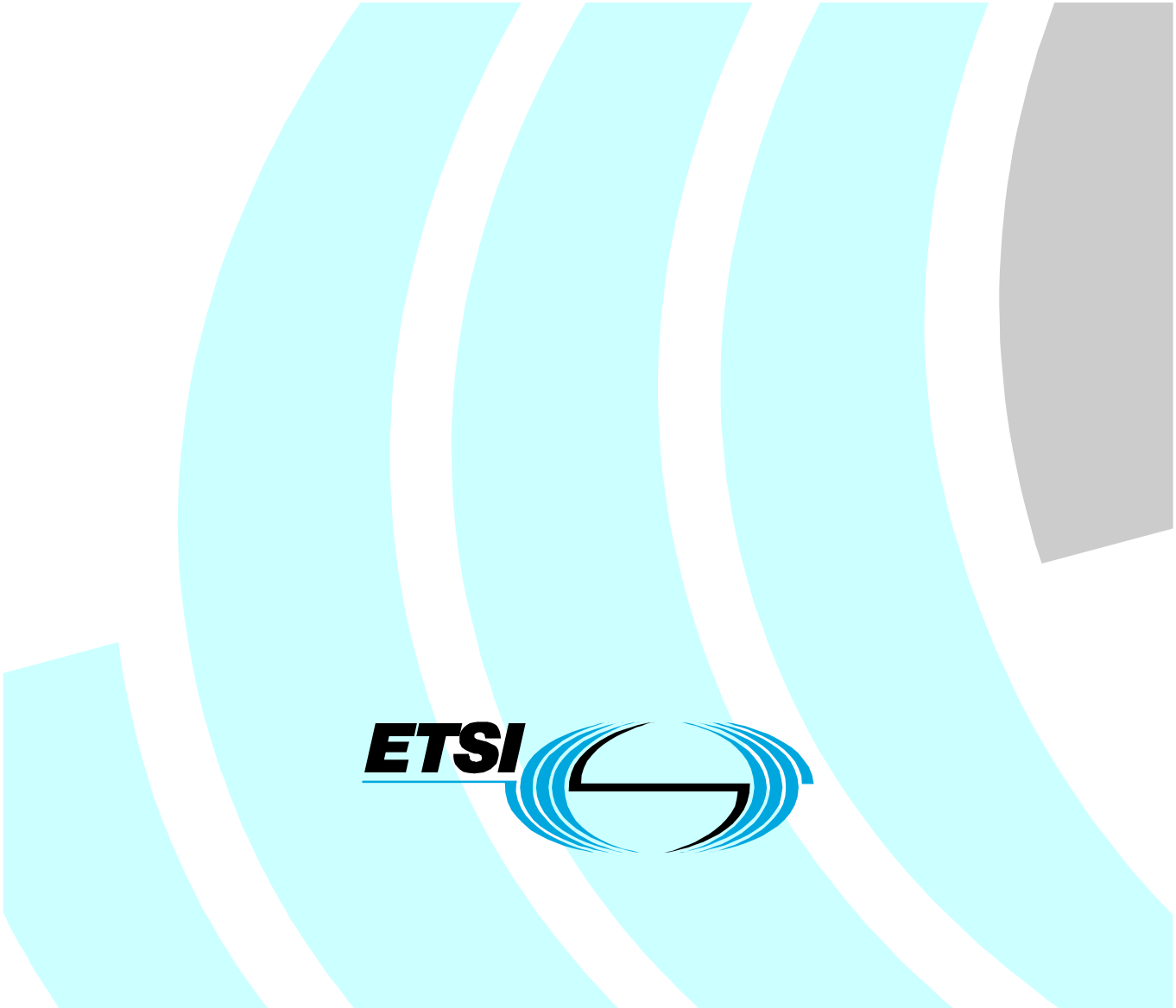
ETSI TS 101 863-3 V1.1.2 (2001-11)

Technical Specification

Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 3: 3,1 kHz speech service



Reference
RTS/DECT-000213-3

Keywords
DECT, interworking, UMTS

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Foreword

This Technical Specification (TS) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is based on DECT Common Interface (CI) specification EN 300 175, parts 1 [1] to 8 [8] to enable DECT terminals to interwork in the public and private environment with DECT systems which are connected to a UMTS core infrastructure.

In addition, the present document is based on the DECT Generic Access Profile (GAP), EN 300 444 [13] to enable the same DECT/UMTS terminal to interwork with a DECT FP complying to the GAP requirements, irrespective of whether this FP provides residential, business or public access services. General attachment requirements and speech attachment requirements are based on EN 301 406 [14].

The present document is part 3 of a multi-part deliverable covering the DECT/UMTS Interworking Profile (IWP), as identified below:

Part 1: "General description and overview";

Part 2: "CN-FP interworking";

Part 3: "3,1 kHz speech service";

Part 4: "Supplementary services";

Part 5: "SMS point-to-point and cell broadcast";

Part 6: "Packet switched data".

The present document 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 the present document. The present document also fulfils the minimum requirements of the GAP enabling backwards compatibility with the respective equipment.

Further details on the DECT system may be found in TR 101 178 [9], ETR 043 [10] and in EN 300 176-1 [11] and EN 300 176-2 [12].

1 Scope

The present document specifies the Digital Enhanced Cordless Telecommunications (DECT) access protocols and Fixed Part (FP) and Portable Part (PP) interworking/mappings necessary to ensure that the Universal Mobile Telecommunication System (UMTS) services can be provided over DECT. To enable DECT terminals to interwork with DECT systems which are connected to the UMTS infrastructure, from the DECT side of the present document is based on EN 300 444 [13] and on the DECT Common Interface specification EN 300 175 parts 1 [1] to 8 [8] (for the cases not covered by Generic Access Profile (GAP)), from UMTS side the present document assumes interworking with UMTS specification release 1999 and later.

An air-interface profile is specified for a particular set of UMTS services so that inter-operability of DECT equipment for these services can be achieved. Interworking functions/mappings are specified for Mobile Switching Centre (MSC) attachment for the DECT FP as the FP is using the Iu-interface towards the UMTS core network in the respect that the FP emulates a UTRAN Radio Network Controller (RNC) with regards to the UTRAN messages which are relevant to the present document. Interworking functions/mappings for the PP are specified for MSC environment.

The provision of the (UMTS) Subscriber Identity Module (SIM, USIM) and DECT Authentication Module (DAM) within the DECT portable are also considered.

UMTS interfaces to non-UMTS networks are out of the scope of the present document.

2 References

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

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".

[3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

[5] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

[6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".

[7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

[8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".

[9] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A high level guide to the DECT standardization".

[10] ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".

[11] ETSI EN 300 176-1: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 1: Radio".

[12] ETSI EN 300 176-2: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 2: Speech".

[13] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[14] ETSI EN 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio".

[15] ETSI TS 101 863-1: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 1: General description and overview".

[16] ETSI TS 101 863-2: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 2: CN-FP interworking".

[17] ETSI TR 121 905: "Universal Mobile Telecommunications System (UMTS); Vocabulary for 3GPP Specifications (3GPP TR 21.905)".

[18] ETSI TS 122 016: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); International Mobile station Equipment Identities (IMEI) (3GPP TS 22.016)".

[19] ETSI TS 123 003: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification (3GPP TS 23.003)".

[20] ETSI TS 123 009: "Universal Mobile Telecommunications System (UMTS); Handover procedures (3GPP TS 23.009)".

[21] ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Mobile radio interface layer 3 specification; Core Network Protocols - Stage 3 (3GPP TS 24.008)".

[22] ETSI TS 125 331: "Universal Mobile Telecommunications System (UMTS); RRC Protocol Specification (3GPP TS 25.331)".

[23] ETSI TS 125 413: "Universal Mobile Telecommunications System (UMTS); UTRAN Iu Interface RANAP Signalling (3GPP TS 25.413)".

[24] ETSI TS 133 102: "Universal Mobile Telecommunications System (UMTS); 3G Security; Security Architecture (3GPP TS 33.102)".

[25] ETSI ETR 206: "Public Switched Telephone Network (PSTN); Multifrequency signalling system to be used for push-button telephones [CEPT Recommendation T/CS 46-02 E (1985)]".

[26] ITU-T Recommendation G.721: "32 kbit/s adaptive differential pulse code modulation (ADPCM)".

[27] ETSI EN 301 503: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification; Radio Resource Control Protocol (GSM 04.18 version 8.4.1 Release 1999)".

[28] ISO/IEC 8859-1: "Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 175-1 [1] and in TR 121 905 [17] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 175-1 [1] and in TR 121 905 [17] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 175-1 [1], in TR 121 905 [17] and the following apply:

ADPCM	Adaptive Differential Pulse Code Modulation
ARI	Access Rights Identity
CC	Call Control
CK	Cipher Key
CKSN	Cipher Key Sequence Number
CN	Core Network
C-Plane	Control-Plane
CS	Circuit Switched
DAM	DECT Authentication Module
DECT	Digital Enhanced Cordless Telecommunications
DSAA	DECT Standard Authentication Algorithm
EF	Elementary File
ELI	Extended Location Information
EMC	Equipment Manufacture Code
ETI	Extended Transaction Identifier
F	Flag
FAC	Final Assembly Code
FGI	Function Group Identifier
FP	Fixed Part
FT	Fixed Termination
GAP	Generic Access Profile
GSM	Global System for Mobile communications
IK	Integrity Key
IMEI	International Mobile station Equipment Identity
IMEISV	IMEI Software Version
ITC	Information Transfer Capability
IWU	InterWorking Unit
KSI	Key Set Identifier
LAI	Location Area Identity
LAP	Link Access Procedure
LLME	Lower Layer Management Entity
LU	LAP U-service
MANIC	MANufacturer Identity for Cordless fixed part and cordless portable part
MODIC	MODel Identity for Cordless fixed part and cordless portable part
MS	Mobile Station
MSB	Most Significant Bit
NWK	NetWorK
OTF	Original Transaction Flag
OTV	Original Transaction Value
PD	Protocol Discriminator
PLMN	Public Land Mobile Network
PLMN-Id	PLMN Identification

PP	Portable Part
PSN	Portable equipment Serial Number
PT	Portable radio Termination
SIM	Subscriber Identification Module
SNR	Serial NumbeR
SS	Supplementary Service
TAC	Type Approval Code
TI	Transaction Identifier
TV	Transaction Value
TVX	Transaction Value EXtension
UMTS	Universal Mobile Telecommunications System
U-Plane	User-Plane
USIM	UMTS SIM

4 General

The present document specifies how the UMTS 3,1 kHz voice CS service is provided over the DECT air interface.

It defines the necessary mappings on the network layer between UMTS and DECT.

5 Interworking mappings, FP attached to the UMTS PLMN, FP C-Plane IWU procedures

This clause focuses on the basic interworking profile procedures; the main clauses focus on the procedures mentioned below:

- call establishment and call release procedures;
- registration, security related, connection management procedures;
- paging related interworking procedures;
- other specific IWU procedures;
- exception handling.

In general, DECT messages are directly mapped to equivalent messages in UMTS and vice-versa. In some procedures there is not a one-to-one correspondence between DECT and UMTS protocols, and a more complex interworking function has to be defined.

5.1 Call handling IWU procedures

5.1.1 Normal outgoing call

The PT and FT shall support dialling information included in the <<MULTI-KEYPAD>> information element in one or several {CC-INFO} messages, as described in clause 8 of GAP, EN 300 444 [13], see a).

The PT may optionally support and the FT shall support dialling information included in the <<CALLED-PARTY-NUMBER>> information element of the {CC-SETUP} message, see b). Upon receipt of an 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) No <<CALLED-PARTY-NUMBER>> included in the {CC-SETUP}. Dialling in {CC-INFO} in DECT OVERLAP SENDING state:

- in the case that the {CC-SETUP} does not contain <<CALLED-PARTY-NUMBER>>, then the FP/IWU shall, upon receipt of a CM-service accept message from CN or successful start of ciphering, issue an 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;

- prior to sending the Setup message to the CN the FP IWU shall initiate the Connection Management (CM) service procedure as described in clause 5.2.7. The CM-service procedure shall be initiated upon receipt of the {CC-SETUP} message, i.e. prior to when the FP has received dialling information;

- the <<MULTI-KEYPAD>> information element shall be used for dialling information. The IWU shall either:

  1) not send a Setup message to the CN before it receives a <<SENDING-COMPLETE>> information element; or

  2) 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 CN with all the stored digits received in previous {CC-INFO} messages mapped into the <<CALLED-PARTY-BCD-NUMBER>> information element. The mapping from {CC-INFO} to Setup shall be carried out as described in clause 6.2.12;

- if the CN replies with Call proceeding, Alerting and/or Connect messages as a response to the received Setup message, the mapping to corresponding DECT messages shall be done as described in clauses 6.1.9, 6.1.8 and 6.1.10. Upon receipt of a Connect from the CN, in addition to the mapping function to the FP, the FP IWU shall send a Connect-ack message to the CN. MNCC_CALL_PROC-req, MNCC_ALERT-req and MNCC_CONNECT-req shall never be issued to the FT before their peer UMTS messages have been received by the FP IWU;

- if the CN replies with a Release message as a response to the Setup message sent to the CN, the FP IWU shall apply the appropriate release procedure defined in clause 5.1.7;

- if the CN does not reply with a Call proceeding, Alerting or Connect message and the timer F<CC.01> expires, the FP shall release the call by issuing an MNCC_RELEASE-ind primitive. The FP IWU shall upon receipt of the MNCC_RELESE-ind primitive send a Release message to the CN;

- if the CN does not send a Connect message after it has sent Call proceeding and/or Alerting and the timer F<CC.04> expires, the FP shall release the call by issuing an MNCC_RELEASE-ind primitive. The FP IWU shall upon receipt of the MNCC_RELESE-ind primitive send a Disconnect message to the CN.

NOTE 1: When the FT is in state F-03 (call proceeding) (EN 300 175-5 [5], clause 9.2.2) or F-04 (call delivered) the FP IWU may map all received {CC-INFO} messages to UMTS, but how it is done is outside the scope of the present document (normally related to supplementary services).

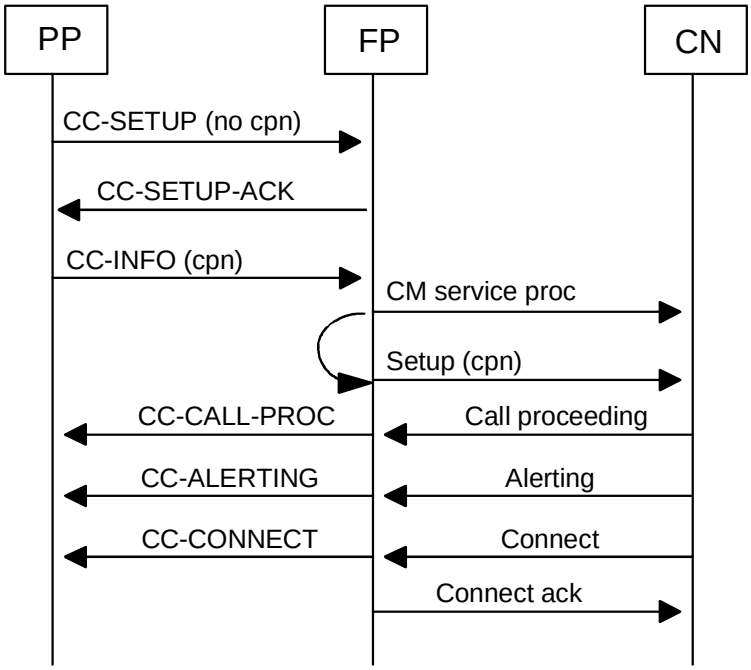

Figure 1: FP receives the dialling information (cpn) in {CC-INFO} message

The outgoing call procedure with a <<MULTI-KEYPAD>> information element included in the {CC-INFO} messages for called party addressing is shown in figure 4.

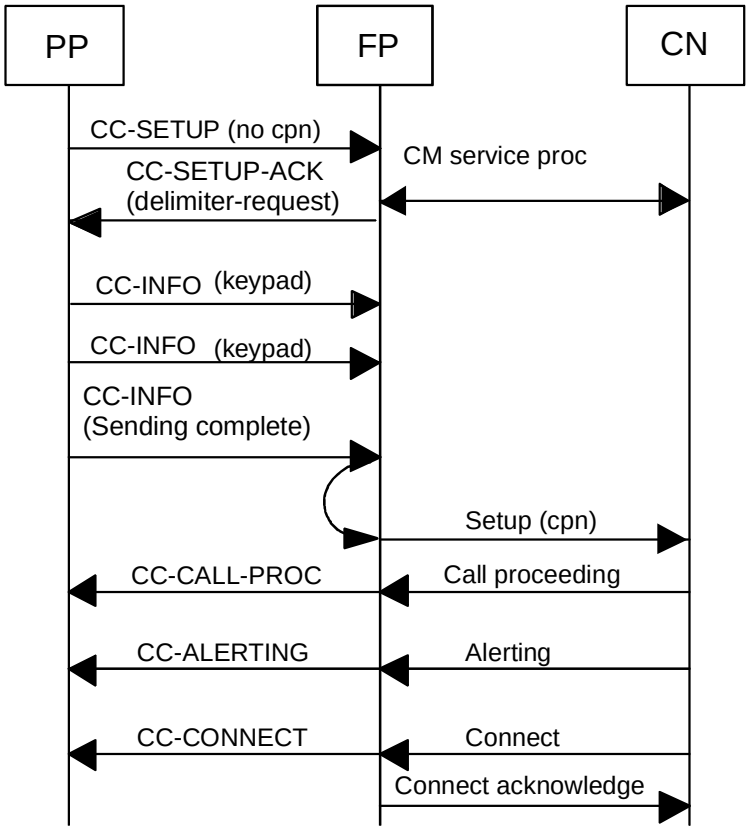

Figure 2: FP receives the dialling information (Multi keypad) in {CC-INFO} message

b) <<CALLED-PARTY-NUMBER>> included in the {CC-SETUP}:

- 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 UMTS Setup as described in clause 6.2.17. Mapping of <<CALLED-PARTY-SUBADDRESS>> is optional. Prior to this the IWU shall initiate the CM service procedure as described in clause 5.2.7;

- if the CN 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 clauses 6.1.9, 6.1.8 and 6.1.10. Upon receipt of a Connect from the CN, in addition to the mapping function to the FP, the FP IWU shall send a Connect-ack message to the CN. MNCC_CALL_PROC-req, MNCC_ALERT-req and MNCC_CONNECT-req shall never be issued to the FT before their peer UMTS messages have been received by the FP IWU;

- if the CN replies with a Release or a Release complete message as a response to the sent Setup message to the CN, the FP IWU shall apply the appropriate release procedure defined in clause 5.1.7;

- if the CN does not send a Connect message after it has sent Call proceeding and/or Alerting and the timer F<CC.04> expires, the FP shall release the call by issuing an MNCC_RELEASE-ind primitive. The FP IWU shall upon receipt of the MNCC_RELESE-ind primitive send a Disconnect message to the CN.

NOTE 2: When the FT is in state F-03 (call proceeding) (EN 300 175-5 [5], clause 9.2.2) or F-04 (call delivered) the FP IWU may map all received {CC-INFO} messages to UMTS, but how it is done is outside the scope of the present document (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.

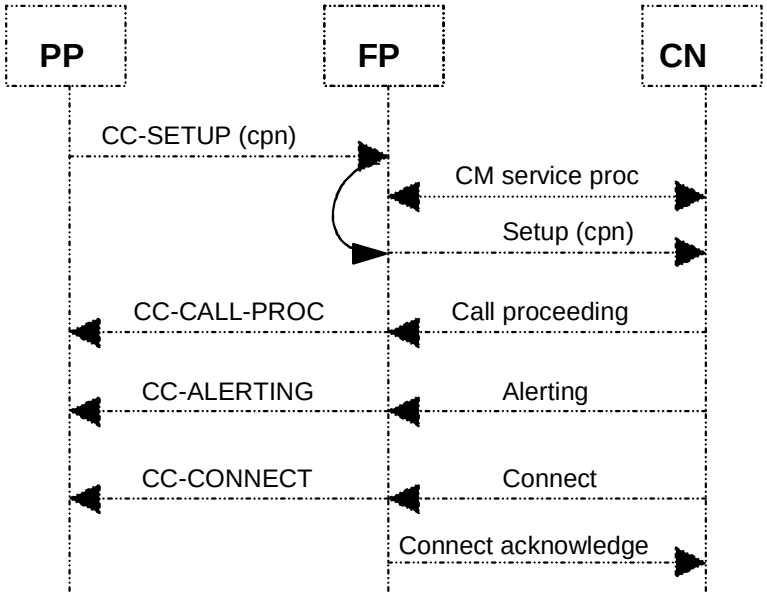

Figure 3: FP receives the dialling information (cpn) in {CC-SETUP} message

The CM service procedure (as defined in clause 5.2.7) shall occur prior to the Setup message being sent to the CN. Other UMTS network initiated procedures may also occur prior to sending the Setup message.

NOTE 3: The number of received dialled digits by the FP IWU may exceed the number of supported digits in the UMTS <<called party BCD number information element>> of the Setup message. Appropriate handling is manufacturer dependant.

5.1.2 Emergency call

The "Emergency call set-up" value in the <<BASIC-SERVICE>> information element shall be used to initiate, the UMTS "Teleservice 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 an Emergency setup message as described in clause 6.2.18. Prior to sending an Emergency Setup message towards the UMTS CN, the FP IWU shall initiate the CM-service procedure as described in clause 5.2.7. The value of the <<CM service type>> information element shall in this case be set to value "Emergency call establishment". The value of the <<PORTABLE IDENTITY>> information element shall be set to IPUI type R. If the IPUI type R is not available the PP shall use the IPUI type N (International Portable Equipment Identity (IPEI)), see clause 10.1.1.2.

All further actions in the FP IWU shall be as for a normal outgoing call.

5.1.3 Incoming call

Upon receipt of a Setup message from the CN as a result of the UMTS mobile terminating call establishment procedure, the FP IWU shall issue an MNCC_SETUP-req primitive to the FT. The UMTS Setup message shall be mapped into DECT {CC-SETUP} message as described in clause 6.1.11.

NOTE: Prior to the UMTS Setup being received at the IWU, MM-connection establishment has been achieved from the CN to the PP using the paging procedure as described in clause 5.3.

If the FP/IWU receives a Setup message form the CN with a <<Bearer capability>> information element it does not support, the FP/IWU shall respond with a Release Complete message with <<Cause value>> "1011000"B (Incompatible destination), see clause 8.2.20.

PT alerting may be initiated in two ways:

1) by including a <<SIGNAL>> information element in the {CC-SETUP} message; or

2) by sending a {CC-INFO} message with a <<SIGNAL>> information element included.

In case the first method is used, FP IWU shall issue MNCC_SETUP-req primitive including a <<SIGNAL>> information element to the FT.

In case the second method is used, after {CC-SETUP} message sent to PT, FP IWU shall issue an MNCC_INFO-req primitive with a <<SIGNAL>> information element included upon completion of assignment procedure.

FP IWU is required to support one of the methods, PP is required to support both.

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 CN, both with cause"0010001"B (user busy). After sending Release complete the FP IWU shall consider the MM-connection with the CN as released.

The IWU shall wait to receive MNCC_ALERT-ind or MNCC_CONNECT-ind from the FT. If the FP/IWU receives a {CC-RELEASE-COM} message with <<RELEASE-REASON>> "00000101"B (incompatible service), the FP/IWU shall send a Release complete message to the CN containing the mapped <<Cause value>> "1011000"B (Incompatible destination) conforming to clause 8.2.20.

If the IWU receives MNCC-ALERT-ind prior to MNCC_CONNECT-ind (figure 4), the IWU shall issue a Call confirmed message indicating the relevant <<BEARER CAPABILITY>> information elements to the CN. If no <<BEARER CAPABILITY>> has been received, the FP IWU shall assume speech. Then the FP IWU shall map the {CC-ALERTING} and possible subsequent {CC-CONNECT} into the corresponding UMTS messages according to clauses 6.2.10 and 6.2.11 respectively. Upon receipt of a {CC-CONNECT-ACK} message from the CN, this message shall be mapped into the DECT {CC-CONNECT-ACK} message as described in clause 6.1.17.

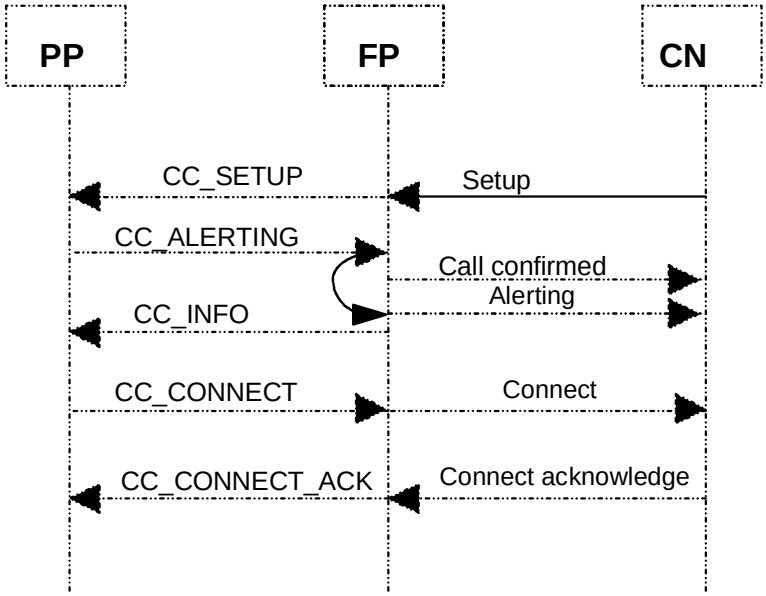

Figure 4: Incoming call where the IWU receives MNCC_ALERT-ind prior to MNCC_CONNECT-ind

If the IWU receives MNCC_CONNECT-ind without MNCC_ALERT-ind (see figure 5), the FP IWU shall issue a Call confirmed message indicating the relevant <<BEARER CAPABILITY>> information elements towards the CN. If no <<BEARER CAPABILITY>> has been received from the CN in a setup, the FP IWU shall assume speech. After this the FP IWU shall map the {CC-CONNECT} into the corresponding UMTS message according to clause 6.2.11. When Connect acknowledge is received from the CN, the FT sends {CC-CONNECT-ACK} message to the PT.

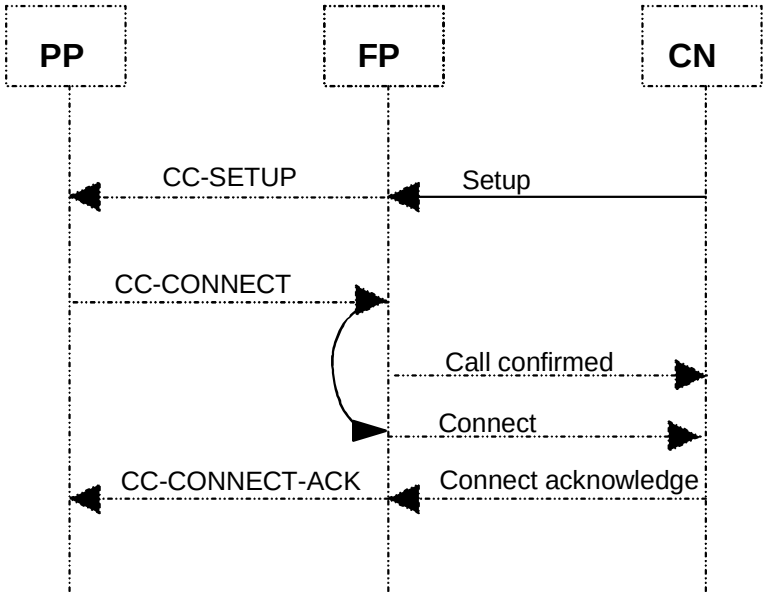

Figure 5: Incoming call where the IWU receives MNCC_CONNECT-ind without MNCC_ALERT-ind

If F <CC.03> (CC setup timer, EN 300 175-5 [5], clause A.1) expires, while waiting for {CC-ALERTING} or {CC-CONNECT} from the PT, the FP shall issue an MNCC_REJECT-ind primitive to the FP IWU. The FP IWU shall send a RELEASE COMPLETE message to the CN.

If F <CC.04> (CC completion timer, EN 300 175-5 [5] clause A.1, optional) expires, while waiting for {CC-CONNECT}, the FP shall issue an MNCC_RELEASE-ind primitive to the FP IWU. The FP IWU shall send a Disconnect message to the CN.

5.1.4 Normal call release initiated by the PP

Upon receipt of an 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 CN. The mapping of the DECT {CC-RELEASE} message to the UMTS Disconnect message is described in clause 6.2.13.

Upon receipt of a Release message from the CN, the IWU shall issue an MNCC_RELEASE-res primitive to the FT. The mapping of the UMTS Release message to DECT {CC-RELEASE-COM} message is described in clause 6.1.13. The FP shall also send a Release complete message to the CN.

The normal call release initiated by the PP is shown in figure 6.

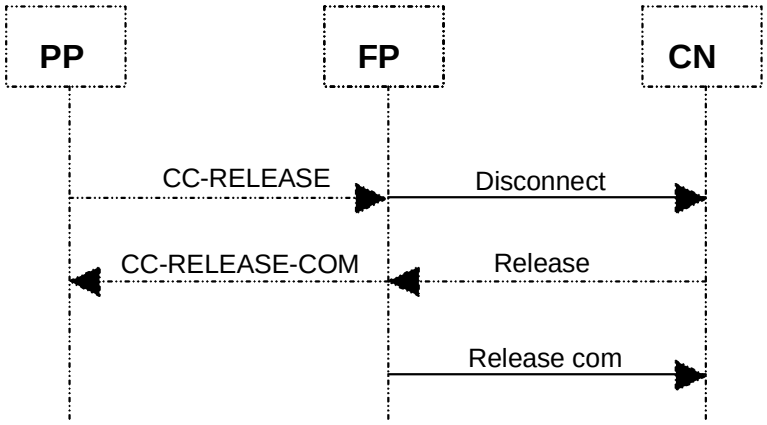

Figure 6: Normal release initiated by the PP

If P <CC.02> (CC release timer, EN 300 175-5 [5] clause A.1) expires due to the fact that no RELEASE message has been received from the CN and therefore no {CC-RELEASE-COM} message has been sent to the PT, the PT sends a {CC-RELEASE-COM} to the FP. The FP shall issue an MNCC_RELEASE-cfm primitive to the FP IWU which will send a RELEASE message to the CN.

5.1.5 Normal call release initiated by the UMTS PLMN

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

Two cases can be discerned depending on the presence of inband information.

If the <<Progress indicator>> information element in the Disconnect message indicates "Inband information or appropriate pattern now available", or the FP requires a traffic channel on the air interface, e.g. for transporting inband tones, the following procedure shall take place:

- upon receipt of a Disconnect message from the CN the FP IWU may issue inband tones towards the PP and issue an MNCC_INFO-req primitive with a <<Progress>> information element for activating the U-Plane between FP and PP. The mapping of the UMTS Disconnect to the DECT {CC-INFO} message is described in clause 6.1.12;

- if the PP user does not release the call, the FP IWU shall issue an MNCC_RELEASE-req on receipt of the Release message. This shall result in the {CC-RELEASE} message being sent to the PT. The mapping of the UMTS Release message to the DECT {CC-RELEASE} message is described in clause 6.1.13;

- if the FP IWU receives an MNCC_RELEASE-cfm from the FT, the DECT {CC-RELEASE-COM} message (figure 7) is mapped into the UMTS Release complete message as described in clause 6.2.16.

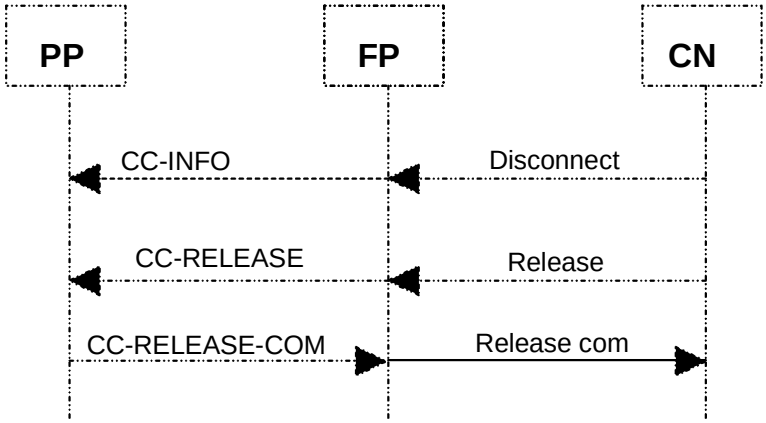

Figure 7: Normal CN initiated call release with tones

If the <<Progress indicator>> information element is not present in the Disconnect message or if the value of the <<Progress indicator>> information element in the Disconnect message does not indicate "Inband information or appropriate pattern now available", and the FP does not require a traffic channel on the air interface, e.g. for transporting inband tones, the following clearing procedure shall take place:

- upon receipt of a Disconnect message from the CN the FP IWU shall issue an MNCC_RELEASE-req and this shall result in the {CC-RELEASE} message being sent to the PT. The mapping of the UMTS Disconnect message to the DECT {CC-RELEASE} message is described in clause 6.1.12;

- if the FP IWU receives an MNCC_RELEASE-cfm from the FT, the DECT {CC-RELEASE-COM} message (figure 8) is mapped into the UMTS Release as described in clause 6.2.14. The reception of a Release complete message from the CN shall terminate at the FP IWU.

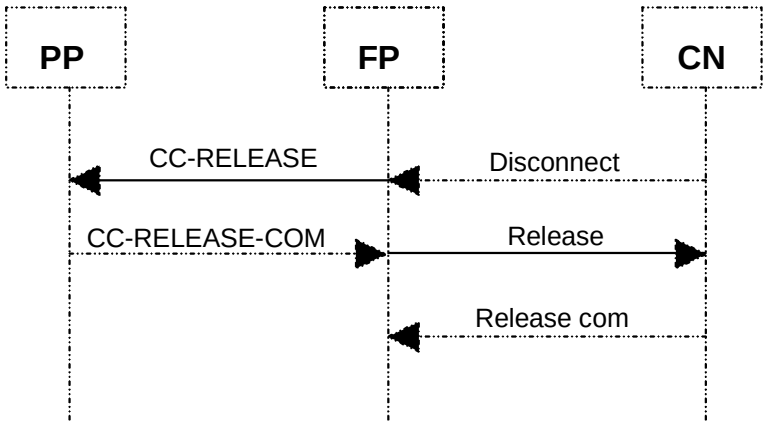

Figure 8: Normal CN initiated call release with no tones

If F <CC.02> (CC release timer, EN 300 175-5 [5] clause A.1) expires, the FP issues an MNCC_RELEASE-cfm primitive to the FP IWU. The FP IWU shall send a RELEASE message to the CN.

The FP IWU at sending of RELEASE message to the CN shall start a timer supervising the reception of a RELEASE COMPLETE message (this timer is similar to timer T308 (release request timer) in TS 124 008 [21] clause 11.3). At the first expiry of this timer, the FP IWU shall retransmit the RELEASE message to the CN and restart the timer. At the second expiry, the call shall be terminated at the FP IWU.

5.1.6 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 an 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 CN. The mapping of the DECT {CC-RELEASE-COM} message to the UMTS Release message is described in clause 6.2.14. The reception of a Release complete message from the CN shall terminate at the FP IWU.

The abnormal call release initiated by the PT in this case is shown in figure 9.

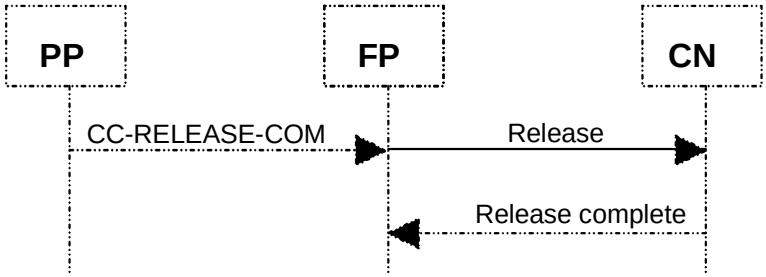

Figure 9: Abnormal call release initiated by the PT

The FP IWU at sending of RELEASE message to the CN shall start a timer supervising the reception of a RELEASE COMPLETE message (this timer is similar to timer T308 (release request timer) in TS 124 008 [21] clause 11.3. At the first expiry of this timer, the FP IWU shall retransmit the RELEASE message to the CN and restart the timer. At the second expiry, the call shall be terminated at the FP IWU.

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

- upon receipt of an 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 CN. The mapping of the DECT {CC-RELEASE-COM} message to the UMTS Release complete message is described in clause 6.2.16.

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

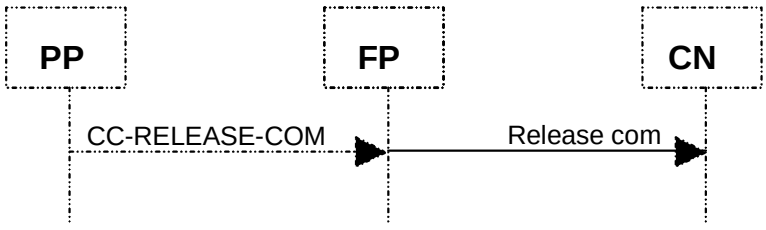

Figure 10: Abnormal call release initiated by the PT

5.1.7 Abnormal call release initiated by the UMTS network

Abnormal call release in the sense of this clause means that the UMTS network sends a Release or a Release complete message but not as a part of the procedure described in clause 5.1.6.

Upon receipt of a Release message from the CN the IWU shall send Release complete back to the CN and map the UMTS Release into the DECT {CC-RELEASE-COM} message as described in clause 6.1.13.

The abnormal call release using Release initiated by the CN is shown in figure 11.

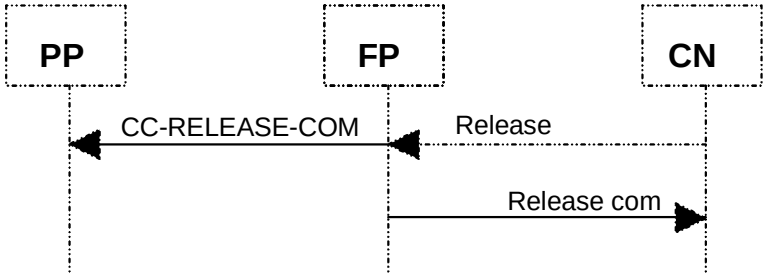

Figure 11: CN initiates a call release with the Release message

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

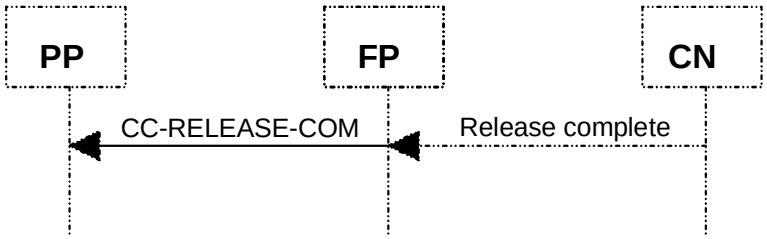

Figure 12: CN initiates a call release with the Release compete message

5.1.8 Exceptional cases

The CN may send an Abort message at any time, see TS 124 008 [21], clause 4.3.5. If the FP IWU receives Abort message after it has sent the Setup to the CN or after it has sent an MNCC_SETUP-req primitive to the FT (to be reflected as a {CC-SETUP} message to the PP), the FP IWU shall send an MNCC_REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT carrying an appropriate release reason.

In overload situations, the FP IWU may decide to reject an incoming MNCC_SETUP-req primitive by sending an MNCC_REJECT-ind primitive reflecting in a {CC-RELEASE-COM} message being sent to the PT. The included <<RELEASE REASON>> information element shall contain one of the temporary overload values indicated in EN 300 175-5 [5]. The PP will, by one of these cause values, be informed about a temporary failure.

If a release collision occurs the FP IWU shall react towards CN as it is specified in TS 124 008 [21] and no mapping is required i.e. no messages are required to be sent back to the PT.

Timer expiry at the FP-IWU shall be handled with respect to the on going procedure and existing state according to TS 124 008 [21] and EN 300 175-5 [5] respectively.

5.1.9 Other

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

5.2 Other IWU procedures

This clause contains security and mobility related procedures and the UMTS specific CM service procedure.

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

All messages, information elements or fields within the information elements which are not mapped across the FP to the UMTS network shall either be ignored or processed locally as defined in the present document, EN 300 175 parts 1 [1] to 8 [8] if not covered by GAP, EN 300 444 [13], or the relevant UMTS specification.

The general philosophy of describing the MM interworking procedures takes place as follows:

a) the procedure description describes the interworking procedures in the FP. In the procedures, references are made to clauses relating to messages, information elements or fields within the information elements which are mapped across the interworking 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 the present document) 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 UMTS specification which is being received or sent at reference point Iu in normal UMTS 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 the present document.

The general layout of the procedures is described in figure 13.

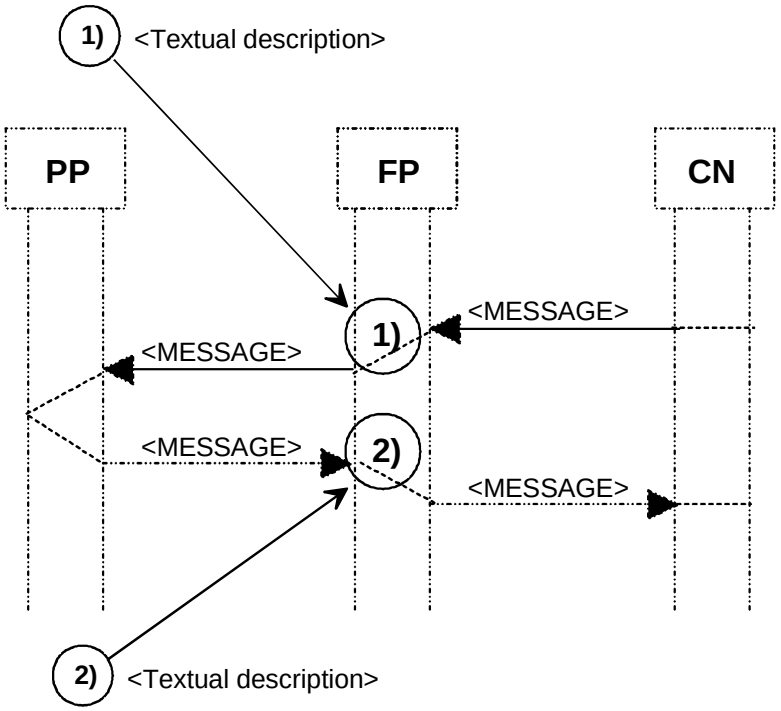

Figure 13: An example of a layout of the FP interworking procedures

5.2.1 Authentication procedure

Clause 5.2.1.1 describes the authentication procedure used for the circuit switched domain. Authentication used for the PS-domain (GPRS) is out of scope.

Depending on the type of SIM used in the UE, either a UMTS security context or a GSM security context is established. The keys sent within the authentication procedures are therefore depending on the security context to be established.

5.2.1.1 CS authentication

This authentication procedure is used within the CS domain.

AUTHENTICATION-RESPONSE

1) Upon receipt of a Authentication request message (figure 14) from the 3G MSC as a result of a authentication procedure as described in TS 124 008 [21] clause 4.3.2 the FP IWU shall issue an 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 Authentication request message to the DECT {AUTHENTICATION-REQUEST} message is shown in clause 6.1.1. The mapping of the cipher key sequence number to DECT authentication type is described in clause 7.1.3.

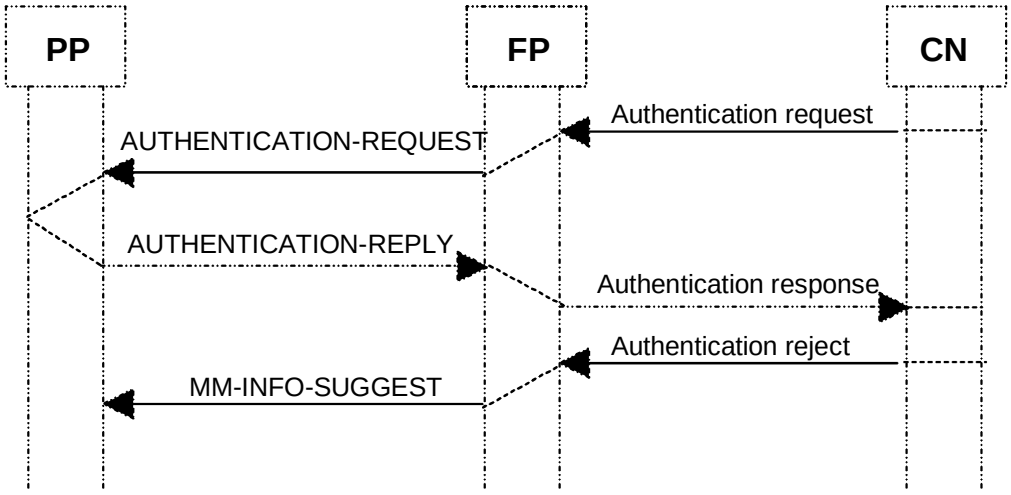

Figure 14: CS Authentication procedure

The fields in the <<AUTH-TYPE>> information element that are generated locally for DECT use shall have the values shown in table 1. The full mapping is described in clause 7.1.3.

Table 1: AUTH-TYPE of DECT Authentication Request

Information element/Item number	Field	Value
<<AUTH-TYPE>>		
1	<Authentication algorithm identifier>	"00100000"B (UMTS authentication algorithm)
2	<Authentication key type>	"0001"B (User authentication key)
3	<Authentication key number>	"0000" (Key associated to the active IPUI)
4	<INC bit>	"0"B
5	<TXC>	"0"B (Do not include the derived cipher key in {AUTHENTICATION-REPLY})
6	<UPC bit>	"1"B (Store cipher key)

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

   The mapping of the DECT {AUTHENTICATION-REPLY} message to the Authentication response message is shown in clause 6.2.3.

   If the {AUTHENTICATION-REJECT} is received from the PT (UMTS security context only) it shall be mapped to AUTHENTICATION RESPONSE as shown in clause 6.2.4.

When an Authentication reject message is received from the CN it shall be mapped to a {MM-INFO-SUGGEST} message in DECT FT coding "UMTS authentication of PP failure". On receipt of such a message in the relevant primitive the PP-IWU shall delete GSM LAI, TMSI and Cipher key sequence number from the "USIM". Mapping between the Authentication reject message and the DECT {MM-INFO-SUGGEST} is shown in clause 6.1.2.

5.2.2 Identity procedure

1) Upon receipt of a Identity request message (figure 15) from the CN as a result of a UMTS identification procedure as described in TS 124 008 [21] the FP IWU shall issue an MM_IDENTITY-req primitive to the FT initiating the DECT Identification of PT procedure by sending a {IDENTITY-REQUEST} message to the PT. The mapping of the received UMTS Identity request message to the DECT {IDENTITY-REQUEST} message is shown in clause 6.1.3.

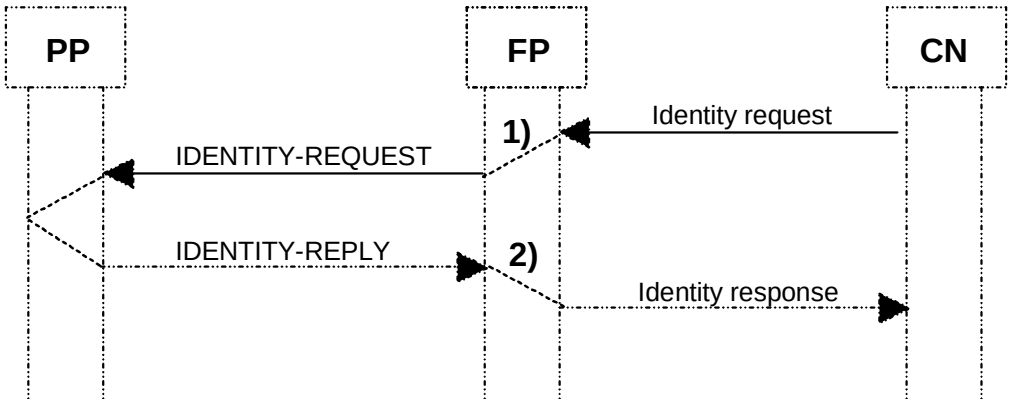

Figure 15: Identity procedure

2) Upon receipt of MM_IDENTITY-cfm primitive from the FT the FP IWU shall send an Identity response message to the CN. The mapping of the DECT {IDENTITY-REPLY} message to the UMTS Identity response message is shown in clause 6.2.9.

If the {IDENTITY-REPLY} message contains no information element (meaning of identity request rejection) or if the timer <MM-ident-2> expires in the FT, i.e. {IDENTITY-REPLY} message has not been received from the PT, the FP IWU, upon receipt of MM_IDENTITY-cfm primitive from the FT indicating a failure shall terminate the procedure. Any further actions in the FP IWU are implementation dependant.

5.2.3 Location registration related procedures

This clause covers three different types of UMTS procedures relating to location registration.

These are:

a) normal location updating;

b) periodic location updating;

c) attach procedure.

Table 2 defines which type of location updating (a, b, or c) the FP IWU shall perform towards the UMTS network relating to conditions listed in table 2 (see note 1).

Table 2: UMTS 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 UMTS PLMN (O&M)
YES	NO	Perform normal location updating procedure	
NO	YES	Perform periodic location updating procedure	
NO	NO	Perform normal location updating procedure	
O&M: Operations and Maintenance.			

NOTE 1: Change of DECT location areas in the same UMTS location area may initiate a UMTS related periodic location registration procedure as described in this clause. The FP may not be able to distinguish a location registration caused by a change of the DECT location area from a periodic location registration.

In the context of the present document the different types of functions in the FP IWU are defined in table 3.

Table 3: 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 CN
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 16) the FP IWU shall initiate a UMTS location registration procedure as described in TS 124 008 [21] by sending a Location updating request message to the CN. The mapping of the DECT {LOCATE-REQUEST} message to the UMTS Location updating request message is shown in clause 6.2.1.

In overload situations, the FP IWU may reject the location registration immediately by sending an MM_LOCATE-res primitive with a reject parameter. In this case the primitive shall include a <<DURATION>> information element to indicate a time period in which the PP will not be allowed to re-attempt a location registration within this DECT LA. The PP shall support the <<DURATION>> information element in the {LOCATE-REJECT} message. The value may be based on defined time limit 1 or 2 (see EN 300 175-5 [5]) or the standard time limit, see clause 6.1.6.

The <<Mobile station classmark 1>> information element shall be forwarded by the FT IWU to the CN.

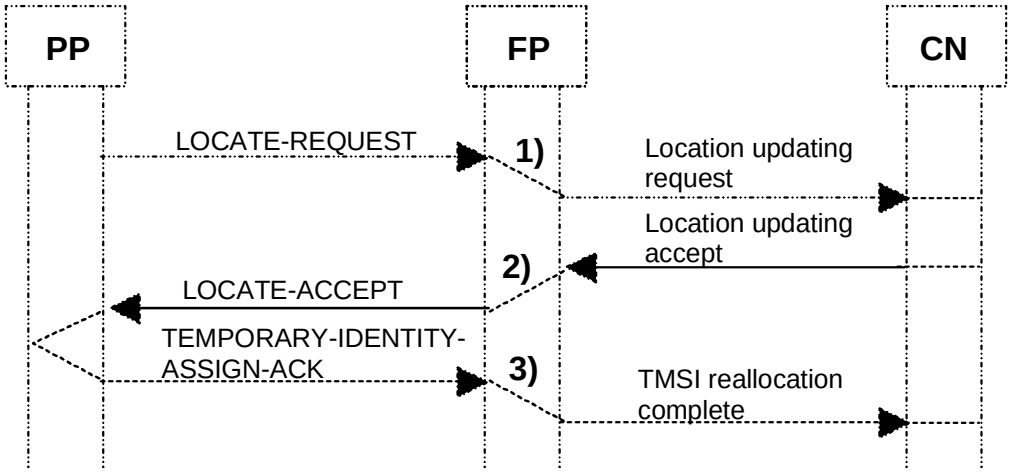

Figure 16: Location registration

2) Upon receipt of a Location updating accept from the CN the FP IWU shall issue an MM_LOCATE-res primitive to the FT. The FT sends a {LOCATE-ACCEPT} message to the PT. The mapping of the UMTS Location updating accept message to the DECT {LOCATE-ACCEPT} is shown in clause 6.1.6.

   The FP IWU shall issue a <<DURATION>> information element in the {LOCATE-ACCEPT} message or use the DECT location update procedure in order to generate the DECT equivalent of a UMTS periodic location registration (as described in clause 8.2 of GAP, EN 300 444 [13]). In this case no <<DURATION>> information element will be present in the {LOCATE-ACCEPT} message.

NOTE 2: The value of the <<DURATION>> information element is a local function of the FP and may be loaded into the FP from the UMTS Operation and Maintenance Centre (OMC).

If the UMTS <<Mobile identity>> information element includes a UMTS IMSI the value of the <<NETWORK ASSIGNED IDENTITY>> information element sent by the FT to the PT shall be set as shown in table 4. This value represents an invalid TMSI.

Table 4: Field value for <<NETWORK ASSIGNED IDENTITY>>

Field	Value
<Identity Value>	"11111111111111111111111111111111"B (32 bits)

The Mobile station classmark 1 information element generated locally by the FP IWU shall be set as defined in table 5.

Table 5: Field values for Mobile station classmark 1

Field	Value
Revision level	"01"B
A5/1	0 (Encryption algorithm A5/1 available)
RF power capability	"010"B (Class 3)

The FT IWU shall store the information of the <<TERMINAL CAPABILITY>> information element received in the {LOCATE-REQUEST} message concerning support of UMTS SMS (see table 6). This information is later used in the Paging response message (clause 5.3) and during CM service procedure (clause 5.2.7).

Table 6: Field values for Mobile station classmark 2

Information element coding DECT	DECT value	Information element coding UMTS	UMTS value
-	-	Mobile station classmark 2	
-	-	Revision level	="01"B (phase 2 supported)
-	-	A5/1	="0"B Encryption algorithm A5/1 available.
-	-	RF power capability	="010"B Class 3
-	-	PS capability	="0"B PS capability not present
-	-	Supplementary Service (SS) screening indicator	="01"B capability of handling ellipses notation and phase 2 error handling
Terminal capability	Profile Indicator_2= SMS service	Short message (SM) capability	(note)
-		Frequency capability (FC)	="0"B The mobile station does not support the extension band G1 in addition to the primary GSM band
-		Classmark 3 (CM3)	="0"B No additional MS capability information available
-		A5/3	="1"B Encryption algorithm A5/3 available
-		A5/2	="1"B Encryption algorithm A5/2 available
NOTE: The value of SM capability is received in the <Profile Indicator_2> field. (0 = SM capability not present, 1 = SM capability present).			

The requirements in the following paragraphs relating to location updating rejection is mandatory in ARI class D environment, where as in ARI class A, B and C environments these are optional and, for example, the access rights terminate procedures may be used.

3) Upon the reception of the MM-IDENTITY_ASSIGN-cfm primitive, in the case when a new TMSI has been allocated to the PP by sending the <<NETWORK ASSIGNED IDENTITY>> the FP IWU shall send a TMSI reallocation complete message to the CN. If a Temporary Portable User Identity (TPUI) assignment has taken place without TMSI (valid value) allocation the procedure shall terminate at the FP IWU.

   If the timer <MM-ident-1> supervising the reception of {TEMPORARY-IDENTITY-ASSIGN-ACK} message from the PT expires, the FP IWU upon reception of an MM_IDENTITY_ASSIGN-cfm primitive indicating a failure shall terminate the procedure. Any further actions in the FP IWU are implementation dependant.

   Upon receipt of a Location updating rejected message from the network after sending the Location request message to the CN (see figure 17) the FP IWU shall issue an MM_LOCATE-res with a reject parameter being set. The FT sends a {LOCATE-REJECT} message to the PT. The mapping of the Location updating rejected message to the {LOCATE-REJECT} message is shown in clause 6.1.7.

   If the reject cause in the Location updating reject message includes a cause value "Location area not allowed" or "National roaming not allowed in this LA", and the DECT location areas do not correspond to the UMTS location areas, the FP IWU shall initiate a location updating procedure by issuing an MM_INFO_SUGGEST-req primitive to the FT to re-initialize the DECT location area level of the PP to correspond to the forbidden LAI. If the reject cause in the Location updating accept message from the CN includes the cause value "PLMN not allowed" the FP IWU may initiate a location updating procedure by issuing an MM_INFO_SUGGEST-req primitive to the FT in order to re-initialize the DECT location area level of the PP to correspond to an appropriate level.

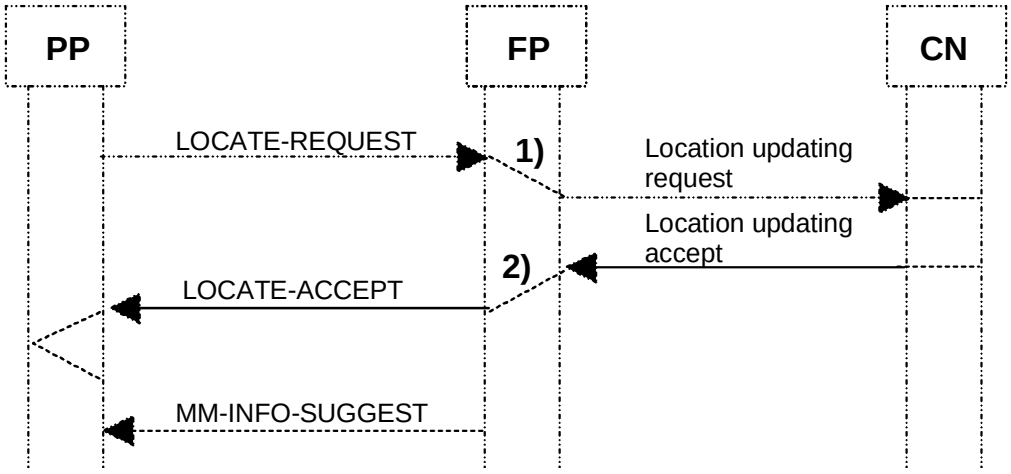

Figure 17: Location registration reject

The FP shall have knowledge of which DECT location area level corresponds the LAI. The re-initialization of the DECT location area level is needed in order to avoid the PP initiating an unnecessary location updating procedure in the current LAI/PLMN.

5.2.4 Detach procedure

Upon receipt of MM_DETACH-ind primitive from the FT as a result of a received {DETACH} message from the PT (figure 18), the FP IWU shall send an IMSI detach indication message to the CN. The mapping of the DECT {DETACH} message to the IMSI detach indication message is shown in clause 6.2.6.

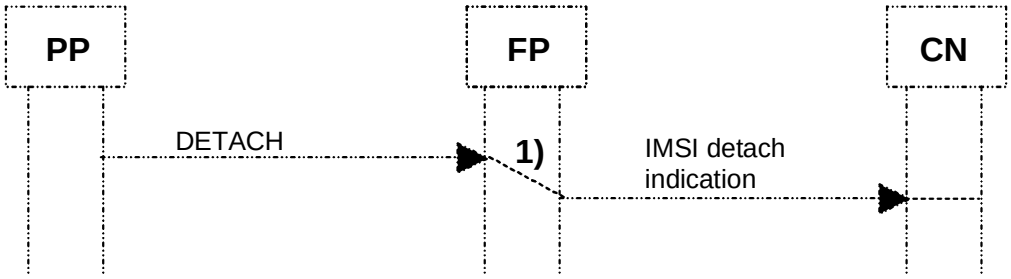

Figure 18: Detach procedure

5.2.5 Temporary identity assignment procedures

1) Upon receipt of a TMSI reallocation command from the CN (figure 19) as a result of a TMSI reallocation procedure defined in TS 124 008 [21], the FP IWU shall issue an 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 EN 300 175-5 [5]. The mapping of the TMSI reallocation command message to the DECT {TEMPORARY-IDENTITY-ASSIGN} message is shown in clause 6.2.7.

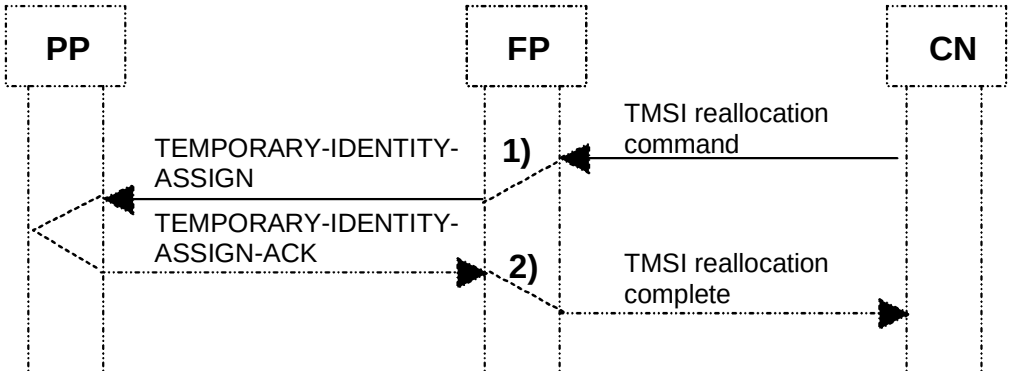

Figure 19: TMSI reallocation procedure

If the PP is required to initiate the periodic location registration, the FT shall 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 an MM_IDENTITY_ASSIGN-cfm primitive as a result of a received {TEMPORARY-IDENTITY-ASSIGN-ACK} message from the PT the FP IWU shall send a TMSI-reallocation complete message to the CN. The mapping of the DECT {TEMPORARY-IDENTITY-ASSIGN-ACK} message to the TMSI reallocation complete message is shown in clause 6.2.7.

   If the PT sends a {TEMPORARY-IDENTITY-ASSIGN-REJ} or timer <MM-ident-1> expires in the FT reflecting in FP IWU receiving an MM_IDENTITY_ASSIGN-cfm primitive indicating "rejection" the procedure shall be terminated in the FP IWU, see figure 20. Any further actions in the FP IWU are implementation dependant.

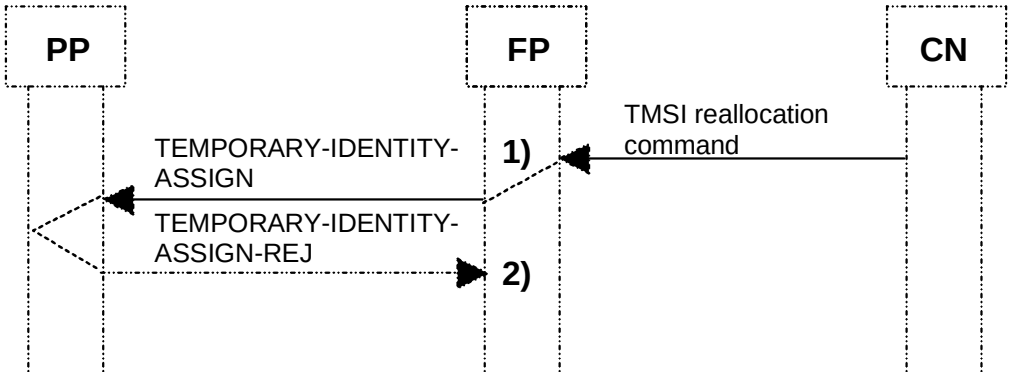

Figure 20: TMSI reallocation procedure rejection from PT

5.2.6 Security procedure

1) Upon receipt of a Security mode command from the CN as described in TS 125 331 [22] clause 8.1.12 the FP IWU shall issue an MM_CIPHER-req primitive to the FT (figure 21) which initiates the ciphering procedure by sending a {CIPHER-REQUEST} message to the PT.

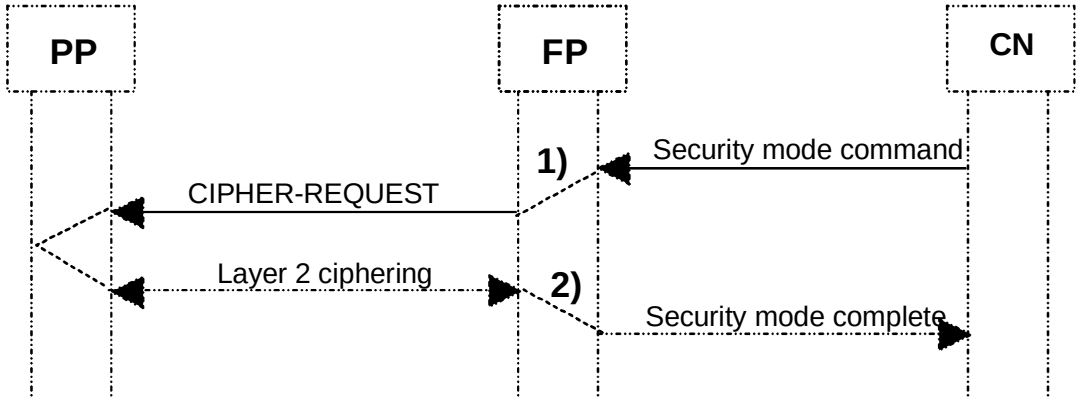

Figure 21: Security mode control procedure

The mapping of the UMTS Security mode command message to the DECT {CIPHER-REQUEST} message is shown in clause 6.1.5.

The received <<Message authentication code>> in the Security mode command message shall be used as follows:

a) the received 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 ciphering;

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 CN 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>> in CIPHER REQUEST

Information element/Item number	Field	Value
<<CIPHER INFO>>		
1	<Cipher algorithm identifier>	"0000001"B (DECT standard cipher algorithm 1)
2	<Proprietary algorithm identifier>	Not sent
3	<Cipher key type>	"1001"B (Derived cipher key)

2) Upon receipt of a layer 2 acknowledgement the FP IWU shall send a Security mode complete message as defined in TS 125 331 [22], clause 8.1.12.3 to the CN (figure 21).

5.2.6.1 Security mode failure

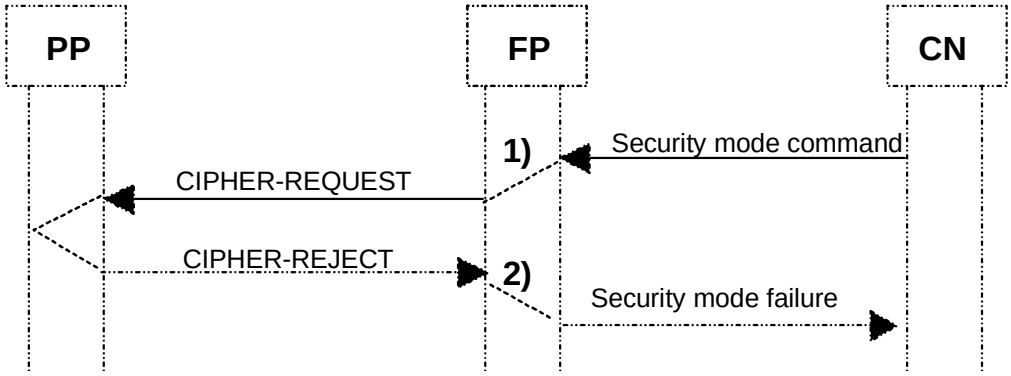

Figure 22: Security mode failure

The PT may reject ciphering (see figure 22):

1) as for clause 5.2.6;

2) on receipt of an MM_CIPHER-cfm primitive indicating "reject" triggered by a PT {CIPHER-REJECT} message, the procedure shall be terminated at the FP IWU;

3) on receipt of MM_CIPHER-cfm primitive indicating a failure resulting from the timeout of <MM-cipher-1> timer, the procedure shall be terminated at the FP IWU.

   When the procedure is terminated due to timer expiry or reception of a {CIPHER-REJECT} message, other actions are possible and are implementation dependant. Radio connections may be released.

5.2.7 CM service procedure

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

NOTE: The CM service procedure is a UMTS specific procedure in order to establish a lower layer Connection Management (CM) service to the upper UMTS 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 clause 5.1.1, i.e. the CM service procedure is an intermediate event prior to proceeding with the normal Call establishment procedure between the PP and the CN. Thus, even though initiated by the DECT {CC-SETUP} message, it is in principle invisible to the end-to-end CC related events.

Upon receipt of a CM-service accept or an indication from the FT for the successful completion of the ciphering procedure initiated the CN, one of the following events shall occur in the FP IWU (a or b):

a) No dialling information was received in the {CC-SETUP} from the PT, i.e. the <<CALLED-PARTY-NUMBER>> information element was not included:

   1) upon receipt of MNCC_SETUP-ind primitive from the FT as a result of a received {CC-SETUP} message from the PT (figure 23) the FP IWU shall initiate a UMTS CM service procedure as described in TS 124 008 [21] by sending a CM service request message to the CN. The mapping of the DECT {CC-SETUP} message information elements to the UMTS CM Service request message is shown in clause 6.2.8. The CM Service request message shall contain the MS Classmark 2 information element previously stored by the FP IWU (see table 2);

   2) the FP IWU shall issue an MNCC_SETUP_ACK-req primitive and this shall result in a {CC-SETUP-ACK} message being sent to the PT, (see figure 23), as described in clause 6.2.8. The mapping of UMTS CM-service accept message and the DECT {CC-SETUP-ACK} message is shown in clause 6.1.25.

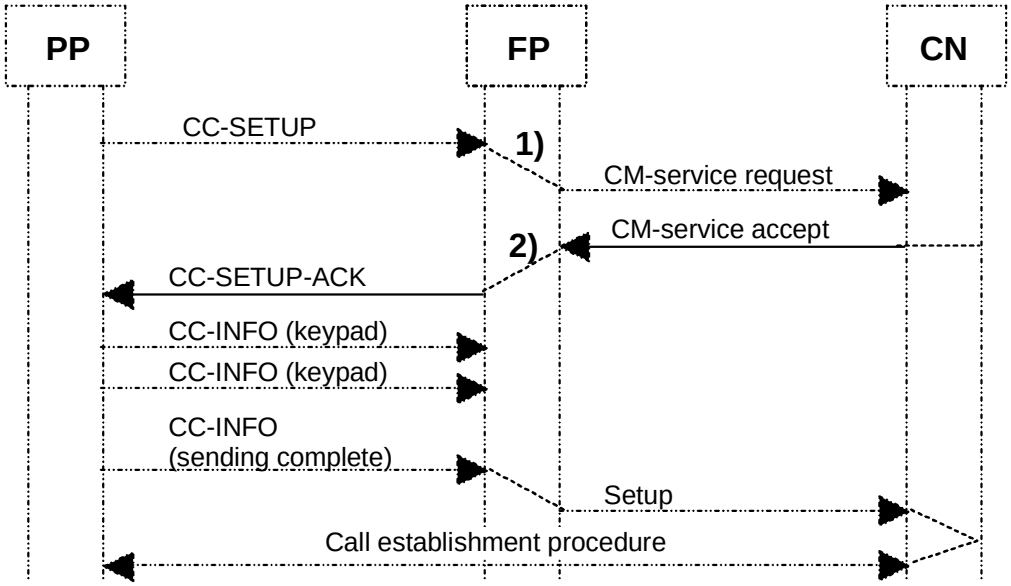

Figure 23: CM service procedure, dialling info in {CC-INFO}, no authentication or ciphering procedure

If the security mode command message is received from the CN it is considered as an implicit CM service request acknowledgement. The FP IWU shall only interpret the procedure as terminated when it has received an acknowledgement from the FT of successful ciphering and it has sent a security mode complete to the CN. The {CC-SETUP-ACK} message to the PT is then locally generated by the FT (figure 24).

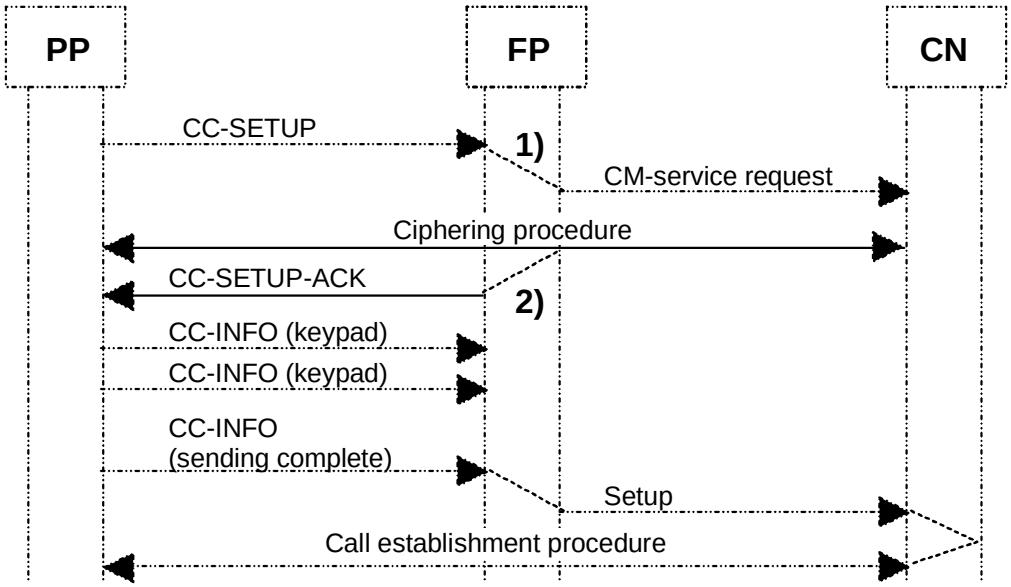

Figure 24: CM service procedure, dialling info in {CC-INFO}

Upon receipt of dialling information the FP IWU shall initiate the UMTS Call establishment procedure as defined in TS 124 008 [21] by sending a Setup message (deriving the necessary information from the {CC-SETUP} message and one or several {CC-INFO} messages) to the CN and proceed with the call establishment procedure as defined in clause 5.1.1.

b) Dialling information was received in the {CC-SETUP} from the PT, i.e. the <<CALLED-PARTY-NUMBER>> information element was included:

1) upon receipt of MNCC_SETUP-ind primitive from the FT as a result of a received {CC-SETUP} message from the PT (figure 25) the FP IWU shall initiate a UMTS CM service procedure as described in TS 124 008 [21] by sending a CM service request message to the CN. The mapping of the DECT {CC-SETUP} message information elements to the UMTS CM Service request message is shown in clause 6.2.8. The CM Service request message shall contain the MS Classmark 2 information element previously stored by the FP IWU (see clause 5.2.3, table 2);

2) the FP IWU shall initiate the UMTS Call establishment procedure as defined in TS 124 008 [21] by sending a Setup message (deriving the necessary information from the same {CC-SETUP} message) to the CN and proceed with the call establishment procedure as defined in clause 5.1.1.

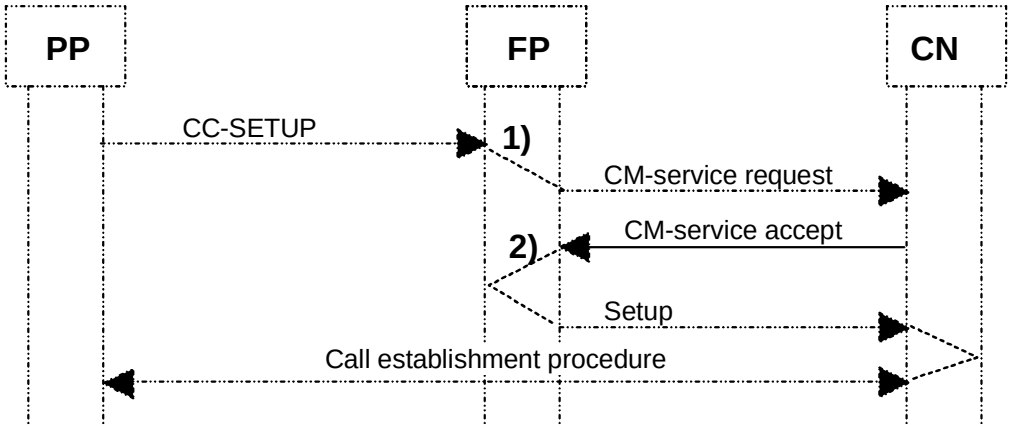

Figure 25: CM service procedure, dialling info in {CC-SETUP}, no authentication or ciphering procedure

If the Cipher mode command message is received from the CN it is used as an implicit CM service request acknowledgement. The FP IWU shall interpret the procedure as terminated only when it has received an acknowledgement from the FT of successful ciphering and it has sent a Cipher mode complete to the CN (see figure 26).

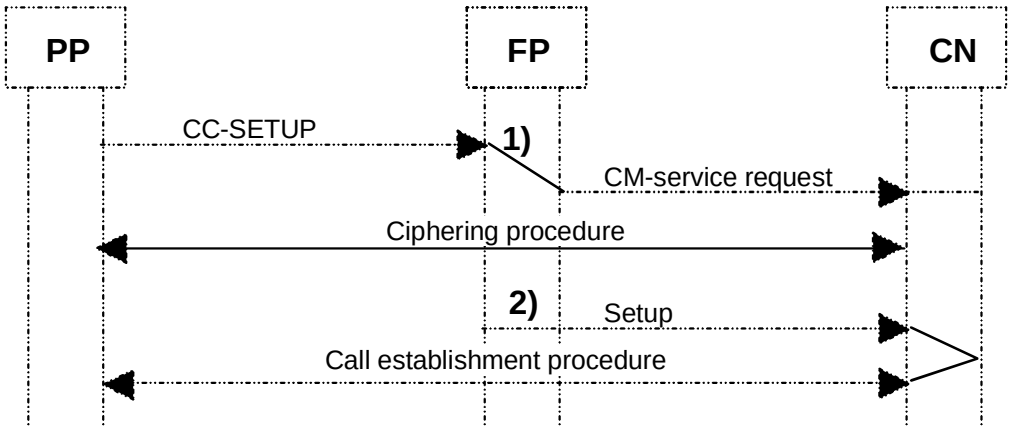

Figure 26: CM service procedure, dialling info in {CC-SETUP}

Upon receipt of dialling information the FP IWU shall initiate the UMTS Call establishment procedure as defined in TS 124 008 [21] by sending a Setup message (deriving the necessary information from the same {CC-SETUP} message) to the CN and proceed with the call establishment procedure as defined in clause 5.1.1.

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 Lower Layer Management Entity (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.

5.2.8 CM service procedure abnormal cases

If at any time FP IWU receives the CM SERVICE REJECT as an answer to the CM SERVICE REQUEST, it shall send an 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 clause 5.2.3.

The 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 an MNCC_RELEASE-ind primitive to the FP IWU, see clause 6.1.1.4. Timer P<CC.03> may expire enforcing PT to send {CC-RELEASE-COM} message to the FT reflecting in an MNCC_REJECT-ind primitive to the FP IWU, see clause 5.1.6 case b). 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 CC message (e.g. SETUP) is sent.

The CN may, at any time, send an Abort message (see TS 124 008 [21], clause 4.3.5). If the FP IWU receives Abort message before it has sent the Setup to the CN the FP IWU shall send an MNCC_REJECT-req reflecting in a {CC-RELEASE-COM} being sent to the PT carrying an appropriate release reason.

The FP IWU shall supervise the acknowledgement from the CN of the CM SERVICE REQUEST message (CM SERVICE ACCEPT, CIPHER MODE COMMAND or CM SERVICE REJECT). When the timer expires, the FP IWU shall issue an MNCC_REJECT-req primitive reflecting in a {CC-RELEASE-COM} message being sent to the PT carrying an appropriate release reason.

5.2.9 External handover procedure (FP)

External Handover is the process of switching a call in progress from one Fixed Radio Termination (FP-1) to another Fixed Radio termination (FP-2) as defined in EN 300 175-5 [5]. In the respect of the present document the procedure is mapped to the CN associated handover procedures as defined below. See figure 28 for an overview of DECT/UMTS external handover. This procedure is based on the procedures in EN 300 175-5 [5], TS 123 009 [20] and TS 125 413 [23]. The modifications to the defined procedures are as described in this clause.

FP specific behaviour is described in this clause. The PP specific behaviour is described in clause 11.7.

5.2.9.1 General description

Prior to initiation of external handover, the PP should obtain handover candidates from the current FP-1. This enables the PP to determine to which FPs an external handover may be attempted.

The PP measures the quality of the received signal strength from the external handover candidate(s) (FP-2(s)) and compares the received link quality with the currently used link. Upon detection of a better link, the PP may decide to perform an external handover.

The PP shall request from the FP-1 a handover reference. This request implicitly informs the FP-1 that an external handover is about to take place. The request contains information to what target cell has been chosen as most appropriate. As a result of this indication, the FP-1 shall request for a handover attempt by signalling to the CN.

The CN should allocate the network resources needed at the terrestrial links as well as in the handover candidate FP-2. Upon successful completion of the resource allocation, the CN should inform the FP-1 that resources were allocated and the handover attempt may continue. The FP-1 shall return the previously requested information to the PP which shall then initiate a setup to the handover candidate FP-2.

If ciphering is required, the PP shall request ciphering on the new link as soon as possible after handover is accepted by the PP. The FP-2 shall also perform a connect procedure in order to switch the DECT U-Plane from the FP-1 to the FP-2.

With a successful connect procedure, the FP-2 shall inform the CN about the handover in the access part. As a result, the CN switches the network connection to the FP-2 and initiate a release of the link to the FP-1.

5.2.9.2 Handover candidate procedure

The external handover candidate information is obtained using two sub-procedures, handover candidate indication, and/or handover candidate retrieval as defined in clause 15.7.1 of EN 300 175-5 [5].

Handover candidate indication, initiated by FP, shall be handled as defined in clause 15.7.1.2 of EN 300 175-5 [5].

Handover candidate retrieval, initiated by the PP, shall be handled as defined in clause 15.7.1.3 of EN 300 175-5 [5].

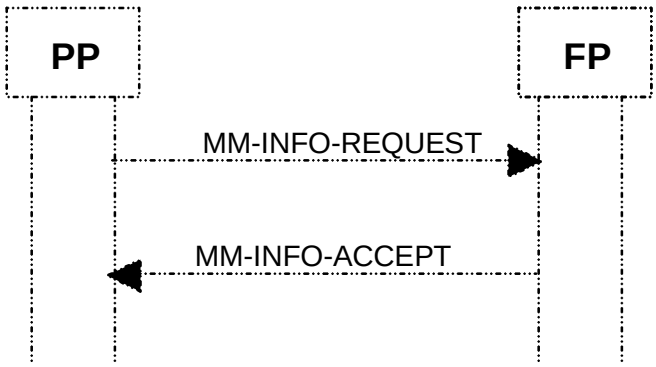

Figure 27: Handover candidate retrieval procedure

5.2.9.3 IU RELOCATION REQUIRED indication

As a result of the request for a handover reference by PP using the {MM-INFO-REQUEST} message (see clause 6.3.2.7.2), FP-1 sends the IU RELOCATION REQUIRED message to the CN with the "proposed external handover candidate(s)" included in the Cell Identifier List information element. The detailed mapping of {MM-INFO-REQUEST} message to IU RELOCATION REQUIRED message is defined in clause 6.2.22.

The IU RELOCATION REQUIRED message may not result in an IU RELOCATION COMMAND Message. In this case the "Response Request" information element will, if present, indicate that the FP/IWU requires an indication.

5.2.9.4 Handover resource allocation

The CN requests for resource allocation in the handover candidate FP-2 using the IU-RELOCATION-REQUEST message. When resources are allocated, FP-2 shall indicate this to the CN with the IU-RELOCATION-REQUEST-ACK message. The message shall include a "network handover reference" and "fixed identity" of target cell in order to identify the reserved resources. This information is passed in the Layer 3 Information IE utilizing the IU-RELOCATION-COMMAND message. The unique coding in the present document of the IU-RELOCATION-COMMAND message is shown in table 8.

Table 8: DECT/UMTS interworking profile unique coding of the IU RELOCATION COMMAND message

IU RELOCATION COMMAND Message coding	Clarification
RR Management Protocol Discriminator	See TS 125 413 [23], clause 9.1.7
Skip Indicator	See TS 125 413 [23], clause 9.1.7
IU RELOCATION COMMAND Message Type	Shall indicate IU RELOCATION COMMAND Message Type, see TS 125 413 [23], clause 9.1.7.
Fixed Identity	Contains the fixed identity of the selected target cell, coded according to DECT Base standard, see EN 300 175-5 [5], clause 7.7.18
Network Parameter	New field added, used to carry "network handover reference", coded according to DECT Base standard, see EN 300 175-5 [5], clause 7.7.29
ID for Network Parameter	
Length of element	
Discriminator	Shall indicate "Handover Reference, UMTS network"
Data	Handover reference, coded using binary representation

5.2.9.5 Handover execution by FP

The CN informs the FP-1 that network resources have been allocated and that the handover procedure may continue. This is carried out by utilizing the IU RELOCATION COMMAND message that transparently transfers the "network handover reference" and selected "target cell" as a Layer 3 Information Element (IE) with the IU RELOCATION-COMMAND message. This message shall then be mapped to the {MM-INFO-ACCEPT} message as defined in clause 6.2.26.

5.2.9.6 IU-RELOCATION-REQUIRED to FP-2

When FP detects handover setup from the PP indicating "external handover call setup", the FP-2 is able to correlate the PP setup attempt to the previously reserved network resources. This is made using the "network handover reference" received in the {CC-SETUP} message. FP-2 shall indicate to the network that the handover is detected by sending an IU RELOCATION DETECT message to the CN. This message is used to initiate switching of the network resources to the new link. For detailed mapping of {CC-SETUP} message to Handover Detect see clause 6.2.23.

For every "network handover reference", the FP-2 shall send only one IU RELOCATION DETECT message. Any additional {CC-SETUP} message using the same "network handover reference", as a result of multiple transactions active on same PP, shall not be interworked and mapped to the UMTS IU RELOCATION DETECT message.

5.2.9.7 Handover confirm by FP-2

The FP-2 shall send a {CC-CONNECT} message to the PP, to indicate confirmation of the external handover by the network.

5.2.9.8 Ciphering procedure

Ciphering shall be initiated by PP as soon as possible after receipt of {CC-CONNECT} message. Ciphering shall occur prior to returning {CC-CONNECT-ACK} message. The ciphering procedure for external handover shall be initiated by the PP as defined in the EN 300 175-5 [5], clause 15.7.6.

5.2.9.9 Handover completion

When the FP-2 receives {CC-CONNECT-ACK} message it shall send the IU RELOCATION COMPLETE message to the CN indicating that handover is completed in the access part. The mapping between the {CC-CONNECT-ACK} message and the IU RELOCATION COMPLETE message is shown in clause 6.2.24. The receipt of IU RELOCATION COMPLETE message is used by the CN to initiate the release of the old link.

For each "network handover reference", the FP-2 shall send only one IU RELOCATION COMPLETE message. Any subsequent {CC-CONNECT-ACK} messages related to the same "network handover reference", as a result of multiple transactions active on same PP, shall not be interworked and mapped to the UMTS IU RELOCATION COMPLETE message.

The IU RELOCATION COMPLETE message will trigger the CN to initiate the release of the old link and the associated resources. The CN shall send the IU RELEASE COMMAND message with cause "Successful Relocation" to the FP-1. Upon receipt of this message a normal call release shall occur, using the {CC-RELEASE} message(s). The mapping between the IU RELEASE COMMAND message and the {CC-RELEASE} message is shown in clause 6.1.27.

When the release of PP resources is completed, the PP will send the {CC-RELEASE-COM} message(s) to the FP-1. The IU RELEASE COMPLETE message is sent by the FP-1 to the CN to indicate the release of terrestrial resources and to initiate the release of the BSSAP SCCP connection associated with the dedicated resource.

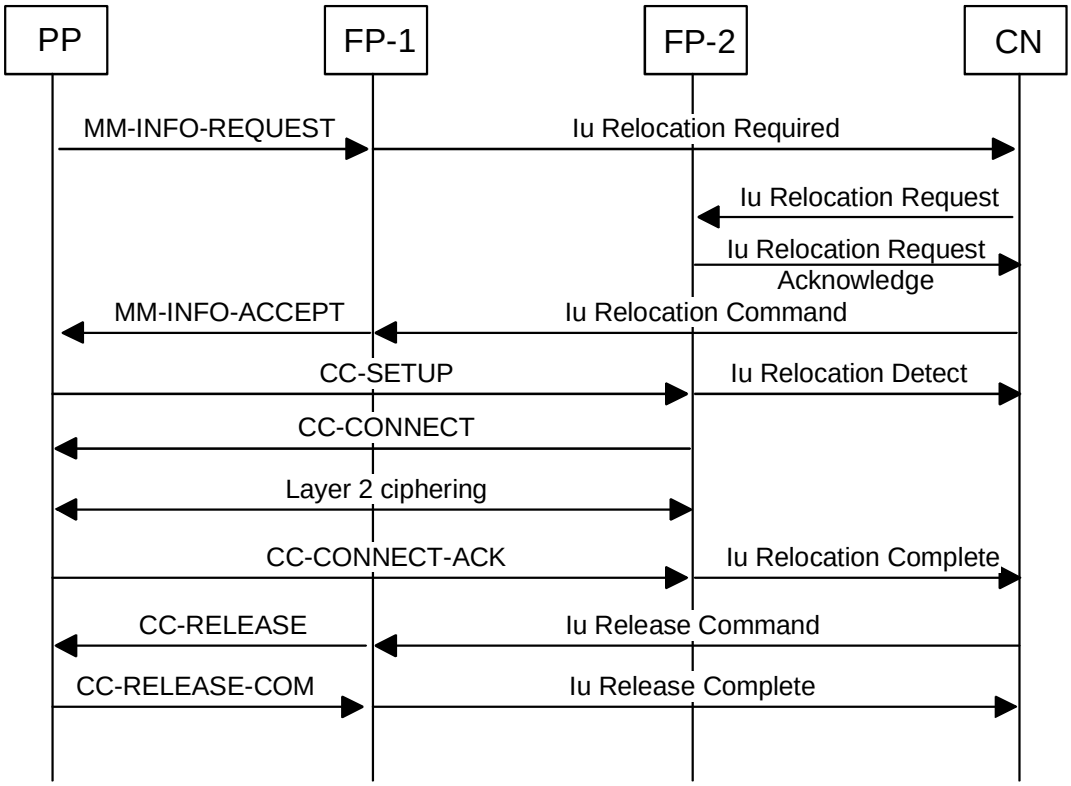

Figure 28: DECT/UMTS interworking profile external handover overview

5.2.9.10 Sequence number handling

To secure that the sequence number of the next sequenced numbered message to be sent is accepted by the CN, the FP IWU shall, after the completion of the external handover procedure, but prior to sending any subsequent MM or CM message using SAPI = 0 to the CN, choose a send sequence number and send an MM-null message.

5.2.9.11 Handover reject

5.2.9.11.1 Handover reject by PP

If PP decides to not complete an initiated handover attempt, PP should send {MM-INFO-REQUEST} message indicating "handover failed, reversion to old channel".

NOTE: The PP may reject handover completion at any time prior to sending the {CC-CONNECT-ACK} message to the FP-2.

After returning a {MM-INFO-ACCEPT} message as a confirmation to a previous {MM-INFO-REQUEST} message, the FP-1 shall generate an Iu RELOCATION REJECT message as defined in clause 6.2.25. This will initiate the reversion of the network resources to the old channel. It will also initiate the release of the FP-2 resources allocated by CN sending IU RELEASE COMMAND to FP-2 with cause "radio interface failure, reversion to old channel".

If the FP-2 receives an IU RELEASE COMMAND message from the CN the FP-2 shall, prior to returning IU RELEASE COMPLETE message to the CN, release any assigned terrestrial resources. If dedicated radio resources were assigned, they shall be released using a normal call release of the transaction(s) using {CC-RELEASE} message(s) (see clause 6.1.27). At the completion of the release of the new link, FP-2 will receive a {CC-RELEASE-COM} message from the PP.

5.2.9.11.2 Handover reject by FP-1

The PP Handover reference retrieval can be rejected by FP-1 prior to initiating the IU RELOCATION REQUIRED indication to the CN. The FP-1 shall then reject the Handover reference retrieval by sending {MM-INFO-REJECT} message to the PP. A precondition for external handover is that a call is in an "active call state" (see EN 300 175-5 [5]). Otherwise the external handover shall be rejected as defined in clause 5.2.9.11.1.

If a RELOCATION PREPARATION FAILURE message is received from the CN, the FP-1 shall generate a {MM-INFO-REJECT} message to the PP to reject the Handover Reference Retrieval. The mapping of the RELOCATION PREPARATION FAILURE message to the {MM-INFO-REJECT} message is shown in clause 6.1.28.

5.2.9.11.3 Handover reject by FP-2

If the FP-2 is unable to comply with the resource allocation initiated by an IU-RELOCATION-REQUIRED message from the CN, the FP-2 shall generate an IU-RELOCATION-FAILURE message to the CN. The FP-2 is also responsible to release all resources assigned to the FP-2.

5.2.9.11.4 Handover reject by CN

If the CN is not able to allocate resources for an IU RELOCATION REQUIRED indication (i.e. the IU RELOCATION REQUIRED message does not result in IU RELOCATION COMMAND message to FP-1), it may respond to FP-1 with a HANDOVER REQUIRED REJECT message. This is only applicable if requested in the IU RELOCATION REQUEST message.

5.2.9.11.5 Support of external handover due to O&M activities

UMTS leaves the possibility to initiate a handover for internal O&M reason, e.g. during replacement of hardware. The support for this functionality in the respect of the present document is provided by utilizing the existing procedures defined in the EN 300 175-5 [5] as follows:

- upon receipt of Handover Command message from the CN, without previously requested external handover, the FP may initiate an external handover by sending a {MM-INFO-SUGGEST} message to the PP as described in clause 15.7.3 of EN 300 175-5 [5]. The mapping of IU RELOCATION COMMAND message to {MM-INFO-SUGGEST} message is shown in clause 6.1.29.

5.2.9.11.6 Handling of transaction identifiers during and after external handover

FP shall support Transaction Identifier (TI) and Extended Transaction Identifier (ETI) during and after external Handover as defined in clause 11.7.7.

5.3 Paging related IWU procedure

1) Upon receipt of a paging message from the CN (figure 29) as a result of a paging procedure as defined in EN 301 503 [27] clause 9.1.25 the FP IWU shall initiate the DECT indirect (paged) FT initiated link establishment procedure.

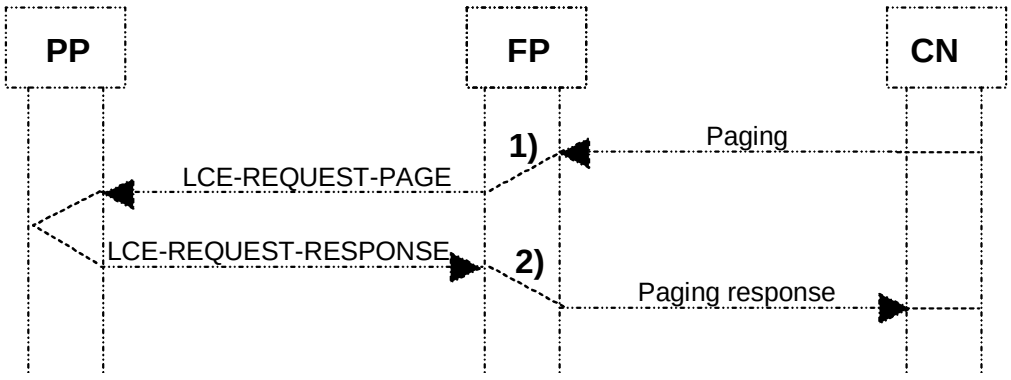

Figure 29: Paging related procedure

The received <<MOBILE IDENTITY>> information element is passed on to the DECT FT LCE which, if no suitable link exists, sends a {LCE-REQUEST-PAGE} message to the PT.

The received <<Mobile identity>> shall be mapped to the DECT paging identities as follows:

- 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.

2) Upon receipt of the {LCE-PAGE-RESPONSE} from the PT the FP IWU sends a Paging response message to the CN. The mapping of the DECT {LCE-PAGE-RESPONSE} message to the Paging response message is shown in clause 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 B) the FP shall map the DECT {LCE-PAGE-RESPONSE} message to the Paging response message as shown in clauses 6.2.2 and 7.2.2.
The Paging response message shall contain the MS Classmark 2 information element previously stored by the FP IWU (see clause 5.2.3, table 2);

   if a suitable link exists the LLME shall inform the FP IWU back and the FP IWU shall send the Paging response message to the CN using the same <<Mobile identity>> as was used in the Paging message.

3) If timer <LCE.03> expires in the FP, i.e. no {LCE-PAGE-RESPONSE} has been received from the PT, the FP IWU does not send any message to the CN.

In overload situations the FP IWU may ignore a Paging message.

5.4 Other specific IWU procedures

5.4.1 Equipment identity IWU procedures

The mapping of the DECT IPEI to the International Mobile Equipment Identity (IMEI) in the FP is defined in TS 101 863-1 [15]. The mapping of the DECT IPEI to the IMEI and the mapping of DECT IPEI to the IMEISV are described in annex C.

5.4.2 Miscellaneous procedures

5.4.2.1 Notification of progress and interworking

At any time during establishment or release of a call and during an active call, the UMTS network may send a Progress message to the FP IWU. This is sent to indicate the progress of the call in the event of interworking or in connection with the provision of in-band information/patterns.

Upon receipt of Progress message from the CN the FP IWU shall issue an MNCC_INFO-req primitive with a <<progress indication>> information element. The mapping of the GSM Progress message to the DECT {CC-INFO} message is described in clause 6.1.18. The FP IWU shall also send a {CC-NOTIFY} message with the <<TIMER RESTART>> information element to the PP as described in clause 6.1.19. In addition, if the message was received during the establishment or release of a call the FP IWU shall stop, or restart, all CC timers related to that call, see figure 30.

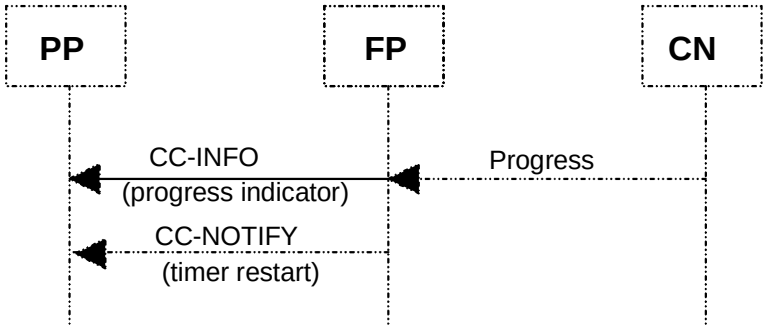

Figure 30: Notification of progress or interworking by progress message

During outgoing call establishment, notification of progress/interworking may also be indicated, by the UMTS network, by including the <<progress indicator>> information element in a Call Proceeding, Alerting, or Connect message. Upon receipt of Call Proceeding, Alerting, or Connect message containing a UMTS <<progress indicator>> information element, the FP IWU shall activate the DECT U-Plane if the progress description is according to the requirements defined in clause 9.1. For detailed mapping see clauses 6.1.8, 6.1.9, and 6.1.10.

During incoming call establishment, notification of interworking may also be indicated, by the UMTS network, by including a <<progress indicator>> information element in the Setup message. Upon receipt of a UMTS <<progress indicator>> information element in a Setup message from the CN, the FP IWU shall activate the DECT U-Plane if the progress description is according to the requirements defined in clause 9.1. For detailed mapping see clauses 5.1.3 and 6.1.11.

During call release, notification of progress may also be indicated by the UMTS network, by including the <<progress indicator>> information element in a Disconnect message. Upon receipt of a UMTS <<progress indicator>> information element in a Setup message from the CN, the FP IWU shall activate the DECT U-Plane if the progress description is according to the requirements defined in clause 9.1. For detailed mapping see clauses 6.1.18 and 6.1.19.

For detailed description of notification of progress and interworking, see TS 124 008 [21].

5.4.2.2 User notification

At any time during an active call, the UMTS network may send a Notify message to the FP/IWU. This is sent to indicate any call related event. For a detailed description of user notification, see TS 124 008 [21].

NOTE: Upon receipt of a Notify message from the CN, the notification indication included may be mapped by the FP/IWU into an appropriate display information to the PP, using the {CC-INFO} message and/or a signalling tone over the downlink of the voice channel. The mapping of Notify to {CC-INFO} message is shown in clause 6.1.30.

5.4.3 Handling of Dual Tone Multi-Frequency (DTMF)

A user may cause a DTMF signal to be generated e.g. by depression of a key at the PP. As shown in figure 31, the PP then sends a {CC-INFO} to the FP/IWU containing the DECT control character "16"H (Go to DTMF dialling; infinite tone length) followed by the selected digit (0...9, A-D, *, #). On receipt of the {CC-INFO} the FP/IWU generates the appropriate Start DTMF message, containing the value of the digit to be transmitted TS 124 008 [21]. The mapping of {CC-INFO} to Start DTMF is shown in clause 6.2.20.

The CN returns a Start DTMF ack message to the FP/IWU. This acknowledgement may optionally be mapped into an appropriate display information to the PP (by {CC-INFO}) and/or start a signalling tone on the downlink of the voice channel. The mapping of Start DTMF ack to {CC-INFO} is shown in clause 6.1.22.

If the network cannot accept the Start DTMF message, a Start DTMF reject message will be sent to the FP/IWU (figure 32). The rejection again can optionally be mapped into an appropriate display information to the PP (by {CC-INFO}) and/or a signalling tone over the downlink of the voice channel. The mapping of Start DTMF reject to {CC-INFO} is shown in clause 6.1.23.

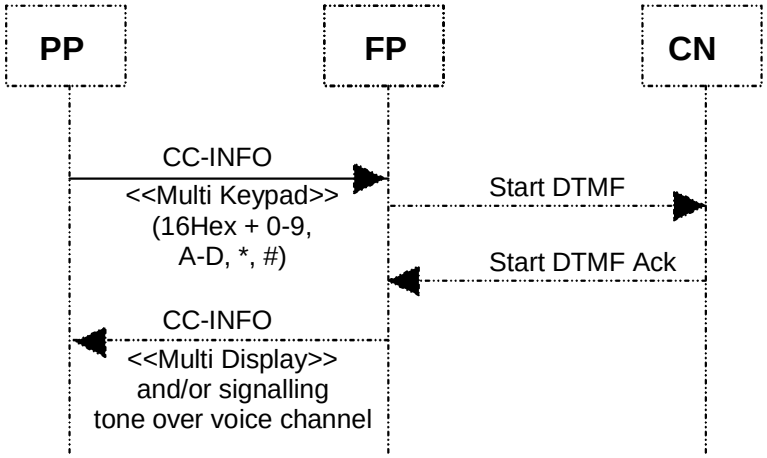

Figure 31: Acceptance of DTMF start message

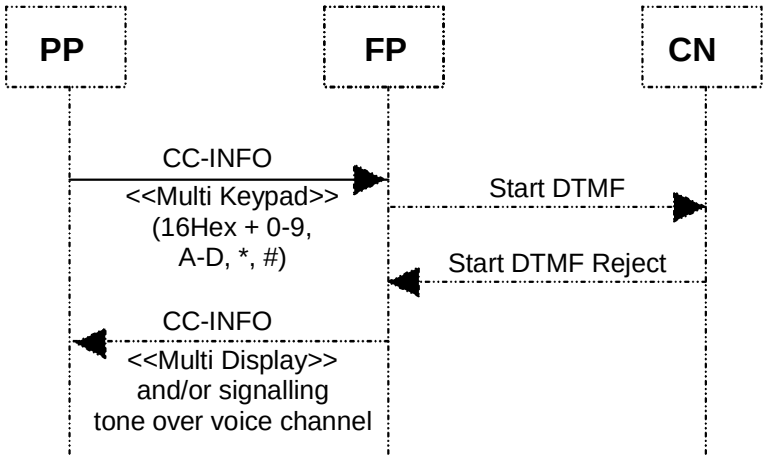

Figure 32: Rejection of DTMF start message

When the user indicates that the DTMF sending should cease, e.g. by releasing the key, the PP emits another {CC-INFO} message containing the "00"H control character (sending any DECT character, for example the next digit, also terminates the DTMF tone). On receipt the FP/IWU generates a Stop DTMF message acknowledged by a Stop DTMF ack message by the CN (figure 33).

The acknowledgement message may be used by the FP/IWU to send a display message to the PP via {CC-INFO} and/or stop the signalling tone over the downlink of the voice channel. The mapping of {CC-INFO} to Stop DTMF is shown in clause 6.2.21. The mapping of Stop DTMF ack to {CC-INFO} is shown in clause 6.1.24.

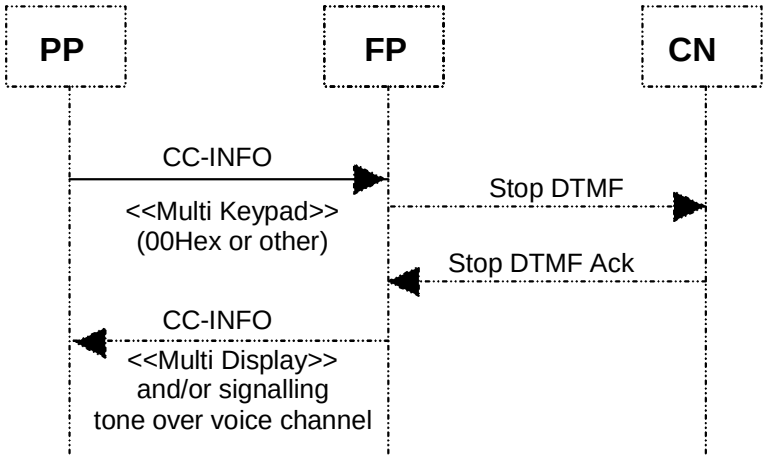

Figure 33: Message flow to stop DTMF signal

The minimum length of tone generated by the CN should be according to ETR 206 [25]. There is no defined maximum length of the tone, which will normally cease when a Stop DTMF message is received by the CN. However, the operator may choose to put a predefined limit on the duration of tones sent.

In case of sending a sequence of DTMF signals to the UMTS network, each of the signals will be transmitted using the above-described message flows. The minimum period of time between two subsequent tones should be according to ETR 206 [25].

The FP/IWU shall ensure that messages are not sent towards the network faster than the minimum times mentioned above will allow. The appropriate sequencing of DTMF control messages is achieved by using two timers which cannot expire before the minimum intervals.

5.5 Exception handling

5.5.1 Error handling

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

The FP IWU shall check the validity of received messages from the CN relating to protocol discriminator, message length, transaction identifier, message type, information elements and in error case act as defined in clause 8 of TS 124 008 [21] for the MS, e.g. ignore the message or the faulty information element, return an MM-STATUS or STATUS message.

Clause 8 of TS 124 008 [21] applies in all cases except that the FP IWU shall never send a RR STATUS to the CN.

The FP shall check the validity of the received messages from the CN in terms of mapped information which are in the scope of the present document relating to protocol discriminator errors, wrong message length and act as defined in clause 8 of TS 124 008 [21] for the MS.

5.5.2 Timers

5.5.2.1 Call handling IWU procedures

The CC timer handling is detailed in clause 5.1 (mainly the actions taken towards the CN are detailed in this clause) and in EN 300 175-5 [5].

5.5.2.2 Other IWU procedures and paging procedures

The timer handling is detailed in clauses 5.2 and 5.3 (mainly the actions taken towards the CN are detailed in these clauses) and in EN 300 175-5 [5].

When timeout occurs in the FP, while waiting for a message from the PT, no message is returned to the CN. The time supervision in the CN applies.

The FP follows the retransmission scheme of the PLMN, i.e. the FP retransmits a message only if it is retransmitted by the CN. Neither PT nor FT shall restart any timer as a part of one and the same procedure.

6 Message mappings

6.1 UMTS to DECT

Table 9: List of mapped messages

Item No	UMTS Message	Status in UMTS	DECT Message	Status in GAP	Reference	Map. status
1a	AUTHENTICATION REQUEST	M	{AUTHENTICATION-REQUEST}	M	6.1.1	M
2a	AUTHENTICATION REJECT	M	{MM-INFO-SUGGEST}	M	6.1.2	M
3	IDENTITY REQUEST	M	{IDENTITY-REQUEST}	O	6.1.3	M
4	TMSI REALLOCATION COMMAND	M	{TEMPORARY-IDENTITY-ASSIGN}	I	6.1.4	M
5	SECURITY MODE COMMAND	M	{CIPHER-REQUEST}	O/M (note)	6.1.5	M
6	LOCATION UPDATING ACCEPT	M	{LOCATE-ACCEPT}	O/M (note)	6.1.6	M
7	LOCATION UPDATING REJECT	M	{LOCATE-REJECT}	O/M (note)	6.1.7	M
8	CM SERVICE REJECT	M	{CC-RELEASE-COM}	M	6.1.15	M
9	ABORT	M	{CC-RELEASE-COM}	M	6.1.16	M
10	CM SERVICE ACCEPT	M	{CC-SETUP-ACK}	M	6.1.25	M
11	ALERTING	M	{CC-ALERTING}	O	6.1.8	M
12	CALL PROC	M	{CC-CALL-PROC}	O	6.1.9	M
13	CONNECT	M	{CC-CONNECT}	M	6.1.10	M
14	DISCONNECT	M	{CC-RELEASE}	M	6.1.12	M
15	RELEASE	M	{CC-RELEASE-COM}	M	6.1.13	M
16	RELEASE-COMPLETE	M	{CC-RELEASE-COM}	M	6.1.14	M
17	SETUP	M	{CC-SETUP}	M	6.1.11	M
18	CONNECT-ACK	M	{CC-CONNECT-ACK}	M	6.1.17	M
19	PROGRESS	M	{CC-INFO}	M	6.1.18	M
20	PROGRESS	M	{CC-NOTIFY}	M	6.1.19	M
21	DISCONNECT	M	{CC-INFO}	M	6.1.12	M
22	RELEASE	M	{CC-RELEASE}	M	6.1.13	M
23	START DTMF ACK	M	{CC-INFO}	M	6.1.22	O
23	START-DTMF-REJECT	M	{CC-INFO}	M	6.1.23	O
24	STOP DTMF ACK	M	{CC-INFO}	M	6.1.24	O
25	CM SERVICE ACCEPT	M	{CC-SETUP-ACK}	M	6.1.25	M
26	IU-RELOCATION-COMMAND	M	{MM-INFO-ACCEPT}	O	6.1.26	M
27	IU RELEASE COMMAND	M	{CC-RELEASE}	M	6.1.27	M
28	RELOCATION PREPARATION FAILURE	M	{MM-INFO-REJECT}	O	6.1.28	M
29	IU RELOCATION COMMAND	M	{MM-INFO-SUGGEST}	M	6.1.29	M
30	NOTIFY	M	{CC-INFO}	M	6.1.30	M
NOTE: optional in PP, mandatory in FP						

The **information elements** of the messages shall be mapped as follows.

6.1.1 AUTHENTICATION REQUEST-{AUTHENTICATION-REQUEST}

Table 10

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	AUTHENTICATION-REQUEST (TS 124 008 [21] table 9.2.3)	{AUTHENTICATION-REQUEST} (EN 300 175-5 [5] clause 6.3.6.9)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	
4	Cipher key sequence number	Auth type	7.1.3	M	
5	Authentication parameter RAND (UMTS challenge or GSM challenge)	RAND1	7.1.2	M	
6	Authentication Parameter AUTN (UMTS authentication challenge only)	RS	7.1.18	C1001	(note)
C1001: Mapping mandatory if AUTN-IE is present in UMTS message (i.e. when UMTS security context used) then M else I.					

6.1.2 AUTHENTICATION REJECT - {MM-INFO-SUGGEST}

Table 11

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	AUTHENTICATION-REJECT (TS 124 008 [21] table 9.2.4)	{MM-INFO-SUGGEST} (EN 300 175-5 [5] clause 6.3.6.23)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	

6.1.3 IDENTITY-REQUEST - {IDENTITY-REQUEST}

Table 12

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	IDENTITY REQUEST (TS 124 008 [21] clause 9.2.10)	{IDENTITY-REQUEST} (EN 300 175-5 [5] clause 6.3.6.15)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Identity request message type	Message type	8.1.3	M	
4	Identity type	Identity type	7.1.6	M	

6.1.4 TMSI REALLOCATION COMMAND - {TEMPORARY-IDENTITY-ASSIGN}

Table 13

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	TMSI REALLOCATION COMMAND (TS 124 008 [21] clause 9.2.17)	{TEMPORARY-IDENTITY-ASSIGN} (EN 300 175-5 [5] clause 6.3.6.24)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	
4	Location area identification	Location area	7.1.5	M	
5	Mobile identity (TS 124 008 [21] clause 10.5.1.4)	NWK assigned identity (EN 300 175-5 [5] clause 7.7.28)	7.1.1	M	
6	-	Duration (EN 300 175-5 [5] clause 7.7.13)		(note)	Lock limit="111"B; Time limits="0100"B, 1 unit = 6 minutes = 2 250 multiframes
NOTE: The <<DURATION>> information element shall be present if periodic location registration is initiated from the PP side.					

6.1.5 SECURITY MODE COMMAND - {CIPHER-REQUEST}

This command shall be used in both GSM and UMTS security contexts as defined in TS 124 008 [21] clause 4.3.2.7a.

Table 14

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	SECURITY MODE COMMAND (TS 125 413 [23] clause 9.1.26)	{CIPHER-REQUEST} (EN 300 175-5 [5] clause 6.3.6.11)			
1	-	Protocol discriminator	8.1.1	-	
2	-	Transaction identifier	8.1.24	-	
3	Message type	Message type	8.1.3	M	
4	Integrity Protection Information	-	TS 125 413 [23] clause 9.2.1.11	I	Integrity information includes key and permitted algorithms
6	Encryption information	Cipher-info	8.1.8	M	Encryption information includes key and permitted algorithms
7	Key status	-	TS 125 413 [23] clause 9.2.1.36	I	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 LOCATION UPDATING ACCEPT - {LOCATE-ACCEPT}

Table 15

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	LOCATION UPDATING ACCEPT (TS 124 008 [21] clause 9.2.13)	{LOCATE-ACCEPT} (EN 300 175-5 [5] clause 6.3.6.17)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Location Updating Accept Message type	Message type	8.1.3	M	
4	-	Portable identity		I	
5	Location area identification	Location area identification	7.1.5	M	
6	-	Use TPUI		I	
7	Mobile identity	NWK assigned identity	7.1.1	C1501	
8	Follow on proceed	-		I	
9	CTS permission	-		I	
10	-	Duration	EN 300 175-5 [5] clause 7.7.13	C1502	Lock limit="111"B; Time limits="0100"B, 1 unit = 6 minutes = 2 250 multiframes
C1501: IF UMTS <<Mobile identity>> information element includes a GSM TMSI THEN M ELSE IF UMTS <<Mobile identity>> information element includes IMSI THEN assign invalid TMSI value ELSE I (see clause 5.2.3). C1502: The <<DURATION>> information element shall be present if periodic location registration is initiated from the PP side.					

6.1.7 LOCATION UPDATING REJECT - {LOCATE-REJECT}

Table 15a

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	LOCATION UPDATING REJECTED (TS 124 008 [21] clause 9.2.14)	{LOCATE-REJECT} (EN 300 175-5 [5] clause 6.3.6.18)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	
4	Reject cause	Reject reason	7.1.7	M	

6.1.8 ALERTING - {CC-ALERTING}

Table 16

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	ALERTING (TS 124 008 [21] clause 9.3.1)	{CC-ALERTING} (EN 300 175-5 [5] clause 6.3.2.5)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Alerting message type	Message type	8.1.3	M	
4	Facility	Facility		I	
5	Progress indicator	Progress indicator	8.1.21	M	
6	User-user	Iwu-to-iwu	-	I	

6.1.9 CALL-PROC - {CC-CALL-PROC}

Table 17

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	CALL-PROCEEDING (TS 124 008 [21] clause 9.3.3)	{CC-CALL-PROC} (EN 300 175-5 [5] clause 6.3.2.4)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Call proceeding message type	Message type	8.1.3	M	
4	Repeat indicator	Repeat indicator5		I	
5	Bearer capability 1	-		-	
6	Bearer capability 2	-		-	
7	Facility	Facility		I	
8	Progress indicator	Progress indicator	8.1.21	M	
9	Priority granted	-		I	
10	Network Call Control Capabilities	-		I	

6.1.10 CONNECT - {CC-CONNECT}

Table 18

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	CONNECT (TS 124 008 [21] clause 9.3.5)	{CC-CONNECT} (EN 300 175-5 [5] clause 6.3.2.6)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Connect message type	Message type	8.1.3	M	
5	Facility	Facility		I	
6	Progress indicator	Progress indicator	8.1.21	M	
7	Connected number	Iwu-to-iwu		I	
8	Connected subaddress	Iwu-to-iwu		I	
10	User to user	Iwu-to-iwu		I	

6.1.11 SETUP - {CC-SETUP}

Table 19

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	SETUP (TS 124 008 [21] clause 9.3.23)	{CC-SETUP} (EN 300 175-5 [5] clause 6.3.2.1)			
1	Call control protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Setup message type	Message type	8.1.3	M	
4	BC repeat indicator	-		I	
5	Bearer capability 1	Basic service	7.1.8	M	
5a	Bearer capability 2	-		I	
6	Facility	Facility		I	
8	Progress indicator	Progress indicator	8.1.21	M	
9	Signal	Signal	7.1.12	M	
10	Calling party BCD number	Calling party number		I	
11	Calling party sub-address	Iwu-to-iwu		I	
12	Called party BCD number	Called party number		I	
13	Called party sub-address	Called party subaddress		I	
13a	Redirecting party BCD number	Iwu-to-iwu		I	
13b	Redirecting party sub-address	Iwu-to-iwu		I	
14	LLC Repeat indicator	Iwu-to-iwu		I	
15	Low layer compatibility i	Iwu-to-iwu		I	
15	Low layer compatibility ii	Iwu-to-iwu		I	
16	HLC Repeat indicator	Iwu-to-iwu		I	
17	High layer compatibility i	Iwu-to-iwu		I	
17a	High layer compatibility ii	Iwu-to-iwu		I	
18	User to user	Iwu-to-iwu		I	
19	Priority	Iwu-to-iwu		I	
20	Alert	Iwu-to-iwu		I	
21	Network Call control capabilities	Iwu-to-iwu		I	
22	Cause of no CLI	Iwu-to-iwu		I	

6.1.12 DISCONNECT - {CC-RELEASE}

Table 20

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	DISCONNECT (TS 124 008 [21] clause 9.3.7)	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Disconnect message type	Message type	8.1.3	M	
4	Cause	Release reason	7.1.10	M	
5	Facility	Facility		I	
6	Progress indicator	-		I	
7	-	Display		I	
8	-	Feature indicate		I	
9	User-user	Iwu-to-iwu		I	
10	-	Iwu packet		I	
11	Allowed actions	-		I	

6.1.13 RELEASE - {CC-RELEASE-COM}

Table 21

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	RELEASE (TS 124 008 [21] clause 9.3.18)	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Release message type	Message type	8.1.3	M	
4	Cause	Release reason	7.1.10	O	
5	Second cause	-		I	
6	Facility	Facility		I	
7	User-user	Iwu-to-iwu		I	

6.1.14 RELEASE COMPLETE - {CC-RELEASE-COM}

Table 22

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	RELEASE COMPLETE (TS 124 008 [21] clause 6.3.19)	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Message type	Message type	8.1.3	M	
4	Cause	Release reason	7.1.10	O	
5	Facility	Facility		I	
7	User-user	Iwu-to-iwu		I	

6.1.15 CM SERVICE REJECT - {CC-RELEASE-COM}

Table 23

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	CM SERVICE REJECT (TS 124 008 [21] clause 9.2.6)	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	
4	Reject cause	Release reason	7.1.11	M	

6.1.16 ABORT - {CC-RELEASE-COM}

Table 24

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	ABORT (TS 124 008 [21] clause 9.2.8)	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	
4	Reject cause	Release reason	7.1.11	M	

6.1.17 CONNECT-ACK to {CC-CONNECT-ACK}

Table 25

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	CONNECT-ACK (TS 124 008 [21] clause 9.3.6)	{CC-CONNECT-ACK}			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	Message type	Message type	8.1.3	M	

6.1.18 PROGRESS - {CC-INFO}

Table 26

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	PROGRESS (TS 124 008 [21] clause 9.3.17)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Message Type	Message Type	8.1.3	M	
4	Progress indicator	Progress indicator	8.1.21	M	
5	User-user	Iwu-to-iwu		I	

6.1.19 PROGRESS - {CC-NOTIFY}

Table 27

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	PROGRESS (TS 124 008 [21] clause 9.3.17)	{CC-NOTIFY} (EN 300 175-5 [5] clause 6.3.2.13)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Message Type	Message Type	8.1.3	M	
4	Progress indicator	-		I	
5	User-user	-		I	
6	-	Timer Restart	-	I	(note)
NOTE: Timer Restart information element is generated locally in the FP IWU and shall indicate "stop timer".					

6.1.20 DISCONNECT - {CC-INFO}

Table 28

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	DISCONNECT (TS 124 008 [21] clause 9.3.7)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Disconnect message type	Message type	8.1.3	M	
4	Cause	-		I	
5	Facility	Facility		I	
6	Progress indicator	Progress indicator	8.1.21	M	
7	-	Display		I	
8	-	Feature indicate		I	
9	User-user	Iwu-to-iwu		I	
10	-	Iwu packet		I	
11	Allowed actions	-		I	

6.1.21 RELEASE - {CC-RELEASE}

Table 29

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	RELEASE (TS 124 008 [21] clause 9.3.18)	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Message type	Message type	8.1.3	M	
4	Cause	Release reason	7.1.10	O	
5	Second cause	-		I	
6	Facility	Facility		I	
7	User-user	Iwu-to-iwu		I	

6.1.22 START DTMF ACK - {CC-INFO}

Table 30

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	START DTMF ACK (TS 124 008 [21] clause 9.3.25)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Start DTMF acknowledge Message type	Message type	8.1.3	M	
4	Keypad facility	Multi Display	7.1.13	C3001	(note)
C3001: If Multi Display then M else I.					
NOTE: Keypad facility is translated into audio and/or display by the IWU.					

6.1.23 START-DTMF-REJECT - {CC-INFO}

Table 31

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	START-DTMF-REJECT (TS 124 008 [21] clause 9.3.26)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Start DTMF reject message type	Message type	8.1.3	M	
4	Cause	Multi Display	7.1.14	C3101	(note)
NOTE: Cause is translated into audio and/or display by the IWU. C3101: If Multi Display then M else I.					

6.1.24 STOP-DTMF-ACK - {CC-INFO}

Table 32

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	STOP DTMF ACK (TS 124 008 [21] clause 9.3.30)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Stop DTMF message type	Message type	8.1.3	M	

6.1.25 CM SERVICE ACCEPT - {CC-SETUP-ACK}

Table 33

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	CM SERVICE ACCEPT (TS 124 008 [21] clause 9.2.5)	{CC-SETUP-ACK} (EN 300 175-5 [5] clause 6.3.2.3)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Skip indicator	Transaction identifier	8.1.24	M	
3	CM Service Accept message type	Message type	8.1.3	M	
4	-	Delimiter request	EN 300 175-5 [5] clause 7.6.2	I	(note)
NOTE: Delimiter request information element is generated locally in the FP IWU.					

6.1.26 IU RELOCATION COMMAND - {MM-INFO-ACCEPT}

Table 34

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	IU-RELOCATION-COMMAND (TS 125 413 [23] clause 9.1.12)	{MM-INFO-ACCEPT} (EN 300 175-5 [5] clause 6.3.6.20)			
1	-	Protocol discriminator		-	
2	-	Transaction identifier		-	
3	Message type	Message type	8.1.3	M	
4	Layer 3 information	Fixed Identity	7.1.15	O.1	
5	Layer 3 information	Network Parameter	7.1.16	O.1	
6	Target RNC to Source RNC Transparent Container			O.1	
7	RAB ID				(radio bearers to be released)
O.1	Either items 4 and 5 or item 6.				

6.1.27 IU RELEASE COMMAND - {CC-RELEASE}

Table 35

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	IU RELEASE COMMAND (TS 125 413 [23] clause 9.1.6)	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)			
1	-	Protocol discriminator		-	
2	-	Transaction identifier		-	
3	Message type	Message type	8.1.3	M	
4	Cause	Release reason	8.1.2	M	

6.1.28 RELOCATION PREPARATION FAILURE - {MM-INFO-REJECT}

Table 36

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	IU RELOCATION PREPARATION FAILURE T	{MM-INFO-REJECT} (EN 300 175-5 [5] clause 6.3.6.21)			
1	-	Protocol discriminator		-	
2	-	Transaction identifier		-	
3	Message type	Message type	8.1.3	M	
4	Cause	Reject reason		I	
5	Criticality Diagnostics	-		n/a	

6.1.29 IU RELOCATION COMMAND - {MM-INFO-SUGGEST}

Table 37

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	IU RELOCATION COMMAND (TS 125 413 [23] clause 9.1.12)	{MM-INFO-SUGGEST} (EN 300 175-5 [5] clause 6.3.6.23)			
1	-	Protocol discriminator		-	
2	-	Transaction identifier		-	
3	Message type	Message type	8.1.3	M	
4	-	Info Type		-	Should indicate "external handover candidate"
5	Layer 3 information	Fixed Identity	7.1.15	C1	
6	Layer 3 information	Network Parameter	7.1.16	C1	
7	Target RNC to Source RNC Transparent Container	Fixed Identity/Network Parameter		C2	
8	RAB ID	-		I	
9	Transport Layer Address	-		I	
10	Iu Transport Association	-		I	
NOTE: Either C1 or C2					

6.1.30 NOTIFY - {CC-INFO}

Table 38

Item No	Message coding UMTS	Message coding DECT	Reference	Map. status	Note
	NOTIFY (TS 124 008 [21] clause 9.3.16)	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Notify message type	Message type	8.1.3	M	
4	Notification indicator	Multi-display	7.1.17	M	

6.2 DECT to UMTS

Table 39: List of mapped messages

Item No	DECT Message	Status in GAP	UMTS Message	Status in UMTS	Reference	Map. status
1	{LOCATE-REQUEST}	O/M	LOCATION -UPDATING-REQUEST	M	6.2.1	M
2	{LCE-PAGE-RESPONSE}	M	PAGING-RESPONSE	M	6.2.2	M
3	{AUTHENTICATION-REPLY}	O/M	AUTHENTICATION RESPONSE	M	6.2.3	M
3a	{AUTHENTICATION-REJECT}	O/M	AUTHENTICATION FAILURE	M	6.2.4	M
4	{DETACH}	I	IMSI DETACH INDICATION	M	6.2.6	M
5	{TEMPORARY-IDENTITY-ASSIGN-ACK}	O/M	TMSI REALLOCATION COMPLETE	M	6.2.7	M
6	{IDENTITY-REPLY}	O	IDENTITY RESPONSE	M	6.2.9	M
7	{CC-ALERTING}	M	ALERTING	Msec_identityreplyidentityresponse	6.2.10	M
8	{CC-CONNECT}	M	CONNECT	M	6.2.11	M
9	{CC-INFO} (F-02)	M	SETUP	M	6.2.12	M
10	{CC-RELEASE}	M	DISCONNECT	M	6.2.13	M
11	{CC-RELEASE}	M	RELEASE	M	6.2.14	M
12	{CC-RELEASE-COM}	M	RELEASE	M	6.2.15	M
13	{CC-RELEASE-COM}	M	RELEASE-COMPLETE	M	6.2.16	M
14	{CC-SETUP}	M	SETUP	M	6.2.17	M
15	{CC-SETUP}	I	EMERGENCY SETUP	M	6.2.18	M
16	{CC-RELEASE}	M	CM SERVICE ABORT	M	6.2.19	M
17	{CC-SETUP}	M	CM SERVICE REQUEST	M	6.2.8	M
18	{CC-INFO}	M	START-DTMF	M	6.2.20	M
19	{CC-INFO}	M	STOP DTMF	M	6.2.21	M
20	{MM-INFO-REQUEST}	O	IU RELOCATION REQUIRED	M	6.2.22	M
21	{CC-SETUP}	M	IU RELOCATION DETECT	M	6.2.23	M
22	{CC-CONNECT-ACK}	M	IU RELOCATION COMPLETE	M	6.2.24	M
23	{MM-INFO-REQUEST}	O	IU RELOCATION FAILURE	M	6.2.25	M
24	{CIPHER-REJECT}	O	SECURITY MODE FAILURE		6.2.26	M
25	{-} (Layer 2 ciphering	O	SECURITY MODE COMPLETE		6.2.27	M

6.2.1 {LOCATE-REQUEST} - LOCATION UPDATING REQUEST

Table 40

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{LOCATE-REQUEST} (EN 300 175-5 [5] clause 6.3.6.19)	LOCATION UPDATING REQUEST (TS 124 008 [21] clause 9.2.15)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Location Updating Request Message type	8.2.3	M	
		Ciphering key sequence number		M	
4	Portable identity	Mobile identity	7.2.1	C4001	
6	Network assigned identity	Mobile identity	7.2.2	C4002	
5	Location area	Location area identification	7.2.3	M	
7	Cipher info	Cipher key sequence number	7.2.4	M	
8	-	Location updating type	TS 124 008 [21] clause 10.5.3.5	I	(note 1)
9		Mobile station classmark 1	-	I	(note 2)
10	Fixed identity	-		I	
11	Terminal capability	-		I	(note 3)
12	Model identifier	Mobile identity	7.2.15	M	
13	Escape to proprietary	-		I	
	-	Mobile station classmark for UMTS (classmark 2)		M	(note 2)

C4001: IF <<NWK ASSIGNED IDENTITY >> information element or the <Extended location information>> field in the <<LOCATION AREA>> information element is not valid (see annex B) THEN M ELSE I.
C4002: IF <<NWK ASSIGNED IDENTITY >> information element and <Extended location information>> field in the <<LOCATION AREA>> information element are valid (see annex B) THEN M ELSE I.
NOTE 1: This information shall be added at the FP IWU. The value of this information element depends on previous transactions as described in clause 5.2.3.
NOTE 2: Mobile station classmark 1/2 information element is generated locally at the FP IWU (see clause 5.2.3).
NOTE 3: The <Profile indicator_2> field is stored in the FP IWU for use in UMTS Paging Response (see clause 6.2.2).

6.2.2 {LCE-PAGE-RESPONSE} - PAGING RESPONSE

Table 41

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{LCE-PAGE-RESPONSE} (EN 300 175-5 [5] clause 6.3.7.1)	PAGING RESPONSE (EN 301 503 [27] clause 9.1.25)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Portable identity	Mobile identity	7.2.1	C4101	
5	Fixed identity	-		I	
6	NWK assigned identity	Mobile identity	7.2.2	C4102	
7	Cipher info	Cipher key sequence number	7.2.4	M	
8	-	Mobile station classmark 2	-	I	(note)
9	-	Mobile station classmark 2	-	I	(note)

C4101: IF the received <<Mobile identity>> information element in the Paging message was the <<IMSI>> or the received <<NWK ASSIGNED IDENTITY>> information element is not valid THEN M ELSE I.
C4102: IF the received <<Mobile identity>> information element in the Paging message was the <<TMSI>> and the received <<NWK ASSIGNED IDENTITY>> information element is valid THEN M ELSE I.
NOTE: Mobile station classmark 2/3 information element is generated locally at the FP IWU.

6.2.3 {AUTHENTICATION-REPLY} - AUTHENTICATION RESPONSE

Table 42

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{AUTHENTICATION-REPLY} (EN 300 175-5 [5] clause 6.3.6.8)	AUTHENTICATION RESPONSE (TS 124 008 [21] clause 9.2.3)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	RES 1	Auth. parameter	7.2.5	M	(note 1)
5	RES 1	Authentication Response Parameter (extension)	7.2.16	O	(note 2)
NOTE 1: RES 1 contains SRES (GSM security context) or RES (UMTS security context). NOTE 2: Mapping mandatory if length of RES field > 4 octets (i.e. when UMTS security context used).					

6.2.4 {AUTHENTICATION-REJECT} - AUTHENTICATION FAILURE

Table 43

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{AUTHENTICATION-REJECT} (EN 300 175-5 [5] clause 6.3.6.7)	AUTHENTICATION FAILURE (TS 124 008 [21] clause 9.2.3a)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Reject Reason	Reject Cause 10.5.3.6	7.2.18	M	
5	Authentication Reject Parameter	Authentication Failure Parameter	7.2.19	M	

6.2.5 void

6.2.6 {DETACH} - IMSI DETACH INDICATION

Table 44

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{DETACH} (EN 300 175-5 [5] clause 6.3.6.13)	IMSI DETACH INDICATION (TS 124 008 [21] clause 9.2.12)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	IMSI Detach Indication Message type	8.2.3	M	
4	Portable identity	Mobile identity	7.2.6	C4401	(note 1)
5	Network assigned identity	Mobile identity	7.2.2	C4402	
6	-	Mobile station classmark 1	5.2.3	I	(note 2)
7	IWU-TO-IWU	-		I	
8	Escape to proprietary	-		I	
C4401: IF <<NWK ASSIGNED IDENTITY>> information element valid (see annex B) THEN M ELSE I. C4402: IF <<NWK ASSIGNED IDENTITY>> information element is not valid (see annex B) THEN M ELSE I. NOTE 1: If Portable identity is TPUI, then FP will derive the IMSI from the IPUI R. NOTE 2: Mobile station classmark 1 information element is generated locally at the FP IWU, (see clause 5.2.3).					

6.2.7 {TEMPORARY-IDENTITY-ASSIGN-ACK} - TMSI REALLOCATION COMPLETE

Table 45

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{TEMPORARY-IDENTITY-ASSIGN-ACK} (EN 300 175-5 [5] clause 6.3.6.25)	TMSI REALLOCATION COMPLETE (TS 124 008 [21] clause 9.2.18)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Escape to proprietary	-		I	

6.2.8 {CC-SETUP} - CM SERVICE REQUEST

Table 46

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-SETUP} (EN 300 175-5 [5] clause 6.3.2.1)	CM SERVICE REQUEST (TS 124 008 [21] clause 9.2.9)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Portable identity	Mobile identity	7.2.6	C4601	
5	Basic service	CM service type	7.2.7	M	(note 1)
6	-	Mobile station classmark 2	-	M	(note 2)
7	Cipher info	Ciphering key sequence number	7.2.4	M	
8	Network assigned identity	Mobile identity	7.2.2	C4602	
9	Iwu-to-Iwu	Priority level		I	

C4601: IF <<NWK ASSIGNED IDENTITY>> information element is not valid (see annex B) THEN M ELSE I.
C4602: IF <<NWK ASSIGNED IDENTITY>> information element is valid (see annex B) THEN M ELSE I.
NOTE 1: Mapping of call class field.
NOTE 2: Mobile station classmark 2 information element is generated locally at the FP IWU (see table 6 in clause 5.2.3).

6.2.9 {IDENTITY-REPLY} - IDENTITY RESPONSE

Table 47

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{IDENTITY-REPLY} (EN 300 175-5 [5] clause 6.3.6.14)	IDENTITY RESPONSE (TS 124 008 [21] clause 9.4.13)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip Indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Portable identity1	Mobile identity	7.2.6	C4702	
5	Fixed identity 2				
6	NWK assigned identity3	Mobile identity	7.2.2	C4701	
7	Model identifier	Mobile identity	7.2.15	M	
8	IWU-TO-IWU	-		I	
9	Escape to proprietary	-		I	
C4701: IF <<NWK ASSIGNED IDENTITY>> information element and <Extended location information>> field in the <<Location area>> information element are valid (see annex B) THEN M ELSE I.					
C4702: IF <<NWK ASSIGNED IDENTITY>> information element or the <Extended location information>> field in the <<LOCATION AREA>> information element is not valid (see annex B) THEN M ELSE I.					

6.2.10 {CC-ALERTING} - ALERTING

Table 48

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-ALERTING} (EN 300 175-5 [5] clause 6.3.2.5)	ALERTING (TS 124 008 [21] clause 9.3.1)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Call attributes	-		I	
5	Connection identity	-		I	
6	Progress indicator	-		I	
7	Display	-		I	
8	Signal1	-		I	
9	Feature indicate	-		I	
10	Terminal capability	-		I	
11	Transit delay	-		I	
12	Window size	-		I	
13	Iwu-to-iwu	User- user		I	
14	Iwu packet	-		I	
15	-	SS version indicator		I	Relate to facility

6.2.11 {CC-CONNECT} - CONNECT

Table 49

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-CONNECT} (EN 300 175-5 [5] clause 6.3.2.6)	CONNECT (TS 124 008 [21] clause 9.3.5)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Call attributes	-		I	
5	Connection identity	-		I	
6	Progress indicator	-		I	
7	Display	-		I	
8	Signal	-		I	
9	Feature indicate	-		I	
10	Terminal capability	-		I	
11	Transit delay	-		I	
12	Window size	-		I	
13	Iwu-to-iwu	User- user		I	
14	Iwu packet	-		I	
15	-	SS version indicator		I	Relate to facility

6.2.12 {CC-INFO} (F-02) - SETUP

Table 50

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-INFO} (F-02) (EN 300 175-5 [5] clause 6.3.2.2)	SETUP (TS 124 008 [21] clause 9.3.23.2)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Location area	-		I	
5	-	Bearer capability 1		I	
6	NWK assigned identity	-		I	
7	Progress indicator	-		I	
8	Display	-		I	
9	Multi keypad	Called party BCD number	7.2.11	C5001	
10	Signal	-		I	
11	Feature activate	-		I	
12	Feature indicate	-		I	
13	Network parameter	-		I	
14	Called party number	Called party BCD number	7.2.9	C5002	
15	Called party subaddress	Called party subaddress	7.2.10	C5003	
16	Sending complete	-		I	
17	Test hook control	-		I	
18	Iwu-to-iwu	-		I	
19	Iwu packet	-		I	
20	-	CC capabilities		I	
C5001: IF keys contain dialling information THEN M ELSE I C5002: IF Multi keypad THEN I ELSE O C5003: IF Multi keypad THEN I ELSE O					

6.2.13 {CC-RELEASE} - DISCONNECT

Table 51

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)	DISCONNECT (TS 124 008 [21] clause 9.3.7)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Release reason	Cause	7.2.13	O	
5	Display	-		I	
6	Feature indicate	-		I	
7	Iwu-to-iwu	User- user		I	
8	Iwu packet	-		I	

6.2.14 {CC-RELEASE} - RELEASE

Table 52

Item No	Message coding DECT	Message coding UTMS	Reference	Map. status	Note
	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)	RELEASE (TS 124 008 [21] clause 9.3.18.2)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Release reason	Cause	7.2.13	O	
5	Repeat indicator	-		I	
6	Progress indicator	-		I	
7	Iwu-to-iwu	User- user		I	
8	Iwu packet	-		I	
9	Escape to proprietary	-		I	

6.2.15 CC-RELEASE-COM - RELEASE

Table 53

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)	RELEASE (TS 124 008 [21] clause 9.3.18)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Release reason	Cause	7.2.13	O	
5	Iwu attributes	-		I	
6	Repeat indicator	-		I	
7	Facility	-		I	
8	Repeat indicator	-		I	
9	Iwu-to-iwu	User- user		I	
10	Iwu packet	-		I	
11	Escape to proprietary	-		I	

6.2.16 {CC-RELEASE-COM} - RELEASE-COMPLETE

Table 54

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-RELEASE-COM} (EN 300 175-5 [5] clause 6.3.2.9)	RELEASE-COMPLETE (TS 124 008 [21] clause 9.3.19)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Release reason	Cause	7.2.13	O	
5	Identity type	-		I	
6	Location area	-		I	
7	Iwu attributes	-		I	
8	Display	-		I	
9	Feature indicate	-		I	
10	Network parameter	-		I	
11	Iwu-to-iwu	User to user		I	
12	Iwu packet	-		I	

6.2.17 {CC-SETUP} - SETUP

In UMTS this SETUP message is sent from the mobile station to the network to initiate a mobile originating call establishment.

Table 55

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-SETUP} (EN 300 175-5 [5] clause 6.3.2.1)	SETUP (TS 124 008 [21] clause 9.3.23.2)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.2.3	M	
4	Portable identity	-		I	
5	Fixed identity	-		I	
6	Basic service 1	Bearer capability 1	7.2.8	M	
7	Iwu attributes	-		I	
8	Repeat indicator	-		I	
9	Call attributes	-		I	
10	Repeat indicator	-		I	
11	Connection attributes	-		I	
12	Cipher info	-	EN 300 175-5 [5] clause 7.7.10	I	Used in CM service procedure
13	Connection identity	-		I	
14	Facility	-		I	
15	Progress indicator	-		I	Not allowed in this direction in DECT
16	Display	-		I	
17	Multi keypad	-		I	
18	Signal	-		I	
19	Feature activate	-		I	
20	Feature indicate	-		I	
21	Network parameter	-		I	Used external H/O procedure
22	Terminal capability	-		I	
23	End to end compatibility	-		I	
24	Rate parameter	-		I	
25	Transit delay	-		I	

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
26	Window size	-		I	
27	Calling party number	-		I	
28	Called party number 10	Called party BCD number	7.2.9	M	
29	Called party subaddress	Called party subaddress	7.2.10	O	
30	Sending complete	-		I	
31	Iwu-to-iwu	-		I	
32	Iwu packet	-		I	
33	-	CC capabilities		I	

6.2.18 {CC-SETUP} - EMERGENCY SETUP

Table 56

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-SETUP} (EN 300 175-5 [5] clause 6.3.2.1)	EMERGENCY-SETUP (TS 124 008 [21] clause 9.3.8)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.2.2	M	
3	Message type	Message type	8.1.3	M	
4	Portable identity	-		I	
5	Fixed identity	-		I	
6	Basic service	Bearer capabilities	7.2.8	O	
7	Iwu attributes	-		I	
8	Repeat indicator	-		I	
9	Call attributes	-		I	
10	Repeat indicator	-		I	
11	Connection attributes	-		I	
12	Cipher info	-		I	
13	Connection identity	-		I	
14	Facility	-		I	
15	Progress indicator	-		I	
16	Display	-		I	
17	Multi keypad	-		I	
18	Signal	-		I	
19	Feature activate	-		I	
20	Feature indicate	-		I	
21	Network parameter	-		I	
22	Terminal capability	-		I	
23	End to end compatibility	-		I	
24	Rate parameter	-		I	
25	Transit delay	-		I	
26	Window size	-		I	
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	

6.2.19 {CC-RELEASE} - CM SERVICE ABORT

Table 57

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-RELEASE} (EN 300 175-5 [5] clause 6.3.2.8)	CM SERVICE ABORT (TS 124 008 [21] clause 9.2.7)			
1	Protocol discriminator	Protocol discriminator	8.2.1	M	
2	Transaction identifier	Skip indicator	8.2.21	M	
3	Message type	Message type	8.2.3	M	
4	Release Reason	-		I	
5	Repeat indicator1	-		I	
6	Facility	-		I	
7	Repeat indicator1	-		I	
8	Progress indicator	-		I	
9	"Display"	-		I	
10	Feature Indicate	-		I	
11	Repeat indicator1	-		I	
12	IWU-TO-IWU	-		I	
13	IWU-PACKET	-		I	
14	Escape to proprietary	-		I	

6.2.20 {CC-INFO} - START-DTMF

Table 58

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)	START-DTMF (TS 124 008 [21] clause 9.3.24)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Transaction identifier	8.1.2	M	
3	Message type	Message type	8.1.3	M	
4	Multi Keypad	Keypad facility	7.2.12	M	

6.2.21 {CC-INFO} - STOP DTMF

Table 59

Item No	Message coding DECT	Message coding UTMS	Reference	Map. status	Note
	{CC-INFO} (EN 300 175-5 [5] clause 6.3.2.2)	STOP DTMF (TS 124 008 [21] clause 9.3.29)			
1	Protocol discriminator	Protocol discriminator	8.1.1	M	
2	Transaction identifier	Skip Indicator	8.1.2	M	
3	Message type	Message type	8.1.3	M	

6.2.22 {MM-INFO-REQUEST} - IU RELOCATION REQUIRED

Table 60

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{MM-INFO-REQUEST} (EN 300 175-5 [5] clause 6.3.6.22)	IU RELOCATION REQUIRED (TS 125 413 [23] clause 9.1.9)			
1	Protocol discriminator	-		I	
2	Transaction identifier	-		I	
3	Message type	Message type	8.2.3	M	
4	Info type	Cause	8.2.25	M	(note 1)
5	Portable identity			I	
6	Repeat indicator			I	(note 2)
7	Fixed identity			I	(note 2)
8	Location area			I	
9	NWK assigned identity			I	
10	Network parameter			I	
11	IWU to IWU			I	
12	Escape to proprietary		-	I	
13	-	Relocation Type = 1 (UE involved in relocation of SRNS)	TS 125 413 [23] clause 9.2.1.23	M	
14	-	Source ID	TS 125 413 [23] TS 125 413 [23] clause 9.2.1.24	M	PLMN/RNC ID (note 2)
15		Target ID	TS 125 413 [23] clause 9.2.1.25	M	LAI/RAC/RNC ID/CI (note 2)
16		Source RNC to target RNC transparent container	7.2.17	M	
NOTE 1: The PP should indicate "handover reference". NOTE 2: Fixed identity may be repeated to indicate multiple target cells. Generation of cell identifier list is a local matter for the FP/IWU. This is based on configuration management data of possible external handover candidates. (For further study).					

6.2.23 {CC-SETUP} - IU RELOCATION DETECT

Table 61

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-SETUP} (EN 300 175-5 [5] clause 6.3.2.1)	IU RELOCATION DETECT (TS 125 413 [23] clause 9.1.13)			
1	Protocol discriminator	-		I	
2	Transaction identifier	-		I	
3	Message type	Message type	8.2.3	M	
4	Portable identity	-		-	
5	Fixed identity	-		-	
6	Basic service (EN 300 175-5 [5] clause 7.6.4)	-		-	Should indicate "external handover call set-up"
7	Network parameter (EN 300 175-5 [5] clause 7.7.29)	-		-	Should indicate "Handover reference, UMTS network"

6.2.24 {CC-CONNECT-ACK} - IU RELOCATION COMPLETE

Table 62

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CC-CONNECT-ACK} (EN 300 175-5 [5] 6.3.2.7)	IU RELOCATION COMPLETE (TS 125 413 [23] clause 9.1.14)			
1	Protocol discriminator	-		I	
2	Transaction identifier	-		I	
3	Message type	Message type	8.2.3	M	
6	Repeat indicator	-		I	
7	IWU-TO-IWU	-		I	
8	IWU-PACKET	-		I	
9	Escape to proprietary	-		I	

6.2.25 {MM-INFO-REQUEST} - IU RELOCATION FAILURE

Table 63

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{MM-INFO-REQUEST} (EN 300 175-5 [5] clause 6.3.6.22)	IU RELOCATION FAILURE (TS 125 413 [23] clause 9.1.16)			
1	Protocol discriminator	-		I	
2	Transaction identifier	-		I	
3	Message type	Message type	8.2.3	M	
4	Info type	Cause	7.2.14	M	(note 1)
5	Portable identity	-		I	
6	Fixed identity	-		I	
7	Location area	-		I	
8	NWK assigned identity	-		I	
9	Network parameter	-		I	
10	IWU to IWU	-		I	
11	-	RR Cause	-	I	(note 2)
12	Escape to proprietary	-	-	I	
13	-	Criticality Diagnostics		I	
NOTE 1: Info type shall indicate "handover failure - reversion to old channel". NOTE 2: No Mapping, RR Cause shall indicate "Abnormal release, channel unacceptable".					

6.2.26 {CIPHER-REJECT} - Security mode failure

Table 64

Item No	Message coding DECT	Message coding UMTS	Reference	Map. status	Note
	{CIPHER-REJECT} (EN 300 175-5 [5] clause 6.3.6.10)	SECURITY MODE FAILURE (TS 125 331 [22] clause 10.2.46)			
1	Protocol discriminator	-		I	
2	Transaction identifier	-		I	
3	Message type	Message type	8.2.3	M	
4	-	Integrity check info (TS 125 331 [22] clause 10.3.3.14)		I	
5	Repeat Indicator1 (EN 300 175-5 [5] clause 7.6.3)	-		I	
6	Cipher info 1 (EN 300 175-5 [5] clause 7.7.10)	-		I	
7	Reject Reason (EN 300 175-5 [5] clause 7.7.34)	Failure cause (TS 125 331 [22] clause 10.3.3.12)		M	(note)
8	Escape to proprietary (EN 300 175-5 [5] clause 7.7.45)	-		I	
NOTE: Failure cause shall be mapped to "configuration unsupported" as defined in TS 125 331 [22] clause 10.3.3.12.					

6.2.27 {-} Layer 2 ciphering - Security mode complete

The SECURITY MODE COMPLETE message is sent by the FP-IWU as defined in clause 5.2.6 when layer 2 ciphering is activated.

7 Information element mappings

7.1 UMTS to DECT

7.1.1 Mobile identity - NWK assigned identity

Table 65

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Mobile identity	NWK assigned identity		M	
1	Mobile identity IEI	ID for NWK assigned identity	8.1.4	M	
2	Length of contents	Length of contents	8.1.5	M	
3	Odd/even indication="0"B	-		I	
4	Type of identity	Type	8.1.6	M	
5	-	Length of identity value = "32"		I	(note)
6	Identity digits	Identity value	8.1.7	M	
NOTE: Given in binary (=4 octets).					

7.1.2 Authentication parameter RAND - RAND1

Table 66

Item No	Information element coding GSM	Information element coding DECT	Reference	Map. status	Note
	Auth. parameter RAND (TS 124 008 [21] clause 10.5.3.1)	RAND (EN 300 175-5 [5] clause 17.7.32)		M	
1	RAND IEI	ID for RAND1	8.1.4	M	
2	-	Length of contents = 16		M	fixed length in UMTS is 128 bits
3	RAND value	RAND1 field	8.1.9	M	

7.1.3 Cipher key sequence number - auth type

Table 67

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Cipher key sequence number (TS 124 008 [21] clause 10.5.1.2)	Auth type (EN 300 175-5 [5] clause 7.7.4)		M	
1	Cipher key sequence number IEI	ID for Auth type	8.1.4	M	
2	-	Length of contents		M	=3
3	-	<Authentication algorithm identifier>		M	=001000000B (UMTS authentication algorithm)
4	-	<Authentication key type>		M	=0001B (User authentication key)
5	-	<Authentication key number>		M	=0000B (Key associated to the active IPUI)
6	-	<INC bit>		M	=0B
7	-	<TXC>		M	=0B (Do not include the derived cipher key in {AUTH-REPLY})
8	-	<UPC bit>		M	=1B (Store cipher key)
9	Key sequence	Cipher key number	8.1.10	M	

7.1.4 void

7.1.5 Location area identification - location area

Table 68

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Location area identification (TS 124 008 [21] clause 10.5.1.3)	Location area (EN 300 175-5 [5] clause 7.7.25)		M	
1	Location area identification IEI	ID for Location area	8.1.4	M	
2	-	Length of contents			
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	8.1.11	M	
NOTE: All values are set to support the UMTS Location Area Identification.					

7.1.6 Identity type - identity type

Table 69

Item No	Information element coding GSM	Information element coding DECT	Reference	Map. status	Note
	Identity type	Identity type		M	
1	Identity type IEI	ID for Identity type	8.1.4	M	
2	-	Length of contents		-	
3	Type of identity	Identity group	8.1.12	M	(note)
4	Type of identity	Type	8.1.13	M	(note)
NOTE: Type of identity mapping to Identity group and/or type depends on the requested identity.					

7.1.7 Reject cause - reject reason

Table 70

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	REJECT cause (TS 124 008 [21] clause 10.5.3.6)	Reject reason (EN 300 175-5 [5] clause 7.7.34)		M	
1	Reject cause IEI	ID for Reject reason	8.1.4	M	
2	Reject cause value	Reject reason code	8.1.17	M	

7.1.8 Bearer capabilities 1 - basic service

Table 71

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Bearer capabilities 1 (TS 124 008 [21] clause 10.5.4.5)	Basic service (EN 300 175-5 [5] clause 6.7.4)		M	
1	Bearer capability IEI	ID for basic service	8.1.4	M	
2	Length of Bearer capabilities contents	-		I	
3	Radio channel requirement	-		I	
4	Coding standard	-		I	
5	Transfer mode	-		I	
7	Information transfer capability	Basic service	8.1.19	M	
8	Coding standard ext.	-		I	
9-29	etc.	-		I	

7.1.9 Progress indicator - progress indicator

Table 72

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Progress indicator (TS 124 008 [21] clause 10.5.4.21)	Progress indicator (EN 300 175-5 [5] clause 7.7.31)		M	
1	Progress indicator IEI	ID for progress indicator	8.1.4	M	
2	Length of progress indicator contents	Length of contents	8.1.5	M	
3	Coding standard	Coding standard	8.1.18	M	
4	Location	Location	8.1.20	M	
5	Progress description	Progress description	8.1.21	M	

7.1.10 Cause - release reason

Table 73

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Cause	Release reason		M	
1	Cause IEI	ID for release reason	8.1.4	M	
2	Length of cause contents	-		I	
3	Coding standard	-		I	
4	Location	-		I	
5	Recommendation	-		I	
6	Cause value	Release reason code	8.1.22	M	
7	Diagnostic	-		I	

7.1.11 Reject cause - release reason

Table 74

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Reject cause (TS 124 008 [21] clause 10.5.3.6)	Release reason (EN 300 175-5 [5] clause 7.6.7)		M	
1	Reject cause IEI	ID for release reason	8.1.4	M	
2	Reject cause value	Release reason code	8.1.25	M	

7.1.12 Signal - signal

Table 75

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Signal (TS 124 008 [21] clause 10.5.4.23)	Signal (EN 300 175-5 [5] clause 6.7.8)		M	
1	Signal IEI	ID for signal	8.1.4	M	
2	Signal value	Signal value	8.1.23	M	

7.1.13 Keypad facility - multi display

Table 76

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Keypad facility (TS 124 008 [21] clause 10.5.4.17)	Multi Display (EN 300 175-5 [5] clause 7.7.26)			
1	Keypad facility IEI	ID for Multi keypad	8.1.4	M	
2		Length of contents	8.1.5	M	(note 1)
3	Keypad information	Display info (DECT characters)		M	(note 2)
NOTE 1: The FP shall set the length of contents field to the appropriate value, depending on the conveyed information to the PP (see note 2). NOTE 2: The FP shall convey the appropriate information to the PP. The detailed mapping for data sent by the FP at the DECT air interface is however not defined in the present document.					

7.1.14 Cause - multi display

Table 77

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Cause (TS 124 008 [21] clause 10.5.4.11)	Multi Display EN 300 175-5 [5] clause 7.7.26)			
1	Cause IEI	ID for Multi keypad	8.1.4	M	
2	Length of Cause contents	Length of contents	8.1.5	M	
3	Coding standard	-		I	
4	Location	-		I	
5	Recommendation	-		I	
6	Cause Value	Display info (DECT characters)		M	(note)
7	Diagnostic	-		I	
NOTE: The FP shall convey the appropriate information to the PP. The detailed mapping for data sent by the FP at the DECT air interface is however not defined in the present document.					

7.1.15 Layer 3 information - fixed identity

Table 78

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Layer 3 Information	Fixed Identity			
1	Layer 3 Information IEI	-		-	
2	Length	-		-	
	Layer 3 Information				
3	RR Management Protocol Discriminator	-		I	
4	Skip Indicator	-		I	
5	Handover Command Message Type	-		I	(note 1)
6	Fixed identity	Fixed Identity		M	(note 2)
7	Network Parameter	-		I	
NOTE 1: Shall indicate Handover Command Message Type, see TS 124 008 [21]. NOTE 2: Fixed Identity is included as DECT/UMTS unique element in the UMTS RR Handover Command Message, see clause 5.2.9.4.					

7.1.16 Layer 3 information - network parameter

Table 79

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Layer 3 Information	Network Parameter			
1	Layer 3 Information IEI	-		-	
2	Length	-		-	
	Layer 3 Information				
3	RR Management Protocol Discriminator	-		I	
4	Skip Indicator	-		I	
5	Handover Command Message Type	-		I	(note 1)
6	Fixed identity	-		I	
	Network Parameter				(note 3)
7	ID for Network Parameter	ID for Network Parameter	8.1.4	M	
8	Length of element	Length of element	8.1.5	M	
9	Discriminator	Discriminator		M	(note 4)
10	Data	Data		M	(note 2)
NOTE 1: Shall indicate Handover Command Message Type, see TS 124 008 [21]. NOTE 2: Shall indicate "Network handover reference", handover reference is coded using binary representation. See DECT Base Standard EN 300 175-5 [5], clause 15.7, for detailed coding. NOTE 3: Network Parameter is included as unique element for the present document, conveyed transparently in the GSM RR Handover Command Message, see clause 5.2.9.4. NOTE 4: Set value to handover reference, GSM network #6A.					

7.1.17 Notification indicator - multi display

Table 80

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Notification Indicator (TS 124 008 [21] clause 10.5.4.20)	Multi Display (EN 300 175-5 [5] clause 7.7.26)			
1	Notification indicator IEI	ID for Multi Display	8.1.4	M	
2	-	Length of contents	8.1.5	M	
3	Notification description	Display info (DECT characters)		M	(note)
NOTE: The FP shall convey the appropriate information to the PP. The detailed mapping for data sent by the FP at the DECT air interface is however not defined in the present document.					

7.1.18 Authentication parameter AUTN - RS

Table 81

Item No	Information element coding UMTS	Information element coding DECT	Reference	Map. status	Note
	Authentication parameter AUTN (TS 124 008 [21] clause 10.5.3.1.1)	RS (EN 300 175-5 [5] clause 7.7.36)			
1	Authentication Parameter AUTN IEI	RS	8.1.4	M	
2	Length of AUTN contents	Length of Contents (L)	8.1.5	M	
3	AUTN (contains SQN xor AK)	RS-Field		M	(note)
NOTE: Value is mapped transparently.					

7.2 DECT to UMTS

7.2.1 Portable identity - mobile identity

Table 82

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Portable identity (EN 300 175-5 [5] clause 7.7.30)	Mobile identity (TS 124 008 [21] clause 10.5.1.4)		M	
1	ID for Portable identity	Mobile identity IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	Length of identity value	Odd/even indication="0"B	8.2.6	M	
4	Type	Type of identity	8.2.7	M	(note)
5	Portable User Type	Type of identity	8.2.8	M	(note)
6	Identity value	Identity digits	8.2.9	M	
NOTE: "Type" and "Portable user type" - fields are mapped as a pair to the UMTS "type of identity": "IMSI".					

7.2.2 Network assigned identity- mobile identity

Table 83

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Network assigned identity (EN 300 175-5 [5] clause 7.7.28)	Mobile identity (TS 124 008 [21] clause 10.5.1.4)			
1	ID for Network assigned identity	Mobile identity IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	-	Odd/even indication="0"B		I	
4	Type	Type of identity	8.2.10	M	
5	Length of identity value = "32"(DEZ)	-		I	
6	Identity value	Identity digits	8.2.11	M	

7.2.3 Location area - location area identification

Table 84

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Location area (EN 300 175-5 [5] clause 7.7.25)	Location area identification (TS 124 008 [21] clause 10.5.1.3)		M	
1	ID for Network assigned identity	Mobile identity IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	Location information type	-		I	(note)
4	Location area level	-		I	(note)
5	Extended location information type	-		I	(note)
6	Extended location information	- Mobile Country Code - Mobile Network Code - Location Area Code	8.2.12	M	(note)
NOTE: All values are set to support the Location Area Identification. Note, that CI value (DECT) is ignored.					

7.2.4 Cipher info - cipher key sequence number

Table 85

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Cipher info (EN 300 175-5 [5] clause 7.7.10)	Cipher key sequence number (TS 124 008 [21] clause 10.5.1.2)		M	
1	ID for Cipher info	Cipher key sequence number IEI	8.2.4	M	
2	Length of contents	-		I	
3	Y/N bit; (Enable/disable ciphering)	-		-	
4	Cipher algorithm identifier	-		-	
5	Proprietary algorithm identifier	-		I	
6	Cipher key type	-		-	
7	Cipher key number	Cipher key sequence number	8.2.13	M	

7.2.5 RES - Authentication Response parameter

Table 86

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	RES (EN 300 175-5 [5] clause 7.7.35)	Auth. Response parameter (TS 124 008 [21] clause 10.5.3.2)		M	
1	ID for RES	Auth. Response parameter IEI	8.2.4	M	
2	Length of contents	-		M	
3	RES field (4 most significant octets)	Auth. Response parameter field	8.2.14	M	(note)
NOTE: The length is always 32 bits. The remaining octets (UMTS security context only) will be mapped to the Authentication Response parameter (extension).					

7.2.6 Portable identity- mobile identity

Table 87

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Portable identity (EN 300 175-5 [5] clause 7.7.30)	Mobile identity (TS 124 008 [21] clause 10.5.1.4)			
1	ID for Portable identity	Mobile identity IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	Type	Type of identity	8.2.15	M	
4	Length of identity value	Odd/even indication = "0"	8.2.6	M	
5	Identity value	Identity value		M	(note)
NOTE: 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 clause 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 annex C.					

7.2.7 Basic service - CM service type

Table 88

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Basic service (EN 300 175-5 [5] clause 7.6.4)	CM service type (TS 124 008 [21] clause 10.5.3.3)			
1	ID for Basic service	CM service type IEI	8.2.4	M	
2	Call class	Service type	8.2.16	M	
3	Basic service	-		I	

7.2.8 Basic service - bearer capabilities

Table 89

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Basic service (EN 300 175-5 [5] clause 7.6.4)	Bearer capabilities (TS 124 008 [21] clause 10.5.4.5)			
1	ID for Basic service	Bearer capabilities IEI	8.2.4	M	
2	-	Length of Bearer capabilities contents		I	
3	-	Radio channel requirement		-	Default value = "11"B (full and half rate supported, full rate preferred)
4	-	Coding standard		-	Default value = "0"B (GSM/UMTS coding)
5	-	Transfer mode		-	Default value = "0"B (Circuit mode)
7	Basic service	Information transfer capability	8.2.17	M	
8-...	-	Etc.		I	

7.2.9 Called-party-number - called-party-number

Table 90

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Called party number (EN 300 175-5 [5] clause 7.7.7)	Called party BCD number (TS 124 008 [21] clause 10.5.4.7)			
1	ID for called party number	Info element ID	8.1.4	M	
2	Length of contents	Length of called party number contents	8.1.5	M	
3	Number type	Type of number	8.2.18	M	
4	Numbering plan identification	Numbering plan identification	8.2.19	M	
5	Called party address (List of DECT characters)	Number digits (IA5 char)		M	DECT char to IA5 char

7.2.10 Called-party-subaddress - called-party-subaddress

Table 91

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Called party subaddress (EN 300 175-5 [5] clause 7.7.8)	Called party subaddress (TS 124 008 [21] clause 10.5.4.8)			
1	ID for called party subaddress	Info element ID	8.1.4	M	
2	Length of contents	Length of called party subaddress contents	8.1.5	M	
3	Subaddress type	Type of subaddress	8.2.23	M	
4	O/E ind	Odd/even indicator		M	(note)
5	List of subaddress information	Subaddress information		M	(note)
NOTE: Field is mapped transparently					

7.2.11 Multi keypad - called-party-number

Table 92

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Multi keypad	Called party BCD number			
1	ID for Multi keypad	Called party BCD number IEI	8.1.4	M	
2	Length of contents	Length of called party number contents	8.1.5	M	
3	Keypad info (DECT char)	Type of number		M	(note)
4	Keypad info (DECT char)	Number digits (IA5 char)		M	DECT char to IA5 char
5	-	Numbering plan identification		I	
NOTE: If the first DECT character entered is the PLUS SIGN of the DECT character set (e.g. "2B"H when the ISO 8859-1 [28] character set is used, see terminal capabilities in EN 300 175-5 [5] clause 7.7.41) the "Type of number" shall be "001"B (international number) else it shall be "000"B (unknown).					

7.2.12 Multi keypad - keypad facility (F-10)

Table 93

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Multi-keypad (EN 300 175-5 [5] clause 7.7.26)	Keypad facility (TS 124 008 [21] clause 10.5.4.17)			
1	ID for Multi keypad	Keypad facility IEI	8.1.4	M	
2	Length of contents	Length of keypad contents	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.

7.2.13 Release reason - cause

Table 94

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Release reason	Cause (TS 124 008 [21] clause 10.5.4.11)			
1	ID for release reason	Cause IEI	8.1.4	M	
2	-	Length of cause contents		I	
3	-	Coding standard		I	Set coding standard to "11"B (Standard defined for the GSM-PLMNS as described table 10.86 in TS 124 008 [21])
4	-	Location		I	Set location to "1010"B (network beyond interworking point)
5	-	Recommendation		I	not included (TS 124 008 [21] clause 10.5.4.11)
6	Release reason code	Cause value	8.2.20	M	
7	-	Diagnostic		I	For SS and bearer service negotiation

7.2.14 Info type - cause

Table 95

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Info Type (EN 300 175-5 [5] clause 7.7.20)	Cause (TS 125 413 [23] clause 9.2.1.4)			
1	ID for Info Type	Cause IEI	8.2.4	M	
2	Length of contents	Length	8.2.5	M	
3	Parameter type(s)	Cause Value	8.2.24	M	

7.2.15 Model identifier- Mobile identity

Table 96

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Model identifier (EN 300 175-5 [5] clause 7.7.46)	Mobile identity (TS 124 008 [21] clause 10.5.1.4)			
1	ID for Model identifier	Mobile identity IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	MANIC/MODIC	IMEISV	8.2.22	M	

7.2.16 RES 1 - Authentication response parameter (extension)

This IE is only present in UMTS security context.

Table 97

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	RES (EN 300 175-5 [5] clause 7.7.35)	Authentication Response Parameter (extension) (TS 124 008 [21] clause10.5.3.2.1)			
1	ID for RES	Authentication Parameter extension IEI	8.2.4	M	
2	Length of contents	Length of contents	8.2.5	M	
3	RES field (all but 4 most significant octets)	Auth. Resp. Param. field		M	(note)
NOTE: Value is mapped transparently.					

7.2.17 Source RNC to target RNC transparent container

Source RNC to Target RNC Transparent Container IE is an information element that is produced by Source RNC (FP IWU) and is transmitted to target RNC (target FP/IWU). In inter system relocation the IE is transmitted from external relocation source to target RNC.

This IE is transparent to CN.

Table 98

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	(note1)	Source RNC to target RNC transparent container (TS 125 413 [23] clause 9.2.1.28)			
1	-	RRC Container		M	
2	-	Number of Iu Instances = 1		M	
3	-	Relocation Type = 1 (UE involved in relocation of SRNS)		M	
4	-	Target Cell ID	6.2.22	M	Same as in IE Target Cell ID of message
5	-	RAB ID		M	(note 2)
NOTE 1: IE is generated locally in the FP1 interworking unit. NOTE 2: Generation of RAB ID is a local matter for the FP/IWU (out of scope).					

7.2.18 IE Reject reason in Authentication Failure

Table 99

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Reject Reason (EN 300 175-5 [5] clause 7.7.34)	Reject Cause (TS 124 008 [21] clause 10.5.3.6)			
1	ID for Reject Reason	Reject Cause IEI	8.2.4	M	
2	Length of Contents (L)	-		I	
3	Reject Reason Code	Reject Cause Value	8.2.26	M	

7.2.19 IE Authentication Failure Parameter in Authentication Failure

This IE is used in UMTS security context only.

Table 100

Item No	Information element coding DECT	Information element coding UMTS	Reference	Map. status	Note
	Authentication Reject Parameter EN 300 175-5 [5] clause 7.7.52)	Authentication Failure Parameter (TS 124 008 [21] clause 10.5.3.2.2)			
1	ID for Authentication Reject Parameter	Authentication Failure parameter IEI	8.2.4	M	
2	Length of Contents (L)	Length of Authentication Failure parameter contents	8.2.5	M	
3	Authentication Reject Parameter value	Authentication Failure parameter value		M	Contains AUTS, (note)
NOTE: Field is mapped transparently					

8 Fields in information element coding

The clause titles in this clause 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.

8.1 UMTS to DECT

8.1.1 Protocol discriminator - protocol discriminator

Table 101

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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
CISS: Call Independent Supplementary Services. CLMS: Connectionless Message Service. COMS: Connection Oriented Message Service. CRSS: Call Related Supplementary Services.					

8.1.2 Transaction identifier - transaction identifier

Table 102

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Transaction identifier	Transaction identifier			
1	Transaction flag	Transaction flag		C10201	(note 1)
2	Transaction flag	Extended transaction value		C10202	(note 3)
3	Transaction value	Transaction value		C10201	(note 2)
4	Transaction value	Extended transaction value		C10202	(note 4)

C10201: Mandatory (M) during normal transaction handling, otherwise out-of-scope (I).
C10202: Mandatory (M) during external handover call setup and subsequent messages, otherwise out-of-scope (I).
NOTE 1: The transaction flag value is mapped transparently through the FP during all procedures.
NOTE 2: Shall be transparent.
NOTE 3: UMTS Transaction flag corresponds to DECT Original transaction flag (OTF) in Extended transaction value field (TVX), see clause 6.3.2.7.8.
NOTE 4: UMTS Transaction value corresponds to DECT Original Transaction value (OTV) in Extended transaction value field (TVX), see clause 6.3.2.7.8.

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 clause, shows which message types shall be mapped with each other.

The N(SD) bit in the UMTS network side shall be incremented (independent of DECT) according to the rules as defined in TS 124 008 [21] every time the FP IWU sends an MM or a CC message to the CN. The N(SD) bit is not mapped to the DECT air interface.

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 clause, shows which element identifiers shall be mapped with each other.

8.1.5 Length of contents - length of contents

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

8.1.6 Type, (Mobile identity, NWK assigned identity)

Table 103

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Type of identity	Type			
1	"100"B	"1110100"B		M	

8.1.7 Identity value, (mobile identity, NWK assigned identity)

Table 104

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Identity value	Identity value			
1	4 octets, binary	4 octets, binary		M	Value is mapped transparently

8.1.8 Y/N bit (encryption information - cipher info)

Table 105

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Algorithm identifier	Y/N bit			
1	"00000001"B				(note)
2	"0000011" or other version of GSM user encryption data	"1"B		M	Enable encryption
NOTE: This value is not mapped. In this case the FP IWU will respond with a SECURITY MODE COMPLETE message to the CN (see TS 101 863-2 [16]).					

8.1.9 RAND field (RAND - RAND)

Table 106

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	RAND value	RAND field			
1	128 bits	128 bits		M	Value is mapped transparently

8.1.10 Cipher key number (key sequence - cipher key number)

Table 107

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Key sequence (TS 124 008 [21] table 10.5.2)	Cipher key number (EN 300 175-5 [5] clause 7.7.4)			
1	Three bits, "111"B reserved	Four bits, most significant bit is set to value "0"B		M	Value is mapped transparently

8.1.11 Extended location information (location area identification - location area)

Table 108

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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 the present document.					

8.1.12 Identity group (identity type - identity type)

Table 109

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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

8.1.13 Type (identity type - identity type)

Table 110

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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 - temporary subscriber id

8.1.14 void

8.1.15 Portable user type, (mobile identity, portable identity)

Table 111

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Type of identity	Portable user type			
1	"001"B	"0100"B		M	IMSI

8.1.16 Identity value, (mobile identity - portable identity)

Table 112

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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

8.1.17 Reject cause value - reject reason code

Table 113

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Reject cause value (TS 124 008 [21] clause 10.5.3.6)	Reject reason code (EN 300 175-5 [5] clause 7.7.34)			
1	"00000010"B (IMSI unknown in HLR)	"02"H (IPUI unknown)		M	
2	"00000011"B (Illegal MS)	"06" H (IPUI not accepted)		M	
3	"00000110"B (Illegal ME)	"05" H (IPEI not accepted)		M	
4	"00001011"B (PLMN not allowed)	"76" H (PLMN not allowed)		M	
5	"00001100"B (Location Area not allowed)	"80" H (Location area not allowed)		M	
6	"00001101"B (Roaming not allowed in this location area)	"81" H (National roaming not allowed in this location area)		M	

8.1.18 Coding-standard - coding-standard

Table 114

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Coding standard (TS 124 008 [21] table 10.5.127)	Coding standard (EN 300 175-5 [5] clause 7.7.31)			
1	"00"B	"00"B		M	CCITT standard
2	"01"B	"01"B		I	Other int. standard
3	"10"B	"10"B		I	Nat. standard
4	"11"B	"11"B		M	PLMN specific

8.1.19 Information transfer capability - basic service

Table 115

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Information transfer capability (TS 124 008 [21] table 10.5.102)	Basic service (EN 300 175-5 [5] clause 7.6.4)			
1	"000"B (speech)	"0110"B		M	DECT/UMTS IWP
2	"001"B (unrestricted digital information)	-		I	
3	"010"B (3,1 kHz audio)	-		I	
4	"011"B (fax group 3)	-		I	
5	"111"B (Reserved; the meaning is alternate speech/facsimile group 3 starting with speech)	-		I	

8.1.20 Location - location

Table 116

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Location (TS 124 008 [21] table 10.5.127)	Location (EN 300 175-5 [5] clause 7.7.31)			
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

8.1.21 Progress-description - progress-description

Table 117

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Progress description (TS 124 008 [21] table 10.5.127)	Progress description (EN 300 175-5 [5] clause 7.7.31)			
1	"0000001"B	"0000001"B		M	Call is not end-to-end PLMN/ISDN, further call progress info may be available in-band
2	"0000010"B	"0000010"B		M	Destination address is non-PLMN/ISDN
3	"0000011"B	"0000011"B		M	Origination address is non-PLMN/ISDN
4	"0000100"B	"0000100"B		M	Call has returned to the PLMN/ISDN
5	"0001000"B	"0001000"B		M	In-band information or appropriate pattern now available
6	"0100000"B	"0100000"B		M	Call is end to end PLMN/ISDN
7	"1000000"B	-		I	Queueing

8.1.22 Cause-value - release-reason-code

Table 118

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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	"00110010"B		M	34-47 to 32-insufficient resources

8.1.23 Signal value - signal value

Table 119

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Signal value (TS 124 008 [21] clause 10.5.4.23)	Signal value (EN 300 175-5 [5] clause 6.7.8)			
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

8.1.24 Skip indicator - transaction identifier

Table 120

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	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 EN 300 175-5 [5], clause 7.3. NOTE 2: Shall be transparent.					

8.1.25 Reject cause value - release reason code

Table 121

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
	Reject cause value (TS 124 008 [21] clause 10.5.3.6)	Release reason code (EN 300 175-5 [5] clause 7.6.7)			
1	"00000100"B	"0A"H		M	(note 1)
2	"00000110"B	"08" H		M	(notes 1 and 2)
3	"00010001"B	"0F" H		O	(notes 1 and 2)
4	"00010110"B	"34" H		O	(note 1)
5	"00100000"B	"06" H		O	(note 1)
6	"00100001"B	"0F" H		O	(note 1)
7	"00100010"B	"0F" H		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 then the Reject cause is included in an Abort message.					

8.1.26 IWU-TO-IWU information (authentication reject/authentication and ciphering reject)

Table 122

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
1	-	c12201		M	
NOTE: c12201 IF (AUTHENTICATION REJECT) THEN '00000000'B ELSE IF (AUTHENTICATION AND CIPHERING REJECT) '00000001'B ELSE IF (AUTHENTICATION AND CIPHERING FAILURE) '00000010'B					

8.1.27 Cause - Release reason

Table 123

Item No	Field(s) coding UMTS	Field(s) coding DECT	Reference	Map. status	Note
1	"11"(DEZ) (Successful Relocation)	"23"H (External handover release)		M	(note)
NOTE: Other UMTS cause values shall be mapped to DECT "0F"H (unknown) as defined in EN 300 175-5 [5] clause 7.6.7.					

8.2 DECT to UMTS

8.2.1 Protocol discriminator - protocol discriminator

See clause 8.1.1.

8.2.2 Transaction identifier - transaction identifier

See clause 8.1.2.

8.2.3 Message type - message type

See clause 8.1.3.

8.2.4 Id for info element - id for info element (IEI)

See clause 8.1.4.

8.2.5 Length of contents - length of contents

See clause 8.1.5.

8.2.6 Length of identity value (portable identity - mobile identity)

Table 124

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Length of identity value (EN 300 175-5 [5] clause 7.7.30)	Odd/even indication (TS 124 008 [21] clause 10.5.1.4)			
1	Binary value representing the length of BCD coded digits	"0"B or "1"B depending if the number of BCD coded digits is odd or even"		M	

8.2.7 Type, (portable identity - mobile identity)

Table 125

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Type (EN 300 175-5 [5] clause 7.7.30)	Type of identity (TS 124 008 [21] clause 10.5.1.4)			
1	"0000000"B (Temporary Portable User Identity (TPUI))	"001"B (IMSI)		M	

8.2.8 Portable user type, (portable identity - mobile identity)

Table 126

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Portable user type (EN 300 175-5 [5] clause 7.7.30)	Type of identity (TS 124 008 [21] clause 10.5.1.4)			
1	"0100"B	"001"B (IMSI)		M	

8.2.9 Identity value, (portable identity - mobile identity)

Table 127

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Identity value (EN 300 175-5 [5] clause 7.7.30)	Identity value (TS 124 008 [21] clause 10.5.1.4)			
1	Maximum of 60 bits representing a maximum of 15 BCD coded digits	Maximum of 15 BCD coded digits		M	Value is mapped transparently

8.2.10 Type, (NWK assigned identity - mobile identity)

Table 128

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Type (EN 300 175-5 [5] clause 7.7.28)	Type of identity (TS 124 008 [21] clause 10.5.1.4)			
1	"1110100"B (Temporary Mobile Subscriber Identity (TMSI))	"100"B (TMSI/P-TMSI)		M	
2	"1111111"B (Proprietary (application specific))	-		I	
3	-	"010"B (IMEI)		I	
4	-	"001"B (IMSI)		I	
5	-	"000"B (no identity)		I	

8.2.11 Identity value, (NWK assigned identity - mobile identity)

Table 129

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Identity value (EN 300 175-5 [5] clause 7.7.28)	Identity digits (TS 124 008 [21] clause 10.5.1.4)			
1	4 octets, binary	4 octets, binary		M	Value is mapped transparently

8.2.12 Extended location information, (location area - location area identification)

Table 130

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Extended location information (EN 300 175-5 [5] clause 7.7.25)	Location area identification (TS 124 008 [21] clause 10.5.1.3)			(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).					

8.2.13 Cipher key number, (cipher info - cipher key sequence number)

In a UMTS authentication challenge, the purpose of the *Ciphering Key Sequence Number* information element is to make it possible for the network to identify the ciphering key CK and integrity key IK which are stored in the MS without invoking the authentication procedure. CK and IK form a Key Set Identifier (KSI) (see TS 133 102 [24]) which is encoded the same as the CKSN and is therefore included in the CKSN field.

Table 131

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Cipher key number (EN 300 175-5 [5] clause 7.7.10)	Cipher key sequence number (TS 124 008 [21] clause 10.5.1.2)			
1	A four bit binary value	A three bit binary value		M	(note)
NOTE: Bits 1 to 3 are mapped transparently. Bit 4 of the DECT <Cipher key number> field shall not be mapped (value "0"B).					

8.2.14 RES field (RES - auth. response parameter)

Table 132

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	RES field (EN 300 175-5 [5] clause 7.7.35)	Auth. response parameter (TS 124 008 [21] clause 10.5.3.2)			
1	RES value	SRES value (GSM security context) or 4 most significant octets of RES (UMTS security context)		M	Value is mapped transparently

8.2.15 Type, (portable identity - mobile identity)

Table 133

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Type (EN 300 175-5 [5] clause 7.7.30)	Type of identity (TS 124 008 [21] clause 10.5.1.4)			
1	"0000000"B (International Portable User Identity (IPUI))	"001"B (IMSI)		M	
2	"0010000"B (International Portable Equipment Identity (IPEI))	"010"B (IMEI)		M	(note)
3	-	"011"B (IMEISV)		I	
4	-	"100"B (TMSI/P-TMSI)		I	
5	-	"000"B (no identity)		I	
6	"0100000"B (Temporary Portable User Identity (TPUI))	-		I	
NOTE: The IPEI structure is different from the IMEI structure the mapping is specified in annex C.					

8.2.16 Call class, (basic service - CM service type)

Table 134

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Call class (EN 300 175-5 [5] clause 7.6.4)	Service type (TS 124 008 [21] clause 10.5.3.3)			
1	"1000"B (Normal call setup)	"0001"B (Mobile originating call establishment or packet mode connection establishment)		M	
2	"1010"B (Emergency call setup)	"0010"B (Emergency call establishment)		M	
3	"1100"B	-		I	External handover call setup
4	"1001"B	-		I	Internal call setup
5	"0111"B	-		I	DECT/ISDN IIP
6	"0100"B (Message call setup)	"0100"B (Short message service)		O	
	-	"1000"B		I	Supplementary service activation
	-	"1001"B		I	Voice group call establishment
	-	"1010"B		I	Voice broadcast call establishment
7	"1011"B	-		I	Service call setup
8	-	"1011"B		I	Location services
8	"1101"B (Supplementary service call setup)	-"1000"B (Supplementary service activation)		O	
9	"1110"B	-		I	OA&M call setup

8.2.17 Basic service - information transfer capability

Table 135

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Basic service (EN 300 175-5 [5] clause 7.6.4)	Information transfer capability (TS 124 008 [21] clause 10.5.4.5)			
1	"0110"B	"000"B (speech)		M	DECT/UMTS IWP
		"001"B (unrestricted digital information)		I	
		"010" B (3,1 kHz audio, ex PLMN)		I	
		"011"B (facsimile group 3)		I	
		"101"B (Other ITC)		I	
		"111"B (reserved, to be used in the network [alternate speech/facsimile group 3 - starting with speech])		I	

8.2.18 Number-type - type-of-number

Table 136

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Number type (EN 300 175-5 [5] clause 7.7.7)	Type of number (TS 124 008 [21] clause 10.5.4.7)			
1	"000"B	"000"B		M	Unknown
2	"001"B	"001"B		M	International number
3	"010"B	"010"B		O	National number
4	"011"B	"011"B		O	Network specific number
5	-	"100"B (dedicated access, short code)		I	
6	-	"101"B (reserved)		I	
7	-	"110"B (reserved)		I	
8	"110"B (Abbreviated number)	-		I	
9	"111"B	"111"B		I	(reserved for extension)

8.2.19 Numbering-plan identification - numbering-plan identification

Table 137

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Numbering plan identification (EN 300 175-5 [5] clause 7.7.7)	Numbering plan identification (TS 124 008 [21] clause 10.5.4.7)			
1	"0000"B	"0000"B		M	Unknown
2	"0001"B	"0001"B		O	ISDN/telephony numbering plan (E.164)
3	"0011"B	"0011"B		O	X.121 (data numbering plan)
4	-	"0100"B		I	F.69 (Telex numbering plan)
5	"0111"B (TCP/IP address)	-		I	
5	"1000"B	"1000"B		O	National numbering plan
6	"1001"B	"1001"B		O	Private numbering plan
7	"1011"B (Internet character format)	-		I	
8	-	"1011"B (Reserved for CTS)		I	
9	"1100"B (LAN MAC address)	-		I	
10	"1101"B (X.400 address)	-		I	
11	"1110"B (profile specific alphanumberic identifier)	-		I	
12	"1111"B	"1111"B		O	(reserved for extension)

8.2.20 Release-reason-code - cause-value

Table 138

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Release reason code (EN 300 175-5 [5] clause 7.6.7)	Cause value (TS 124 008 [21] table 10.5.123)			
1	"00000000"B (normal)	"0010000"B (Normal call clearing)		M	0 to 16
2	"00000101"B (incompatible service)	"1011000"B (Incompatible destination)		M	5 to 88
3	"00000110"B (Service not implemented)	"1001111"B (Service or option not implemented, unspecified)		M	6 to 79
4	"00001111"B (Unknown)	"0011111"B (Normal, unspecified)		M	15 to 31
5	"00010000"B (User detached)	"0010010"B (No user responding)		M	16 to 18
6	"00010001"B (User not in range)	"0000011"B (No route to destination)		M	17 to 3
7	"00010010"B (User unknown)	"0000001"B (Unassigned (unallocated) number)		M	18 to 1
8	"00010100"B (User busy)	"0010001"B (User busy)		M	20 to 17
9	"00010101"B (User rejection)	"0010101"B (Call rejected)		M	21 to 21
10	"00110010"B (Insufficient resources)	"0101111"B (Resources unavailable, unspecified)		M	50 to 47

8.2.21 Transaction identifier - skip indicator

Table 139

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	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

8.2.22 Type, (MANIC-MODIC - mobile identity)

Table 140

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	MANIC/MODIC (EN 300 175-5 [5] clause 7.7.46)	IMEISV (TS 123 003 [19])			
1	-	'10' (TAC first two digits)	Annex C	M	(note)
2	EMC (first 4 digits)	TAC (remaining 4 digits)	Annex C	M	
3	EMC (last digit)	FAC (first digit)	Annex C	M	
4	PSN (first digit)	FAC (remaining digit)	Annex C	M	
5	PSN (last 6 digits)	SNR	Annex C	M	
6	MODIC (last 6 digits)	SVN (2 digits)	Annex C	M	Decimal value of MODIC digits
NOTE: Two highest bits of <MODIC> are not mapped. See annex C.					

8.2.23 Subaddress type- Type of subaddress

Table 141

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Subaddress type	Type of subaddress			
1	"000"B	"000"B		M	NSAP (ITU-T Recommendation X.213/ISO 8348 AD2)
2	"010"B	"010"B		M	User specific
3	"100"B	-		I	Profile service specific alphanumeric identifier

8.2.24 Parameter type - Cause Value

Table 142

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Parameter type (EN 300 175-5 [5] clause 7.7.20)	Case Value (TS 125 413 [23] clause 9.2.1.4)			
1	"0100011"B (handover failed, reversion to old channel)	"29"(DEZ) (Relocation Failure in Target CN/RNC or Target System)		M	
2	-	"115"(DEZ) (Unspecified Failure)		O	

8.2.25 Info type - Cause

Table 143

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Info type (EN 300 175-5 [5] clause 7.7.20)	Case Value (TS 125 413 [23] clause 9.2.1.4)			
1	"0001010"B (hand over reference)	"11"(DEZ) (Reallocation)		M	

8.2.26 Reject Reason - Reject Cause Value

Table 144

Item No	Field(s) coding DECT	Field(s) coding UMTS	Reference	Map. status	Note
	Reject Reason (EN 300 175-5 [5] clause 7.7.34)	Reject Cause (TS 124 008 [21] clause 10.5.3.6)			
1	"10"H (authentication failed)	"00010100"B (MAC failure)		M	

9 FP U-Plane IWU procedures

For the FP CS UMTS PLMN attachment, the DECT LU1 (ADPCM, 32 kbit/s) U-Plane service should be mapped into the UMTS Pulse Coded Modulation (PCM) speech service. Requirements in clause 8.3 of EN 300 175-8 [8] shall be applied. Mapping for packet switched (voice) services is for further study.

9.1 Service activation

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

1) UMTS Connect for outgoing call;

2) UMTS Connect-ack for incoming call;

3) During call establishment phases, UMTS <<Progress indicator>> information element with progress description indicating " call is not end-to-end PLMN/ISDN; further call progress information may be available in-band ", "Destination address is non-PLMN/ISDN", "Origination address is non-PLMN/ISDN", or "In band information or appropriate pattern now available" for incoming or outgoing call;

4) During call release phases, UMTS <<Progress indicator>> information element with progress description indicating "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 UMTS part do not cause unnecessary 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 UMTS PLMN on the lower layer interconnection of those entities, and thus the necessary signalling information transfer at call establishment, is outside the scope of the present document.

10 PP C-Plane IWU mappings

10.1 CS Call handling IWU procedures

With the exceptions given in this clause, the CC procedures shall be performed as defined in GAP or if not covered by GAP as defined in EN 300 175-5 [5].

10.1.1 CS Call establishment procedure

10.1.1.1 Outgoing call

Prior to issuing an MNCC_SETUP-req primitive to the PT in order to establish an outgoing call, the PP IWU shall map the Ciphering Key (KSI) 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 "0010"B (UMTS profile, CI EN 300 175-5 [5] clause 7.6.4). In ARI-D environment the <<FIXED IDENTITY>> information element shall still be included in the {CC-SETUP} message but with 0 length contents. See clause 6.2.17 for mapping details.

If the received {CC-SETUP-ACK} message contains a <<DELIMITER-REQUEST>>, the PP IWU shall indicate the completion of the dialling information with a <<SENDING COMPLETE>> information element.

10.1.1.2 Emergency call

Prior to issuing an MNCC_SETUP-req primitive to the PT in order to establish an outgoing emergency call and an IPUI type R is not available, the PP IWU shall retrieve the IPUI type N (IPEI) from the Portable Equipment (PE) which shall be sent as portable identity in the {CC-SETUP} message to the FP.

NOTE: The mapping between the IPEI and IMSI, used in the Emergency call setup, may be found in annex C.

10.1.1.3 Incoming call

If the PP receives a {CC-SETUP} message indicating a <<BASIC SERVICE>> information element which it does not support, the PP shall respond with a {CC-RELEASE-COM} message with <<RELEASE REASON>> "05"H "incompatible service".

10.1.2 Call release/reject procedures

Upon receipt of an MNCC_RELEASE-ind or an 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 authentication vectors stored in the USIM 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 authentication vectors stored in the USIM as defined in annex B;
- shall accomplish the relevant release procedure;
- shall not initiate outgoing calls except emergency calls;
- shall not initiate detach procedure;
- shall set the update status to ROAMING NOT ALLOWED.

c) Any other release reason:

- the PP IWU shall react in a way that the reaction of PT as it is described in GAP, EN 300 444 [13] to be achieved.

11 Other IWU procedures

This clause defines the interworking 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 itself.

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 the present document) 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 figure 34.

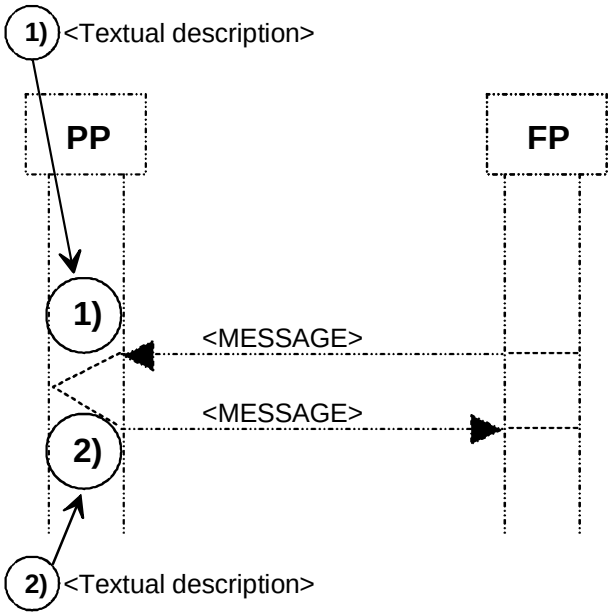

Figure 34: General layout of the procedures in the PP

11.1 CS Authentication procedure

(Reference: TS 124 008 [21] clause 4.3.2b)

1) Upon receipt of an MM_AUTHENTICATE-ind primitive from the PT as a result of a received {AUTHENTICATION-REQUEST} message from the FT (figure 35) the PP IWU shall send the received information elements to the (U)SIM as defined in TS 133 102 [24].

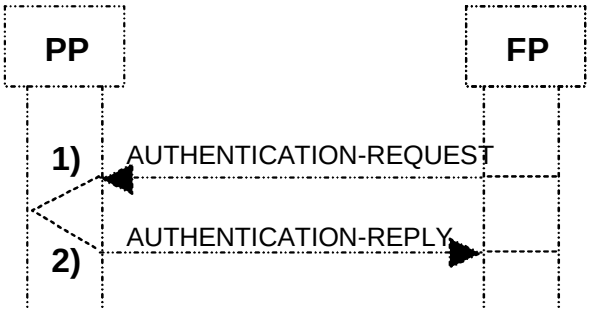

Figure 35: Authentication procedure

2) The PP IWU shall issue the MM_AUTHENTICATE-res primitive to the PT. The PT sends a {AUTHENTICATION-REPLY} message to the FT.

If the PP IWU receives an MM_AUTHENTICATE_REJECT-ind primitive from the PT after sending the MM_AUTHENTICATION-res primitive to the PT the PP IWU shall delete GSM ciphering key, GSM ciphering key sequence number in a GSM security context and delete the UMTS ciphering key, GSM ciphering key, UMTS integrity key, ciphering key sequence number (KSI).

NOTE: The IWU deletes any elementary file (ciphering key etc.) in the USIM by storing it full of "1"Bs in the associated elementary file.

11.2 Identity procedure

1) Upon receipt of an MM_IDENTITY-ind primitive from the PT as a result of a received {IDENTITY-REQUEST} message from the FT (figure 36) the PP IWU shall retrieve the required information either from the USIM or the PE.

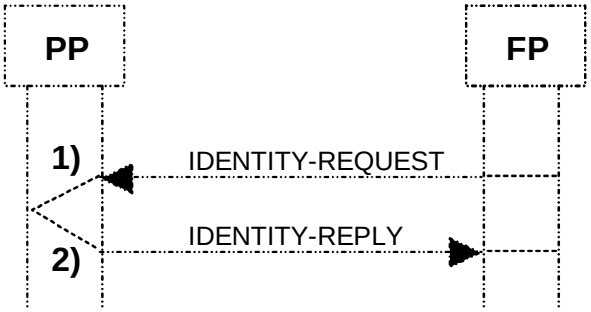

Figure 36: Identity procedure

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 USIM;

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 USIM.

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.

11.3 Location registration procedure

11.3.1 General

The PP location updating procedure is a general procedure which is used for the following purposes:

- normal location updating (see clause 11.3.2);
- periodic updating (see clause 11.3.3);
- IMSI attach (see clause 11.3.4).

The PP IWU does not distinguish between these three different types of procedures in the message coding. In all cases the generic location updating procedure as described in clause 11.3.5 applies.

To limit the number of location updating attempts made, where location updating is unsuccessful, an attempt counter is used. The attempt counter is reset when a PP is switched on or a USIM is inserted. Upon successful location updating, the PP sets the update status to UPDATED in the SIM and stores the received Location Area Identification on the USIM. The attempt counter shall be reset (see clause 11.3.5.2).

The location update procedure shall be performed as it is described in GAP with the additions described in this clause.

11.3.2 Normal location updating

The normal location updating procedure is used to update the registration of the actual Location Area of a PP in the network. The normal location updating procedure shall also be started if the network indicates that the PP is unknown in the VLR as a response to connection establishment request.

The location updating procedure is always initiated by the PP.

11.3.3 Periodic location updating

Periodic location updating may be used to notify periodically the availability of the PP to the network. As already indicated in clause 5.2.3, there are two ways to implement periodic location registration: one is based on a location update suggestion by the FP, the other is based on the use of the <<DURATION>> information element and a periodic timer in the PP. This last approach is described in this clause.

The procedure is controlled by the timer <MM loc_upd.1> in the PP IWU. If the timer is not running already, it is started each time the PP IWU terminates the last active transaction. The timer is stopped when the PP IWU receives a network-layer message from the FP which is not related to an MM transaction.

The timer is reset to 0 when:

- a network-layer message is received which is not related to an MM transaction;
- the timer has expired;
- the UE is deactivated (i.e. equipment powered down or USIM removed).

When the timer reaches the <MM loc_upd.1> time-out value the location updating procedure shall be started as soon as no MM transaction is active. The time-out value is the value received in the latest <<DURATION>> information element in a {LOCATE-ACCEPT} message.

No location registration procedure may replace the periodic location registration, i.e. if timer <MM loc_upd.1> expires during ongoing normal location registration procedure, the PP shall still initiate a periodic location registration as described in this clause.

11.3.4 IMSI attach procedure

The IMSI attach procedure is the complement of the IMSI detach procedure (see clause 11.4). It is used to indicate the IMSI as active in the network.

The normal location registration procedure used to implement an IMSI attach should be started by the PP IWU when an IMSI is activated in a PP (i.e. activation of a PP with plug-in USIM, insertion of a card in a card-operated PP, etc.) within coverage area from the network or when a PP with an IMSI activated outside the coverage area enters the coverage area.

11.3.5 Generic location updating procedure

11.3.5.1 Location updating initiation by the PP

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 USIM. 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. In this case, if the location registration is successful, the accessed PLMN shall be deleted from the forbidden PLMN list of the SIM:

1) upon change of the DECT location area the PP IWU retrieves the IMSI, TMSI, LAI, UMTS CK and Cipher key number from the SIM. The DECT specific (non-UMTS) part of <<LOCATION AREA>> and the <<FIXED IDENTITY >> information shall be retrieved from the active DECT subscription. After this the PP IWU issues an MM_LOCATE-req primitive to the PT.

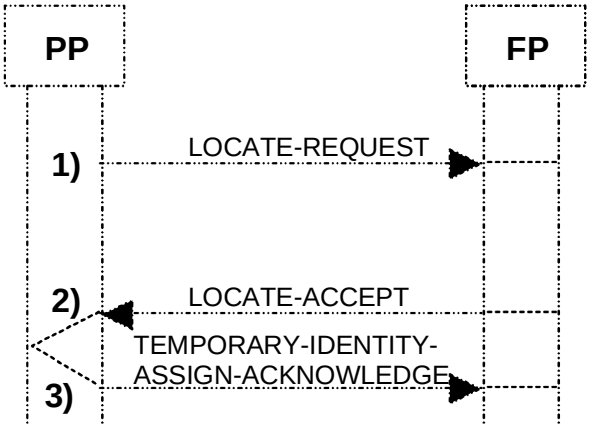

Figure 37: Location registration procedure

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 37) including the <<PORTABLE IDENTITY>>, <<FIXED IDENTITY>>, <<LOCATION AREA>>, <<NWK ASSIGNED IDENTITY>>, <<CIPHER INFO>> and <<MODEL-IDENTIFIER>> information elements provided by the PP IWU.

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

The <<CIPHER KEY SEQUENCE NUMBER>> retrieved by the PP IWU from the USIM 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 SEQUENCE 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 145.

Table 145: Field values for <<CIPHER INFO>> in LOCATE-REQUEST

Information element/Item number	Field	Value
<<CIPHER INFO>>		
3	MSB of the <Cipher key number>	"0"B
4	<Y/N bit>	"1" (Enable ciphering)
5	<Cipher algorithm identifier>	"0000001" (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 146.

Table 146: Field values for <<LOCATION AREA>>

Information element/Item number	Field	Value
<<LOCATION AREA>>		
1	<LI-type>	"11"B (LAL + extended location area information)
2	<ELI>	"1111"B (UMTS location information)

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 147.

Table 147: Field values for <<PORTABLE IDENTITY>>

Information element/Item number	Field	Value
<<PORTABLE IDENTITY>>		
1	<Identity type>	"0000000"B ("IPUI")
2	<PUT>	'0100'B (PUT for IPUI R)
3	<Identity type>	"0100000"B ("TPUI")
4	<PUT>	'0000'B (PUT for TPUI)
PUT: Portable User Type		

2) upon receipt of an 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 USIM with the received <Extended location information> field value of the <<LOCATION AREA>> information element and the existing TMSI in the USIM with the received <<NWK assigned id>> information element value if being received by the PT. The PP shall also reset the attempt counter and set the update status in the USIM to UPDATED.

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

11.3.5.2 Attempt counter

To limit the number of location updating attempts made, where location updating is unsuccessful, an attempt counter is used. It counts the number of consecutive unsuccessful location update attempts.

The attempt counter is incremented when a location update procedure fails. The specific situations are specified in clause 11.5.3.

The attempt counter is reset when:

- the PP is powered on;
- a USIM is inserted;
- location update is successfully completed;
- location update completed with cause #"76"H, #"80"H or #"81"H;
- a new DECT location area is entered;
- on expiry of <MM loc_upd.1> if this timer was started when the attempt counter reached its maximum value.

The attempt counter is used when deciding whether to re-attempt a location update after time-out of timer <MM loc_upd.2>.

11.3.5.3 Location updating not accepted by the network

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

a) "IPEI not accepted", "IPUI unknown" or "IPUI not accepted":
   - shall consider the USIM invalid until switch-off or the USIM is removed;
   - shall not initiate location updating;

b) "PLMN not allowed":
   - shall store the current PLMN-Id value (contained in the ARI D) in the forbidden PLMNs list in the USIM;
   - shall not initiate location updating until the ARI broadcast by an FP has changed;
   - reset the attempt counter;

c) "Location area not allowed":

- shall not initiate location updating until the DECT location area has changed;
- reset the attempt counter;

d) "National roaming not allowed in this location area":

- shall not initiate location updating until the DECT location area has changed;
- memorize that during the next cell search, FP's with the same PLMN-ID should be excluded if possible;
- reset the attempt counter.

In all cases a), b), c) and d) the PP IWU shall:

- delete the LAI, Cipher key, Cipher key number and TMSI as defined in annex B;
- set the update status to ROAMING NOT ALLOWED;
- not initiate detach procedure;
- not initiate outgoing calls except emergency calls.

The PP shall be capable of storing up to 4 entries in the forbidden PLMNs list.

In all other reject cases or situations of procedural failure the following behaviour should be implemented by the PP IWU:

1) increment the attempt counter;

2) depending on the DECT LA and the value of the attempt counter:

   a) if the update status is UPDATED and the PP was last registered in the current DECT LA and the attempt counter is smaller than 4 then:

      - the PP shall start timer <MM loc_upd.2>. When timer <MM loc_upd.2> expires the location updating procedure is triggered again;

   b) if the update status is different from UPDATED, or the PP was not last registered in the current DECT LA or the attempt counter is greater or equal to 4:

      - the PP shall delete any LAI, TMSI, ciphering key sequence number stored in the USIM and set the update status to NOT UPDATED. If the attempt counter is smaller than 4 the PP shall start timer <MM loc_upd.2>, otherwise <MM loc_upd.1> after the last active transaction is finished. When the started timer expires the location updating procedure is triggered again.

11.4 Detach procedure

1) The PP IWU shall retrieve the IMSI from the USIM and issue an MM_DETACH-req primitive to the PT. The PT shall send a {DETACH} message to the FT (figure 38). The {DETACH} message shall contain the IMSI in the <<PORTABLE IDENTITY>> information element and the TMSI in the <<NWK ASSIGNED IDENTITY>> information element.

Figure 38: Detach procedure

On removal of the USIM, the PT may send a {DETACH} message to the FT using the already retrieved subscription related data. All data related to the active subscription shall be deleted and ongoing transactions shall be aborted, using the abnormal call release as defined in clause 5.1.6.

11.5 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 USIM with the received <<NWK ASSIGNED IDENTITY>> and the LAI in the USIM 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. If the TEMPORARY_IDENTITY_ASSIGN-res primitive received by the PT indicates an accept, the PT shall attempt to assign a new TPUI value (if received). If this assignment is successful, or no TPUI value was received, the PT sends a {TEMPORARY-IDENTITY-ASSIGN-ACK} message to the FT (figure 39). If the TPUI assignment fails the PP shall send a {TEMPORARY-IDENTITY-ASSIGN-REJ}.

   If the TEMPORARY_IDENTITY_ASSIGN-res primitive received by the PT indicates a reject, the PT shall not attempt to assign a new TPUI value and send a {TEMPORARY-IDENTITY-ASSIGN-REJ}.

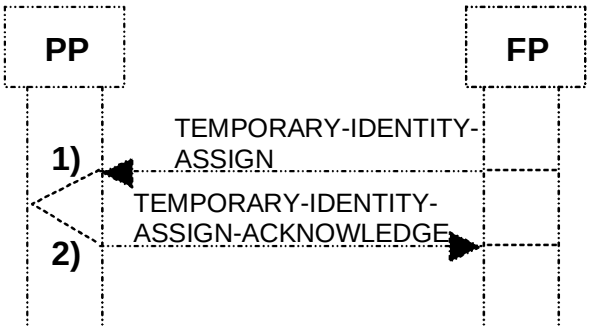

Figure 39: TMSI reallocation procedure

11.6 Ciphering related procedure

1) Upon receipt of an MM_CIPHER-ind primitive from the PT as a result of a received {CIPHER-REQUEST} message from the FT (figure 40) the PP IWU shall check that there exists an associated cipher key UMTS CK in the USIM as indicated in the <cipher key number> field (table 145) in the <<CIPHER INFO>> information element. If the cipher key UMTS CK exists the PP IWU shall retrieve the cipher key from the USIM and calculate the DECT cipher key as described in annex A.

2) After this the PP IWU sends an MM_CIPHER-res primitive to the PT which initiates DECT standard ciphering.

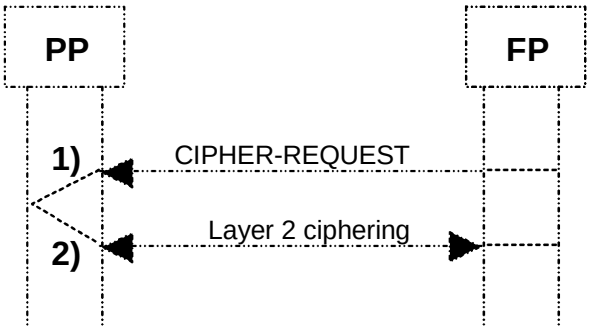

Figure 40: Ciphering procedure

PP IWU may reject the cipher request that reflecting in PT sending {CIPHER-REJECT} message to the FT. The possible reject reasons are described in EN 300 175-7 [7]. FT behaviour is described in clause 5.2.6.

11.7 External handover procedure (PP)

For a description of the external handover procedure, see clause 5.2.9, PP specific behaviour is described in this clause.

11.7.1 Handover candidate procedure

The external handover candidate information is obtained using two sub-procedures, handover candidate indication and/or handover candidate retrieval as defined in EN 300 175-5 [5], clause 15.7.1.

Handover candidate retrieval, performed by the PT, shall be handled as defined in EN 300 175-5 [5], clause 15.7.1.3.

Target FP selection performed by the PP shall be handled as defined in EN 300 175-5 [5].

11.7.2 Handover reference retrieval

When the PP determines that an external handover is required it shall initiate the handover reference retrieval procedures as defined in EN 300 175-5 [5] with the following additions:

- the procedure is mandatory for every external handover, regardless if the "handover reference" was previously received or not;
- the PP shall indicate "handover reference" in the <<info type>> information element within the {MM-INFO-REQUEST} message. This will trigger the FP-1 to initiate the IU RELOCATION REQUIRED Indication to the CN;
- the PP shall include the identities of its proposed external handover candidates in the <<fixed identity>> information element(s) within the {MM-INFO-REQUEST} message in order of preference.

In addition the PP shall only initiate one external handover reference retrieval procedure. The received "network handover reference" shall be used by the PP for all transactions affected by the external handover.

11.7.3 Handover execution by PP

Successful handover resource allocation (see clause 5.2.9.4) is indicated to the PP with a {MM-INFO-ACCEPT} message. The {MM-INFO-ACCEPT} message contains a "network handover reference" to be used to correlate the reserved resources and also includes the chosen FP, identified by the <<FIXED IDENTITY>> information element.

11.7.4 IU-RELOCATION-REQUIRED to FP-2

The PP shall initiate the layer 3 setup procedure, based on the target cell provided in {MM-INFO-ACCEPT} message by sending the {CC-SETUP} message to the handover candidate FP-2 indicating in the <<BASIC SERVICE>> information element <Call class> field the external handover call setup. The PP shall also include the "network handover reference" in the <<NETWORK PARAMETER>> information element as received from the FP-1.

During IU-RELOCATION-REQUIRED to FP-2 and also during all subsequent messages until all transactions have been released, the PP shall use a Transaction Identifier that contains an Extended Transaction Value (TVX). See clause 11.7.7 for detailed information related to the present document on specific handling of transaction identifiers during external handover.

11.7.5 Handover accept by PP

When the network has indicated confirmation of handover, the PP shall send a {CC-CONNECT-ACK} message to the FP-2 to indicate to the network that the PP accepts the handover.

Since the DECT external handover is performed on an individual transaction basis, compared to UMTS where the handover is performed on a radio connection level, the PP shall not send any {CC-CONNECT-ACK} message until all transactions affected by the external handover have been accepted.

11.7.6 Ciphering procedure

Ciphering shall be initiated by the PP as soon as possible after receipt of the {CC-CONNECT} message, prior to returning the {CC-CONNECT-ACK} message. The ciphering procedure for external handover shall be initiated by the PP as defined in the DECT base standard EN 300 175-5 [5], clause 15.7.6. In addition the following shall apply:

- ciphering mode shall not be changed during external handover;
- ciphered/unciphered information shall not be sent on parallel legs during handover;
- ciphering shall be re-established on old leg if handover failed.

PP shall indicate failed ciphering to FP-1 by sending a {MM-INFO-REQUEST} message indicating "handover failed, reversion to old channel" to be able to restore old network connections.

11.7.7 Release of old connection

The external handover is completed with the release of the old connection. The release procedure is defined in EN 300 175-5 [5], clause 15.7.4.5.

11.7.8 Handover reject

A precondition for external handover is that the PP is state T-10, the "active state". If not, the external handover shall not be initiated.

PP may decide to not complete the initiated handover attempt e.g. due to changed radio conditions. For these cases, if the handover attempt is aborted/rejected, it is the responsibility of the PP to inform the FP-1 about the new situation so that reserved network resources can be released, and the original connection restored.

If an external handover is initiated and not yet completed and the PP has decided that it will not complete the handover it shall send a {MM-INFO-REQUEST} message to the FP-1 indicating "handover failed, reversion to old channel" in the <<info type>> information element. The FP will return a {MM-INFO-ACCEPT} message as a confirmation.

NOTE: PP shall await response of already initiated {MM-INFO-REQUEST} before initiating another {MM-INFO-REQUEST}.

The PP may reject the handover after reception of the {CC-CONNECT} from the FP-2. The PP shall, in addition to the above, then release the new link by sending {CC-RELEASE} to the FP-2, which will return {CC-RELEASE-COM} to the PP.

11.7.9 Support of external handover due to O&M activities

In UMTS it is possible to initiate a handover for internal O&M reason, e.g. during replacement of hardware. The support for this functionality in DECT/UMTS Interworking is provided by utilizing the existing procedures defined in EN 300 175-5 [5] as follows:

- upon receipt of a {MM-INFO-SUGGEST} message, without previously requested external handover, the PP may initiate a NWK layer set up procedure as defined in clause 15.7.4 of EN 300 175-5 [5].

11.7.10 Handling of transaction identifiers during and after external handover

During IU-RELOCATION-REQUIRED to FP-2 and all the subsequent messages, special handling of the Transaction Identifiers is required since it is required to use the original transaction identifier towards the UMTS network. This is also required during and after an external handover has been executed.

After the completion of an external handover, Extended Transaction Identifiers (ETI) will be used on the new PP - FP-2 connection, as defined in table 148. Extended Transaction Identifiers shall be used for all subsequent messages used on the new connection.

The ETI shall be structured as defined in clause 7.3 of EN 300 175-5 [5], in addition the unique coding of the present document and usage of the TVX shall be supported as defined in this clause. This shall be supported by both PP and FP during and after execution of external handover.

The Transaction value (TV) shall indicate "TV extension" and the TVX shall consist of an Original Transaction Value (OTV), Original Transaction Flag (OTF), and a Function Group Identifier (FGI) as defined in table 148.

Table 148: Definition of Extended Transaction Identifier (ETI) used during and after external handover

Field	Description
Transaction Identifier (TI)	Transaction Identifier, see clause 8.1.2 and EN 300 175-5 [5], clause 7.3
Extended Transaction Identifier (ETI)	Transaction Identifier (TI) where an additional octet is used containing an 8-bit Extended Transaction Value (TVX), see EN 300 175-5 [5], clause 7.3
Flag (F)	Indicating Transaction originator See EN 300 175-5 [5], clause 7.3
Transaction Value (TV)	Transaction Value, see EN 300 175-5 [5], clause 7.3
Extended Transaction Value (TVX)	Extended Transaction value when Transaction Value coded to "TV Extension" (111). See below and EN 300 175-5 [5], clause 7.3
Function Group Identifier (FGI)	Identifier of original transaction type
Original Transaction Flag (OTF)	Indicating Transaction Flag (F) value for original call, prior to first external handover
Original Transaction Value (OTV)	Transaction Value used prior to first external handover. Shall be identical to the Transaction Value (TV) used prior to external handover

PP and FP shall support transparent mapping of TV and F or OTV and OTF respectively, thereby allowing for a transparent handling of Transaction Identifiers.

The structure of the ETI as defined in table 149 shall be supported.

Table 149

8	7	6	5	4	3	2	1	Octet
Flag (F)	Transaction Value (TV) =TV Extension (1 1 1)			Protocol Discriminator (PD) (see clause 8.1.1)				1
Extended Transaction Value (TVX)								1a

The detailed coding of the Extended Transaction Value (TVX) as defined in table 150 shall be used.

Table 150

8	7	6	5	4	3	2	1	Octet
Function Group Identifier (FGI)			spare	(OTF)	Original Transaction Value (OTV)			1a

Table 151: Function Group Identifier (FGI)

Bits	8	7	6		Meaning
	0	0	0		CC Transaction
	0	0	1		SMS Transaction
	0	1	0		SS Transaction
	0	1	1	}	
		to		}	Reserved
	1	1	1	}	

Original Transaction Flag (OTF):

Same coding as for Transaction Flag (F), see EN 300 175-5 [5], clause 7.3.

Original Transaction Value (OTV):

Same coding as for Transaction Value (TV), see EN 300 175-5 [5], clause 7.3.

11.8 Paging related IWU procedure

1) Upon receipt of a {LCE-REQUEST-PAGE} 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 USIM. The <Cipher key number> field value shall be the one which has been received during the latest authentication procedure and stored in the USIM.

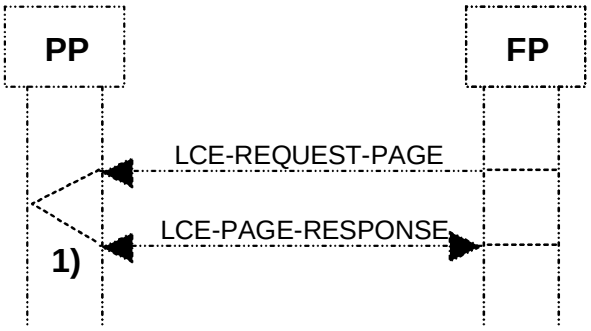

Figure 41: Paging procedure

The fields in the <<CIPHER INFO>> information element shall be set as shown in table 152.

Table 152: Field values for <<Cipher info>> in LCE-PAGE-RESPONSE

Information element/Item number	Field	Value
<<CIPHER INFO>>		
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)

11.9 Stopping of CC timers

Upon receipt of a << TIMER RESTART>> information element in a {CC-NOTIFY} message from the FP IWU the PP shall act as follows:

1) if the Restart value coding indicates "restart timer", the PP shall proceed according to GAP;

2) if the Restart value coding indicates "stop timer" and the {CC-NOTIFY} message was received during establishment or release of a call the PP shall stop all CC timers related to that call.

12 Interworking connection type definitions

There is only one DECT connection type defined in the present document. 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 "DECT UMTS IWP ".

Table 153: Default coding for UMTS <<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 Information transfer rate	Circuit mode 32 kbit/s
6	Protocol identifier User protocol id	User protocol identifier G.721 ADPCM [26]

Table 154: Default coding for UMTS <<CALL-ATTRIBUTES>> information element

Octet	Information element field	Field value
3	Coding standard Network layer attributes	DECT standard UMTS IWP="00100"B
4	C-Plane class C-Plane routing	Class A; shared Cs only
5	U-Plane symmetry LU identification	Symmetric LU1 (32 kbit/s ADPCM voice)
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 64 Bit DECT ciphering key CK (CI EN 300 175-7 [7] clause 4.4.3.3) from the 128 Bit UMTS ciphering key CK (TS 133 102 [24] clause 6.6.4.2).

A.2 Algorithm to calculate the DECT CK from UMTS CK

The CK_{UMTS} with L1 > N bits can be mapped into a CK_{DECT} with N bits by taking the lower N bits of CK_{UMTS}. A key CK_{UMTS} with L2 < N bits can be mapped into a CK_{DECT} with N bits by using:

$$CK_{DECT}(i) = CK_{UMTS}(i \text{ modulo } L2),\ 0 \leq i \leq N - 1.$$

Annex B (normative): Deletion of the UMTS CK,UMTS IK, KSI(CKSN), GSM CK, TMSI and LAI

When explicitly stated in the present document, the PP IWU shall delete Elementary Files (EFs) in the USIM associated to the Location Area Identification (LAI) and Temporary Mobile Subscriber Identity (TMSI) by filling the EFs with binary "1" s. The Ciphering Key (UMTS CK), Integrity Key (UMTS IK), KSI/CKSN, GSM CK are deleted implicitly by filling the associated EF with binary "1" s.

The PP IWU shall never explicitly examine the contents of these EFs when retrieving/passing information from/to the USIM, i.e. the FP IWU shall always process the information as required by the associated procedure (as an exception to normal action in an UMTS User Equipment) and the examination of the information contents shall be done in the FP IWU (if deleted or not). See table B.1.

NOTE: The FP may implicitly delete the wanted EFs by sending binary "1" s in the associated DECT information elements.

Table B.1: Associated information elements of DECT and UMTS

DECT	UMTS	Invalid/deleted value
<<NWK ASSIGNED IDENTITY>>	TMSI	"11111111111111111111111111111111"B (32 bits)
<Extended location information> in <<LOCATION AREA>>	LAI	"1111111111111111"B (16 bits)
<Cipher key number> in <<CIPHER KEY>>	CKSN	"1111"B

Annex C (normative): Mapping of equipment identities

Each PP has a unique identity and shall transmit this to the FP on request. All IMEI enquiry procedures (IPEI) shall be supported by the PP as specified in TS 122 016 [18].

The following procedure shall instruct the PP to display its IPEI: *#06#.

The procedure shall be accepted and performed with and without an inserted USIM.

Support of Mobile Equipment Identity and Software Version Number (IMEISV)

The IMEISV is coded in 16 digits where the last two digits indicate software revision number (SV = 2 digits software version number / software revision number). The FP shall map the IPEI and Model identifier received from the PP to the IMEISV as described in TS 123 003 [19] according to the following principle:

- in order to identify an IMEISV as DECT specific, the two most significant digits of the TAC in the IMEISV shall be "10";
- the decimal value of the EMC shall be mapped to the 4 remaining digits of the TAC and the first digit of the FAC;
- the decimal value of the PSN shall be mapped to the remaining digit of the FAC and to the 6 digits of the SNR;
- the DECT FP shall interpret the Model identifier during location registration. The decimal value of the lowest 6 bits of the <MODIC> field in the <<MODEL IDENTITIFIER>> information element shall be mapped to the 2 digits of the SVN. The EMC mapped shall be set according to the EMC value of the IPEI.

NOTE: The mapping of Model identifier to the SVN supports 64 (0 to 63) different version numbers of PP software. The two highest bits of the <MODIC> should not be used since they are not mapped to the SVN.

Annex D (informative): Physical attachment models for the FP

D.1 Introduction

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

D.2 Physical attachment to the 3G MSC

The attachment in figure D.1 is used for the circuit switched domain.

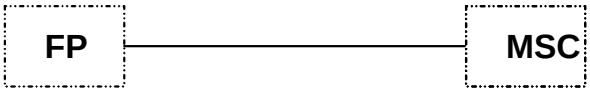

Figure D.1: FP CS CN attachment

D.3 Physical attachment to the GSN

The attachment in figure D.2 is used for the packet switched domain.

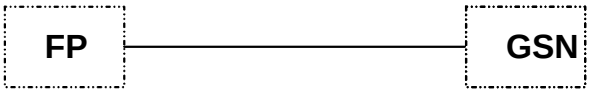

Figure D.2: FP PS CN attachment

Annex E (informative): Bibliography

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- ETSI TS 122 083: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Call Waiting (CW) and Call Holding (HOLD); Supplementary Services - Stage 1 (3G TS 22.083)".
- ETSI TS 122 084: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); MultiParty (MPTY) Supplementary Services - Stage 1 (3G TS 22.084)".
- ETSI TS 122 085: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Closed User Group (CUG) Supplementary Services - Stage 1 (3G TS 22.085)".
- ETSI TS 122 086: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Advice of Charge (AoC) Supplementary Services - Stage 1 (3G TS 22.086)".
- ETSI TS 122 088: "Digital cellular telecommunications system (Phase 2+) GSM); Universal Mobile Telecommunications System (UMTS); Call Barring (CB) Supplementary Services - Stage 1 (3G TS 22.088)".
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History

Document history		
V1.1.1	April 2001	Publication
V1.2.1	November 2001	Publication