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Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); GSM Phase 2 supplementary services implementation

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Contents

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Foreword

This European Standard (EN) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT) in co-operation with the ETSI Technical Committee Global System for Mobile communications (GSM).

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Introduction

The present document is a part of a set of standards for the Digital Enhanced Cordless Telecommunications / Global System for Mobile communications (DECT/GSM) Interworking Profile (IWP) concept that includes:

- general description of service requirements, functional capabilities and information flows, (ETS 300 466 [13]);
- access and mapping (protocol/procedure description for 3,1 kHz speech service), (ETS 300 370 [11]);
- GSM-MSC/DECT-FP Fixed Interconnection, (ETS 300 499 [14]);
- **GSM Phase 2 supplementary services implementation, (the present document);**
- short message services, point to point and cell broadcast, (ETS 300 764 [51]);
- implementation of bearer services, (ETS 300 756 [50]);
- implementation of facsimile group 3, (ETS 300 792 [52]).

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

In addition, the present document is based on ETS 300 444 [12] to enable the same DECT/GSM terminal to inter-work with a DECT Fixed Part (FP) complying to the Generic Access Profile (GAP) requirements, irrespective of whether this FP provides residential, business or public access services. General attachment requirements and speech attachment requirements are based on TBR 6 [53] and TBR 10 [54].

Further details on the DECT system may be found in ETR 015 [55], ETR 043 [56], and ETR 056 [57], ETS 300 176-1 [9] and ETS 300 176-2 [10].

The present document is based upon ETS 300 557 [38] (GSM 04.08), ETS 300 565 to ETS 300 572 [41] to [48] (GSM 04.8x and GSM 04.90) and ETS 300 370 [11].

1 Scope

The present document specifies the interworking procedures and mappings necessary to ensure that Global System for Mobile communication (GSM) Phase 2 supplementary services can be provided over Digital Enhanced Cordless Telecommunications (DECT), as specified in ETS 300 466 [13]. To enable DECT terminals to interwork with DECT systems which are connected to the GSM infrastructure, the DECT access protocols and Fixed Part (FP) and Portable Part (PP) interworking and mappings are specified for Mobile Switching Centre (MSC) attachment of the DECT FP.

In the present document, the general aspects relevant for interworking are given, together with the interworking procedures and mappings used at the DECT radio interface for registration, erasure, activation, deactivation, invocation and interrogation of supplementary services. Provision and withdrawal of supplementary services is an administrative matter between the DECT subscriber attached to the GSM network, and the service provider and causes no signalling on the radio interface.

Under the aspects of interworking, definitions and descriptions of supplementary services are given in ETS 300 466 [13]. The present document covers the additions to the interworking and mappings in ETS 300 370 [11] for the DECT FP and PP, to ensure that GSM supplementary services can be provided over the DECT air interface.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

2.1 Normative references

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

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

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

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

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

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

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

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

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

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

[11] ETS 300 370: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Interworking Profile(IWP); Access and mapping (Protocol/procedure description for 3,1 kHz speech service)".

[12] ETS 300 444 (1995): "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[13] ETS 300 466: "Digital Enhanced Cordless Telecommunications(DECT); Global System for Mobile Communications (GSM); Interworking Profile (IWP); General description of service requirements; Functional capabilities and information flows".

[14] ETS 300 499: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile Communications (GSM); Interworking Profile (IWP); Mobile services Switching Centre (MSC) - Fixed Part (FP) interconnection".

[15] ETS 300 500: "Digital cellular telecommunications system (Phase 2); Principles of telecommunication services supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.01)".

[16] ETS 300 502: "European digital cellular telecommunications system (Phase 2); Teleservices supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.03)".

[17] ETS 300 503: "Digital cellular telecommunications system (Phase 2); General on supplementary services (GSM 02.04)".

[18] ETS 300 510: "Digital cellular telecommunications system (Phase 2); Description of Charge Advice Information (CAI) (GSM 02.24)".

[19] ETS 300 511: "European digital cellular telecommunications system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS) (GSM 02.30)".

[20] ETS 300 514: "Digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 1 (GSM 02.81)".

[21] ETS 300 515: "Digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1 (GSM 02.82)".

[22] ETS 300 516: "Digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Holding (HOLD) supplementary services - Stage 1 (GSM 02.83)".

[23] ETS 300 517: "Digital cellular telecommunication system (Phase 2); MultiParty (MPTY) supplementary services - Stage 1 (GSM 02.84)".

[24] ETS 300 518: "Digital cellular telecommunication system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1 (GSM 02.85)".

[25] ETS 300 519: "Digital cellular telecommunication system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1 (GSM 02.86)".

[26] ETS 300 520: "Digital cellular telecommunication system (Phase 2); Call Barring (CB) supplementary services - Stage 1 (GSM 02.88)".

[27] ETS 300 625: "European digital cellular telecommunications system (Phase 2); Stage 1 description of Unstructured Supplementary Service Data (USSD) (GSM 02.90)".

[28] ETS 300 522: "Digital cellular telecommunications system (Phase 2); Network architecture (GSM 03.02)".

[29] ETS 300 542: "Digital cellular communications system (Phase 2); Line identification supplementary services - Stage 2 (GSM 03.81)".

[30] ETS 300 543: "Digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 2 (GSM 03.82)".

[31] ETS 300 544: "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2 (GSM 03.83)".

[32] ETS 300 545: "European digital cellular telecommunications system (Phase 2); Multi Party (MPTY) supplementary services - Stage 2 (GSM 03.84)".

[33] ETS 300 546: "Digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 2 (GSM 03.85)".

[34] ETS 300 547 "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 2 (GSM 03.86)".

[35] ETS 300 548: "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 2 (GSM 03.88)".

[36] ETS 300 549: "Digital cellular telecommunications system (Phase 2); Unstructured Supplementary Service Data (USSD) - Stage 2 (GSM 03.90)".

[37] ETS 300 551: "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration (GSM 04.02)".

[38] ETS 300 557: "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification (GSM 04.08)".

[39] ETS 300 558: "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects (GSM 04.10)".

[40] ETS 300 564: "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification Formats and coding (GSM 04.80)".

[41] ETS 300 565: "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 3 (GSM 04.81)".

[42] ETS 300 566: "Digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 3 (GSM 04.82)".

[43] ETS 300 567: "Digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3 (GSM 04.83)".

[44] ETS 300 568: "European digital cellular telecommunications system (Phase 2); Multi Party (MPTY) supplementary service - Stage 3 (GSM 04.84)".

[45] ETS 300 569: "Digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 3 (GSM 04.85)".

[46] ETS 300 570: "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 3 (GSM 04.86)".

[47] ETS 300 571: "Digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 3 (GSM 04.88)".

[48] ETS 300 572: "European digital cellular telecommunications system (Phase 2); Unstructured Supplementary Service Data (USSD) - Stage 3 (GSM 04.90)".

[49] ETS 300 599: "Digital cellular telecommunications system (Phase 2); Mobile Application Part (MAP) specification (GSM 09.02)".

[50] ETS 300 756: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Interworking Profile (IWP); Implementation of bearer services".

[51] ETS 300 764: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Interworking Profile (IWP); DECT/GSM Implementation of short message service, point-to-point and cell broadcast".

[52] ETS 300 792: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile(IWP); Implementation of facsimile group 3".

[53] TBR 6: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".

[54] TBR 10: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements; Telephony applications".

[55] ETR 015: "Digital Enhanced Cordless Telecommunications (DECT); Reference document".

[56] ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common interface; Services and facilities requirements specification".

[57] ETR 056: "Digital Enhanced Cordless Telecommunications (DECT); System description document".

[58] EN 301 238: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Isochronous data bearer services with roaming mobility (service type D, mobility class 2)".

[59] DEN/DECT-020087: "Digital Enhanced Cordless Telecommunications (DECT); Dynamic multimedia service change on the DECT access interface".

[60] ISO/IEC 9646-Parts 1 and 6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

2.2 Informative references

[61] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[62] ETS 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[63] ETS 300 435: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Base standard including interworking to connectionless networks (service types A and B, Class 1)".

[64] ETS 300 501: "European digital cellular telecommunications system (Phase 2); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.02)".

[65] ETS 300 512: "Digital cellular telecommunications system (Phase 2); Procedure for call progress indications (GSM 02.40)".

[66] ETS 300 529: "Digital cellular telecommunications system (Phase 2); Technical realization of supplementary services (GSM 03.11)".

[67] ETS 300 562: "European digital cellular telecommunications system (Phase 2); Rate adaption on the Mobile Station - Base Station System (MS - BSS) Interface (GSM 04.21)".

[68] ETS 300 590: "Digital cellular telecommunications system (Phase 2); Mobile-services Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification (GSM 08.08)".

[69] ETS 300 651: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic data link service; Service type C, class 2".

[70] ETS 300 755: "Digital Enhanced Cordless Telecommunications (DECT); Data services profile; Multimedia Messaging Service (MMS) with specific provision for facsimile services; (Service type F, class 2)".

[71] ETR 099: "European digital cellular telecommunications system (Phase 2); General description of a GSM Public Land Mobile Network (PLMN) GSM Public Land Mobile Network (PLMN) (GSM 01.02)".

[72] ETR 100: "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms (GSM 01.04)".

[73] ITU-T Recommendations Q6xx Series: "Interworking of signalling systems".

[74] ITU-T Recommendation T.30: "Procedures for document facsimile transmission in the general switched telephone network".

[75] ITU-T Recommendation T.31 (1995): "Asynchronous facsimile DCE control - Service Class 1".

[76] ITU-T Recommendation T.32 (1995): "Asynchronous facsimile DCE control - Service Class 2".

[77] CCITT Recommendation V.24 (1988): "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[78] CCITT Recommendation V.25bis (1988): "Automatic calling and/or answering equipment on the general switched telephone network (GSTN) using the 100-series interchange circuits".

[79] CCITT Recommendation V.110: "Support of data terminal equipments with V-Series type interfaces by an integrated services digital network".

3 Definitions, abbreviations and symbols

3.1 Definitions

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

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

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

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

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

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

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

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

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

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

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

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

NOTE 6: A DNW is a logical grouping that contains one or more Fixed radio Terminations (FTs) plus their associated Portable radio Termination (PT). The boundaries of the DECT network are not physical boundaries.

external handover: The process of switching a call in progress from one FT to another FT.

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

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

FP GSM PLMN attachment (DECT FP attached to a GSM MSC): A definition of a functional environment where a DECT system (FP) is attached to an GSM MSC. The MSC in this case refers to a functional entity providing the required Mobility Management (MM) and Call Control (CC) functionality defined in the present document in order to communicate with the FP.

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

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

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

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

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

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

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

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

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

incoming call: A call received at a PP.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

outgoing call: A call originating from a PP.

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

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

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

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

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

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

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [60].

Protocol Implementation Extra Information For Testing (PIXIT): See ISO/IEC 9646-1 [60].

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

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

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

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

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

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

Tree and Tabular Combined Notation (TTCN): See ISO/IEC 9646-6 [60].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AoCC	Advice of Charge Charging supplementary service
AoCI	Advice of Charge Information supplementary service
BAIC	Barring of All Incoming Calls supplementary service
BIC-Roam	Barring of All Incoming Calls when Roaming outside the home PLMN country supplementary service
BAOC	Barring of All Outgoing Calls supplementary service
BCD	Binary Coded Decimal
BOIC	Barring of Outgoing International Calls supplementary service
BOIC-exHC	Barring of Outgoing International Calls except those directed to the Home PLMN Country supplementary service
CAI	Charge Advice Information
CC	Call Control
CFB	Call Forwarding on mobile subscriber Busy
CFNRc	Call Forwarding on mobile subscriber Not Reachable supplementary service
CFNRy	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CH	Call Hold
CI	Common Interface
CISS	Call Independent Supplementary Service
CLI	Calling Line Identification
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line identification Presentation
COLR	Connected Line identification Restriction
CRSS	Call Related Supplementary Service
CUG	Closed User Group
CW	Call Waiting
DAM	DECT Authentication Module
DECT	Digital Enhanced Cordless Telecommunications
DNW	DECT Network
DLC	Data Link Control
F	Flag
FGI	Function Group Identifier
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
GNW	Global Network
GSM	Global System for Mobile communications
IE	Information Element
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IWU	Interworking Unit
IWP	Interworking Profile
LNW	Local Network
MAC	Medium Access Control
MAP	GSM Mobile Application Part
MBC	Multi-Bearer Control
MM	Mobility Management
MPTY	MultiParty
MS	Mobile Station
MSC	Mobile Switching Centre
NDUB	Network Determined User Busy
NWK	Network
PA	Portable Application
PARI	Primary Access Rights Identity
PE	Portable Equipment

PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information For Testing
PLMN	Public Lands Mobile Network
PP	Portable Part
PT	Portable radio Termination
RES	a Response calculated by a PP
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
RR	Radio Resource
SI	Signal Information
SS	Supplementary Service
SRES	a GSM specific authentication response calculated by the GSM SIM or the DAM
TTCN	Tree and Tabular Combined Notation
TUP	Telephony User Part
TV	Transaction Value
UDUB	User Determined User Busy
USSD	Unstructured Supplementary Service Data

3.3 Symbols for status columns

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

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

NOTE: The symbol "-" in the mapping subclause of the present document means that there is no message, IE or coding specified in this column.

C for conditional to map/support/use (the message, IE mapping depends on the selection of other optional or/and conditional items).

4 General

The present document specifies how GSM Phase 2 supplementary services shall be provided over the DECT air interface.

One of the main objectives is to describe how the GSM Phase 2 supplementary services are mapped across the DECT air interface in a formal way, so that inter-operability of different manufacturers equipment can be achieved. This is done by describing the Interworking Unit (IWU) procedures and mappings loosely following ITU-T Q.6xx Series of Recommendations [73] and by describing an air interface profile following ISO/IEC 9646-6 [60].

The air interface profile enables the subsequent generation of test cases, if required.

The present document is made up of two main clauses.

Clause 5 describes the general approach for the handling of call related and call independent GSM supplementary services over the DECT air interface. The procedural support is based upon the DECT functional protocol that act as the transport mechanism. The signalling mappings are described in terms of IWU procedures with informative data flow diagrams. The handling of individual services is described when necessary, as well as error handling and recovery procedures.

Clause 6 describes interworking mappings for supplementary services, shows the C-plane mappings for GSM - DECT and DECT - GSM in respective order. One IWU is considered, the FP/IWU. Detailed descriptions follow, using tables

of what is mapped, what is ignored and what is transferred transparently. The tables are based upon the mapping tables of clause 6 in ETS 300 370 [11] and specify only the additions necessary for the support of supplementary services. The detailed IE mappings between the functional DECT protocol and the functional GSM protocol is the responsibility of the IWU and is described merely as guidance for implementation.

For the general interworking functions, the interworking model and the interworking context, the requirements of clause 5 in ETS 300 370 [11] apply.

4.1 Reference configurations

Reference configurations describe the functional groupings of DECT and GSM and their relationships via reference points. In general, reference points may or may not correspond to a physical interface. The functional groupings and reference points for GSM access are described in ETS 300 551 [37]. The GSM network entities and physical interfaces are described in ETS 300 522 [28]. The functional (logical) groupings and reference points for DECT are described in this subclause.

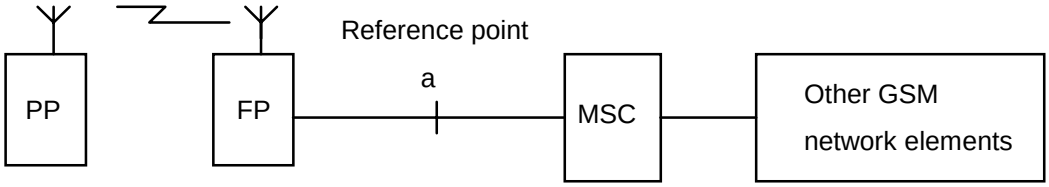


Figure 1: Attachment to the GSM PLMN

Figure 1 shows the functional attachment of the DECT FP to the GSM Public Land Mobile Network (PLMN). Reference point "a" is the interface which supports the functional structure of the GSM A-interface at the network layer reflecting the associated ISDN User Part (ISUP)/Telephony User Part (TUP) and GSM Mobile Application Part (MAP) functions in terms of Call Control (CC) and Mobility Management (MM) needed to support the basic speech service, i.e. protocols at this reference point are a subset of the standard MM and CC functions of the standard GSM A-interface. GSM Radio Resource (RR) management and other GSM specific functionality is explicitly outside the scope of the present document. Further details are described in ETS 300 499 [14].

5 Supplementary services support procedures

5.1 General

This subclause describes the general approach for the handling of GSM supplementary services over the DECT common interface.

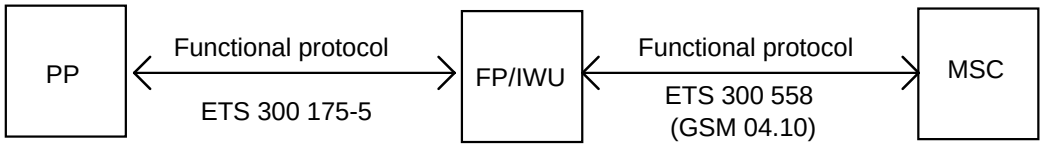


Figure 2: Transport mechanisms between DECT PP, FP/IWU, and GSM MSC

The standardized functional protocol as defined in ETS 300 558 [39] (GSM 04.10), ETS 300 557 [38] (GSM 04.08), ETS 300 564 [40] (GSM 04.80), GSM 04.8x series [41] to [47], ETS 300 572 [48] (GSM 04.90) and ETS 300 599 [49] (GSM 09.02) shall be used for the interworking.

The used transport mechanisms for supplementary services are:

- for hold and retrieve procedures, the separate message approach as defined in ETS 300 558 [39] (GSM 04.10) and ETS 300 175-5 [5], subclause 10.4.1, with the messages {HOLD}, {HOLD-ACK}, {HOLD-REJECT}, {RETRIEVE}, {RETRIEVE-ACK} shall be used as described in subclause 5.2 of the present document;

- the {FACILITY} message (ETS 300 564 [40] (GSM 04.80) and ETS 300 175-5 [5], subclause 6.3.3.1) together with IWU-TO-IWU IEs containing GSM facility elements shall be used for different Call Independent Supplementary Service (CISS) and Call Related Supplementary Service (CRSS) procedures as described in subclauses 5.3 and 5.4 for CRSS and CISS;

- for CISS, the CC-connections with the basic service IE and call class "supplementary service call set-up" (ETS 300 175-5 [5], subclause 7.6.4) shall be used as described in subclause 5.4 of the present document.

The reason for that procedure is that the DECT external handover procedure is only defined for CC connections.

NOTE: Although functional procedures using the {FACILITY} message and the Facility IE are described in ETS 300 175-5 [5], subclause 10.4, these procedures are only described for ISDN supplementary services and do not foresee the transparent transport of GSM supplementary services information. Especially the <<FACILITY>> IE is reserved to be used only for transparent passing through of ISDN services.

5.2 Separate Messages Category

As defined in ETS 300 558 [39] (GSM 04.10) and ETS 300 175-5 [5], the following messages utilize the hold and retrieve set of messages:

- {HOLD}
- {HOLD-ACK}
- {HOLD-REJECT}
- {RETRIEVE}
- {RETRIEVE-ACK}
- {RETRIEVE-REJECT}

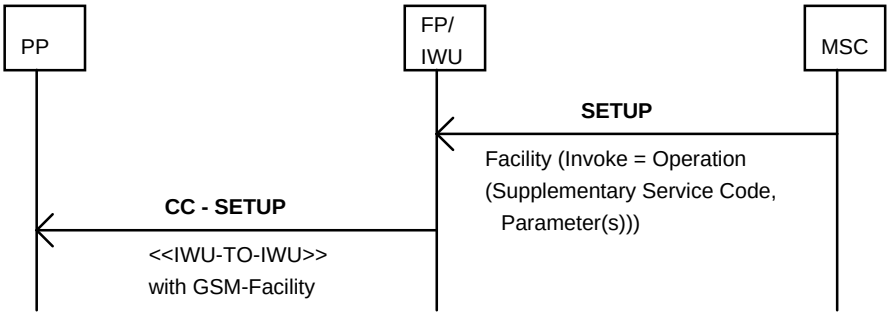
These messages will be used for the call hold and the call retrieval supplementary services.

5.3 CRSS procedures

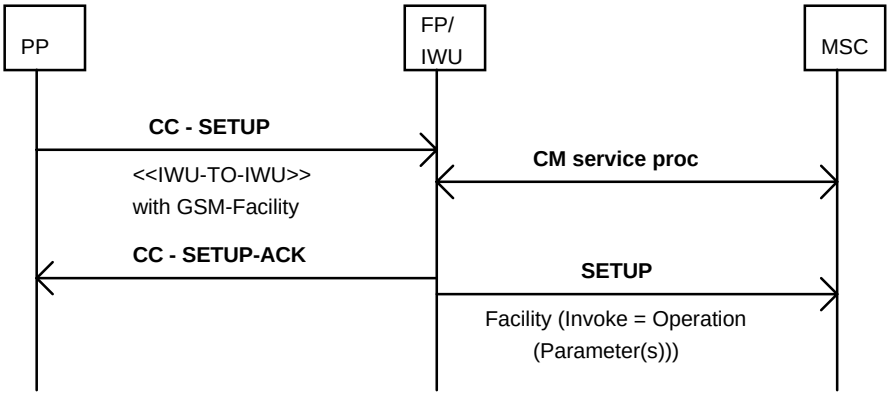
5.3.1 Supplementary service procedures at call establishment or call clearing

Call related supplementary service procedures initiated at call establishment or call clearing shall be realized according to ETS 300 558 [39] (GSM 04.10).

The call related procedures shall be handled using the <<IWU-TO-IWU>> IE in different DECT messages (e.g. CC-SETUP, FACILITY, CC-ALERTING, etc.). The protocol discriminator of the <<IWU-TO-IWU>> IE shall be coded '010001', 'GSM Recommendation 04.08, element(s)' as described in subclause 7.7.23 of ETS 300 175-5 [5], to encapsulate the GSM facility IE.



a) CRSS - Message flow network originated



b) CRSS - Message flow PP originated

Figure 3: CRSS - Message flows PP originated

5.3.2 Supplementary service procedures during the call

Supplementary services procedures during the call shall be implemented according to ETS 300 557 [38] (GSM 04.08) and ETS 300 558 [39] (GSM 04.10).

A call related supplementary service GSM FACILITY message including a GSM Facility IE received from the MSC shall be mapped into a DECT {FACILITY} message with the <<IWU-TO-IWU>> IE by the FP/IWU. The <<IWU-TO-IWU>> IE contains the GSM Facility IE as described in subclause 5.3.1.

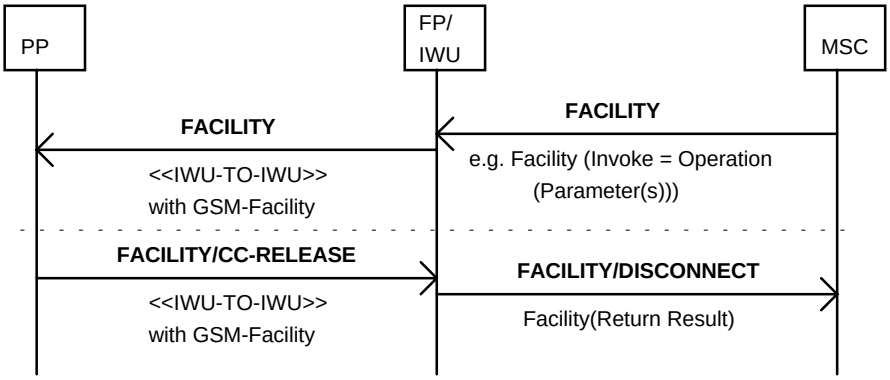


Figure 4: Flow of a network originated supplementary service message during the call

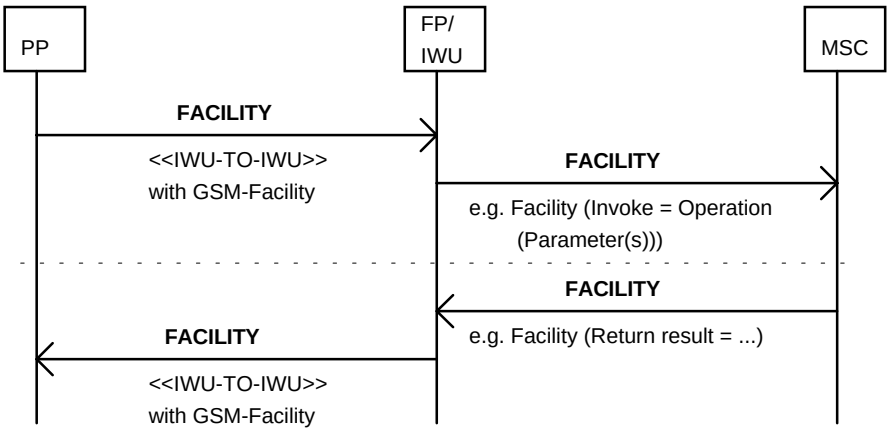


Figure 5: Flow of a PP originated supplementary service message during the call

5.4 CISS procedures

5.4.1 Supplementary service support establishment at the originating side

At the beginning of each call independent supplementary service procedure the supplementary service support shall be established according to ETS 300 558 [39] (GSM 04.10).

For the establishment of a supplementary service call on the DECT side the call shall be indicated as a 'supplementary service call setup' in the <<BASIC-SERVICE>> IE. (SS-Call Setup, ETS 300 175-5 [5], subclause 7.6.4)

Figure 6 shows the general handling for call independent supplementary services procedures like registration, erasure, activation, deactivation and interrogation of supplementary services. As an additional procedure the password management is shown between the dashed lines. The password management shall be handled according to ETS 300 558 [39] (GSM 04.10), clause 4.

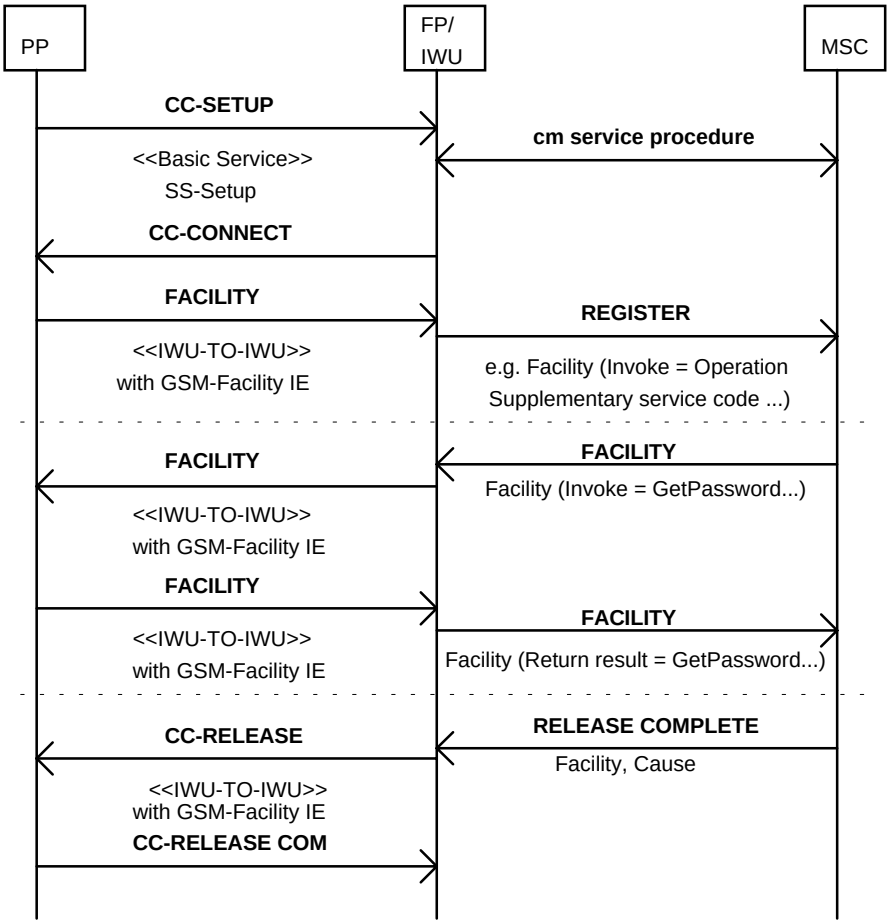


Figure 6: Establishment of a CM connection for supplementary services support (using the coding for SS-transaction establishment)

5.4.2 Supplementary service support establishment at the terminating side

For the support of call independent supplementary services at the terminating side the GSM REGISTER message, received from the MSC, shall be mapped into the DECT message {CC-SETUP} at the DECT side and the call shall be indicated as a 'supplementary service call setup' with the <<BASIC-SERVICE>> IE in the {CC-CONNECT} message.

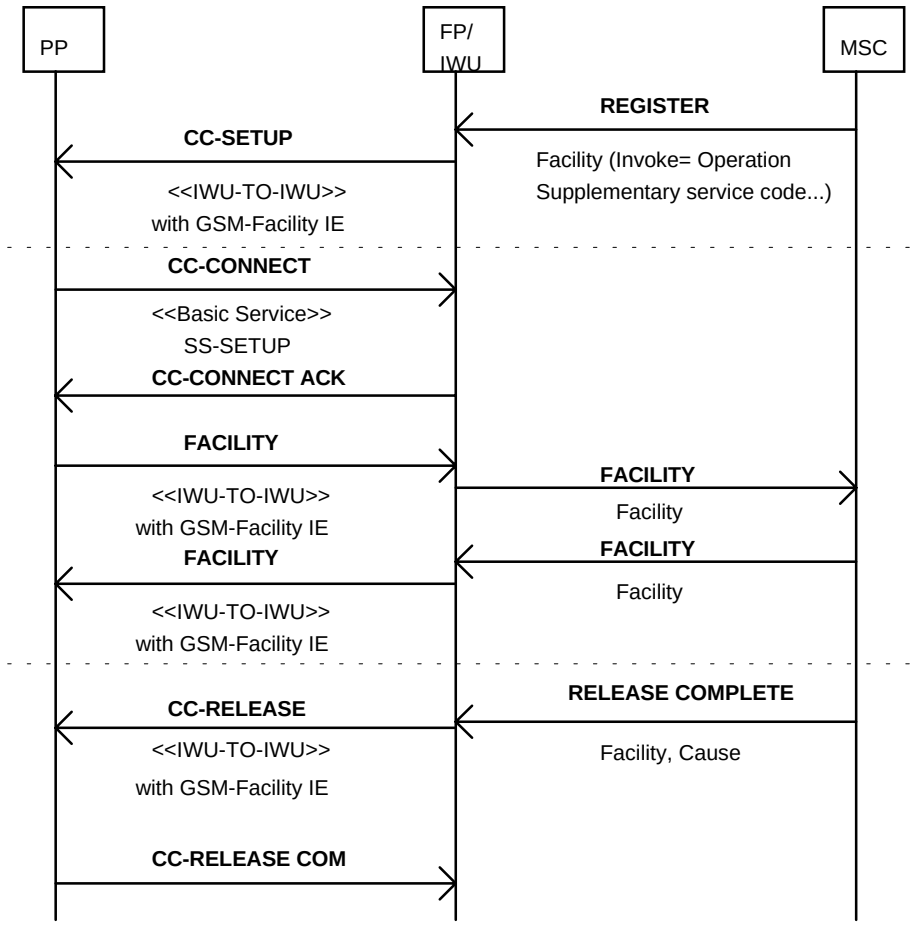


Figure 7: Establishment of a CISS supplementary services support (terminating side, using the coding for SS-transaction)

NOTE: The U-Plane connection is established, when sending {CC-CONNECT} and {CC-CONNECT-ACK}. Because this is a silent call, the receive path should be muted when U-Plane is connected due to ETS 300 175-5 [5], subclause 9.3.2.8.

5.5 Multiple supplementary services invocations

The handling of multiple and parallel supplementary service invocations shall be according to ETS 300 558 [39] (GSM 04.10), subclause 2.2.6.

5.6 Handling of transaction identifiers for supplementary service operation

The Transaction Identifier in the DECT CC should correspond to the Transaction Identifier in the GSM CC according to ETS 300 370 [11], which mandates that both the Transaction Value (TV) and Flag (F) should be mapped transparently.

For call independent supplementary services however the extended transaction value shall be used and the following applies:

Since DECT CC is used for both call related procedures and call independent supplementary service procedures, the extended transaction identifier, as described in ETS 300 370 [11], subclause 6.3.2.7.8, is used for call independent supplementary service procedures with the Function Group Identifier set to 'SS Transaction'. Additionally transaction identifier descriptions can be found in subclause 6.3.3 of the present document.

If the supplementary service procedure is related only to a single call, the {FACILITY} message will use the transaction identifier and protocol discriminator of this call.

If the supplementary service procedure affects more then one call, the {FACILITY} message may use the transaction identifier and protocol discriminator of one of these calls.

If a call related {FACILITY} message is sent using the transaction identifier of a call in progress, and this call is cleared due to call related causes, then the transaction identifier may not be cleared simultaneously in all cases. See also ETS 300 558 [39] (GSM 04.10), subclause 2.2.4.2.

5.7 Supplementary services operation with unsuccessful outcome

The contents of the cause IE shall be passed transparently into the <<IWU-TO-IWU>> IE as described in subclause 6.2.1.6 and be mapped into the appropriate DECT Release Reasons as described in ETS 300 370 [11], subclause 6.1.7.1.9.

The GSM messages DISCONNECT and RELEASE shall be mapped into the DECT {CC-RELEASE} message. The GSM message RELEASE COMPLETE shall be mapped into the DECT {CC-RELEASE} message or into the {CC-RELEASE-COM} message where appropriate.

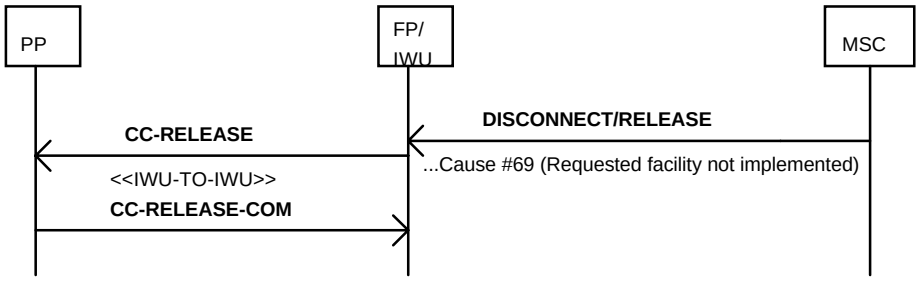


Figure 8: Message flow: Example for a network initiated release due to an unsuccessful operation (e.g. advice of charge (charging) service)

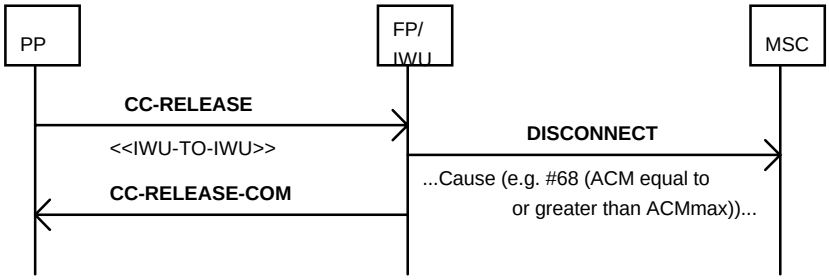


Figure 9: Message flow: Example for a mobile initiated release due to an unsuccessful operation (e.g. advice of charge (charging) service)

5.8 Handling of GSM Phase 2 supplementary services

5.8.1 Supported GSM Phase 2 supplementary services

The supplementary services shall be supported as described in ETS 300 466 [13]. A list of supported GSM Phase 2 supplementary services can be found in annex A.

5.8.2 Number identification supplementary service

The relevant GSM recommendations for the number identification supplementary service are the GSM 0X.81 series [20], [29] and [41].

5.8.2.1 Calling Line Identification Presentation / Connected Line identification Presentation (CLIP/COLP)

A called subscriber subscribing to the CLIP supplementary service receives the call with corresponding information. The calling party Binary Coded Decimal (BCD) number information consists of information units as indicated in ETS 300 557 [38] (GSM 04.08).

The calling party information is transferred to the PP as part of the {CC-SETUP} message. The GSM IEs "calling party BCD number" and "calling party subaddress" shall be mapped into the DECT <<IWU-TO-IWU>> IE.

NOTE: If the PP does not support CLIP, the received CLIP information will be ignored.

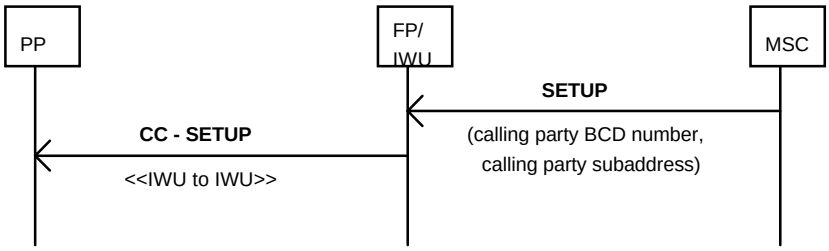


Figure 10: CLIP - presentation of calling number (PP terminated)

In the call set-up phase the calling subscriber receives the information of the called subscriber (i.e. COLP) as part of the CC-CONNECT message in the <<IWU-TO-IWU>> IE as shown in figure 11. The connected number is made up of a number of information units as indicated in ETS 300 557 [38] (GSM 04.08).

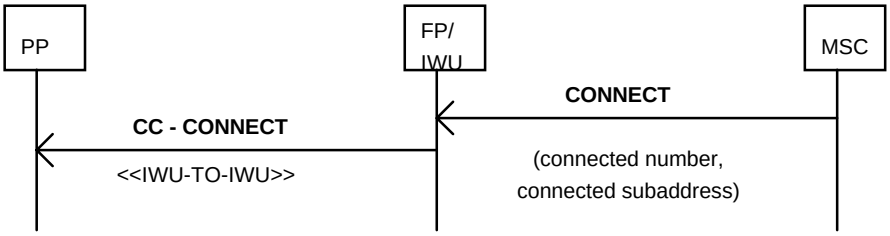


Figure 11: COLP - presentation of called number (PP originated)

The connected subaddress is passed to the PP if it is received form the terminating network.

Activation, deactivation, registration and erasure of the supplementary services CLIP and COLP are not applicable.

The interrogation of CLIP and COLP shall be handled as described in subclause 5.4.1.

5.8.2.2 Invocation/suppression of Calling Line Identification Restriction (CLIR)

If CLIR presentation mode is temporary (set to restricted or allowed), it is possible for the subscriber to present/restrict his Calling Line Identification (CLI) on a per call basis. The CLIR invocation and the CLIR suppression shall be handled by using the GSM CLIR invocation and CLIR suppression IE as shown in figure 12. The mapping can be found in subclauses 6.2.2.6 and 6.2.2.7.

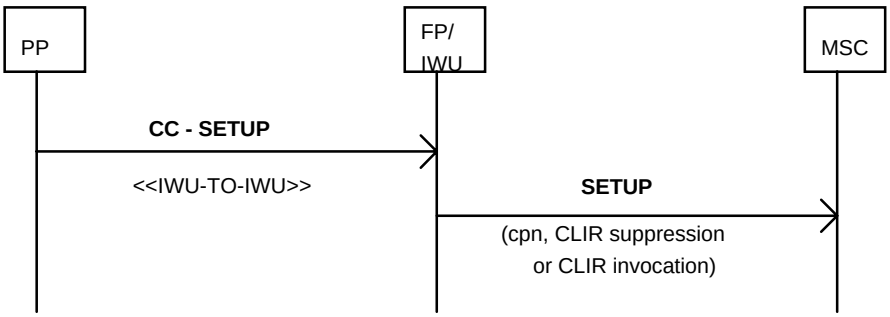


Figure 12: Handling of CLIR invocation/suppression

If the calling mobile user subscribes to Connected Line identification Presentation (COLP) and the connected party has Connected Line identification Restriction (COLR) applied, the calling mobile party shall receive the presentation indicator showing "presentation restricted". In this case, the connected number will not be presented to the calling subscriber.

NOTE: This is an operator controlled input.

Activation, deactivation, registration and erasure of the supplementary services CLIR and COLR are not applicable.

The interrogation of CLIR and COLR shall be handled as described in subclause 5.4.1.

5.8.3 Call offering supplementary service

The relevant GSM recommendations for the call offering supplementary service are the GSM 0X.82 series [21], [30] and [42].

The general procedure for the registration, erasure, activation, deactivation and interrogation of the call offering supplementary services (Call Forwarding Unconditional (CFU), Call Forwarding on mobile subscriber Busy (CFB), Call Forwarding on No Reply (CFNRy) and Call Forwarding on mobile subscriber Not Reachable (CFNRc)) is described in subclause 5.4.1 of the present document.

5.8.3.1 Call Forwarding Unconditional (CFU)

The general approach for the different types of notifications is described in subclause 5.3.1 for CRSS.

When CFU is active, the ability of the served mobile subscriber to originate calls is not affected. However, a NotifySS operation containing the SS-Status indicating that CFU is currently active and operative shall be sent to the served mobile subscriber each time an outgoing call is made. The notification will be mapped into the {CC-ALERTING} message with the <<IWU-TO-IWU>> IE as shown in the next figure:

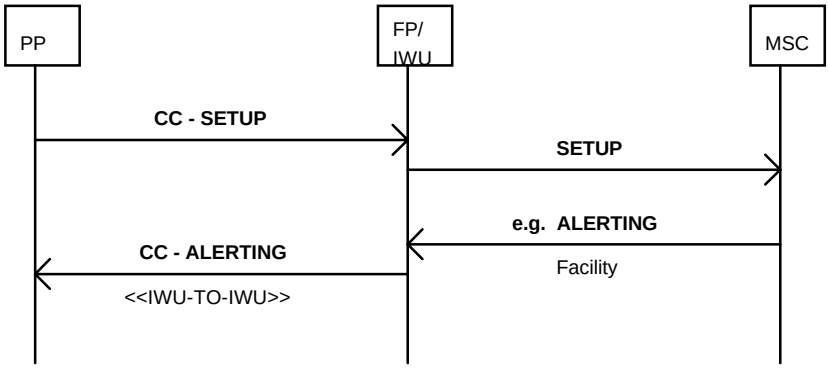


Figure 13: Message flow: notification to the served mobile subscriber that call forwarding is active

The forwarded-to mobile subscriber shall receive the NotifySS operation included in the GSM Facility IE mapped transparently into the DECT <<IWU-TO-IWU>> IE containing the SS-Notification indicating that the incoming call is a forwarded call as shown in figure 14. When available, the SS-Code of the invoked forwarding service is also included.

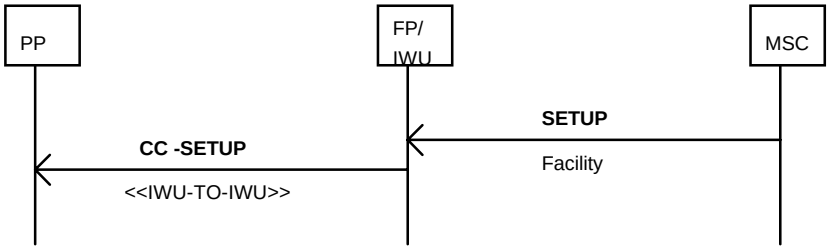


Figure 14: Message flow: notification to the forwarded-to mobile subscriber that the incoming call is a forwarded call

As a subscription option, the served mobile subscriber can request that the calling mobile subscriber receives a NotifySS operation containing the SS-Notification indicating that the call has been forwarded. When available, the SS-Code of the invoked forwarding service is also included.

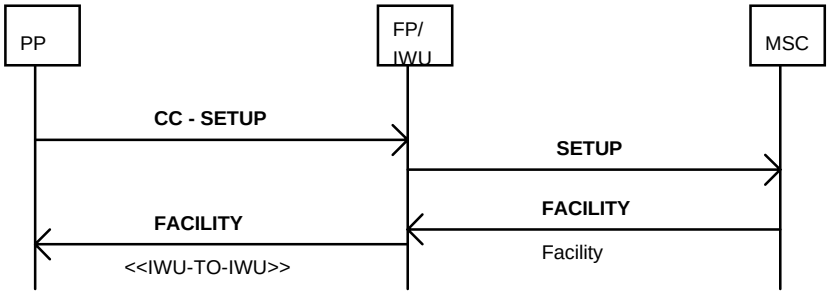


Figure 15: Message flow: notification to the calling mobile subscriber that the call is forwarded

5.8.3.2 Call Forwarding on mobile subscriber Busy (CFB) and User Determined User Busy (UDUB)

The CFB supplementary service shall be handled in a similar as the CFU supplementary service. All described notifications apply. An additional notification to the served mobile subscriber occurs when an incoming call is forwarded on mobile subscriber busy due to Network Determined User Busy (NDUB).

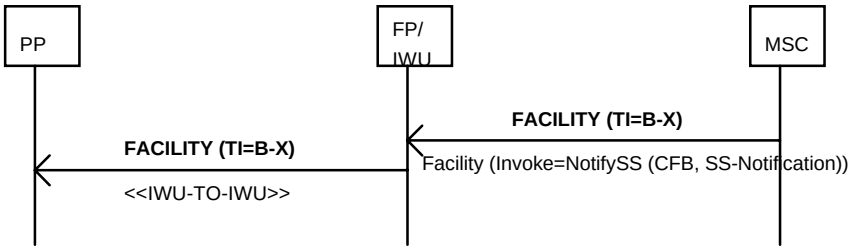


Figure 16: Message flow: notification to the served mobile subscriber that a call is forwarded on mobile subscriber busy

The DECT release cause #14 (hex)(user busy) shall be mapped into the GSM cause #17 (user busy).

For the invocation of the service UDUB the user has to enter the MMI string "0" followed by SEND.

The PP shall treat UDUB towards the FP/IWU according to ETS 300 500 [15] (GSM 02.01) and ETS 300 511 [19] (GSM 02.30).

5.8.3.3 Call Forwarding on No Reply (CFNRy)

The procedures for the call forwarding supplementary services described in the subclauses 5.4.1 and 5.8.3.1 apply.

5.8.3.4 Call Forwarding on mobile subscriber Not Reachable (CFNRc)

The procedures for call forwarding supplementary services described in the subclauses 5.4.1 and 5.8.3.1 apply.

5.8.4 Call completion supplementary service

The relevant GSM recommendations for the call completion supplementary service are the GSM 0X.83 series [22], [31] and [43].

5.8.4.1 Call Waiting (CW)

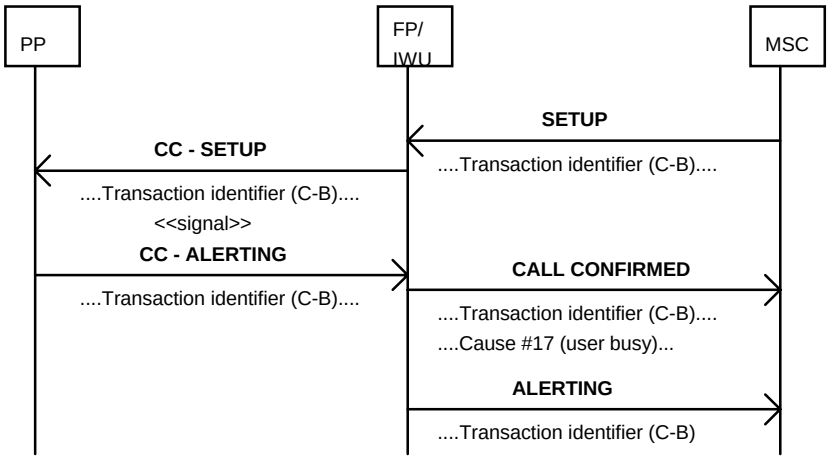


Figure 17: Message flow: call waiting

The GSM SETUP message includes the a 'Signal Information' (SI) element with value #7 (call waiting tone on). This IE shall be mapped into the <<signal>> IE with the coding 'call waiting tone on' by the FP/IWU. In the CALL CONFIRMED message sent to the network the Cause IE shall be included with cause #17 "user busy".

The notification to a calling mobile station that a call is in the waiting state is in GSM transported in the Alerting or Facility message including the Facility IE with the 'CallsWaiting-Indicator'. This information shall be transported as described in subclause 5.3.2.

Activation, deactivation and interrogation of the CW supplementary service shall be handled as described in subclause 5.4.1.

Registration and erasure of the CW supplementary service are not applicable.

5.8.4.2 Call Hold (CH), call retrieve

The separate messages category approach described in subclause 5.2 applies for CH and call retrieve supplementary service.

If the served subscriber requests to set a call on hold, a {HOLD} message shall be sent to the FP/IWU as described in ETS 300 175-5 [5], subclause 10.4.1. This message shall be mapped into the GSM HOLD message as described in figure 18 and subclause 6.1.2.7.

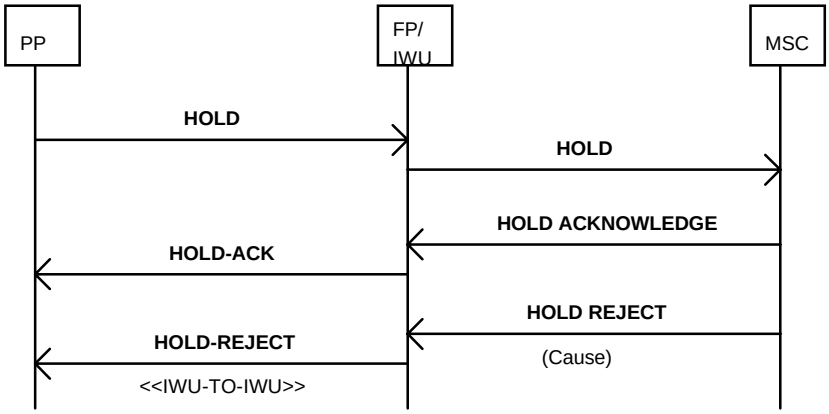


Figure 18: Message flow: invocation of call hold

The notification to the held mobile party that an existing call is being put on hold (CallOnHold-Indicator) shall be transported in an <<IWU-TO-IWU>> IE in a {FACILITY} message.

For the retrieve procedure the DECT messages {RETRIEVE}, {RETRIEVE-ACK} and {RETRIEVE-REJECT} shall be used as described in figure 19:

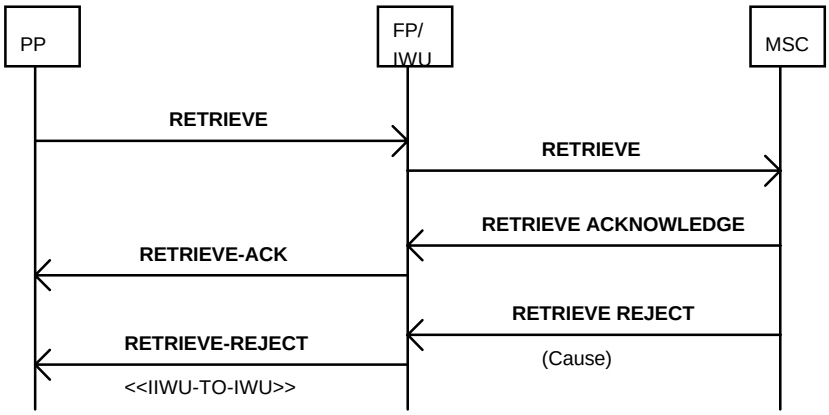


Figure 19: Message flow: call retrieve

The notification to the held mobile party that a held call has been retrieved (CallOnHold-Indicator) shall be transported in an <<IWU-TO-IWU>> IE in a {FACILITY} message.

Registration, erasure and interrogation of the CH supplementary service are not applicable. Activation and deactivation is provided by the provision and the withdrawal by the operator.

5.8.5 MultiParty (MPTY) supplementary service

The relevant GSM recommendations for the MPTY supplementary service are the GSM 0X.84 series [23], [32] and [44].

5.8.5.1 MPTY

The served mobile subscriber A may initiate an active multi party call from an active call C and a held call B. The invocation of the service shall be handled according to the general approach described in subclause 5.3.2.

The mobile station invokes the service by sending a {FACILITY} message to the network containing the BuildMPTY request included in the DECT <<IWU-TO-IWU>> IE. This BuildMPTY request indicates to the network that the mobile subscriber wishes all his calls to be connected together in a multi party call. The network will normally accept the request and connect the mobile subscriber with the other existing connections (active call C and held call B). If the request is not accepted, the network will indicate the error to the served mobile, see figure 20. The network confirms with the same transaction identifier. Error values are specified in ETS 300 564 [40] (GSM 04.80).

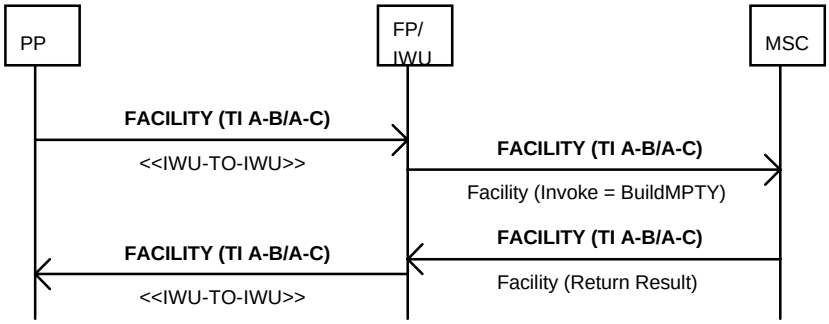
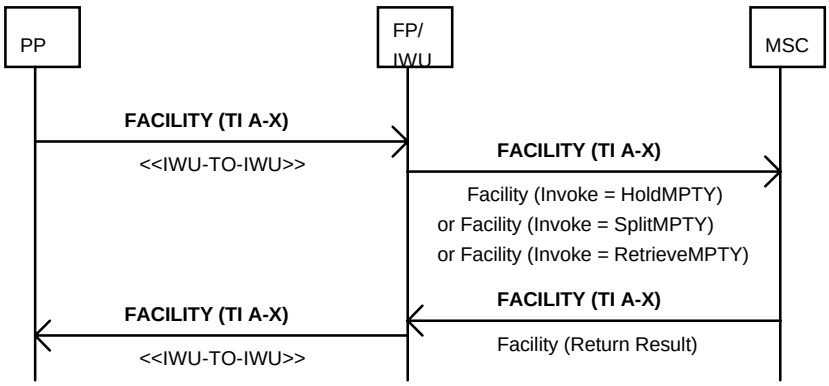


Figure 20: Invocation of a multi party call

The CallOnHold notification described in ETS 300 568 [44] (GSM 04.84), shall be mapped accordingly.

The retrieval, split of a MPTY and putting the MPTY on hold is shown in figure 21.



X = Any remote party in a multi party call.

Figure 21: Hold, split or retrieve of a multi party call

The hold, split of retrieve of a multi party call is achieved by sending a {FACILITY} message including the DECT <<IWU-TO-IWU>> IE to the network with any transaction identifier corresponding to a call within the multi party call. This requests the network to place the mobile subscriber's connection to the multi party call on hold. The network confirms with another message containing the same transaction identifier.

Activation, deactivation, registration, erasure and interrogation of the MPTY supplementary service are not applicable.

5.8.6 Community of interest supplementary service

The relevant GSM recommendations for the community of interest supplementary service are the GSM 0X.85 series [24], [33] and [45].

5.8.6.1 Closed User Group (CUG)

The transfer of CUG information shall be realized during the call set-up as described in subclause 5.3.1.

For the indication of CUG invocation to the calling subscriber the GSM FACILITY message or the CALL PROCEEDING message with the GSM Facility IE shall be mapped into the corresponding DECT messages {FACILITY} and {CC-CALL-PROC} including the <<IWU-TO-IWU>> IE as described in subclause 5.3.2.

Activation, deactivation, registration, erasure and interrogation of the CUG supplementary service are not applicable.

5.8.7 Charging supplementary service

The relevant GSM recommendations for the charging supplementary service are the GSM 0X.86 series [25], [34] and [46].

Registration, erasure and invocation of the advice of charge supplementary service are not applicable.

Activation and deactivation is provided by the provision and the withdrawal by the operator.

5.8.7.1 Advice of charge (information)

The network sends the Charge Advice Information (CAI) to the FP/IWU and it is sent to the mobile station with the <<IWU-TO-IWU>> IE in the {CC-CONNECT} or the {FACILITY} message. With this information the mobile station is able to calculate the units associated with the requested service in real time. In the case where the served mobile is to be charged for multi party calls, separate processes within the mobile station are used to calculate units appropriate to each call. For unit calculation, each call is treated in the same way as a normal "two-party" call. Any change in the charging rate during a call may be indicated to the mobile station.

For a PP originated call, charging information is transferred to the Mobile Station (MS) as shown in the next figure. The charging information is acknowledged in a {FACILITY} message only if the PP supports the Advice of Charge Information supplementary service (AoCI) functionality specified in ETS 300 510 [18] (GSM 02.24) and ETS 300 519 [25] (GSM 02.86).

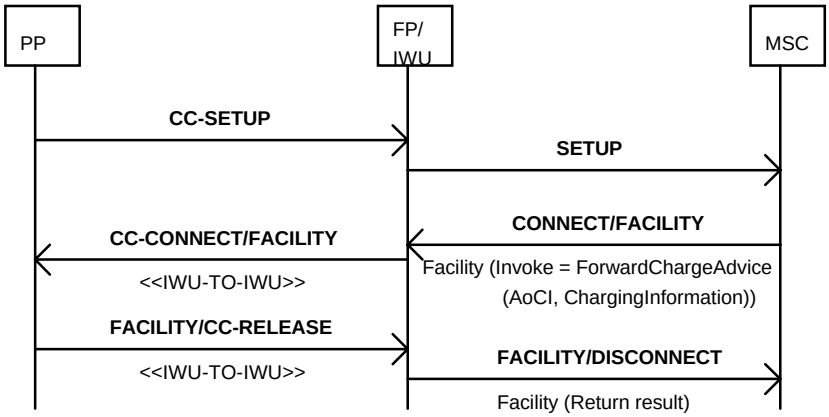


Figure 22: Message flow: notification to the served mobile subscriber of the charging information in case of an originated call setup

For a PP terminated call, where required, charging information is transferred to the PP as shown in figure 2.3. The charging information is acknowledged only if the PP supports the AoCI functionality specified in ETS 300 510 [18] (GSM 02.24) and ETS 300 519 [25] (GSM 02.86).

The GSM Facility IE with the e-parameters can be sent in either the {CC-CONNECT} or the {FACILITY} message using the <<IWU-TO-IWU>> IE.

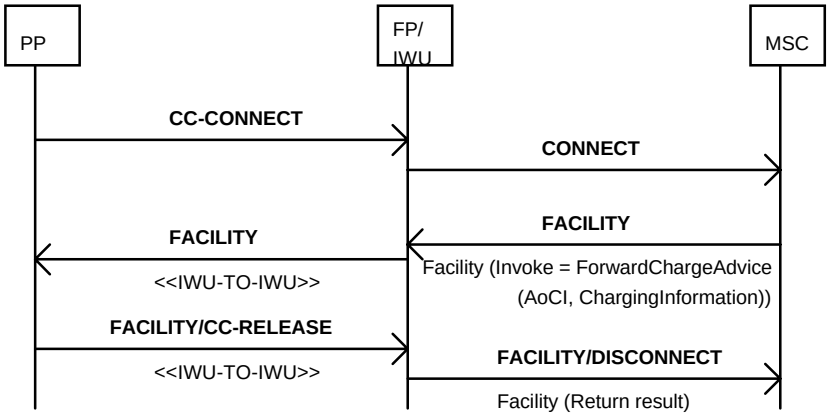


Figure 23: Message flow: notification to the served mobile subscriber of the charging information in case of a terminated call setup

For the change of charging information the subclause 5.3.2 applies.

5.8.7.2 Advice of charge (charging)

For advice of charge charging all previously mentioned message flows are applicable. Additionally there exist the cases where the normal operation with unsuccessful outcome applies. It is described in subclause 5.7.

5.8.8 Call restriction supplementary service

The relevant GSM recommendations for the call restriction supplementary service are the GSM 0X.88 series [26], [35] and [47].

Registration, erasure, activation, deactivation and interrogation of call barring supplementary service shall be handled as described in subclause 5.4.1.

The password procedure according to ETS 300 558 [39] (GSM 04.10) and subclause 5.4.1 applies.

5.8.8.1 Barring of All Outgoing International Calls supplementary service (BAOC)

The served subscriber gets a notification that barring of outgoing calls is active.

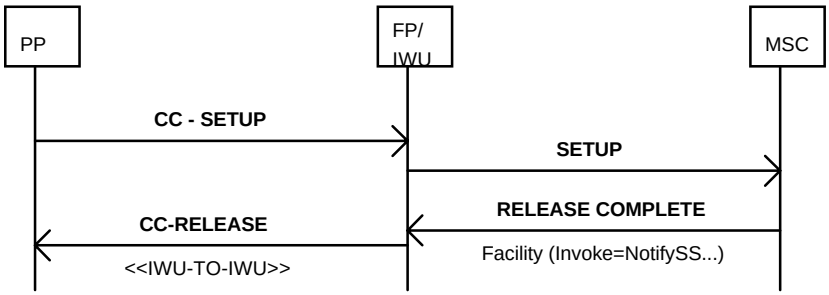


Figure 24: Notification to the served mobile subscriber that barring of outgoing calls is active

The GSM Facility IE (Invoke = NotifySS...) shall be carried in the DECT <<IWU-TO-IWU>> IE.

5.8.8.2 Barring of Outgoing International Calls supplementary service (BOIC)

The same procedures as for BAOC applies.

5.8.8.3 Barring of Outgoing International Calls except those directed to the home PLMN Country supplementary service (BOIC-exHC)

The same procedures as for BAOC applies.

5.8.8.4 BAIC

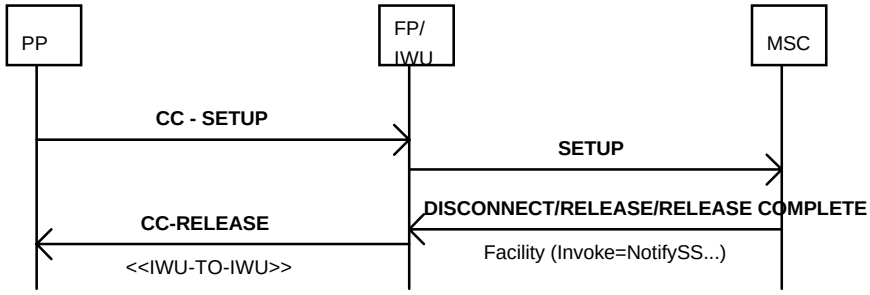


Figure 25: Notification to the calling mobile subscriber that barring is active at the called subscriber side

The calling mobile subscriber gets a notification that at the called subscriber side barring of incoming calls is active.

The GSM Facility IE (Invoke = NotifySS...) shall be carried in the DECT <<IWU-TO-IWU>> IE.

5.8.8.5 Barring of All Incoming Calls when Roaming outside the home PLMN country supplementary service (BIC-Roam)

The same procedures as for BAIC applies.

5.8.9 Unstructured Supplementary Service Data (USSD)

The DECT FP/IWU shall support PP initiated USSD and network initiated USSD according the relevant GSM recommendations series GSM 0X.90 series [27], [36] and [48].

A mobile initiated unstructured supplementary service data request shall be handled as described in subclause 5.4.1. Network initiated unstructured supplementary service data requests shall be handled according to the procedures described in subclause 5.4.2.

5.8.10 Forward check supplementary service indication

Forward check supplementary service indication shall be handled as described in ETS 300 558 [39] (GSM 04.10), clause 6 and shall be mapped according to figure 26.

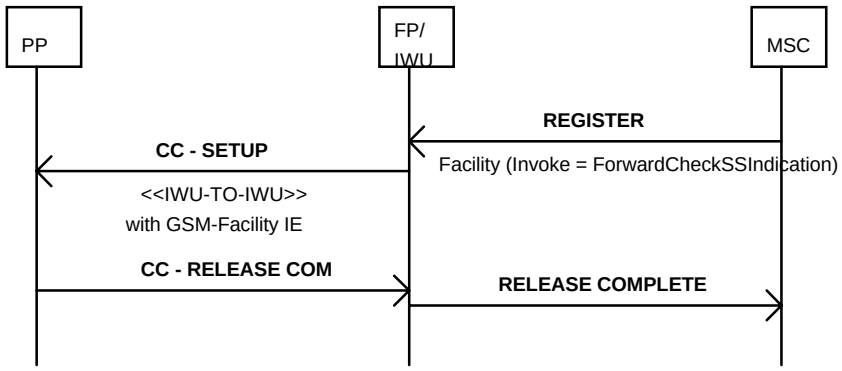


Figure 26: ForwardCheckSSIndication sent on a new transaction

5.9 Error handling

This subclause describes the general approach for the error handling of GSM supplementary services within the DECT/GSM IWP.

The DECT procedure specified in ETS 300 175-5 [5], recommends the use of the ISDN supplementary service procedures of ETS 300 196-1 [62]. The ISDN supplementary service procedures of ETS 300 196-1 [62] refer to the error handling in ETS 300 102-1 [61]. Also error handling procedures are specified in ETS 300 175-5 [5], clause 17. In general the DECT FP/IWU shall perform the appropriate error handling for the supplementary services i.e. error handling procedures which apply to the GSM stations shall be supported by the DECT FP/IWU.

The FP IWU shall check the validity of received messages from the MSC relating to protocol discriminator, message length, transaction identifier, message type, IEs and in error case act as defined in clause 8 of ETS 300 557 [38] (GSM 04.08) "Handling of unknown, unforeseen, and erroneous protocol data" for the PP, e.g. ignore the message or the faulty IE, return a MM-STATUS or STATUS message. According to the GSM supplementary services specifications, the user shall be informed about an erroneous procedure.

5.9.1 Error handling in CRSS procedures

The handling of protocol and other errors in CRSS procedures shall be according to ETS 300 558 [39] (GSM 04.10) subclause 2.2.4. The error handling for the component part of the supplementary services shall be according to ETS 300 558 [39] (GSM 04.10) subclause 2.2.8.

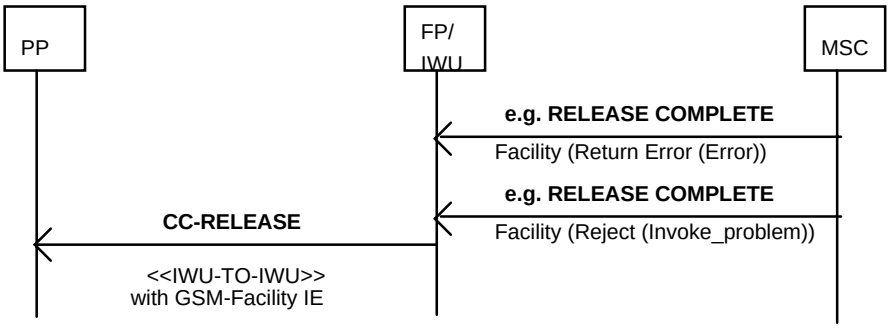


Figure 27: Network initiated error message

5.9.2 Error handling in CISS procedures

The handling of protocol and other errors in CISS procedures shall be according to ETS 300 558 [39] (GSM 04.10), subclause 2.2.5. The error handling for the component part of the supplementary services shall be according to ETS 300 558 [39] (GSM 04.10) subclause 2.2.8.

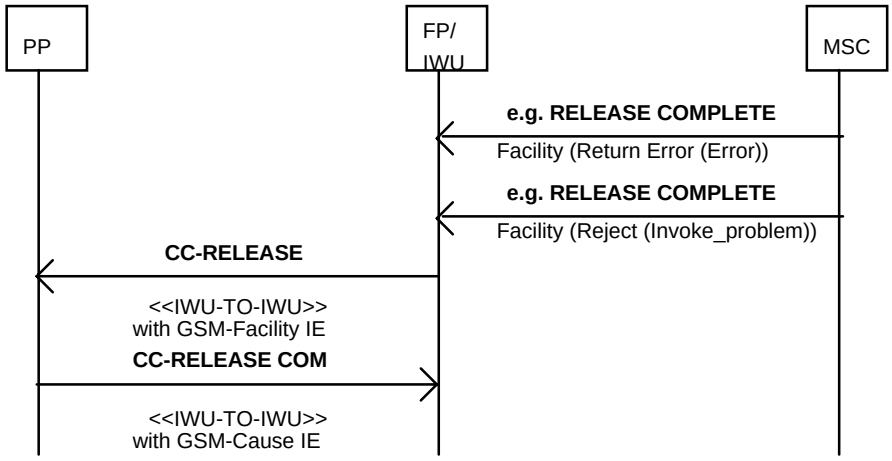


Figure 28: Message flow: Network initiated release

5.10 Handling of unknown, unforeseen and erroneous protocol data for CISS procedures

The handling of unknown, unforeseen and erroneous protocol data by the receiving entity shall be according to ETS 300 558 [39] (GSM 04.10), subclause 3.7.

5.11 Recovery procedures

5.11.1 CRSS recovery procedures

There are no additional recovery procedures for CRSS signalling on the radio path. Normal call handling as specified in ETS 300 370 [11] applies.

5.11.2 CISS recovery procedures

In case a transaction is not terminated according to the procedure as described in the present document, the FP shall be responsible that the transaction is terminated, e.g. by a supervision timer. The recovery procedure shall not terminate an ongoing call, i.e. the call shall be maintained.

6 Interworking mappings for supplementary services

6.1 Message mappings

6.1.1 GSM to DECT

Table 1: List of mapped messages

Item no.	GSM message	Status in GSM	DECT message	Status in GAP	Reference	Map status
1	SETUP	M	{CC-SETUP}	M	6.1.1.1	M
2	REGISTER	M	{CC-SETUP}	M	6.1.1.2	M
3	FACILITY	M	{FACILITY}	I	6.1.1.3	M
4	RELEASE	M	{CC-RELEASE}	M	6.1.1.4	M
5	RELEASE-COMPLETE	M	{CC-RELEASE}	M	6.1.1.5	M
6	RELEASE-COMPLETE	M	{CC-RELEASE-COM}	M	6.1.1.6	M
7	ALERTING	M	{CC-ALERTING}	O	6.1.1.7	M
8	DISCONNECT	M	{CC-RELEASE}	M	6.1.1.8	M
9	CONNECT	M	{CC-CONNECT}	M	6.1.1.9	M
10	HOLD-ACK	M	{HOLD-ACK}	I	6.1.1.10	M
11	HOLD-REJECT	M	{HOLD-REJ}	I	6.1.1.11	M
12	RETRIEVE-ACK	M	{RETRIEVE-ACK}	I	6.1.1.12	M
13	RETRIEVE-REJECT	M	{RETRIEVE-REJ}	I	6.1.1.13	M
14	CM SERVICE ACCEPT	M	{CC-CONNECT}	M	6.1.1.14	M

6.1.1.1 SETUP - {CC-SETUP}

Table 2

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	SETUP	**{CC-SETUP}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Repeat indicator	-		X	
5	Bearer capability 1	basic service	ETS 300 370, 6.1.7.1.7	M	
5a	Bearer capability 2	-		X	
6	Facility	facility		I	
7	Facility	iwu-to-iwu	6.2.1.1	M	
8	Progress indicator	progress indicator	ETS 300 370, 6.1.7.1.8	M	
9	Signal	signal	ETS 300 370, 6.1.7.1.11	M	
10	Calling party BCD number	iwu-to-iwu	6.2.1.2	M	
11	Calling party subaddress	iwu-to-iwu	6.2.1.3	M	
12	Called party BCD number	iwu-to-iwu	6.2.1.4	M	
13	Called party subaddress	iwu-to-iwu	6.2.1.5	M	
14	Repeat indicator	-		X	
15	Low layer compatibility	iwu-to-iwu		I	
16	Repeat indicator	-		X	
17	High layer compatibility	iwu-to-iwu		I	
18	User-to-user	iwu-to-iwu		I	

6.1.1.2 REGISTER - {CC-SETUP}

Table 3

Item no.	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	REGISTER	{CC-SETUP}			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Facility	iwu-to-iwu	6.2.1.1	M	

6.1.1.3 FACILITY - {FACILITY}

Table 4

Item no.	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	FACILITY	{FACILITY}			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Facility	iwu-to-iwu	6.2.1.1	M	

6.1.1.4 RELEASE - {CC-RELEASE}

Table 5

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	RELEASE	{CC-RELEASE}			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300, 370, 6.1.8.1.3	M	
4	Cause	release reason	ETS 300 370, 6.1.7.1.9	O	
5	Cause	iwu-to-iwu	6.2.1.6	M	
6	Second cause	-		X	
7	Facility	facility		I	
8	Facility	iwu-to-iwu	6.2.1.1	M	
9	User-to-user	iwu-to-iwu		I	

6.1.1.5 RELEASE COMPLETE - {CC-RELEASE}

Table 6

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	RELEASE COMPLETE	**{CC-RELEASE}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Cause	release reason	ETS 300 370, 6.1.7.1.9	O	
5	Cause	iwu-to-iwu	6.2.1.6	M	
6	Facility	facility		I	
7	Facility	iwu-to-iwu	6.2.1.1	M	
8	User-to-user	iwu-to-iwu		I	

6.1.1.6 RELEASE COMPLETE - {CC-RELEASE-COM}

Table 7

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	RELEASE COMPLETE	**{CC-RELEASE-COM}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Cause	release reason	ETS 300 370, 6.1.7.1.9	O	
5	Cause	iwu-to-iwu	6.2.1.6	M	
6	Facility	facility		I	
7	Facility	iwu-to-iwu	6.2.1.1	M	
8	User-to-user	iwu-to-iwu		I	

6.1.1.7 ALERTING - {CC-ALERTING}

Table 8

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	ALERTING	**{CC-ALERTING}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Facility	facility		I	
5	Facility	iwu-to-iwu	6.2.1.1	M	
6	Progress indicator	progress indicator	ETS 300 370, 6.1.7.1.8	M	
7	User-to-user	iwu-to-iwu	-	I	

6.1.1.8 DISCONNECT - {CC-RELEASE}

Table 9

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	DISCONNECT	**{CC-RELEASE}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Cause	iwu-to-iwu	6.2.1.6	M	
5	Cause	release reason	ETS 300 370, 6.1.7.1.9	M	
6	Facility	facility		I	
7	Facility	iwu-to-iwu	6.2.1.1	M	
8	Progress indicator	-		X	
9	-	display		X	
10	-	feature indicate		X	
11	User-to-user	iwu-to-iwu		I	
12	-	iwu-to-iwu		X	

6.1.1.9 CONNECT - {CC-CONNECT}

Table 10

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	CONNECT	**{CC-CONNECT}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction identifier	transaction identifier	6.3.3	M	
3	Message type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Facility	facility		I	
5	Facility	iwu-to-iwu	6.2.1.1	M	
6	Progress indicator	progress indicator	ETS 300 370, 6.1.7.1.8	M	
7	Connected number	iwu-to-iwu	6.2.1.7	M	
8	Connected subaddress	iwu-to-iwu	6.2.1.8	M	
9	User-to-user	iwu-to-iwu		I	

6.1.1.10 HOLD-ACK - {HOLD-ACK}

Table 11

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	HOLD-ACK	**{HOLD-ACK}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction Identifier	transaction identifier	6.3.3	M	
3	Message Type	message type	ETS 300 370, 6.1.8.1.3	M	

6.1.1.11 HOLD-REJECT - {HOLD-REJECT}

Table 12

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	HOLD-REJECT	**{HOLD-REJECT}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction Identifier	transaction identifier	6.3.3	M	
3	Message Type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Cause	reject reason		I	
5	Cause	iwu-to-iwu	6.2.1.6	M	

6.1.1.12 RETRIEVE-ACK - {RETRIEVE-ACK}

Table 13

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	RETRIEVE-ACK	**{RETRIEVE-ACK}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction Identifier	transaction identifier	6.3.3	M	
3	Message Type	message type	ETS 300 370, 6.1.8.1.3	M	

6.1.1.13 RETRIEVE-REJECT - {RETRIEVE-REJECT}

Table 14

Item No	Message coding GSM	Message coding DECT	Reference	Map status	NOTE
	RETRIEVE-REJECT	**{RETRIEVE-REJECT}**			
1	Protocol discriminator	protocol discriminator	6.3.2	M	
2	Transaction Identifier	transaction identifier	6.3.3	M	
3	Message Type	message type	ETS 300 370, 6.1.8.1.3	M	
4	Cause	reject reason		I	
5	Cause	iwu-to-iwu	6.2.1.6	M	

6.1.1.14 CM SERVICE ACCEPT - {CC-CONNECT}

Table 15

Item No	Message coding GSM	Message coding DECT	Ref.	Map status	NOTE
	CM SERVICE ACCEPT	**{CC-CONNECT}**			
1	Protocol discriminator	protocol discriminator	ETS 300 370, 6.1.8.1.1	M	MM to CC
2	Skip indicator	transaction identifier	ETS 300 370, 6.1.8.1.25	M	
3	message type	message type	ETS 300 370, 6.1.8.1.3	M	

6.1.2 DECT to GSM

Table 16: List of mapped messages

Item no.	DECT message	Status in GAP	GSM message	Status in GSM	Reference	Map Status
1	{CC-SETUP}	M	CM-SERVICE-REQ	M	6.1.2.1	M
2	{CC-SETUP}	M	SETUP	M	6.1.2.2	M
3	{FACILITY}	I	FACILITY	M	6.1.2.3	M
4	{FACILITY}	I	REGISTER	M	6.1.2.4	M
5	{CC-RELEASE}	M	DISCONNECT	M	6.1.2.5	M
6	{CC-ALERTING}	M	CALL CONFIRMED	M	6.1.2.6	M
7	{HOLD}	I	HOLD	M	6.1.2.7	M
8	{RETRIEVE}	I	RETRIEVE	M	6.1.2.8	M
9	{CC-RELEASE}	M	RELEASE COMPLETE	M	6.1.2.9	M

6.1.2.1 {CC-SETUP} - CM SERVICE REQUEST

Table 17

Item No	Message coding DECT	Message coding GSM	Reference	Map. status	NOTE
	{CC-SETUP}	**CM SERVICE REQUEST**			
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Skip Indicator	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	portable identity	Mobile identity	ETS 300 370, 6.1.7.2.6	C1	
5	basic service	CM service type	6.2.2.1	M	note 1
6	basic service	Mobile station classmark 2	-	M	see ETS 300 370, 6.1.6.2.6
7	cipher info	Ciphering key sequence number	ETS 300 370, 6.1.7.2.4	M	
8	network assigned identity	Mobile identity	ETS 300 370, 6.1.7.2.2	C2	

NOTE 1: Mapping of call class field.

C1: IF <<NWK ASSIGNED IDENTITY>> IE is not valid (see ETS 300 370 [11], annex B) THEN M ELSE X.
C2: IF <<NWK ASSIGNED IDENTITY>> IE is valid (see ETS 300 370 [11], annex B) THEN M ELSE X.

6.1.2.2 {CC-SETUP} - SETUP

Table 18

Item No	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{CC-SETUP}	**SETUP**			
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Transaction identifier	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	portable identity	-		I	
5	fixed identity	-		I	
6	basic service	Bearer capabilities	ETS 300 370, 6.1.7.2.8	M	
7	iwu attributes	-		I	
8	repeat indicator	-		I	
9	call attributes	-		I	
10	repeat indicator	-		I	
11	connection attributes	-		I	
12	cipher info	-		I	Used in CM service procedure
13	connection identity	-		X	
14	facility			I	
15	progress indicator	-		X	Not allowed in this direction in DECT
16	display	-		X	
17	multi keypad	-		I	
18	signal	-		X	
19	feature activate	-		I	
20	feature indicate	-		X	
21	network parameter	-		I	Used external H/O procedure
22	terminal capability	-		I	
23	end to end compatibility	-		I	
24	rate parameter	-		X	
25	transit delay	-		X	
26	window size	-		X	
27	iwu-to-iwu	Calling party BCD number	6.2.2.2	M	
28	iwu-to-iwu	Called party BCD number	6.2.2.3	M	
29	iwu-to-iwu	Calling party subaddress	6.2.2.4	M	
30	iwu-to-iwu	Called party subaddress	6.2.2.5	M	
31	sending complete	-			
32	iwu to iwu	CLIR suppression	6.2.2.6	M	
33	iwu to iwu	CLIR invocation	6.2.2.7	M	
34	iwu to iwu	Facility	6.2.2.8	M	
35	iwu packet	-		X	
36	-	CC capabilities		X	

6.1.2.3 {FACILITY} - FACILITY

Table 19

Item no.	Message coding DECT	Message coding GSM	Reference	Map. status	NOTE
	{FACILITY}	**FACILITY**			
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Transaction identifier	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	iwu-to-iwu	Facility	6.2.2.8	M	

6.1.2.4 {FACILITY} - REGISTER

Table 20

Item no.	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{FACILITY}	REGISTER		M	
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Transaction identifier	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	iwu-to-iwu	Facility	6.2.2.8	M	
5	iwu-to-iwu	Supplementary service version indicator	6.2.2.9	M	

6.1.2.5 {CC-RELEASE} - DISCONNECT

Table 21

Item No	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{CC-RELEASE}	**DISCONNECT**			
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Transaction identifier	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	iwu-to-iwu	Cause	6.2.2.10	M	
5	release reason	Cause	ETS 300 370, 6.1.7.1.9	M	
6	facility	Facility		I	
7	iwu-to-iwu	Facility	6.2.2.8	M	
8	-	Progress indicator		X	
9	display	-		X	
10	feature indicate	-		X	
11	iwu-to-iwu	User-to-user		I	
12	iwu-to-iwu	-		X	

6.1.2.6 {CC-ALERTING} - CALL CONFIRMED

Table 22

Item No	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{CC-ALERTING}	**CALL CONFIRMED**			
1	protocol discriminator	Protocol discriminator	6.3.2	M	
2	transaction identifier	Transaction identifier	6.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	repeat indicator	Repeat Indicator	-	O	
5		Bearer capability	-	I	
6		Bearer capability	-	I	
7	iwu-to-iwu	Cause	6.2.2.10	M	

6.1.2.7 {HOLD} - HOLD

Table 23

Item No	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{HOLD}	**HOLD**			
1	protocol Discriminator	Protocol discriminator	6.3.2	M	
2	transaction Identifier	Transaction identifier	6.3.3	M	
3	message Type	Message type	ETS 300 370, 6.1.8.2.3	M	

6.1.2.8 {RETRIEVE} - RETRIEVE

Table 24

Item No	Message coding DECT	Message coding GSM	Reference	Map status	NOTE
	{RETRIEVE}	**RETRIEVE**			
1	protocol Discriminator	Protocol discriminator	6.3.2	M	
2	transaction Identifier	Transaction identifier	6.3.3	M	
3	message Type	Message type	ETS 300 370, 6.1.8.2.3	M	

6.1.2.9 {CC-RELEASE} - RELEASE COMPLETE

Table 25

Item No	Message coding DECT	Message coding GSM	Ref.	Map status	NOTE
	{CC-RELEASE}	**RELEASE COMPLETE**			
1	protocol discriminator	Protocol discriminator	3.3.2	M	
2	transaction identifier	Transaction identifier	3.3.3	M	
3	message type	Message type	ETS 300 370, 6.1.8.2.3	M	
4	release reason	Cause	ETS 300 370, 6.1.7.1.9	O	
5	iwu to iwu	Cause	6.2.2.10	M	
6	iwu to iwu	Facility	6.2.2.8	M	

6.2 IE mappings

6.2.1 GSM to DECT

6.2.1.1 Facility - IWU-TO-IWU

Table 26

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	Note
	Facility	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol Discriminator		X	note 1
4	Facility IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of facility contents	IWU-TO-IWU INFORMATION		M	note 2
6	Component(s)	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Facility IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.2 Calling party BCD number- IWU-TO-IWU

Table 27

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Calling party BCD number	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	length		X	
3	-	Protocol Discriminator		X	note 1
4	Calling party BCD number IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of number	IWU-TO-IWU INFORMATION		M	note 2
7	Numbering plan identification	IWU-TO-IWU INFORMATION		M	note 2
8	Presentation indicator	IWU-TO-IWU INFORMATION		M	note 2
9	Screening indicator	IWU-TO-IWU INFORMATION		M	note 2
10	Number digits	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Calling Party BCD number IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.3 Calling party subaddress - IWU-TO-IWU

Table 28

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Calling party subaddress	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Calling party subaddress IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of subaddress	IWU-TO-IWU INFORMATION		M	note 2
7	Odd/even indicator	IWU-TO-IWU INFORMATION		M	note 2
8	Subaddress information	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Calling party subaddress IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.4 Called party BCD number- IWU-TO-IWU

Table 29

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Called party BCD number	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Called party BCD number IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of called party number contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of number	IWU-TO-IWU INFORMATION		M	note 2
7	Numbering plan identification	IWU-TO-IWU INFORMATION		M	note 2
8	Number digits	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Called party BCD number IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.5 Called party subaddress - IWU-TO-IWU

Table 30

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Called party subaddress	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Called party subaddress IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of called party subaddress contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of subaddress	IWU-TO-IWU INFORMATION		M	note 2
7	Odd/even indicator	IWU-TO-IWU INFORMATION		M	note 2
8	Subaddress information	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Called party subaddress IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.6 Cause - IWU-TO-IWU

Table 31

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Cause	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Cause IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of cause contents	IWU-TO-IWU INFORMATION		M	note 2
6	Coding standard	IWU-TO-IWU INFORMATION		M	note 2
7	Location	IWU-TO-IWU INFORMATION		M	note 2
8	Recommendation	IWU-TO-IWU INFORMATION		M	note 2
9	Cause value	IWU-TO-IWU INFORMATION		M	note 2
10	Diagnostic	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Cause IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.7 Connected number - IWU-TO-IWU

Table 32

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Connected number	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Connected number IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of connected number contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of number	IWU-TO-IWU INFORMATION		M	note 2
7	Number plan identification	IWU-TO-IWU INFORMATION		M	note 2
8	Presentation indicator	IWU-TO-IWU INFORMATION		M	note 2
9	Screening indicator	IWU-TO-IWU INFORMATION		M	note 2
10	Number digits	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Connected number IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.1.8 Connected subaddress - IWU-TO-IWU

Table 33

Item no.	Information element coding GSM	Information element coding DECT	Reference	Map status	NOTE
	Connected subaddress	IWU-TO-IWU			
1	-	ID for IWU-TO-IWU		X	
2	-	Length		X	
3	-	Protocol discriminator		X	note 1
4	Connected subaddress IEI	IWU-TO-IWU INFORMATION		M	note 2
5	Length of connected subaddress contents	IWU-TO-IWU INFORMATION		M	note 2
6	Type of address	IWU-TO-IWU INFORMATION		M	note 2
7	Odd/even indicator	IWU-TO-IWU INFORMATION		M	note 2
8	Subaddress information	IWU-TO-IWU INFORMATION		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the GSM Connected subaddress IE shall be mapped transparently into the DECT <<IWU-TO-IWU>> IE.					

6.2.2 DECT to GSM

6.2.2.1 Basic service - CM service type

Table 34

Item No	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	Basic service	CM service type			
1	ID for basic service	CM service type IEI	ETS 300 370, 6.1.8.2.4	M	
2	Call class	Service type	6.3.1	M	

6.2.2.2 IWU-TO-IWU - Calling party BCD number

Table 35

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Calling party BCD number			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Calling Party BCD number IEI		M	note 2
5	IWU-TO-IWU INFORMATION	Length of contents		M	note 2
6	IWU-TO-IWU INFORMATION	Type of number		M	note 2
7	IWU-TO-IWU INFORMATION	Numbering plan identification		M	note 2
8	IWU-TO-IWU INFORMATION	Presentation indicator		M	note 2
9	IWU-TO-IWU INFORMATION	Screening indicator		M	note 2
10	IWU-TO-IWU INFORMATION	Number digits		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Calling Party BCD number IE.					

6.2.2.3 IWU-TO-IWU - Called party BCD number

Table 36

Item No	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	**Called party BCD number**			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Info element ID		M	note 2
5	IWU-TO-IWU INFORMATION	Length of called party number contents		M	note 2
6	IWU-TO-IWU INFORMATION	Type of number		M	note 2
7	IWU-TO-IWU INFORMATION	Numbering plan identification		M	note 2
8	IWU-TO-IWU INFORMATION	Number digits		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Called party BCD number IE.					

6.2.2.4 IWU-TO-IWU - Calling party subaddress

Table 37

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Calling party subaddress			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Calling Party Subaddress IEI		M	note 2
5	IWU-TO-IWU INFORMATION	Length of contents		M	note 2
6	IWU-TO-IWU INFORMATION	Type of subaddress		M	note 2
7	IWU-TO-IWU INFORMATION	Odd/even indicator		M	note 2
8	IWU-TO-IWU INFORMATION	Subaddress information		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Calling party subaddress IE.					

6.2.2.5 IWU-TO-IWU - Called party subaddress

Table 38

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Called party subaddress			
1	ID for IWU-TO-IWU	-			
2	Length	-			
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Called party subaddress IEI		X	note 2
5	IWU-TO-IWU INFORMATION	Length of called party subaddress contents		X	note 2
6	IWU-TO-IWU INFORMATION	Type of subaddress		M	note 2
7	IWU-TO-IWU INFORMATION	Odd/even Indicator		M	note 2
8	IWU-TO-IWU INFORMATION	Subaddress information		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Called party subaddress IE.					

6.2.2.6 IWU-TO-IWU - CLIR suppression

Table 39

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	CLIR suppression			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	CLIR suppression IEI		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM CLIR suppression IE.					

6.2.2.7 IWU-TO-IWU - CLIR invocation

Table 40

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	CLIR invocation			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	CLIR invocation IEI		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM CLIR invocation IE.					

6.2.2.8 IWU-TO-IWU - Facility

Table 41

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Facility			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Facility IEI		M	note 2
5	IWU-TO-IWU INFORMATION	Length of facility contents		M	note 2
6	IWU-TO-IWU INFORMATION	Component(s)		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Facility IE.					

6.2.2.9 IWU-TO-IWU - supplementary service version indicator

Table 42

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Supplementary service version indicator			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Supplementary service version		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM supplementary service version indicator IE.					

6.2.2.10 IWU-TO-IWU - Cause

Table 43

Item no.	Information element coding DECT	Information element coding GSM	Reference	Map status	NOTE
	IWU-TO-IWU	Cause			
1	ID for IWU-TO-IWU	-		X	
2	Length	-		X	
3	Protocol discriminator	-		X	note 1
4	IWU-TO-IWU INFORMATION	Cause IEI		M	note 2
5	IWU-TO-IWU INFORMATION	Length of cause contents		M	note 2
6	IWU-TO-IWU INFORMATION	Coding standard		M	note 2
7	IWU-TO-IWU INFORMATION	Location		M	note 2
8	IWU-TO-IWU INFORMATION	Recommendation		M	note 2
9	IWU-TO-IWU INFORMATION	Cause value		M	note 2
10	IWU-TO-IWU INFORMATION	Diagnostic		M	note 2
NOTE 1: Set to "GSM Recommendation 04.08 element(s)", "010001"B. NOTE 2: The contents of the DECT <<IWU-TO-IWU>> IE shall be mapped transparently into the GSM Cause IE.					

6.3 Fields in IE coding

Tables 44 to 46 are used both in GSM to DECT and DECT to GSM direction.

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

Table 44

Item No	Field(s) coding DECT	Field(s) coding GSM	Reference	Map status	NOTE
	Call class	Service type			
1	"1101"B	"1000"B		M	Supplementary service activation
NOTE: Other field codings may be found in ETS 300 370, subclause 6.1.8.2.16.					

6.3.2 Protocol discriminator mapping

As one DECT value can be mapped into two different GSM values the FP/IWU has to analyse the contents of other IEs in the same message (e.g. <<Basic Service>> IE with the call class field).

6.3.2.1 Protocol discriminator - Protocol discriminator for CISS

Table 45

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Protocol discriminator	Protocol discriminator			
1	"1011"B	"0011"B		M	GSM CISS / DECT CC

6.3.2.2 Protocol discriminator - Protocol discriminator for CC

Table 46

Item No	Field(s) coding GSM	Field(s) coding DECT	Ref	Map status	NOTE
	Protocol discriminator	Protocol discriminator			
1	"0011"B	"0011"B		M	GSM CRSS / DECT CC

6.3.3 Transaction identifier mapping

6.3.3.1 Transaction identifier - transaction identifier for CISS

The DECT extended transaction identifier shall always be used, i.e. the DECT transaction value shall have value "111"B. The DECT extended transaction value shall be coded according to ETS 300 370 [11], subclause 6.3.2.7.8. with:

- the Function Group Identifier (FGI) shall be set to "SS Transaction", "010";
- the DECT Original transaction flag shall be mapped transparently to the GSM transaction flag;
- the DECT Original transaction value shall be mapped transparently to the GSM transaction value.

6.3.3.2 Transaction identifier - transaction identifier for CC

See ETS 300 370 [11], subclause 6.1.8.1.2.

Annex A (informative): Supported supplementary services

For information, the supplementary services in ETS 300 503 [17] (GSM 02.04) include those given in table A.1.

Table A.1: GSM 02.04 GSM Phase 2 supplementary services

Supplementary service						
GSM specification/section	**Reg.**	**Era.**	**Act.**	**Deact.**	**Inv.**	**Int.**
02.81 Number identification supplementary service, ETS 300 514 [20]						
CLIP	-	-	p	w	n	s
CLIR	-	-	p	w	n	dr
COLP	-	-	p	w	n	s
COLR	-	-	p	w	n	s
02.82 Call offering supplementary service, ETS 300 515 [21]						
CFU	a/s	w/r/s	r/s	e/s	n	dr
CFB	a/s	w/r/s	r/s	e/s	n	dr
CFNRy	a/s	w/r/s	r/s	e/s	n	dr
CFNRc	a/s	w/r/s	r/s	e/s	n	dr
02.83 Call completion supplementary service, ETS 300 516 [22]						
CW	-	-	a/s	a/s	n	s
HOLD	-	-	p	w	u	-
02.84 MPTY supplementary service, ETS 300 517 [23]						
MPTY	-	-	-	-	u	-
02.85 Community of interest supplementary service, ETS 300 518 [24]						
CUG	-	-	p	w	u/n	-
02.86 Charging supplementary service, ETS 300 519 [25]						
AoCI	-	-	p	w	n	-
AoCC	-	-	p	w	n	-
02.88 Call restriction supplementary service, ETS 300 520 [26]						
BAOC	a/s	w/r	a/s	s/a	n	dr
BOIC	a/s	w/r	a/s	s/a	n	dr
BOIC-exHC	a/s	w/r	a/s	s/a	n	dr
BAIC	a/s	w/r	a/s	s/a	n	dr
BIC-Roam	a/s	w/r	a/s	s/a	n	dr

Further services: USSD ETS 300 572 [48] (GSM 04.90).

The following abbreviations are used in table A.1.

Registration:

p = as a result of provision;

a = service provider controlled procedure;

s = subscriber controlled procedure;

- = not applicable.

Erasure:

w = as a result of withdrawal;

s = subscriber controlled procedure;

r = due to new registration;

- = not applicable.

Activation:

p = as a result of provision;

r = as a result of registration;

s = subscriber controlled procedure;

a = service provider controlled procedure;

c = when the conditions in the subscription options are met;

- = not applicable.

Deactivation:

w = as a result of withdrawal;

s = subscriber controlled procedure;

a = service provider controlled procedure;

e = as a result of erasure;

n = when the conditions in the subscription options are not met;

c = at the end of a per call basis activation;

- = not applicable.

Invocation:

n = automatic invocation by the network as a result of a particular condition;

u = user invocation, by means of a control procedure;

- = not applicable.

Interrogation:

s = status check;

dr = data request;

- = not applicable.

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