23] subclause 4.3.5. If the FP IWU receives {Abort} message after it has sent the {Setup} to the MSC the FP IWU shall send a MNCC-REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT carrying an appropriate release reason.

IF a release collision occurs the FP IWU shall react towards MSC as it is specified in GSM 04.08 [23] and no mapping is required i.e. no messages are required to be sent back to the PT.

Timer expiry at the MSC side shall be handled with respect to the on going procedure and existing state according to GSM 04.08 [23] and ETS 300 175-5 [5] respectively.

6.1.1.9 Other

The DLC "more bit" shall be used when doing segmentation as defined in DECT ETS 300 175-4 [4].

6.1.2 MM IWU procedures

This section defines the inter-working procedures in the FP relating to the associated DECT and GSM MM procedures.

NOTE: The GSM specific CM service procedure is initiated during the DECT call establishment phase (upon receipt of the DECT {CC-SETUP} message). With this exception, all inter-working functions in the FP are related to MM procedures on both sides (DECT and GSM).

All messages, information elements or fields within the information elements which are not mapped across the FP to the GSM network shall either be ignored or processed locally as defined in this ETS, GAP, ETS 300 175 [1] to [8] if not covered by GAP [9], or the relevant GSM specification.

The general philosophy of describing the MM inter-working procedures takes place as follows:

- a) the procedure description describes the inter-working procedures in the FP. In the procedures, references are made to subclauses relating to messages, information elements or fields within the information elements which are mapped across the inter-working unit;
- b) if no mappings are defined for data at the DECT air interface which is being received or sent (as being mandatory for the GAP or this ETS) the handling of this data is described in the procedure itself. If not, the data shall be either ignored or, if covered by GAP, shall be processed accordingly;
- c) if no mappings are defined for data described in the associated GSM specification (GSM 04.08 [23] or ETS 300 590 [25]) which is being received or sent at reference point A in normal GSM usage, the handling of this data is described in the procedure itself. If not, the processes relating to the received or sending events of this data is outside the scope of this ETS.

The general layout of the procedures is described in figure 14.

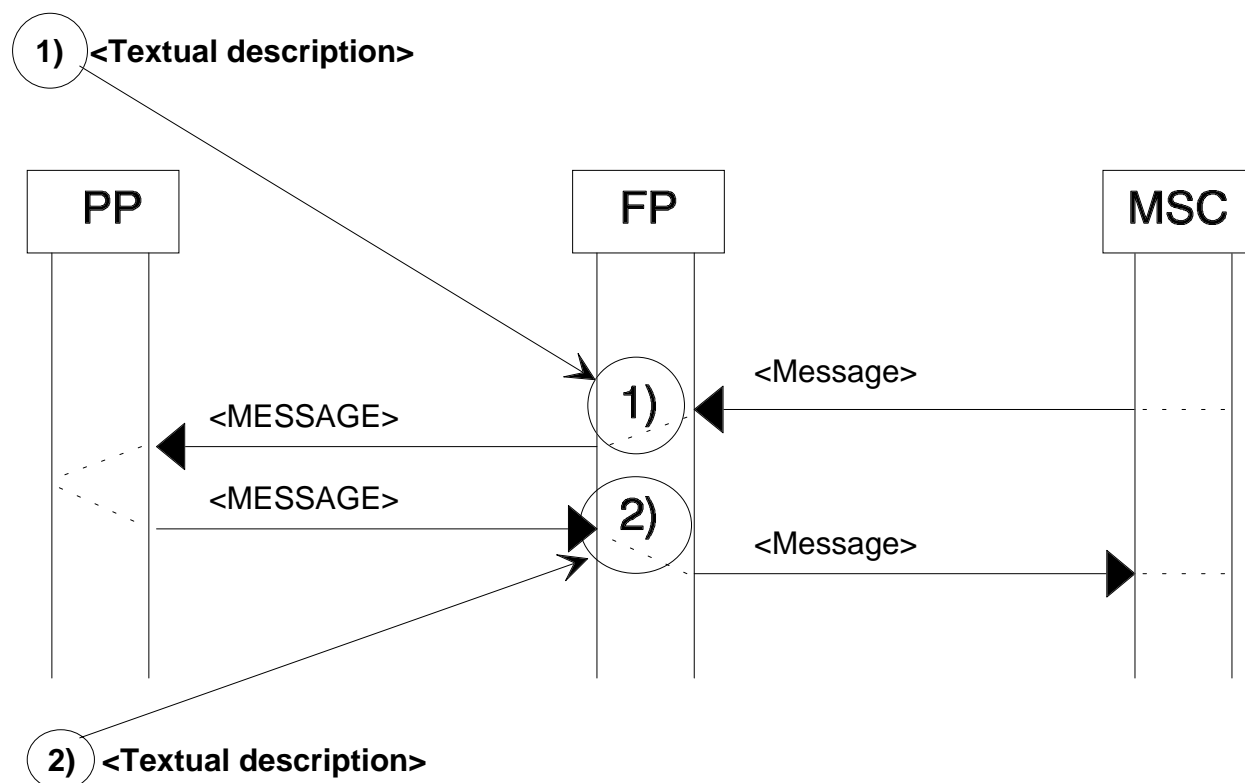


Figure 14: An example of a layout of the FP inter-working procedures

### 6.1.2.1 Authentication procedure

- 1) Upon receipt of a {Authentication request} message (figure 15) from the MSC as a result of a GSM authentication procedure as described in GSM 04.08 [23] the FP IWU shall issue a MM-AUTHENTICATE-req primitive to the FT initiating the DECT PT authentication procedure by sending a {AUTHENTICATION-REQUEST} message to the PT. The mapping of the GSM {Authentication request} message to the DECT {AUTHENTICATION-REQUEST} message is shown in subclause 6.1.6.1.1.

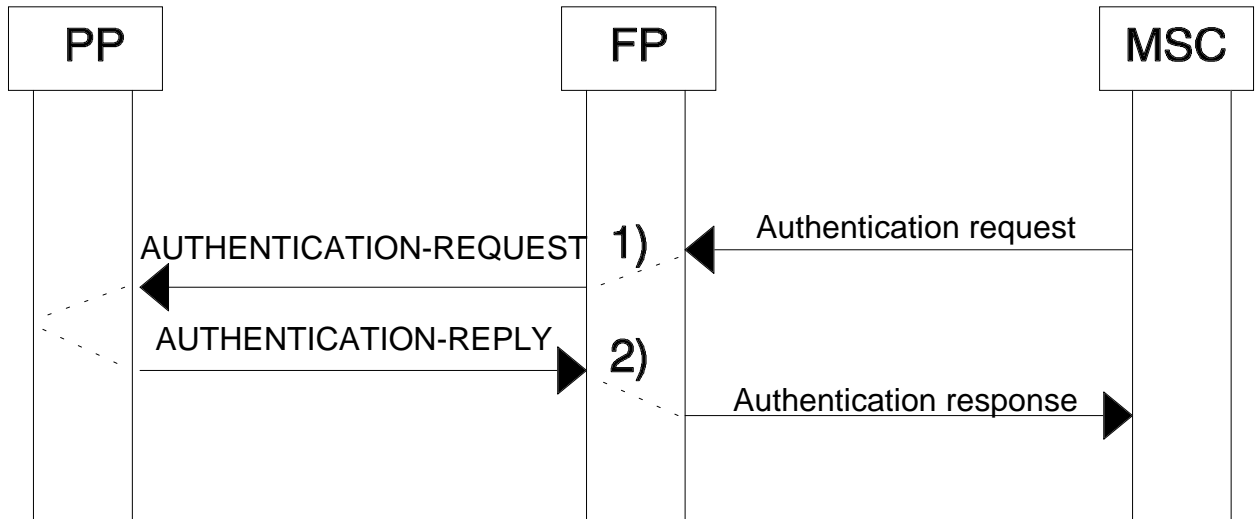


Figure 15: Authentication procedure

The fields in the <<Auth-type>> information element that are generated locally for DECT use shall have the values shown in table 3. The full mapping is described in subclause 6.1.7.1.3.

Table 3

Information element/Item number	Field	Value
<<Auth-type>>		
1	<Authentication algorithm identifier>	"00000001"B (GSM authentication algorithm)
2	<Authentication key type>	"0001"B (User authentication key)
3	<Authentication key number>	"0000" (Key associated to the active IPU)
4	<INC bit>	"0"B
5	<TXC>	"0"B (Do not include the derived cipher key in {AUTH-REPLY})
6	<UPC bit>	"1"B (Store cipher key)

- 2) Upon receipt of a MM-AUTHENTICATE-cfm primitive from the FT as a result of a received {AUTHENTICATION-REPLY} message from the PT the FP IWU shall send a {Authentication response} message to the MSC.

The mapping of the DECT {AUTHENTICATION-REPLY} message to the GSM {Authentication response} message is shown in subclause 6.1.6.2.3.

The {AUTHENTICATION-REJECT} message, if received from the PT, is terminated at the FP and no further actions are required by the FP IWU.

If the FP IWU receives a {Authentication reject} message from the MSC after sending the {Authentication response} message to the MSC the FP IWU issues a MM-AUTHENTICATE-res primitive to the FT. The FT sends a {AUTHENTICATE-REJECT} message to the PP. The mapping of the GSM {Authentication reject} to the DECT {AUTHENTICATE-REJECT} message is shown in subclause 6.1.6.1.2.

### 6.1.2.2 Identity procedure

- 1) Upon receipt of a {Identity request} message (figure 16) from the MSC as a result of a GSM identification procedure as described in GSM 04.08 [23] the FP IWU shall issue a MM-IDENTITY-req primitive to the FT initiating the DECT Identification of PT procedure by sending a {IDENTITY-REQUEST} message to the PP. The mapping of the received GSM {Identity request} message to the DECT {IDENTITY-REQUEST} message is shown in subclause 6.1.6.1.3.

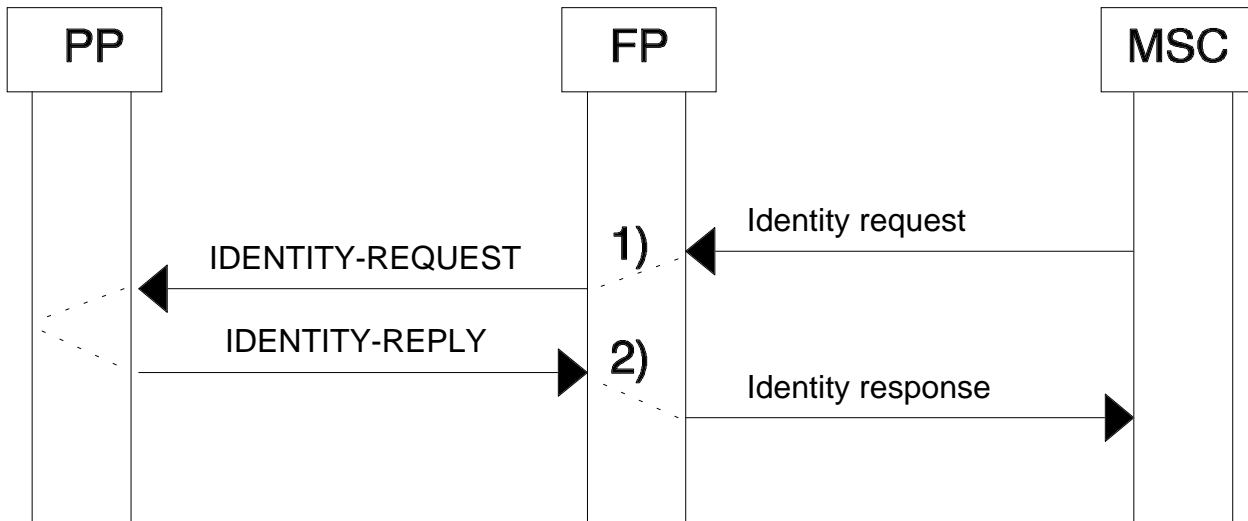


Figure 16: Identity procedure

- 2) Upon receipt of MM-IDENTITY-cfm primitive from the FT the FP IWU shall send a {Identity response} message to the MSC. The mapping of the DECT {IDENTITY REPLY} message to the GSM {Identity response} message is shown in subclause 6.1.6.2.7.

If the {IDENTITY-REPLY} message contains no information elements (meaning of identity request rejection) the FP IWU shall not map this message to the GSM {Identity response} and shall not send any message to MSC.

### 6.1.2.3 Location registration related procedures

This subclause covers three different types of GSM procedures relating to location registration.

These are:

- a) normal location updating;
- b) periodic location updating;
- c) attach procedure.



Table 4 defines which type of location updating (a, b, or c) the FP IWU shall perform towards the GSM network relating to conditions listed in table 4 (see note 1).

**Table 4: GSM network specific functions in the FP IWU after receiving a {LOCATE-REQUEST} message from the PP**

Detach performed previously	The received <Extended location information> received from the PP equivalent to the LAI associated to the RFP	Function in the FP IWU	NOTE
YES	YES	Perform attach procedure	If attach allowed by the GSM PLMN (O&M)
YES	NO	Perform normal location updating procedure	
NO	YES	Perform periodic location updating procedure	
NO	NO	Perform normal location updating procedure	

NOTE 1: Change of DECT location areas in the same GSM location area does not initiate a GSM related location registration procedure as described in this subclause. The change of the DECT location area can be determined from the received (old) <<Fixed id>> information element and the associated location area level. The FP may also use the <<Duration>> information element in order to distinguish between a "normal location updating" and "periodic location updating".

In the context of this ETS the different types of functions in the FP IWU are defined in table 5.

**Table 5: Relation of <<Location updating type>> information element value to the functions listed for the FP IWU**

Location updating type	<<Location updating type>> information element value in the {Location updating request} message to the MSC
Normal location registration	"Normal location updating"
Periodic location registration	"Periodic updating"
Attach procedure	"IMSI attach"

- 1) Upon receipt of MM-LOCATE-ind primitive from the FT as a result of a received {LOCATE-REQUEST} message from the PT (figure 17) the FP IWU shall initiate a GSM location registration procedure as described in GSM 04.08 [23] by sending a {Location updating request} message to the MSC. The mapping of the DECT {LOCATE-REQUEST} message to the GSM {Location updating request} message is shown in subclause 6.1.6.2.1.

The FT shall send a <<Mobile station class mark 1>> to the MSC.



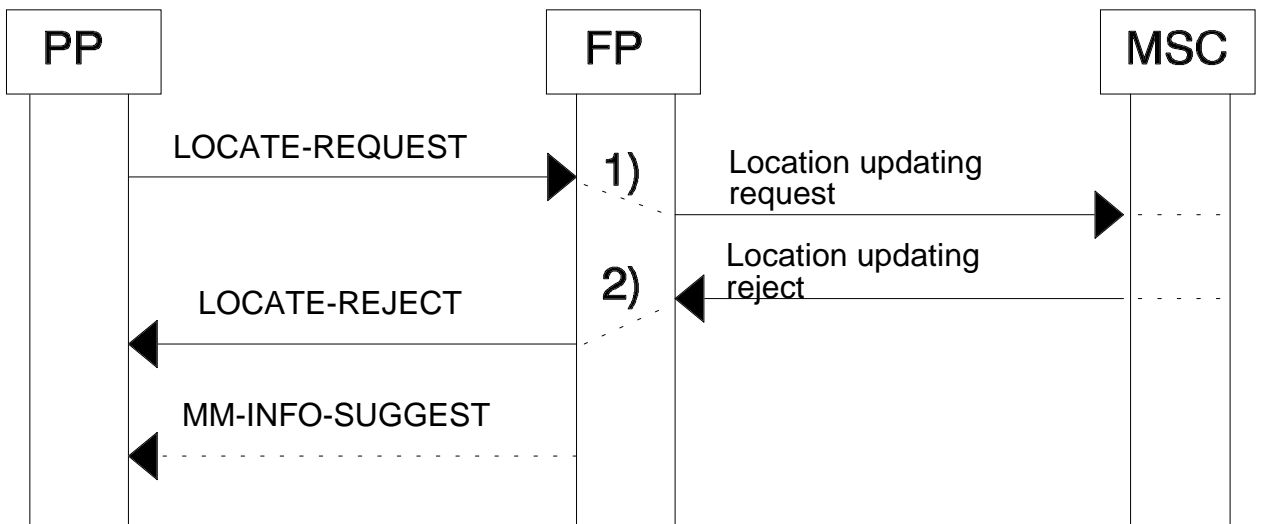


Figure 18: Location registration reject

The FP shall have knowledge of which DECT location area level corresponds the GSM LAI. The re-initialisation of the DECT location area level is needed in order to avoid the PP to initiate location updating procedure in the current GSM LAI.

#### 6.1.2.4 Detach procedure

- 1) Upon receipt of MM-DETACH-ind primitive from the FT as a result of a received {DETACH} message from the PT (figure 19) the FP IWU shall send a {IMSI detach indication} message to the MSC. The mapping of the DECT {DETACH} message to the GSM {IMSI detach indication} message is shown in subclause 6.1.6.2.4.

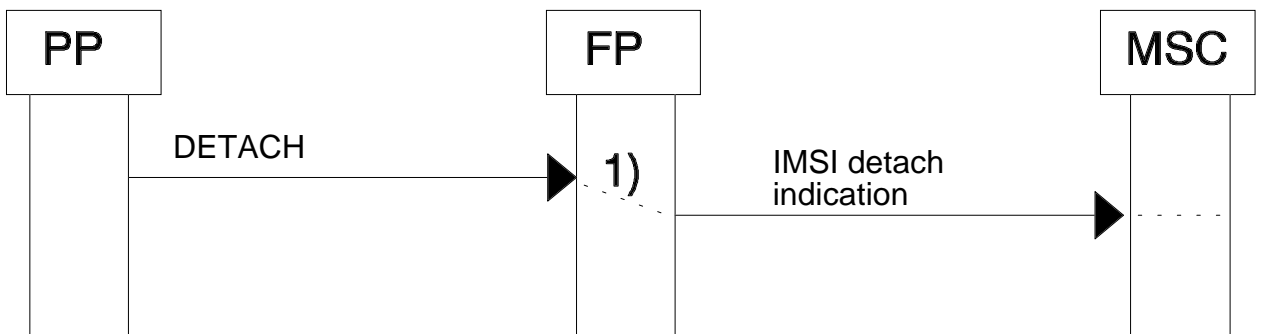
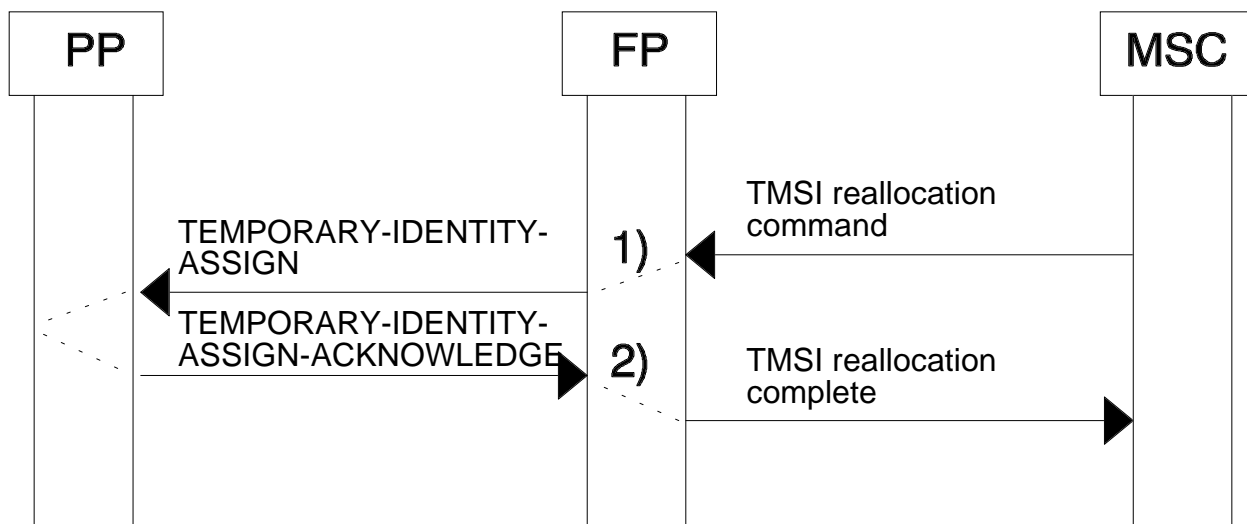


Figure 19: Detach procedure

#### 6.1.2.5 Temporary identity assignment procedures

- 1) Upon receipt of a {TMSI reallocation command} from the MSC (figure 20) as a result of a GSM TMSI re allocation procedure defined in GSM 04.08 [23] FP IWU shall issue a MM-IDENTITY-ASSIGN-req primitive to the FT initiating the temporary identity assignment procedure by sending a {TEMPORARY-IDENTITY-ASSIGN} message to the PT as described in ETS 300 175-5 [5]. The mapping of the GSM {TMSI reallocation command} message to the DECT {TEMPORARY-IDENTITY-ASSIGN} message is shown in subclause 6.1.6.1.4.



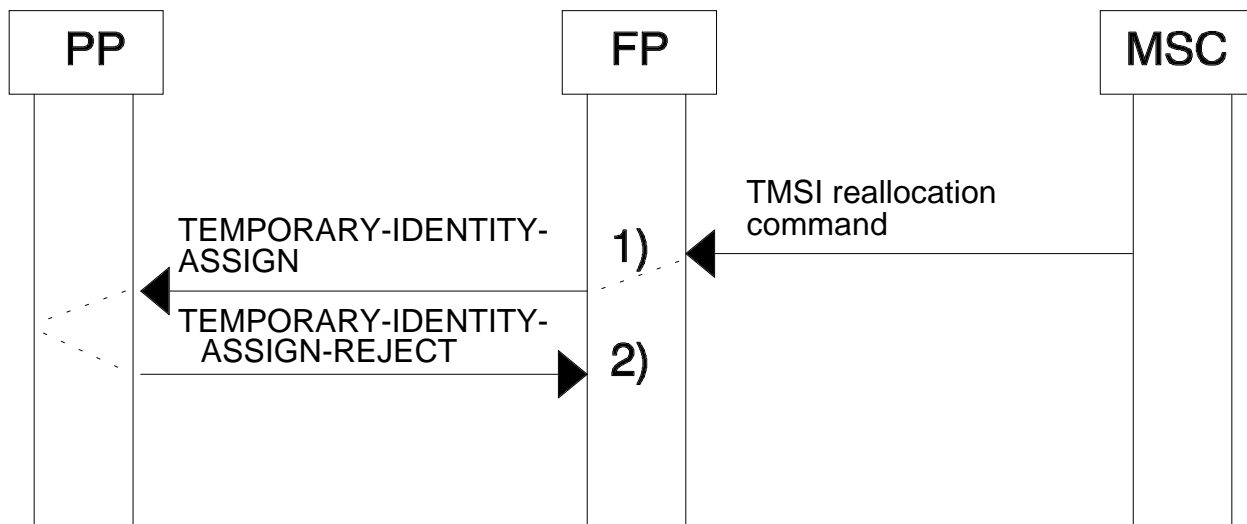
**Figure 20: TMSI reallocation procedure**

The FT can optionally send a <<Duration>> information element which is only applied for the DECT TPUI.

NOTE: Rules for TPUI assignment in relation to DECT location areas as described in GAP are applied.

- 2) Upon receipt of a MM-IDENTITY-ASSIGN-cfm primitive as a result of a received {TEMPORARY-IDENTITY-ASSIGN-ACKnowledge} message from the PT the FP IWU shall send a {TMSI-reallocation complete} message to the MSC. The mapping of the DECT {TEMPORARY-IDENTITY-ASSIGN-ACKnowledge} message to the GSM {TMSI reallocation complete} message is shown in subclause 6.1.6.2.5.

If the PT sends a {TEMPORARY-IDENTITY-ASSIGN-REJECT} reflecting in FP IWU receiving a MM-IDENTITY-ASSIGN-cfm primitive indicating "rejection" the procedure shall be terminated in the FP IWU and no message shall be sent to the MSC, see figure 21).



**Figure 21: TMSI reallocation procedure rejection from PT**

6.1.2.6 Cipherring procedure

- 1) Upon receipt of a {Cipher mode command} from the MSC as described in GSM 08.08 [25] the FP IWU shall issue a MM-CIPHER-req primitive to the FT (figure 22) which initiates the cipherring procedure by sending a {CIPHER-REQUEST} message to the PT.

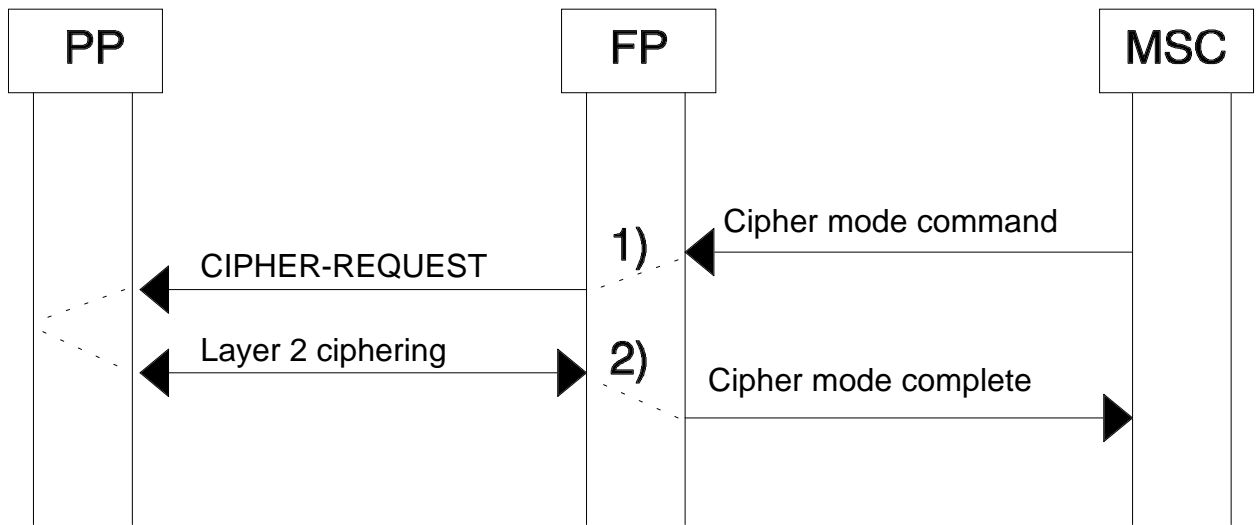


Figure 22: Cipherring procedure

The mapping of the GSM {Cipher mode command} message to the DECT {CIPHER- REQUEST} message is shown in subclause 6.1.6.1.5.

The received <<Encryption information>> in the {Cipher mode command} message shall be used as follows:

- a) the received <Key> field is used by the FP in order to generate the DECT Cipher Key (CK) as described in annex A. The calculated CK shall be used for DSAA cipherring;
- b) the <<Cipher-info>> information element field values (except <Y/N bit>) shall be set as follows: <Cipher key number> field value shall be the same one as received during a previous DECT location registration, paging, PP initiated call establishment procedure or the value given from the MSC during a previous authentication procedure depending on which one has been performed latest.

Other fields in the <<Cipher info>> information element shall be set to the values shown in table 7.

Table 7: Field values for <<Cipher info>>

Information element/Item number	Field	Value
<b>&lt;&lt;Cipher info&gt;&gt;</b>		
1	<Cipher algorithm identifier>	"0000001"B (DECT standard cipher algorithm 1)
2	<Proprietary algorithm identifier>	Not sent
3	<Cipher key type>	"1001" (Derived cipher key)

- 2) Upon receipt of a layer 2 acknowledgement the FP IWU shall send a {Cipher mode complete} message as defined in ETS 300 590 [25] to the MSC (figure 22).

The PT may reject ciphering (see figure 23):

- 1) As above.
- 2) On receipt of a MM-CIPHER-cfm primitive indicating "reject" triggered by a PT {CIPHER-REJECT} message the FP IWU shall not send message to the MSC so the procedure shall be terminated at FP IWU.

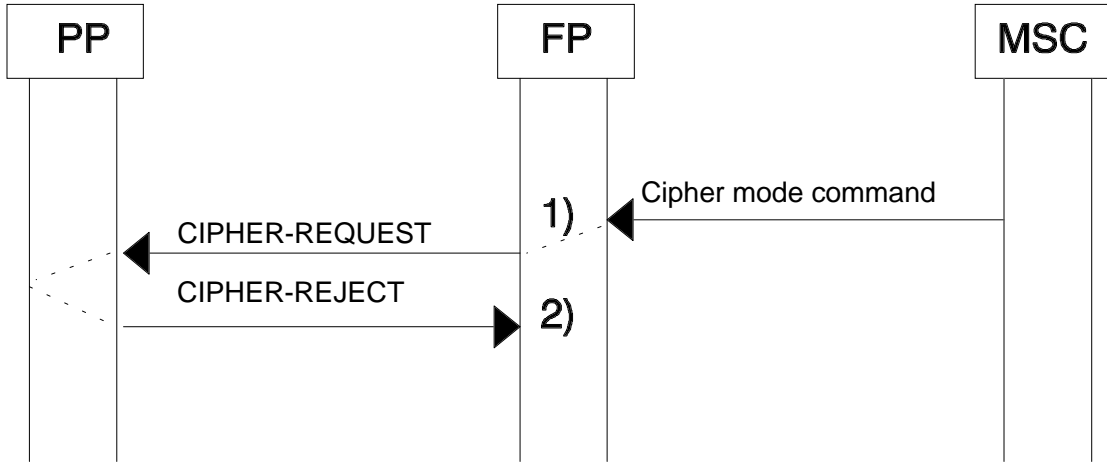


Figure 23: Ciphering procedure - rejection

6.1.2.7 CM service procedure

This procedure is associated to the initialisation of the GSM connection management entity in order to allow the usage of the GSM CC.

- 1) Upon receipt of MNCC-SETUP-ind primitive from the FT as a result of a received {SETUP} message from the PT (figure 24) the FP IWU shall initiate a GSM CM service procedure as described in GSM 04.08 [23] by sending a {CM service request} message to the MSC. The mapping of the DECT {CC-SETUP} message information elements to the GSM {CM-SERVICE-REQUEST} message is shown in subclause 6.1.6.2.6.

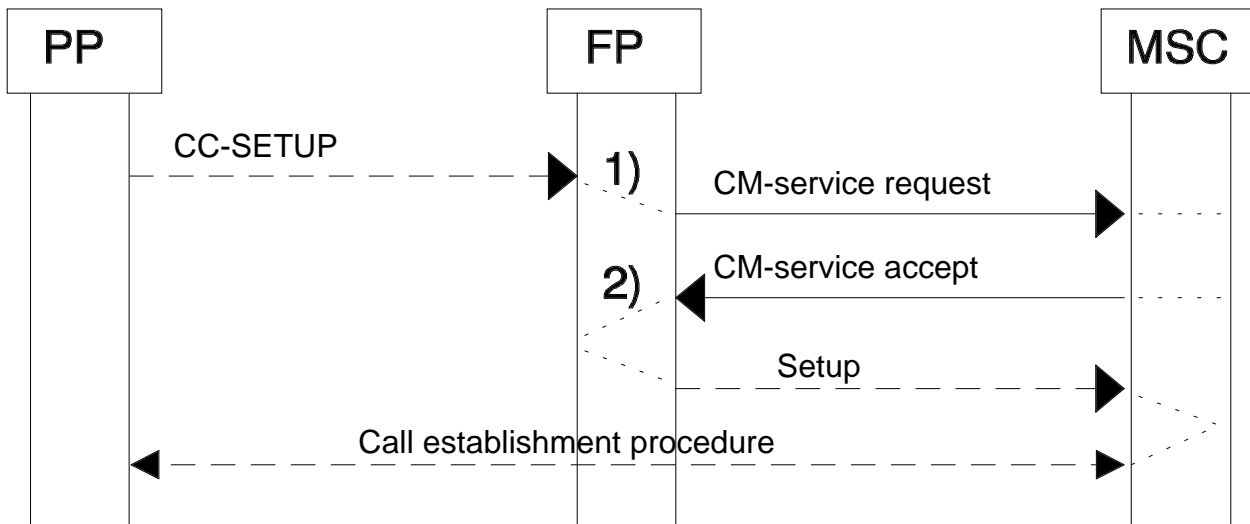


Figure 24: CM service procedure, no authentication or ciphering procedure

- 2) Upon receipt of a {CM-service accept} (figure 24) or an indication from the FT for the successful completion of the ciphering procedure (figure 25) initiated from the MSC the FP IWU shall initiate the GSM Call establishment procedure as defined in GSM 04.08 [23] by sending a {Setup} message (deriving the necessary information from the same {CC-SETUP} message) to the MSC and proceed with the call establishment procedure as defined in subclause 6.1.1.1.

If the {Cipher mode command} message is received from the MSC it is used as an implicit CM service request acknowledgement the FP IWU shall interpret the procedure terminated only when it has received an acknowledgement from the FT of successful ciphering and it has sent a {Cipher mode complete} to the MSC.

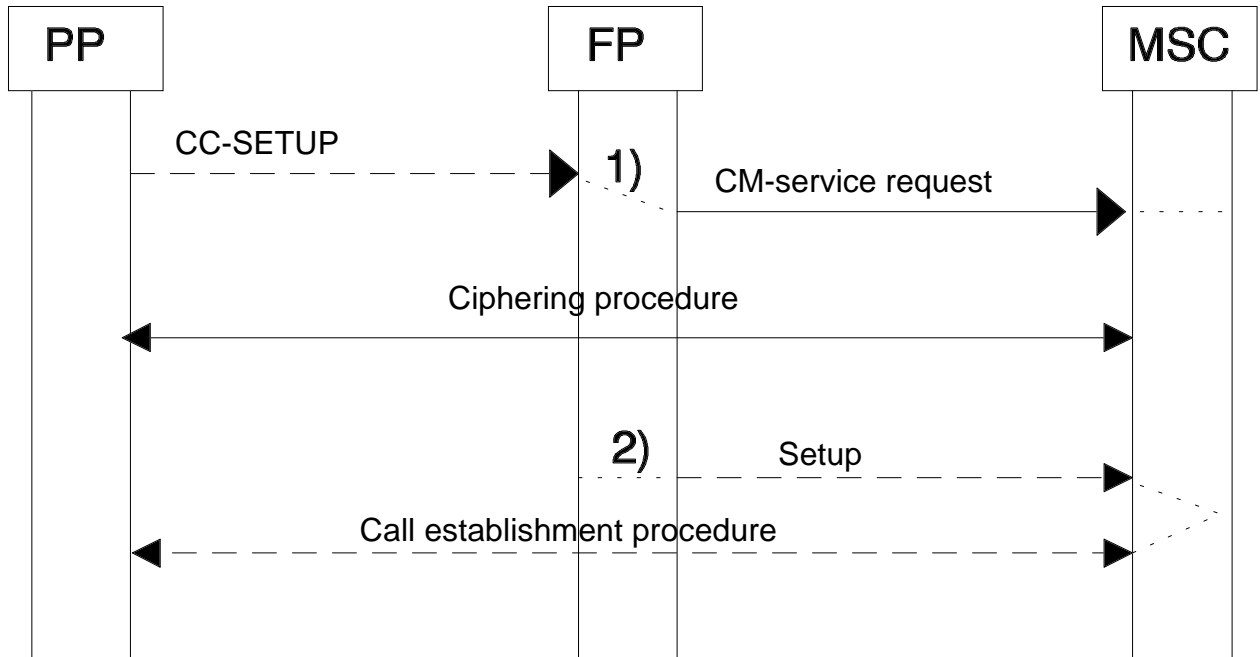


Figure 25: CM service procedure

NOTE: The CM service procedure is a GSM specific procedure in order to establish a lower layer Connection Management (CM) service to the upper GSM Connection Management (CM) sub-layers such as the CC entity. The DECT CC (CC-SETUP message) entity in this case is used to initiate the CM service procedure as well as the Call establishment procedure as defined in subclause 6.1.1.1, i.e. the CM service procedure is an intermediate event prior to proceeding with the normal Call establishment procedure between the PP and the MSC. Thus, even though initiated by the DECT CC-SETUP message, it is in principle invisible to the end-to-end CC related events.

To prevent the PT CC state machine of timing out due to eventual delay caused by the implementation of some GSM specific procedures before answering to PT the LLME shall have the possibility of requesting FT to send the {CC-NOTIFY} message with <<TIMER RESTART>> information element, thereby restarting the PT CC timer.

#### 6.1.2.8 CM service procedure abnormal cases

Any time FP IWU receives the CM SERVICE REJECT as an answer to the CM SERVICE REQUEST, it shall send a MNCC-REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT carrying an appropriate release reason.

If the FP IWU receives a {CM service reject} message with a cause value "IMSI unknown to VLR" after the CC release has been accomplished it shall initiate location update, see subclause 6.1.2.3.

PT may decide to release the setup immediately after the {CC-SETUP} has been sent sending a {CC-RELEASE} message to the FT reflecting in a MNCC-RELEASE-ind primitive to the FP IWU. Timer P<CC.03> may expire enforcing PT to send {CC-RELEASE-COM} message to the FT reflecting in a MNCC-REJECT-ind primitive to the FP IWU. In all these cases the FP IWU shall send a CM SERVICE ABORT message any time after the completion of the RR connection and not after the first CM message (e.g. SETUP) is sent.

Anytime MSC may send an {Abort} message see GSM 04.08 subclause 4.3.5. If the FP IWU receives {Abort} message before it has sent the {Setup} to the MSC the FP IWU shall send a MNCC-REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT carrying an appropriate release reason.

### 6.1.2.9 External handover procedure

The mapping of the DECT external handover procedure corresponding to the MSC associated handover procedure in the GSM PLMN is for further study.

### 6.1.3 Paging related IWU procedure

- 1) Upon receipt of a {Paging} message from the MSC (figure 26) as a result of a paging procedure as defined in ETS 300 590 [25] the FP IWU shall initiate the DECT indirect (paged) FT initiated link establishment procedure.

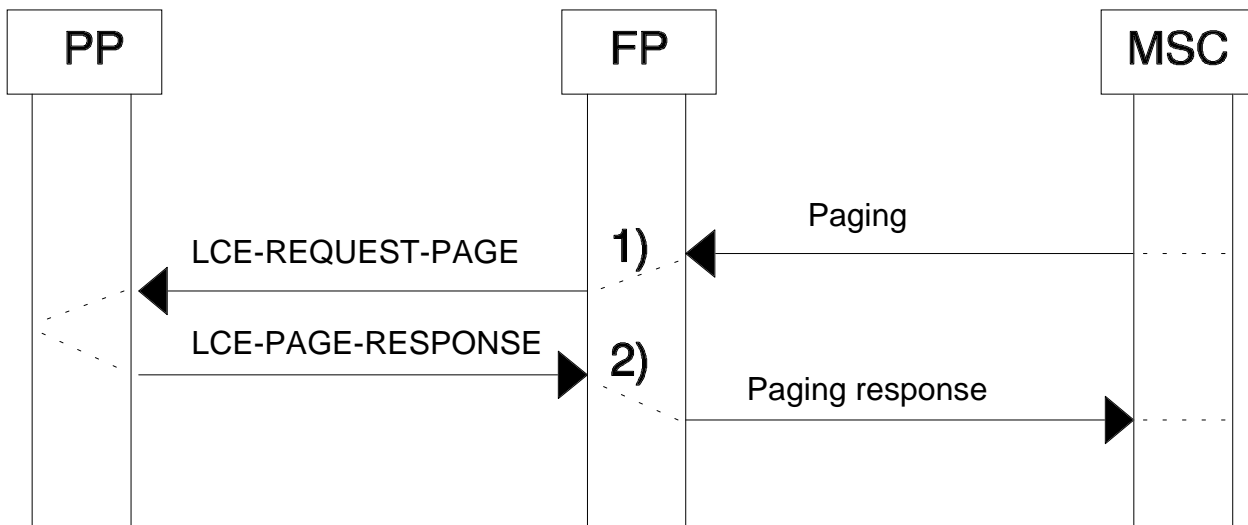


Figure 26: Paging related procedure

The received <<Mobile identity>> information element is passed on to the DECT FT Link Control Entity (LCE) which if no suitable link exists sends a {LCE-REQUEST-PAGING} message to the PT.

The received <<Mobile identity>> shall be mapped to the DECT paging identities according to one of the options listed below:

- if the FP has previously assigned an individual assigned TPUI to the PP, the FP IWU shall associate the received IPUI to the assigned TPUI which is used to page the PP;
  - if no assigned individual TPUIs have been allocated to the PP, the FP uses the default TPUI (short or the long page format).
- 2) Upon receipt of the {LCE-PAGE-RESPONSE} from the PT the FP IWU sends a {Paging response} message to the MSC. The mapping of the DECT {LCE-PAGE-RESPONSE} message to the GSM {Paging response} message is shown in subclause 6.1.6.2.2 if the <<Mobile identity>> information element in the {Paging} message was the IMSI. If the received <<Mobile identity>> information element in the {Paging} message was the <<TMSI>> and the received <<NWK assigned identity>> information element in the DECT {LCE-PAGE-RESPONSE} message was valid (as defined in annex D) the FP shall map of the DECT {LCE-PAGE-RESPONSE} message to the GSM {Paging response} message is shown in subclauses 6.1.6.2.2 and 6.1.7.2.2.

If a suitable link exists the LLME shall inform the FP IWU back and the last shall send the {Paging response} message to the MSC using the same <<Mobile identity>> as it was in the {Paging} message.



#### 6.1.4 Other specific IWU procedures

The mapping of the DECT IPEI to the GSM IMEI in the FP is defined in General Description of Service Requirements, Functional Capabilities and Information flows [16] part of the DECT/GSM IWP.

#### 6.1.5 Exception handling

##### 6.1.5.1 General

The FP shall handle the received DECT messages in error situations (e.g. protocol discriminator error) as defined in clause 17 of ETS 300 175-5 [5] as a local matter and shall not perform any inter-working mapping functions in this case.

The FP shall check the validity of the received messages from the MSC in terms of mapped information which are in the scope of this ETS relating to protocol discriminator errors, wrong message length and act as defined in clause 8 of GSM 04.08 [23] for the MS, i.e. ignore the message.

If the FP receives a message with mandatory information element error or it does not understand (support) the received message type it shall not perform any mapping functions and may return a {Status} message to the network with a relevant cause value as defined in GSM 04.08 [23].

##### 6.1.5.2 Timers

##### 6.1.5.2.1 Mobility Management (MM)

The FP follows the re transmission scheme of the GSM PLMN i.e. the FP re transmits a message only if it is re transmitted by the MSC. Neither PT nor FT shall restart any MM timer as part of one and the same procedure.

##### 6.1.5.2.2 Call Control (CC)

The CC timer handling is performed as with any external network.

#### 6.1.6 Message mappings

##### 6.1.6.1 GSM to DECT

Table 8: List of mapped MM messages

Item No	GSM Message	Status in GSM	DECT Message	Status in GAP	Ref.	Map status
1	AUTHENTICATION REQUEST	M	AUTHENTICATION REQUEST	M	6.1.6.1.1	M
2	AUTHENTICATION REJECT	M	AUTHENTICATION-REJECT	M	6.1.6.1.2	M
3	IDENTITY REQUEST	M	IDENTITY REQUEST	O	6.1.6.1.3	M
4	TMSI REALLOCATION COMMAND	M	TEMPORARY IDENTITY ASSIGN	I	6.1.6.1.4	M
5	CIPHER MODE COMMAND	M	CIPHER REQUEST	O/M	6.1.6.1.5	M
6	LOCATION UPDATING ACCEPT	M	LOCATE ACCEPT	O/M	6.1.6.1.6	M
7	LOCATION UPDATING REJECT	M	LOCATE REJECT	O/M	6.1.6.1.7	M
8	CM SERVICE REJECT	M	CC-RELEASE-COM	M	6.1.6.1.15	M
9	ABORT	M	CC-RELEASE-COM	M	6.1.6.1.16	M

Table 9: List of mapped CC messages

Item No	GSM MSG	Status in GSM	DECT MSG	Status in GAP	Ref.	Map Status
1	ALERTING	M	CC-ALERTING	O	6.1.6.1.8	M
2	CALL PROC	M	CC-CALL-PROC	O	6.1.6.1.9	M
3	CONNECT	M	CC-CONNECT	M	6.1.6.1.10	M
4	DISCONNECT	M	CC-RELEASE	M	6.1.6.1.12	M
5	RELEASE	M	CC-RELEASE-COM	M	6.1.6.1.13	M
6	RELEASE-COMPLETE	M	CC-RELEASE-COM	M	6.1.6.1.14	M
7	SETUP	M	CC-SETUP	M	6.1.6.1.11	M

6.1.6.1.1 AUTHENTICATION REQUEST-AUTHENTICATION REQUEST

Table 10

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	AUTHENTICATION-REQUEST	AUTHENTICATION-REQUEST			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Cipher key sequence number	Auth type	6.1.7.1.3	M	
5	Auth. parameter RAND	RAND	6.1.7.1.2	M	

6.1.6.1.2 AUTHENTICATION REJECT-AUTHENTICATION-REJECT

Table 11

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	AUTHENTICATION-REJECT	AUTHENTICATE-REJECT			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	

6.1.6.1.3 IDENTITY-REQUEST - IDENTITY-REQUEST

Table 12

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	IDENTITY-REQUEST	IDENTITY-REQUEST			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Identity type	Identity type	6.1.7.1.5	M	

6.1.6.1.4 TMSI REALLOCATION COMMAND - TEMPORARY-IDENTITY-ASSIGN

Table 13

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	TMSI REALLOCATION COMMAND	TEMPORARY-IDENTITY ASSIGN			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Location area identification	Location area	6.1.7.1.4	M	
5	Mobile identity	NWK assigned identity	6.1.7.1.1	M	

6.1.6.1.5 CIPHERING MODE COMMAND - CIPHER-REQUEST

Table 14

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	CIPHERING MODE COMMAND	CIPHER-REQUEST			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Ciphering Mode Setting	Cipher-info	6.1.8.1.8	M	For the precise constriction see subclause 6.1.2.6 as well.
5	Cipher response	-		-	The FP IWU shall remember this request (if present) and shall add the IMEI corresponding to the relevant PP to the {Ciphering mode complete} message.

6.1.6.1.6 LOCATION UPDATING ACCEPT - LOCATE-ACCEPT

Table 15

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	LOCATION UPDATING ACCEPT	LOCATE ACCEPT			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Location area identification	Location area	6.1.7.1.4	M	
5	Mobile identity	NWK assigned identity	6.1.7.1.1	C1	
6	Follow on proceed	-		-	
C1: IF GSM <<Mobile identity>> information element includes a GSM TMSI THEN M ELSE IF GSM <<Mobile identity>> information element includes IMSI THEN assign invalid TMSI value ELSE X (see subclauses 6.1.2.3, 2)					

6.1.6.1.7 LOCATION UPDATING REJECT - LOCATE-REJECT

Table 16

Item No	Message coding GSM	Message coding DECT	Ref	Map. status	NOTE
	LOCATION UPDATING REJECTED	LOCATE REJECT			
1	Protocol discriminator	Protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	Transaction identifier	6.1.8.1.25	M	
3	Message type	Message type	6.1.8.1.3	M	
4	Reject cause	Reject reason	6.1.7.1.6	M	

6.1.6.1.8 ALERTING - CC-ALERTING

Table 17

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	ALERTING	CC-ALERTING			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	facility	facility		I	
5	progress indicator	progress indicator	6.1.7.1.8	M	
6	user-user	iwu to iwu	-	I	

6.1.6.1.9 CALL-PROC - CC-CALL-PROC

Table 18

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	CALL-PROCEEDING	CC-CALL-PROCEEDING			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	Repeat indicator	-		-	
5	Bearer capability 1	-		-	
6	Bearer capability 2	-		-	
7	Progress indicator	progress indicator	6.1.7.1.8	M	

6.1.6.1.10 CONNECT - CC-CONNECT

Table 19

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	CONNECT	CC-CONNECT			
1	protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	transaction identifier	transaction identifier	6.1.8.1.2	M	
3	message type	message type	6.1.8.1.3	M	
5	facility	facility		I	
6	progress indicator	progress indicator	6.1.7.1.8	M	
10	user to user	iwu to iwu		I	

6.1.6.1.11 SETUP - CC-SETUP

Table 20

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	SETUP	CC-SETUP			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	Repeat indicator	-		X	
5	Bearer capability 1	basic service	6.1.7.1.7	M	
5a	Bearer capability 2	-		X	
6	Facility	facility		I	
8	Progress indicator	progress indicator	6.1.7.1.8	M	
9	Signal	signal	6.1.7.1.11	M	
10	calling party BCD number	calling party number		I	
11	calling party subaddress	iwu to iwu		I	
12	called party BCD number	called party number		I	
13	called party subaddress	called party subaddress		I	
14	repeat indicator	-		X	
15	low layer compatibility	iwu to iwu		I	
16	repeat indicator	-		X	
17	high layer compatibility	iwu to iwu		I	
18	user to user	iwu to iwu		I	

6.1.6.1.12 DISCONNECT - CC-RELEASE

Table 21

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	DISCONNECT	CC-RELEASE			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	Cause	release reason	6.1.7.1.9	O	
5	Facility	facility		I	
6	Progress indicator	-		X	
7	-	display		X	
8	-	feature indicate		X	
9	User-user	iwu to iwu		I	
10	-	iwu packet		X	

6.1.6.1.13 RELEASE - CC-RELEASE-COM

Table 22

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	RELEASE	CC-RELEASE-COM			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	Cause	release reason	6.1.7.1.9	O	
5	Second cause	-		X	
6	Facility	facility		I	
7	User-user	iwu to iwu		I	

6.1.6.1.14 RELEASE COMPLETE - CC-RELEASE-COM

Table 23

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	RELEASE COMPLETE	CC-RELEASE-COM			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Transaction identifier	transaction identifier	6.1.8.1.2	M	
3	Message type	message type	6.1.8.1.3	M	
4	Cause	release reason	6.1.7.1.9	O	
5	Facility	facility		I	
7	User-user	iwu to iwu		I	

6.1.6.1.15 CM SERVICE REJECT - CC-RELEASE-COM

Table 24

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	CM SERVICE REJECT	CC-RELEASE-COM			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	transaction identifier	6.1.8.1.25	M	
3	Message type	message type	6.1.8.1.3	M	
4	Reject cause	release reason	6.1.7.1.10	M	

6.1.6.1.16 ABORT - CC-RELEASE-COM

Table 25

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	ABORT	CC-RELEASE-COM			
1	Protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	Skip indicator	transaction identifier	6.1.8.1.25	M	
3	Message type	message type	6.1.8.1.3	M	
4	Reject cause	release reason	6.1.7.1.10	M	

6.1.6.2 DECT to GSM

Table 26: List of mapped MM messages

Item No	DECT Message	Status in GAP	GSM Message	Status in GSM	Ref.	Map status
1	LOCATE-REQUEST	O/M	LOCATION - UPDATING-REQUEST	M	6.1.6.2.1	M
2	LCE-PAGE-RESPONSE	M	PAGING-RESPONSE	M	6.1.6.2.2	M
3	AUTHENTICATION- REPLY	O/M	AUTHENTICATION RESPONSE	M	6.1.6.2.3	M
4	DETACH	I	IMSI DETACH INDICATION	M	6.1.6.2.4	M
5	TEMPORARY- IDENTITY-ASSIGN-ACK	O/M	TMSI REALLOCATION COMPLETE	M	6.1.6.2.5	M
6	CC-SETUP	M	CM SERVICE REQUEST	M	6.1.6.2.6	M
7	IDENTITY-REPLY	O	IDENTITY RESPONSE	M	6.1.6.2.7	M

Table 27: List of mapped CC messages

Item No	DECT MSG	Status in GAP	GSM MSG	Status in GSM	Ref.	Map Status
1	CC-ALERTING	M	ALERTING	M	6.1.6.2.8	M
2	CC-CONNECT	M	CONNECT	M	6.1.6.2.9	M
3	CC-INFO (F-02)	M	SETUP	M	6.1.6.2.10	M
4	CC-RELEASE	M	DISCONNECT	M	6.1.6.2.11	M
5	CC-RELEASE	M	RELEASE	M	6.1.6.2.12	M
6	CC-RELEASE-COM	M	RELEASE	M	6.1.6.2.13	M
7	CC-RELEASE-COM	M	RELEASE-COMPLETE	M	6.1.6.2.14	M
8	CC-SETUP	M	SETUP	M	6.1.6.2.15	M
9	CC-SETUP	I	EMERGENCY SETUP	M	6.1.6.2.16	M
10	CC-RELEASE	M	CM SERVICE ABORT	M	6.1.6.2.17	M
11	CC-RELEASE-COM	M	CM SERVICE REJECT	M	6.1.6.2.18	M

6.1.6.2.1 LOCATE-REQUEST - LOCATION-UPDATING-REQUEST

Table 28

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	LOCATE-REQUEST	LOCATION-UPDATING-REQUEST			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
4	Portable identity	Mobile identity	6.1.7.2.1	C1	
5	Location area	Location area identification	6.1.7.2.3	M	
6	Network assigned identity	Mobile identity	6.1.7.2.2	C2	
7	Cipher info	Cipher key sequence number	6.1.7.2.4	M	
8	-	Location updating type	-	X	(note)
9	Setup capability	Mobile station classmark 1	6.1.7.2.8	M	
<p>C1: IF &lt;&lt;Network assigned identity&gt;&gt; information element or the &lt;Extended location information&gt;&gt; field in the &lt;&lt;Location area&gt;&gt; information element is not valid (see annex B) THEN M ELSE X.</p> <p>C2: IF &lt;&lt;Network assigned identity&gt;&gt; information element and &lt;Extended location information&gt;&gt; field in the &lt;&lt;Location area&gt;&gt; information element are valid (see annex B) THEN M ELSE X.</p> <p>NOTE: This information element does not exist at the DECT air interface. The value of this information element depends on previous transactions as described in subclause 6.1.2.3.</p>					

6.1.6.2.2 LCE-PAGE-RESPONSE - PAGING RESPONSE

Table 29

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	LCE-PAGE-RESPONSE	PAGING RESPONSE			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
4	Portable identity	Mobile identity	6.1.7.2.1	M	
5	Fixed identity	-		X	
6	NWK assigned identity	-		X	
7	Cipher info	Cipher key sequence number	6.1.7.2.4	M	
8	-	Mobile station classmark 2		X	(note)

NOTE: Mobile station classmark information element is generated locally at the FP IWU see ETS 300 xxx[16].

6.1.6.2.3 AUTHENTICATION-REPLY - AUTHENTICATION RESPONSE

Table 30

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	AUTHENTICATION-REPLY	AUTHENTICATION RESPONSE			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
4	RES	Auth. parameter SRES	6.1.7.2.5	M	

6.1.6.2.4 DETACH - IMSI DETACH INDICATION

Table 31

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	DETACH	IMSI-DETACH-INDICATION			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
	Portable identity	Mobile identity	6.1.7.2.6	C1	
5	Network assigned identity	Mobile identity	6.1.7.2.2	C2	
6	-	Mobile station classmark 1		X	(note)

C1: IF <<Network assigned identity>> information element valid (see annex B) THEN M ELSE X.  
C2: IF <<Network assigned identity>> information element is not valid (see annex B) THEN M ELSE X.  
NOTE: Mobile station classmark information element is generated locally at the FP IWU see ETS 300 466 [16].



6.1.6.2.5 TEMPORARY-IDENTITY-ASSIGN-ACK - TMSI REALLOCATION COMPLETE

Table 32

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	TEMPORARY-IDENTITY-ASSIGN-ACK	TMSI REALLOCATION COMPLETE			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	

6.1.6.2.6 CC-SETUP - CM SERVICE REQUEST

Table 33

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	CC-SETUP	CM SERVICE REQUEST			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
4	Portable identity	Mobile identity	6.1.7.2.1	M	
5	Basic service	CM service type	6.1.7.2.7	M	
6	Basic service	Mobile station classmark 2	6.1.7.2.9	M	
7	Cipher info	Ciphering key sequence number	6.1.7.2.4	M	

6.1.6.2.7 IDENTITY-REPLY - IDENTITY RESPONSE

Table 34

Item No	Message coding DECT	Message coding GSM	Ref	Map. status	NOTE
	IDENTITY-REPLY	IDENTITY RESPONSE			
1	Protocol discriminator	Protocol discriminator	6.1.8.2.1	M	
2	Transaction identifier	Skip Indicator	6.1.8.2.24	M	
3	Message type	Message type	6.1.8.2.3	M	
4	NWK assigned identity	Mobile identity	6.1.7.2.2	C1	
5	Portable identity	Mobile identity	6.1.7.2.6	C2	
<p>C1: IF &lt;&lt;Network assigned identity&gt;&gt; information element and &lt;Extended location information&gt;&gt; field in the &lt;&lt;Location area&gt;&gt; information element are valid (see annex B) THEN M ELSE X.</p> <p>C2: IF &lt;&lt;Network assigned identity&gt;&gt; information element or the &lt;Extended location information&gt;&gt; field in the &lt;&lt;Location area&gt;&gt; information element is not valid (see annex B) THEN M ELSE X.</p>					

6.1.6.2.8 CC-ALERTING - ALERTING

Table 35

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-ALERTING	ALERTING			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	call attributes	-		X	
5	connection identity	-		X	
6	facility	facility		I	
7	progress indicator	-		X	
8	display	-		X	
9	signal	-		X	
10	feature indicate	-		X	
11	terminal capability	-		X	
12	transit delay	-		X	
13	window size	-		X	
14	iwu to iwu	user to user		I	
15	iwu packet	-		X	
16	-	SS version indicator		I	Relate to facility

6.1.6.2.9 CC-CONNECT - CONNECT

Table 36

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-CONNECT	CONNECT			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	call attributes	-		X	
5	connection identity	-		X	
6	facility	facility		I	
7	progress indicator	-		X	
8	display	-		X	
9	signal	-		X	
10	feature indicate	-		X	
11	terminal capability	-		X	
12	transit delay	-		X	
13	window size	-		X	
14	iwu to iwu	user to user		I	
15	iwu packet	-		I	
16	-	SS version indicator		I	Relate to facility

6.1.6.2.10 CC-INFO (F-02) - SETUP

Table 37

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-INFO (F-02)	SETUP			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	location area	-		I	
5	nwk assigned identity	-		I	
6	facility	-		I	
7	progress indicator	-		X	
8	display	-		X	
9	multi keypad	called party number	6.1.7.2.12	C1	
10	signal	-		X	
11	feature activate	-		I	
12	feature indicate	-		X	
13	network parameter	-		I	
14	called party number	-		X	
15	called party subaddress	-		I	
16	sending complete	-		I	
17	test hook control	-		X	
18	iwu to iwu	-		I	
19	iwu packet	-		I	

C1: IF keys are dialling information THEN M ELSE X

6.1.6.2.11 CC-RELEASE - DISCONNECT

Table 38

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE	DISCONNECT			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	cause	6.1.7.2.14	O	
5	facility	-		X	
6	display	-		X	
7	feature indicate	-		X	
8	iwu to iwu	user to user		I	
9	iwu packet	-		I	

6.1.6.2.12 CC-RELEASE - RELEASE

Table 39

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE	RELEASE			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	cause	6.1.7.2.14	O	
5	facility	-		X	
6	display	-		X	
7	feature indicate	-		X	
8	iwu to iwu	user to user		I	
9	iwu packet	-		I	

6.1.6.2.13 CC-RELEASE-COM - RELEASE

Table 40

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE-COM	RELEASE			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	cause	6.1.7.2.14	O	
5	identity type	-		X	
6	location area	-		X	
7	iwu attributes	-		X	
8	facility	-		X	
9	display	-		X	
10	feature indicate	-		X	
11	network parameter	-		X	
12	iwu to iwu	user to user		I	
13	iwu packet	-		I	

6.1.6.2.14 CC-RELEASE-COM - RELEASE-COMPLETE

Table 41

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE-COM	RELEASE-COMPLETE			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	cause	6.1.7.2.14	O	
5	identity type	-		X	
6	location area	-		X	
7	iwu attributes	-		X	
8	facility	-		X	
9	display	-		X	
10	feature indicate	-		X	
11	network parameter	-		X	
12	iwu to iwu	user to user		I	
13	iwu packet	-		I	

6.1.6.2.15 CC-SETUP - SETUP

Table 42

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-SETUP	SETUP			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.2.3	M	
4	portable identity	-		I	
5	fixed identity	-		I	
6	Basic service	Bearer capabilities	6.1.7.2.10	M	
7	iwu attributes	-		I	
8	repeat indicator	-		I	
9	call attributes	-		I	
10	repeat indicator	-		I	
11	connection attributes	-		I	
12	cipher info	-		I	Used in CM service procedure
13	connection identity	-		X	
14	facility	-		I	
15	progress indicator	-		X	Not allowed in this direction in DECT
16	display	-		X	
17	multi keypad	-		I	
18	signal	-		X	
19	feature activate	-		I	
20	feature indicate	-		X	
21	network parameter	-		I	Used external H/O procedure
22	terminal capability	-		I	
23	end to end compatibility	-		I	
24	rate parameter	-		X	
25	transit delay	-		X	
26	window size	-		X	
27	calling party number	-		I	
28	called party number	called party number	6.1.7.2.11	M	
29	called party subaddress	-		I	
30	sending complete	-		X	
31	iwu to iwu	-		X	
32	iwu packet	-		X	

6.1.6.2.16 CC-SETUP - EMERGENCY-SETUP

Table 43

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-SETUP	EMERGENCY-SETUP			
1	protocol discriminator	protocol discriminator	6.1.8.1.1	M	
2	transaction identifier	transaction identifier	6.1.8.2.2	M	
3	message type	message type	6.1.8.1.3	M	
4	portable identity	-		I	
5	fixed identity	-		I	
6	basic service	bearer capabilities	6.1.7.2.10	M	
7	iwu attributes	-		I	
8	repeat indicator	-		X	
9	call attributes	-		X	
10	repeat indicator	-		X	
11	connection attributes	-		X	
12	cipher info	-		I	
13	connection identity	-		X	
14	facility	-		I	
15	progress indicator	-		X	
16	display	-		X	
17	multi keypad	-		I	
18	signal	-		X	
19	feature activate	-		I	
20	feature indicate	-		X	
21	network parameter	-		I	
22	terminal capability	-		X	
23	end to end compatibility	-		I	
24	rate parameter	-		X	
25	transit delay	-		X	
26	window size	-		X	
27	calling party number	-		I	
28	called party number	-		I	
29	called party subaddress	-		I	
30	sending complete	-		I	
31	iwu to iwu	-		I	
32	iwu packet	-		I	

6.1.6.2.17 CC-RELEASE - CM SERVICE ABORT

Table 44

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE	CM SERVICE ABORT			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	Skip indicator	6.1.8.2.24	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	-		X	
5	facility	-		X	
6	display	-		X	
7	feature indicate	-		X	
8	iwu to iwu	-		X	
9	iwu packet	-		X	

6.1.6.2.18 CC-RELEASE-COM - CM SERVICE REJECT

Table 45

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	CC-RELEASE-COM	CM SERVICE ABORT			
1	protocol discriminator	protocol discriminator	6.1.8.2.1	M	
2	transaction identifier	Skip indicator	6.1.8.2.24	M	
3	message type	message type	6.1.8.2.3	M	
4	release reason	-		X	
5	identity type	-		X	
6	location area	-		X	
7	iwu attributes	-		X	
8	facility	-		X	
9	display	-		X	
10	feature indicate	-		X	
11	network parameter	-		X	
12	iwu to iwu	-		X	
13	iwu packet	-		X	

6.1.7 Information element mappings

6.1.7.1 GSM to DECT

6.1.7.1.1 Mobile identity - NWK assigned identity

Table 46

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	Mobile identity	NWK assigned identity		M	
1	Mobile identity IEI	ID for NWK assigned identity	6.1.8.1.4	M	
2	Length of contents	Length of contents	6.1.8.1.5	M	
3	Odd/even indication = "0"	-		X	
4	Type of identity	Type	6.1.8.1.6	M	
5	-	Length of identity value = "32"		X	(note)
6	Identity digits	Identity value	6.1.8.1.7	M	

NOTE: Given in binary (=4 octets).

6.1.7.1.2 Authentication parameter RAND - RAND

Table 47

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	Auth. parameter RAND	RAND		M	
1	RAND IEI	ID for RAND	6.1.8.1.4	M	
2	-	Length of contents			16, fixed length in GSM 128 bits
3	RAND value	RAND field	6.1.8.1.9	M	

6.1.7.1.3 Cipher key sequence number - Auth type

Table 48

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	Cipher key sequence number	Auth type		M	
1	Cipher key sequence number IEI	ID for Auth type	6.1.8.1.4	M	
2	-	Length of contents		-	= 3
3	-	<Authentication algorithm identifier>		-	= 0000001B (GSM authentication algorithm)
4	-	<Authentication key type>		-	= 0001B (User authentication key)
5	-	<Authentication key number>		-	= 0000B (Key associated to the active IPUI)
6	-	<INC bit>		-	= 0B
7	-	<TXC>		-	= 0B (Do not include the derived cipher key in {AUTH-REPLY})
8	-	<UPC bit>		-	= 1B (Store cipher key)
9	Key sequence	Cipher key number	6.1.8.1.10	M	

6.1.7.1.4 Location area identification - Location area

Table 49

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	Location area identification	Location area	.	M	
1	Location area identification IEI	ID for Location area	6.1.8.1.4	M	
2	-	Length of contents			5 octets
3	-	Location information type			(note)
4	-	Location area level			(note)
5	-	Extended location information type			(note)
6	- Mobile Country Code - Mobile Network Code - Location Area Code	- Extended location information	6.1.8.1.11	M	
NOTE: All values are set to support the GSM Location Area Identification.					



6.1.7.1.5 Identity type - Identity type

Table 50

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	Identity type	Identity type	.	M	
1	Identity type IEI	ID for Identity type	6.1.8.1.4	M	
2	-	Length of contents		-	
3	Type of identity	Identity group	6.1.8.1.12	M	(note)
4	Type of identity	Type	6.1.8.1.13	M	(note)

NOTE: Type of identity mapping to Identity group and/or type depends on the requested identity.

6.1.7.1.6 Reject cause - Reject reason

Table 51

Item No	Information element coding GSM	Information element coding DECT	Ref	Map status	NOTE
	REJECT cause	Reject reason	.	M	
1	Reject cause IEI	ID for Reject reason	6.1.8.1.4	M	
2	reject cause value	Reject reason code	6.1.8.1.17	M	

6.1.7.1.7 Bearer capabilities 1 - Basic service

Table 52

Item No	Information element coding GSM	Information element coding DECT	Ref.	Map status	NOTE
	Bearer capabilities 1	Basic service		M	
1	Bearer capability IEI	ID for basic service	6.1.8.1.4	M	
2	Length of Bearer capabilities contents	-		X	
3	Radio channel requirement	-		X	
4	Coding standard	-		X	
5	Transfer mode	-		X	
6	Information transfer capability	Call Class	6.1.8.1.19	M	
7	Information transfer capability	Basic service	6.1.8.1.20	M	
8	coding standard ext.	-		I	
9-29	etc.	-		I	

6.1.7.1.8 Progress indicator - Progress indicator

Table 53

Item No	Information element coding GSM	Information element coding DECT	Ref.	Map status	NOTE
	Progress indicator	progress indicator		M	
1	Progress indicator IEI	ID for progress indicator	6.1.8.1.4	M	
2	length of progress indicator contents	length of contents	6.1.8.1.5	M	
3	coding standard	coding standard	6.1.8.1.18	M	
4	location	location	6.1.8.1.21	M	
5	progress description	progress description	6.1.8.1.22	M	

6.1.7.1.9 Cause - Release reason

Table 54

Item No	Information element coding GSM	Information element coding DECT	Ref.	Map status	NOTE
	cause	release reason		M	
1	Cause IEI	ID for release reason	6.1.8.1.4	M	
2	length of cause contents	-		X	
3	coding standard	-		I	
4	location	-		I	
5	recommendation	-		I	
6	cause value	release reason code	6.1.8.1.23	M	
7	diagnostic	-		I	

6.1.7.1.10 Reject cause - Release reason

Table 55

Item No	Information element coding GSM	Information element coding DECT	Ref.	Map status	NOTE
	Reject cause	release reason		M	
1	Reject cause IEI	ID for release reason	6.1.8.1.4	M	
2	reject cause value	release reason code	6.1.8.1.26	M	

6.1.7.1.11 Signal - Signal

Table 56

Item No	Information element coding GSM	Information element coding DECT	Ref.	Map status	NOTE
	signal	signal		M	
1	Signal IEI	ID for signal	6.1.8.1.4	M	
2	signal value	signal value	6.1.8.1.24	M	

6.1.7.2 DECT to GSM

6.1.7.2.1 Portable identity - Mobile identity

Table 57

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Portable identity	Mobile identity	.	M	
1	ID for Portable identity	Mobile identity IEI	6.1.8.2.4	M	
2	Length of contents	Length of contents	6.1.8.2.5	M	
3	Length of identity value	Odd/even indication = "0"	6.1.8.2.6	M	
4	Type	Type of identity	6.1.8.2.7	M	(note)
5	Portable User Type	Type of identity	6.1.8.2.8	M	(note)
6	Identity value	Identity digits	6.1.8.2.9	M	

NOTE: "Type" and "Portable user type" - fields are mapped as a pair to the GSM "type of identity": "IMSI".

6.1.7.2.2 Network assigned identity- Mobile identity

Table 58

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Network assigned identity	Mobile identity		M	
1	ID for Network assigned identity	Mobile identity IEI	6.1.8.2.4	M	
2	Length of contents	Length of contents	6.1.8.2.5	M	
3	-	Odd/even indication = "0"		-	
4	Type	Type of identity	6.1.8.2.10	M	
5	Length of identity value = "32"	-		-	
6	Identity value	Identity digits	6.1.8.2.11	M	

6.1.7.2.3 Location area - Location area identification

Table 59

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Location area	Location area identification		M	
1	ID for Network assigned identity	Mobile identity IEI	6.1.8.2.4	M	
2	Length of contents	Length of contents	6.1.8.2.5	M	
3	Location information type	-		X	(note)
4	Location area level	-		X	(note)
5	Extended location information type	-		X	(note)
6	Extended location information	- Mobile Country Code - Mobile Network Code - Location Area Code	6.1.8.2.12	M	(note)

NOTE: All values are set to support the GSM Location Area Identification. Note, that CI value (DECT) ignored.

6.1.7.2.4 Cipher info - Cipher key sequence number

Table 60

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Cipher info	Cipher key sequence number		M	
1	ID for Cipher info	Cipher key sequence number IEI	6.1.8.2.4	M	
2	Length of contents	-		X	
3	Y/N bit; Enable/disable ciphering	-		-	
4	Cipher algorithm identifier	-		-	
5	Proprietary algorithm identifier	-		-	If sent
6	Cipher key type	-		-	
7	Cipher key number	Ciphering key sequence number	6.1.8.2.13	M	

6.1.7.2.5 RES - Auth. parameter SRES

Table 61

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	RES	Auth parameter SRES		M	
1	ID for RES	Auth parameter SRES IEI	6.1.8.2.4	M	
2	-	Length of contents		-	(note)
3	RES field	Auth parameter SRES field	6.1.8.2.14	M	

NOTE: The length is always 32 bits.

6.1.7.2.6 Portable identity- Mobile identity

Table 62

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Portable identity	Mobile identity	.		
1	ID for Portable identity	Mobile identity IEI	6.1.8.2.4	M	
2	Length of contents	Length of contents	6.1.8.2.5	M	
3	Type	Type of identity	6.1.8.2.15	M	
4	Length of identity value	Odd/even indication = "0"	6.1.8.2.6	M	
5	Identity value	Identity value		C1	

C1: If the <type> field value in item 3 is set to value "0000000"B the mapping of <identity value> shall be done as shown in subclause 6.1.8.2.9 (IMSI). If the <type> field value in item 3 is set to value "0010000"B the mapping of IPEI to IMEI shall be done as described in ETS 300 466 [16].

6.1.7.2.7 Basic service - CM service type

Table 63

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Basic service	CM service type			
1	ID for Basic service	CM service type IEI	6.1.8.2.4	M	
2	Call class	service type	6.1.8.2.16	M	

6.1.7.2.8 Setup capability- Mobile station classmark 1

Table 64

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Setup capability	Mobile station classmark 1			
1	ID for Setup capability	Mobile station classmark 1 IEI	6.1.8.2.4	M	
2	Profile indicator	Mobile station classmark 1	6.1.8.2.17	M	

6.1.7.2.9 Basic service - Mobile station classmark 2

Table 65

Item No	Information element coding DECT	Information element coding GSM	Ref	Map status	NOTE
	Basic service	Mobile station classmark 2			
1	ID for Basic service	Mobile station classmark 2 IEI	6.1.8.2.4	M	
2	Basic service	Mobile station classmark 2	6.1.8.2.18	M	Default value "0100"B for GSM.

6.1.7.2.10 Basic service - Bearer capabilities

Table 66

Item No	Information element coding DECT	Information element coding GSM	Ref.	Map status	NOTE
	Basic service	Bearer capabilities			
1	ID for Basic service	Bearer capabilities IEI	6.1.8.1.4	M	
2	-	Length of Bearer capabilities contents		X	
3	-	Radio channel requirement		-	
4	-	Coding standard		-	
5	-	Transfer mode		-	
6	Call Class	Information transfer capability	6.1.8.2.19	M	
7	Basic service	Information transfer capability	6.1.8.2.20	M	
8-...	-	etc.		I	

6.1.7.2.11 Called-party-number - Called-party-number

Table 67

Item No	Information element coding DECT	Information element coding GSM	Ref.	Map status	NOTE
	Called party number	Called party BCD number			
1	ID for called party number	info element ID	6.1.8.1.4	M	
2	length of contents	length of called party number contents	6.1.8.1.5	M	
3	number type	type of number	6.1.8.2.21	M	
4	numbering plan identification	numbering plan identification	6.1.8.2.22	M	
5	called party address (DECT char)	number digits (IA5 char)		M	DECT char to IA5 char

6.1.7.2.12 Multi keypad - Called-party-number

Table 68

Item No	Information element coding DECT	Information element coding GSM	Ref.	Map status	NOTE
	Multi keypad	Called party BCD number			
1	ID for Multi keypad	Called party BCD number IEI	6.1.8.1.4	M	
2	length of contents	length of called party number contents	6.1.8.1.5	M	
3	-	type of number		-	
4	-	numbering plan identification		-	
5	keypad info (DECT char)	number digits (IA5 char)		M	DECT char to IA5 char

6.1.7.2.13 Multi keypad - Keypad facility (F-10)

Table 69

Item No	Information element coding DECT	Information element coding GSM	Ref.	Map status	NOTE
	multi-keypad	keypad facility			
1	ID for Multi keypad	Keypad facility IEI	6.1.8.1.4	M	
2	length of contents	length of keypad contents	6.1.8.1.5	M	
3	keypad info (DECT char)	keypad info (IA5 char)	-	M	single DECT char (0-9,A,B,C,D,*,# only) at a time into IA5 char All other DECT chars not mapped.

6.1.7.2.14 Release reason - Cause

Table 70

Item No	Information element coding DECT	Information element coding GSM	Ref.	Map status	NOTE
	release reason	cause			
1	ID for release reason	Cause IEI	6.1.8.1.4	M	
2	-	length of cause contents		X	
3	-	coding standard		X	set coding standard to 11 (GSM)
4	-	location		X	set to network beyond inter-working point?
5	-	recommendation		X	not included
6	release reason code	cause value	6.1.8.2.23	M	
7	-	diagnostic		I	For SS and bearer service negotiation

6.1.8 Fields in information element coding

The subclause titles in this subclause refer to the DECT field name if only one field name is used.

If a note contains the phrase "Value is mapped transparently", this implies that the FP IWU shall process the information element/field value in a way which the most significant bits or digits versus least significant are kept in alignment on both sides of the FP IWU.

**6.1.8.1 GSM to DECT**

**6.1.8.1.1 Protocol discriminator - Protocol discriminator**

**Table 71**

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Protocol discriminator	Protocol discriminator			
1	"0000"B	-			LCE
2	"0011"B	"0011"B		M	CC, (CRSS)
3	"0100"B	-		I	(CISS)
4	"0101"B	"0101"B		M	MM
5	"0110"B	-		I	CLMS
6	"0111"B	-		I	COMS
7	"1???"B	-		-	unknown

**6.1.8.1.2 Transaction identifier - Transaction identifier**

**Table 72**

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Transaction identifier	Transaction identifier			
1	Transaction flag	Transaction flag		M	(note 1)
2	Transaction value	Transaction value		M	(note 2)
NOTE 1: The transaction flag value is mapped transparently through the FP during all procedures. The DECT extended transaction value is outside the scope of this ETS.					
NOTE 2: Shall be transparent.					

**6.1.8.1.3 Message type - Message type**

The messages mapping is dependent on which procedure and state the FT is in. The table which refers to this subclause shows which message types shall be mapped with each other.

The N(SD) bit in the GSM network side shall be incremented (independent of DECT) according to the rules as defined in GSM 04.08 [23] every time the FP IWU sends a MM or a CC message to the MSC. The N(SD) bit is not mapped to the DECT air interface.

**6.1.8.1.4 Id for info element (IEI) - id for info element**

The element identifier mapping is depending of which message it is sent in. The table which refers to this subclause shows which element identifiers shall be mapped with each other.

**6.1.8.1.5 Length of contents - length of contents**

Unless explicitly stated in this specification, the value of this field should be mapped in alignment with the appropriate specification.

**6.1.8.1.6 Type, (Mobile identity, NWK assigned identity)**

**Table 73**

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Type of identity	Type			
1	"100"	"1110100"		M	

6.1.8.1.7 Identity value, (Mobile identity, NWK assigned identity)

Table 74

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Identity value	Identity value			
1	4 octets, binary	4 octets, binary		M	Value is mapped transparently.

6.1.8.1.8 Y/N bit (Encryption information - Cipher info)

Table 75

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Algorithm identifier	Y/N bit			
1	"00000001"	"0"		M	Disable encryption
2	"0000011" or other version of GSM user encryption data.	"1"		M	Enable encryption

6.1.8.1.9 RAND field (RAND - RAND)

Table 76

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	RAND value	RAND field			
1	128 bits	128 bits		M	Value is mapped transparently

6.1.8.1.10 Cipher key number (Key sequence - Cipher key number)

Table 77

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Key sequence	Cipher key number			
1	Three bits, values from "000"B to "110"B, "111"B reserved	Four bits, most significant bit is set to value "0"B		M	Value is mapped transparently



6.1.8.1.11 Extended location information (Location area identification - Location Area)

Table 78

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Location area identification	Extended location information			(note 1)
1	Mobile Country Code BCD coded digits 1,2 and 3	Mobile Country Code BCD coded digits 1,2 and 3		M	(note 2)
2.	Mobile Network Code, BCD coded digits 1,2 and 3	Mobile Network Code, BCD coded digits 1,2 and 3		M	(note 2)
3.	Location Area Code, 2 octets (hexadecimal, binary)	Location Area Code, 2 octets (hexadecimal, binary)		M	(note 2)
4.	-	Cell Identifier			(note 3)
NOTE 1: "Location area identification" is the value (field) of the <<location area identification>> information element.					
NOTE 2: Value is mapped transparently.					
NOTE 3: This an arbitrary value generated at the FT. The value has no relevance for this ETS.					

6.1.8.1.12 Identity group (Identity type - Identity type)

Table 79

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Type of identity	Identity group			
1	"001"B	"0000"B		M	IMSI-Portable id
2	"010"B	"0000"B		M	IMEI-Portable id
3	"100"B	"0001"B		M	TMSI-NWK assigned id

6.1.8.1.13 Type (Identity type - Identity type)

Table 80

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Type of identity	Type			
1	"001"B	"0000000"B		M	IMSI-IPUI
2	"010"B	"0010000"B		M	IMEI-IPEI
3	"100"B	"1110100"B		M	TMSI-GSM temporary subscriber id

6.1.8.1.14 Type, (Mobile identity, Portable identity)

Table 81

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Type of identity	Type			
1	"001"	"0000000"		M	IMSI

6.1.8.1.15 Portable user type, (Mobile identity, Portable identity)

Table 82

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Type of identity	Portable user type			
1	"001"	"0100"		M	IMSI

6.1.8.1.16 Identity value, ( Mobile identity - Portable identity)

Table 83

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Identity value	Identity value			
1	maximum of 15 BCD coded digits	maximum of 64 bits representing a maximum of 15 BCD coded digits		M	IMSI

6.1.8.1.17 Reject cause value - Reject reason code

Table 84

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Reject cause value	Reject reason code			
1	"00000010"B	"02" (HEX)		M	
2	"00000011"B	"06" (HEX)		M	
3	"00001011"B	"76" (HEX)		M	
4	"00001100"B	"80" (HEX)		M	

6.1.8.1.18 Coding-standard - coding-standard

Table 85

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	coding standard	coding standard			
1	"00"B	"00"B		M	CCITT standard
2	"01"B	"01"B		I	other int. stand
3	"10"B	"10"B		I	nat. standard
4	"11"B	"00"B		M	GSM. specific (Equivalent to ISDN)

6.1.8.1.19 Information transfer capability - Call Class

Table 86

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	Information transfer capability	Call class			
1	"000"B	"000"B		M	speech
2	"001"B	-		I	unrestricted dig
3	"010"B	"000"B		O	3,1 kHz audio
4	"011"B	-		I	group 3 fax
5	"100"B	-		I	speech/unrestricted dig.
6	"111"B	-		X	reserved

6.1.8.1.20 Information transfer capability - basic service

Table 87

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	Information transfer capability	Basic service			
1	"000"B	"000"B		M	speech
2	"001"B	-		X	unrestricted dig
3	"010"B	"000"B		O	3,1 kHz audio
4	"011"B	-		X	group 3 fax
5	"100"B	-		X	speech/unrestricted dig.
6	"111"B	-		X	reserved

6.1.8.1.21 Location - location

Table 88

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	location	location			
1	"0000"B	"0000"B		M	user
2	"0001"B	"0001"B		M	pr.net.loc.user
3	"0010"B	"0010"B		M	pu.net.loc.user
4	"0100"B	"0100"B		M	pu.net.rem.user
5	"0101"B	"0101"B		M	pr.net.rem.user
6	"1010"B	"1010"B		M	net.beyond interw. point

6.1.8.1.22 Progress-description - progress-description

Table 89

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	progress description	progress description			
1	"0000001"B	"0000001"B		M	not end-to-end ISDN
2	"0000010"B	"0000010"B		M	dest.non-ISDN
3	"0000011"B	"0000011"B		M	orig.non-ISDN
4	"0000100"B	"0000100"B		M	return.to ISDN
5	"0001000"B	"0001000"B		M	in-band or appr. pattern availab.

6.1.8.1.23 Cause-value - release-reason-code

Table 90

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	cause value	release reason code			
1	"0010000"B	"00000000"B		M	16 to 00-norm.
2	"0110001"B until "1001111"B	"00000110"B		M	49-79 to 06-not implemented
3	"0011111"B	"00001111"B		M	31 to 0F-unkn.
4	"0010010"B	"00011000"B		M	18 to 10-detac.
5	"0000011"B	"00010001"B		M	3 to 11-no rou.
6	"0000001"B	"00010010"B		M	1 to 12-user unknown
7	"0010001"B	"00010100"B		M	17 to 14-busy
8	"0010101"B	"00010101"B		M	21 to 15-reject.
9	"0100010"B until "0101111"B	"000110010"B		M	34-47 to 32- insufficient resources

6.1.8.1.24 Signal value - signal value

Table 91

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref.	Map status	NOTE
	signal value	signal value			
1	"00000000"B	"00000000"B		M	dial tone on
2	"00000001"B	"00000001"B		M	ring-back tone on
3	"00000010"B	"00000010"B		M	interc. tone on
4	"00000011"B	"00000011"B		M	net.con.tone on
5	"00000100"B	"00000100"B		M	busy tone on
6	"00000101"B	"00000101"B		M	confirm tone on
7	"00000110"B	"00000110"B		M	answer tone on
8	"00000111"B	"00000111"B		M	call wait.tone on
9	"00001000"B	"00001000"B		M	off-hook warn. tone on
10	"00111111"B	"00111111"B		M	tones off
11	"01001111"B	"01001111"B		M	alerting off

**6.1.8.1.25 Skip Indicator - Transaction identifier**

**Table 92**

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Skip indicator	Transaction identifier			
1	'0'B (bit 8)	Transaction flag		M	(note 1)
2	'000'B (bits 6, 7, 5)	Transaction value		M	(note 2)
NOTE 1: The transaction flag value is mapped according to the rules defined in ETS 300 175-5 [5] subclause 7.3.					
NOTE 2: Shall be transparent.					

**6.1.8.1.26 Reject cause value - Release reason code**

**Table 93**

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Reject cause value	Release reason code			
1	"00000100"B	"0A" (HEX)		M	(note 1)
2	"00000110"B	"08" (HEX)		M	(notes 1 & 2)
3	"00010001"B	"0F" (HEX)		O	(notes 1 & 2)
4	"00010110"B	"34" (HEX)		O	(note 1)
5	"00100000"B	"06" (HEX)		O	(note 1)
6	"00100001"B	"0F" (HEX)		O	(note 1)
7	"00100010"B	"0F" (HEX)		O	(note 1)
NOTE 1: These values apply when the Reject cause is included in a {CM service reject} message.					
NOTE 2: These values apply when the Reject cause is included in an {Abort} message.					

**6.1.8.2 DECT to GSM**

**6.1.8.2.1 Protocol discriminator - Protocol discriminator**

See subclause 6.1.8.1.1.

**6.1.8.2.2 Transaction identifier - Transaction identifier**

See subclause 6.1.8.1.2.

**6.1.8.2.3 Message type - Message type**

See subclause 6.1.8.1.3.

**6.1.8.2.4 Id for info element - id for info element (IEI)**

See subclause 6.1.8.1.4.

**6.1.8.2.5 Length of contents - length of contents**

See subclause 6.1.8.1.5.

6.1.8.2.6 Length of identity value (Portable identity - Mobile identity)

Table 94

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Length of identity value	Odd/even indication			
1	Binary value representing the length of BCD coded digits	"0" or "1 depending if the number of BCD coded digits is odd or even"		M	

6.1.8.2.7 Type, (Portable identity - Mobile identity)

Table 95

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Type	Type of identity			
1	"0000000"	"001"		M	

6.1.8.2.8 Portable user type, (Portable identity - Mobile identity)

Table 96

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Portable user type	Type of identity			
1	"0100"	"001"		M	

6.1.8.2.9 Identity value, (Portable identity - Mobile identity)

Table 97

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Identity value	Identity value			
1	maximum of 64 bits representing a maximum of 15 BCD coded digits	maximum of 15 BCD coded digits		M	Value is mapped transparently

6.1.8.2.10 Type, (NWK assigned identity - Mobile identity)

Table 98

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Type	Type of identity			
1	"1110100"	"100"		M	

6.1.8.2.11 Identity value, (NWK assigned identity - Mobile identity)

Table 99

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Identity value	Identity value			
1	4 octets, binary	4 octets, binary		M	Value is mapped transparently.

6.1.8.2.12 Extended location information, (Location area - Location area identification)

Table 100

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Extended location information	Location area identification			(note 1)
1	Mobile Country Code BCD coded digits 1,2 and 3	Mobile Country Code BCD coded digits 1,2 and 3		M	(note 2)
2.	Mobile Network Code, BCD coded digits 1,2	Mobile Network Code, BCD coded digits 1,2		M	(note 2)
3	Location Area Code, 2 octets (hexadecimal, binary)	Location Area Code, 2 octets (hexadecimal, binary)		M	(note 2)
4	Cell Identifier	-		I	(note 3)
NOTE 1: "Location area identification" is the value (field) of the <<location area identification>> information element.					
NOTE 2: Value is mapped transparently.					
NOTE 3: This value is terminated at the FT (not used).					

6.1.8.2.13 Cipher key number, (Cipher info - Cipher key sequence number)

Table 101

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Cipher key number	Cipher key sequence number			
1	A four bit binary value	A three bit binary value		M	(note)
NOTE: Value is mapped transparently. The MSB of the <Cipher key number> field shall be of value "0".					

6.1.8.2.14 RES field (RES - Auth. parameter SRES)

Table 102

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	RES field	Auth. parameter SRES field			
1	RES value	SRES value		M	Value is mapped transparently.

6.1.8.2.15 Type, (Portable identity - Mobile identity)

Table 103

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Type	Type of identity			
1	"0000000"B	"001"B		M	
2	"0010000"B	"010"B		M	(note)
NOTE: The IPEI structure is different from the IMEI structure the mapping is specified in ETS 300 466 [16].					

6.1.8.2.16 Call class, (Basic service - CM service type)

Table 104

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Call class	Service type			
1	"000"B	"0001"B		M	Normal call setup
2	"010"B	"0010"B		M	Emergency call setup
3	"100"	-		-	External H/O call setup

6.1.8.2.17 Profile indicator, (Profile indicator - Mobile station classmark 1)

Table 105

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Profile indicator	Revision level			See [16]
1	"XXXX100"B	"01"B		M	'X'=Don't care.

6.1.8.2.18 Basic service, (Basic service - Mobile station classmark 2)

Table 106

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Basic service	Revision level			
1	"0100"B	"01"B		M	

6.1.8.2.19 Call Class - Information transfer capability

Table 107

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref.	Map status	NOTE
	Call class	Information transfer capability			
1	"000"B	"000"B		M	(note)
2	"010"B	"000"B		M	(note)
3	"100"B	-			

NOTE: Normal and emergency setups in DECT are mapped as "speech" (Emergency setup indicated in the GSM CM service procedure as described in subclause 6.1.2.7).

6.1.8.2.20 Basic service - Information transfer capability

Table 108

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref.	Map status	NOTE
	Basic service	Information transfer capability			
1	"0000"B	"000"B		M	



6.1.8.2.21 Number-type - type-of-number

Table 109

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref.	Map status	NOTE
	Number type	Type of number			
1	"000"B	"000"B		M	unknown
2	"001"B	"001"B		O	intern.number
3	"010"B	"010"B		O	national numb.
4	"011"B	"011"B		O	netw.spec.num
5	"100"B	-		X	subscr.numb.
6	"110"B	-		X	abbreviat.numb
7	"111"B	-		X	res.for extens.

6.1.8.2.22 Numbering-plan identification - numbering-plan identification

Table 110

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref.	Map status	NOTE
	Numbering plan identification	Numbering plan identification			
1	"0000"B	"0000"B		M	unknown
2	"0001"B	"0001"B		O	E.164/E.163
3	"0011"B	"0011"B		O	X.121 (data)
4	-	"0100"B		X	F.69 (Telex)
5	"1000"B	"1000"B		O	Nat.stand.plan
6	"1001"B	"1001"B		O	private plan
7	"1111"B	"1111"B		O	res.for extens.

6.1.8.2.23 Release-reason-code - cause-value

Table 111

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref.	Map status	NOTE
	release reason code	cause value			
1	"00000000"B	"0010000"B		M	00 to 16-norm.
2	"00000110"B	"1001111"B		M	06 to 79-not im
3	"00001111"B	"0011111"B		M	0F to 31-unkn.
4	"00010000"B	"0010010"B		M	10 to 18-detac.
5	"00010001"B	"0000011"B		M	11 to 3-no rou.
6	"00010010"B	"0000001"B		M	12 to 1-user unknown
7	"00010100"B	"0010001"B		M	14 to 17-busy
8	"00010101"B	"0010101"B		M	15 to 21-reject.
9	"000110010"B	"0101111"B		M	32 to 47- insufficient resources

6.1.8.2.24 Transaction identifier - Skip indicator

Table 112

Item No	Field(s) coding DECT	Field(s) coding GSM	Ref	Map status	NOTE
	Transaction identifier	Skip indicator			
1	Transaction flag	0'B (bit 8)		M	always
2	Transaction value	000'B (bits 6, 7, 5)		M	always

6.2 FP U-Plane IWU procedures

For the FP GSM PLMN attachment, the DECT LU1 U-plane service should be mapped into the GSM Pulse Coded Modulation (PCM) speech service. Requirements in subclause 8.3 of ETS 300 175-8 [8] shall be applied.

6.2.1 Service activation

The FP IWU shall activate the DECT U-plane between the FP and the PP upon or before the receipt of:

- 1) GSM {Connect} for outgoing call;
- 2) GSM {Connect-ack} for incoming call;
- 3) GSM <<Progress indicator>> information element with progress description indicating "Call is not end-to-end PLMN/GSM further call information may be available in-band" or "In band information or appropriate pattern now available" for incoming or outgoing call.

The U-plane activation shall be co-ordinated by the FP IWU such that both the DECT FT part and GSM part do not cause un-necessary noise to the calling and called party.

NOTE: The procedure for selecting and identification of the U-plane channels to be used between the FP and the GSM PLMN on the lower layer interconnection of those entities, and thus the necessary signalling information transfer at call establishment, is outside the scope of this ETS.

6.3 PP C-plane IWU mappings

6.3.1 CC IWU procedures

With the exceptions given in this subclause, the call control procedures shall be performed as defined in GAP or if not covered by GAP as defined in ETS 300 175-5 [5].

6.3.1.1 Call establishment procedure

Prior to issuing a MNCC-SETUP-req primitive to the PT in order to establish an outgoing call, the PP IWU shall retrieve the GSM Cipher key sequence number from the DAM GA and map it to the <Cipher key number> field in the <<Cipher info>> information element which shall be sent in the {CC-SETUP} message to the FP. The <Basic service> field in the <<Basic service>> information element shall be set to value "0100"B (GSM profile). In ARI-D environment the <<Fixed identity>> information element shall still be included in the {CC-SETUP} message but with 0 length contents.

6.3.1.2 Call release/reject procedures

Upon receipt of a MNCC-RELEASE-ind or a MNCC-REJECT-ind primitive, reflecting respectively a {CC-RELEASE} or a {CC-RELEASE-COM} message being received by the PT, the PP IWU shall act as follows depending of the <<Release reason>> value:

- a) "Unknown identity":
- shall delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
  - shall accomplish the relevant release procedure;
  - shall initiate location registration procedure after the link has been released.

- b) "Invalid identity":
- shall delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
  - shall accomplish the relevant release procedure;
  - shall not initiate outgoing calls except emergency calls.

- c) Any other release reason

the PP IWU shall react in a way that the reaction of PT as it is described in GAP [9] to be achieved.

### 6.3.2 MM IWU procedures

This subclause defines the inter-working procedures in the PP relating to the associated DECT and DAM related interaction and their relation to the DECT air interface MM procedures.

The PP procedures do not refer to mapping tables but are described in the procedure it self. The DAM GSM application part (DAM GA) refers to the GSM specific part of the DAM functions or the associated elementary files in a GSM SIM.

NOTE: The DAM GA is a functional entity and does not refer to a physical implementation see ETS 300 331 [10].

If no mappings are defined for data at the DECT air interface which is being received or sent (as being mandatory by the GAP or this ETS) the handling of this data is described in the procedure itself. If not, the data shall be either ignored or, if covered by the GAP, shall be processed accordingly.

The general layout of the procedures is described in the figure 27.

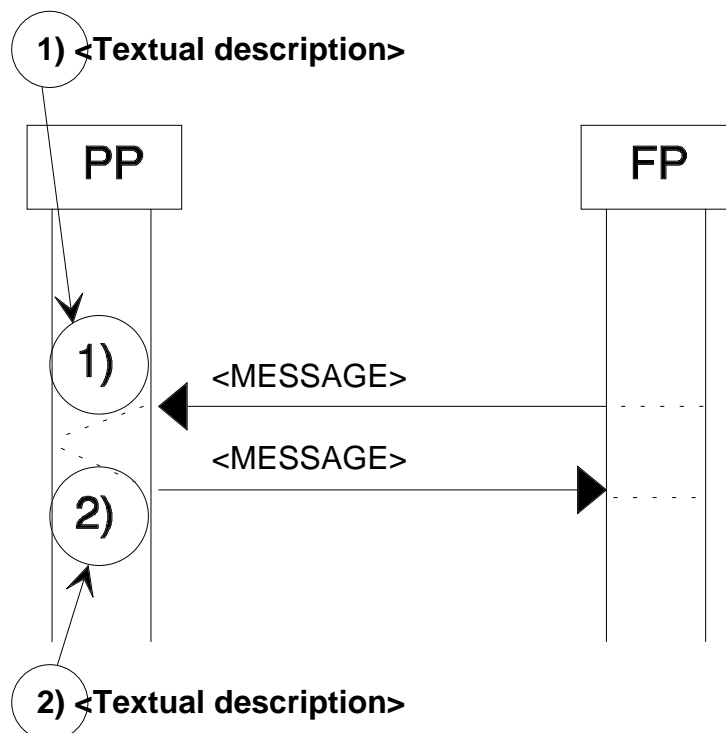


Figure 27: General layout of the procedures in the PP

6.3.2.1 Authentication procedure

- 1) Upon receipt of a MM-AUTHENTICATE-ind primitive from the PT as a result of a received {AUTHENTICATION-REQUEST} message from the FT (figure 28) the PP IWU shall send the received <<RAND>> information element to the DAM GA. The DAM GA shall calculate the <<RES>> and the standard GSM ciphering key Kc by using the associated GSM authentication algorithm and shall send the <<SRES>> information element and the Kc to the PP IWU, after which the PP IWU shall store the Kc and the associated <<Cipher key number>> in the DAM GA.



Figure 28: Authentication procedure

- 2) The PP IWU shall issue the MM-AUTHENTICATE-res primitive to the PT. The PT sends a {AUTHENTICATION-REPLY} message to the FT including the calculated GSM <<SRES>> mapped transparently to the DECT <<RES>> information element.

If the PP IWU receives a MM-AUTHENTICATE-REJECT-ind primitive from the PT after sending the MM-AUTHENTICATE-res primitive to the PT the PP IWU shall delete the GSM LAI, TMSI and the Cipher key sequence number from the DAM GA.

NOTE: The IWU deletes any elementary file (LAI, TMSI etc.) in the DAM GA by storing it full of "1"Bs in the associated elementary file.

6.3.2.2 Identity procedure

- 1) Upon receipt of a MM-IDENTITY-ind primitive from the PT as a result of a received {IDENTITY-REQUEST} message from the FT (figure 29) the PP IWU shall retrieve the required information either from the DAM GA or the PE.

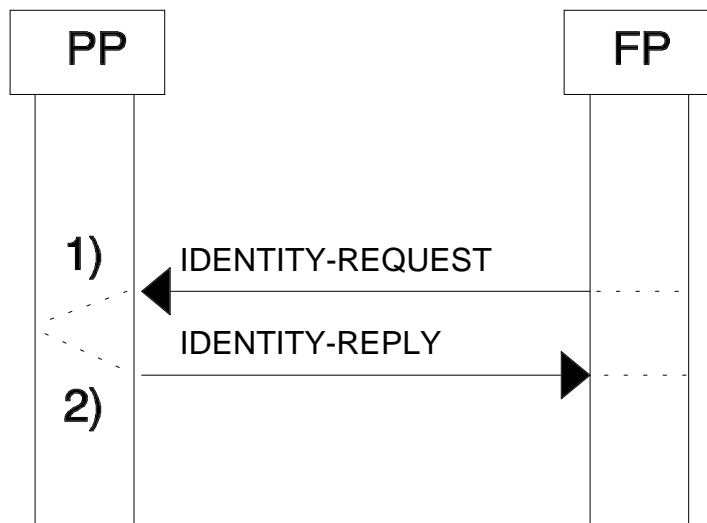


Figure 29: Identity procedure

If the <Identity group> field in the <<Identity type>> information element in the received {IDENTITY-REQUEST} message is set to value "0000" and:

- a) if the <type> field value is set to "0000000"B the PP IWU shall retrieve the IMSI from the DAM GA;
- b) if the <type> field value is set to "0010000"B the PP IWU shall retrieve the IPEI from the PE.

If the <Identity group> field is set to value "0001" and if the <type> field value is set to "1110100"B the PP IWU shall retrieve the TMSI from the DAM GA.

The PP IWU shall send the MM-IDENTITY-res primitive to the PT. The PT shall either send the IMSI or the IPEI in the respective <<Portable identity>> information element or the TMSI in the respective <<NWK assigned identity>> information element to the FT in the {IDENTITY-REPLY} message.

### 6.3.2.3 Location registration procedure

The PP location registration procedure is the respective procedure for the FP normal or periodic location updating and the attach procedure. i.e. the PP does not distinguish these three different types of procedures and the mapping to these procedures is done in the FP.

The location registration procedure shall be performed as it is described in GAP with the additions included in this subclause.

Before initiating the location registration procedure the PP IWU shall compare the received ARI provided by the Lower Layer Management Entity (LLME) to the ARIs stored in the forbidden PLMNs list which are retrieved from the DAM GA. If the received ARI is equivalent to one of the ARIs in the forbidden PLMNs list, the location registration procedure shall not take place before a change of received ARI. The user can override this rule by manually initiating the location registration procedure.

- 1) Upon change of the DECT location area the PP IWU retrieves the IMSI, TMSI, LAI, Kc and Cipher key number from the DAM GA. The DECT specific (non-GSM) part of <<Location area>> and the <<Fixed id>> information shall be retrieved from the DAM DA. After this the PP IWU issues a MM-LOCATE-req primitive to the PT. The <Basic service> field in the <<Basic service>> information element shall be also sent set to value "0100"B (GSM profile).

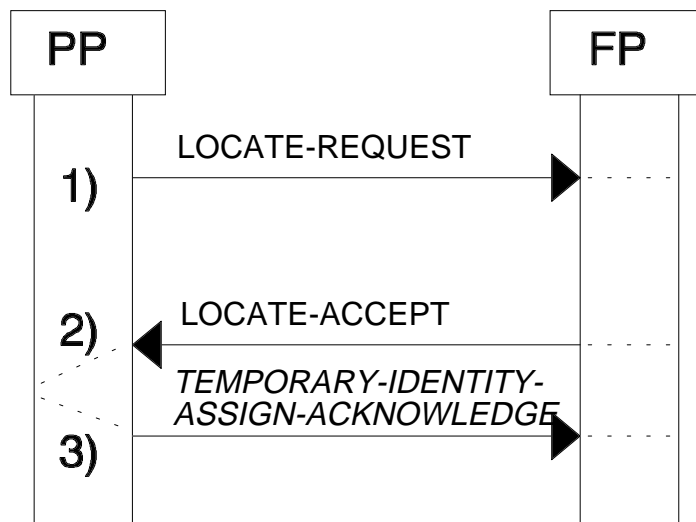


Figure 30: Location registration procedure

NOTE: Standard DECT rules for the inclusion of <Extended location information> field in the <<LOCATION-AREA>> information element are applied.

Upon receipt of the MM-LOCATE-req primitive from the PP IWU the PT shall send a {LOCATE-REQUEST} message to the FT (figure 30) including the <<Portable identity>>, <<Fixed identity>>, <<Location area>>, <<NWK assigned identity>> and <<Cipher info>> information elements provided by the PP IWU.

The field values of the <<Location area>> information element shall be set as follows: the GSM LAI shall be sent in the <Extended location information> field.

The <<Cipher key sequence number>> retrieved by the PP IWU from the DAM GA shall be sent transparently in the <Cipher key number> of the <<Cipher info>> information element. <Proprietary algorithm identifier> field shall not be sent. <<Cipher key number>> field value shall be the one which has been received during the latest authentication procedure. The IMSI received from the PP IWU shall be sent in the <<Portable identity>> Information element.

The field values in the <<Cipher info>> information element shall be set as shown in table 113.

**Table 113: Field values for <<Cipher info>>**

Information element/Item number	Field	Value
<b>&lt;&lt;Cipher info&gt;&gt;</b>		
3	MSB of the <Cipher key number>	"0"B
4	<Y/N bit>	"1" (Enable ciphering)
5	<Cipher algorithm identifier>	"000001" (DECT standard cipher algorithm 1)
6	<Cipher key type>	"1001" (Derived cipher key)

The field values in the <<Location area>> information element shall be set as shown in table 114.

**Table 114: Field values for <<Location area>>**

Information element/Item number	Field	Value
<b>&lt;&lt;Location area&gt;&gt;</b>		
1	<LI-type>	"11"B
2	<ELI>	"1111"B

The IMSI received from the PP IWU shall be sent in the <<Portable identity>> Information element. The field values in the <<Portable identity>> information element shall be set as shown in table 115.

**Table 115: Field values for <<Portable identity>>**

Information element/Item number	Field	Value
<b>&lt;&lt;Portable identity&gt;&gt;</b>		
1	<Identity type>	"000000"B ("IPUI")
2	<PUT>	'0100'B (PUT for IPUI R)

- 2) Upon receipt of a MM-LOCATE-cfm primitive from the PT as a result of a {LOCATE-ACCEPT} message received by the PT the PP IWU shall replace the LAI value in the DAM GA with the received <Extended location information> field value of the <<Location area>> information element and the existing TMSI in the DAM GA with the received <<NWK assigned id>> information element value if being received by the PT.

Upon receipt of a {LOCATE-REJECT} message the PP IWU shall act as follows depending of the <<Reject reason>> value:

- a) "IPUI unknown" or "IPUI not accepted":
- shall delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
  - shall not initiate location updating;
  - shall not initiate detach procedure;
  - shall not initiate outgoing calls except emergency calls.

- b) "PLMN not allowed":
- shall store the current ARI value (in class D environment only) in the forbidden PLMNs list in the DAM GA;
  - shall delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
  - shall not initiate location updating until the ARI broadcast by an FP has changed;
  - shall not initiate detach procedure;
  - shall not initiate outgoing calls except emergency calls.
- c) "Location area not allowed":
- shall delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
  - shall not initiate location updating until the DECT location area has changed;
  - shall not initiate detach procedure;
  - shall not initiate outgoing calls except emergency calls.

If other reject reason is indicated the PP IWU shall react in a way that the reaction of PT as it is described in GAP [9] to be achieved.

- 3) If the <<NWK assigned id>> has been received in the {LOCATE-ACCEPT} message the PT shall send a {TEMPORARY-IDENTITY-ASSIGN-ACK} message to the FT as defined in ETS 300 175-5 [5].

#### 6.3.2.4 Detach procedure

- 1) The PP IWU shall retrieve the IMSI from the DAM GA and issue a MM-DETACH-req primitive to the PT. The PT shall send a {DETACH} message to the FT (figure 31). The {DETACH} message shall contain the IMSI in the <<Portable identity>> information element and the TMSI in the <<NWK assigned identity>> information element.

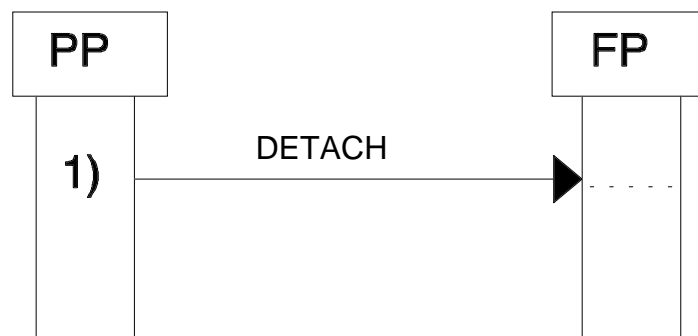


Figure 31: Detach procedure

#### 6.3.2.5 Temporary identity assignment procedure

- 1) Upon receipt of a TEMPORARY-IDENTITY-ASSIGN-ind primitive from the PT the PP IWU shall replace the existing TMSI in the DAM GA with the received <<NWK assigned id>> and the LAI in the DAM GA with the <Extended location area information> in the <<Location area>> information element.

- 2) The PP IWU issues a TEMPORARY-IDENTITY-ASSIGN-res primitive to the PT. Upon receipt of the TEMPORARY-IDENTITY-ASSIGN-res primitive the PT sends a {TEMPORARY-IDENTITY-ASSIGN-ACK} message to the FT (figure 32).

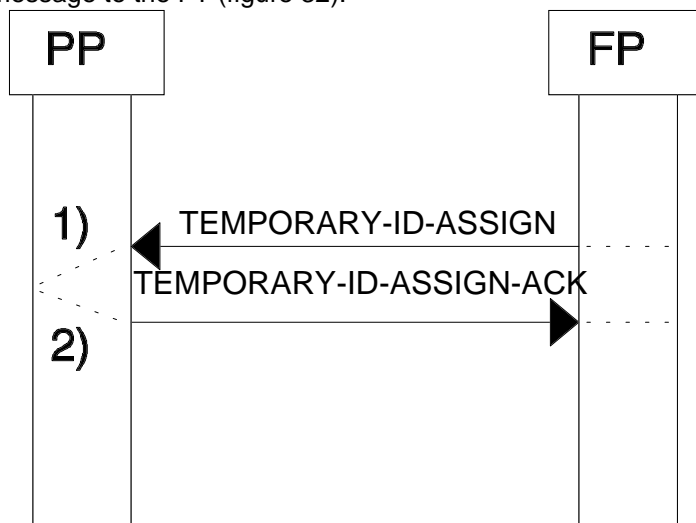


Figure 32: TMSI reallocation procedure

#### 6.3.2.6 Cipherring related procedure

- 1) Upon receipt of a MM-CIPHER-ind primitive from the PT as a result of a received {CIPHER-REQUEST} message from the FT (figure 33) the PP IWU shall check that there exists an associated cipher key Kc in the DAM GA as indicated in the <cipher key number> field in the <<Cipher info>> information element. If the cipher key Kc exists the PP IWU shall retrieve the cipher key from the DAM and calculate the DECT cipher key as described in annex A.
- 2) After this the PP IWU sends a MM-CIPHER-res primitive to the PT which initiates DECT standard cipherring.

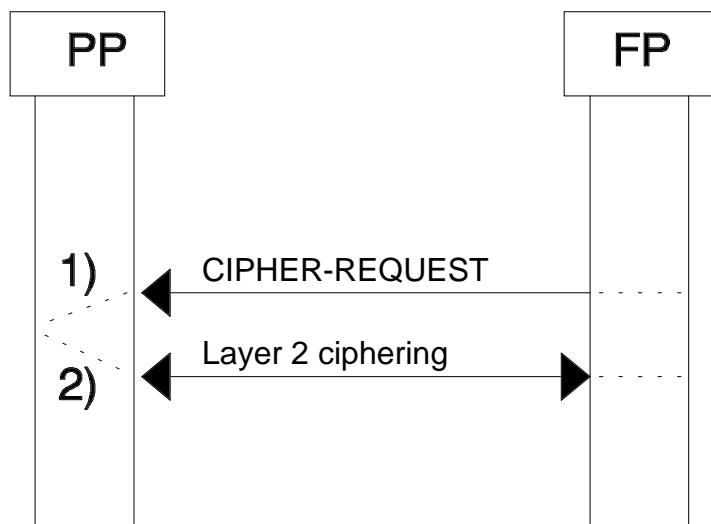


Figure 33: Cipherring procedure

PP IWU may reject the cipher request that shall reflect in PT sending {CIPHER-REJECT} message to the PT. The possible reasons and FT reaction upon are described in ETS 300 175-7 [7].



### 6.3.2.7 External handover procedure

For further study.

### 6.3.3 Paging related IWU procedure

- 1) Upon receipt of a {LCE-REQUEST-PAGING} message from the FT the PT shall send a {LCE-PAGE-RESPONSE} message with the following information elements: <<Portable identity>>, <<Cipher info>> and <<NWK assigned identity>> retrieved from the DAM GA. The <Cipher key number> field value shall be the one which has been received during the latest authentication procedure and stored in the DAM GA.

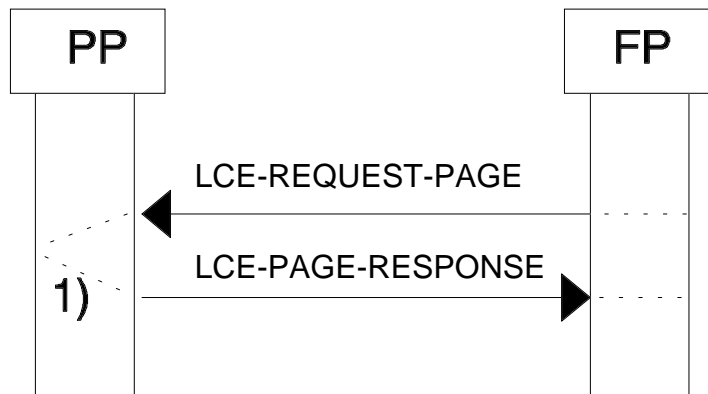


Figure 34: Paging procedure

The fields in the <<Cipher info>> information element shall be set as shown in table 116.

Table 116: Field values for <<Cipher info>>

Information element/Item number	Field	Value
<b>&lt;&lt;Cipher info&gt;&gt;</b>		
1	MSB of the <Cipher key number>	"0"B
2	<Y/N bit>	"1" (Enable ciphering)
3	<Cipher algorithm identifier>	"0000001" (DECT standard cipher algorithm 1)
4	<Cipher key type>	"1001" (Derived cipher key)

### 6.3.4 Message mappings

No message mappings applied.

### 6.3.5 Information element mappings

These are the only information elements that are required to be mapped to the DAM GA. Other possible local application between PT and DAM GA are out of the scope of this ETS.

**Table 117: Mapping of DECT air interface fields/information elements to the DAM EFs**

DECT Information element/field, Identity	DAM GA Element	Elementary File (EF)
<<Portable Identity>> (IPUI type R)	IMSI	EF IMSI
<<NWK assigned identity>>	Temporary Mobile Subscriber Identity	EF LOCI
<Extended location area information> field in <<Location area>> information element	Location Area identification	EF LOCI
<Cipher key number> field in <<Cipher info>> information element	Cipher key sequence number	EF Kc
-	Cipher key Kc	EF Kc
ARI Class D	PLMN (forbidden)	EF FPLMN

## 7 Inter-working connection types

### 7.1 Connection type definitions

There is only one DECT connection type defined in this ETS. This is equivalent to the GAP basic service for DECT air interface requirements.

The DECT C-plane and U-plane attributes are described as the default set-up attributes in the <<Basic service>> element defined as "GSM Profile phase 2".

**Table 118: Default coding for GSM profile phase 2 <<IWU-ATTRIBUTES>> information element**

	Information element field	Field value
3	Coding standard Information transfer cap.	DECT standard Speech
4	Negotiation indicator External connection type	Not possible Connection oriented
5	Transfer mode Info. transfer rate	Circuit mode 32 kbits/s
6	Protocol identifier User protocol id	User protocol id G.721 ADPCM

**Table 119: Default coding for GSM Profile Phase 2 <<CALL-ATTRIBUTES>> information element**

Octet	Information element field	Field value
3	Coding standard Network layer attributes	DECT standard GSM Profile Phase 2 = "00100"B
4	C-plane class C-plane transfer rate	Class A; shared Cs only
5	U-plane symmetry LU identification	Symmetric LU1
6	U-plane class U-plane frame type	Class 0 min_delay FU1

## **Annex A (normative): Derivation of the DECT ciphering key CK**

### **A.1 Introduction**

This annex defines the method of deriving the DECT ciphering key CK from the GSM ciphering key Kc in the case the length of CK differs from the Kc. If the keys are equivalent in length the GSM Kc shall be mapped transparently to the DECT CK.

### **A.2 Algorithm to calculate the DECT CK from Kc**

The Kc with  $L1 > N$  bits can be mapped into a CK with N bits by taking the lower N bits of Kc. A key Kc with  $L2 < N$  bits can be mapped into a CK with N bits by using:

$CK(i) = Kc(i \text{ modulo } L2), 0 \leq i \leq N-1.$



## Annex C (informative): Physical attachment models for the FP

### C.1 Introduction

This annex lists some alternative physical models for different FP attachments for the GSM PLMN.

### C.2 Physical attachment to the MSC

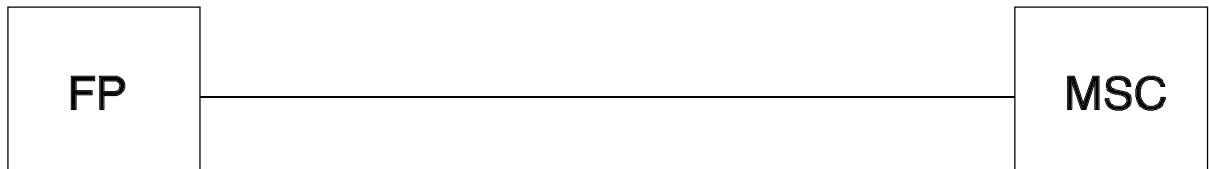


Figure C.1: FP MSC attachment

### C.3 Physical attachment to the BSC

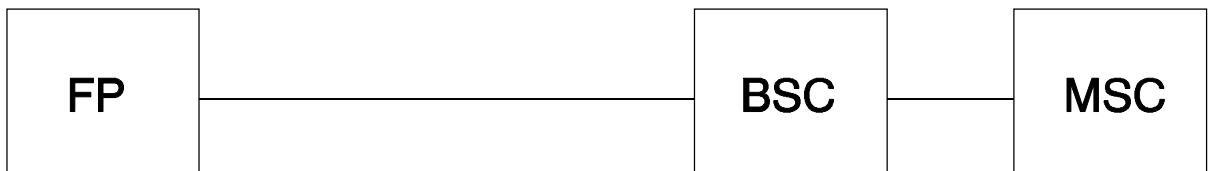


Figure C.2: FP BSC attachment

### C.4 Physical attachment to the BTS

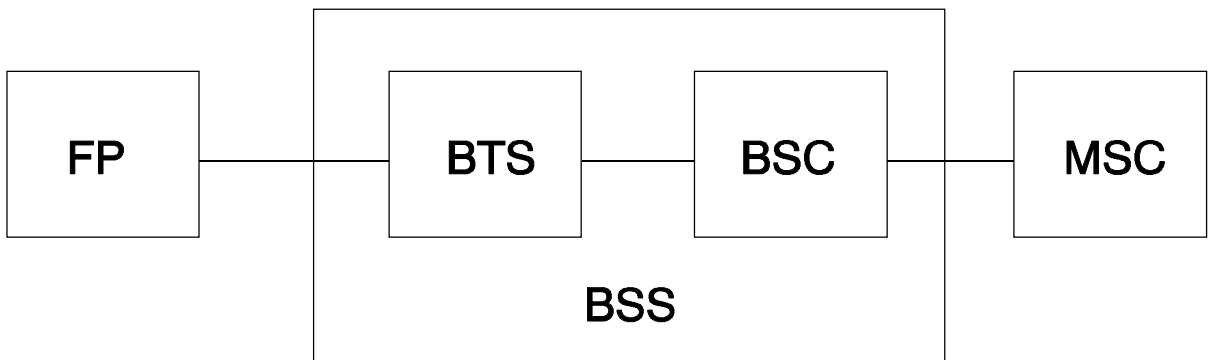


Figure C.3: FP BTS attachment

## Annex D (informative): References to not yet approved standards

These references will be part of the normative references as soon as the relevant documents will be approved.

- 1) DE/RES-03042-1 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Network layer - Portable Termination (PT)".
- 2) DE/RES-03042-2 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Data Link Control layer - Portable Termination (PT)".
- 3) DE/RES-03042-3 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Medium Access Control layer - Portable Termination (PT)".
- 4) DE/RES-03042-4 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Network layer - Fixed Termination (FT)".
- 5) DE/RES-03042-5 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Data Link Control layer - Fixed Termination (FT)".
- 6) DE/RES-03042-6 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Medium Access Control layer - Fixed Termination (FT)".
- 7) DE/RES-03042-7 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Common Interface (CI), Protocol Implementation Conformance Statement (PICS), Physical layer".
- 8) DE/RES-03043-1 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Generic Access Profile (GAP), Profile specific Implementation Conformance Statement (ICS), Portable Termination (PT)".
- 9) DE/RES-03043-1 (June 1994): "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT), Generic Access Profile (GAP), Profile specific Implementation Conformance Statement (ICS), Fixed Termination (FT)".

## History

Document history	
July 1995	First Edition
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