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Contents

Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

Every ETS prepared by ETSI is a voluntary standard. This ETS may contain text concerning conformance testing of the equipment to which it relates. This text should be considered as guidance only and does not make this ETS mandatory.

This ETS is based on ETS 300 175 parts 1 to 8 [1]-[8], ETS 300 444 [13], ETS 300 822 [20], ETS 300 701 [22], ETS 300 651 [23] and ETS 300 755 [24]. This ETS has been developed in accordance to the rules of documenting a profile specification as described in ISO/IEC 9646-6 [11].

This ETS forms part 2 of a 2 part ETS, as follows:

Part 1: "Basic telephony services";

Part 2: "Advanced telephony services".

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This European Telecommunication Standard (ETS) specifies that set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Part (FP) and DECT Cordless Terminal Adapter (CTA) for the support of the Radio in the Local Loop (RLL) Access Profile (RAP).

The objective of this ETS is to ensure the air interface interoperability of DECT RAP CTAs and DECT RAP FPs and Wireless Relay Stations (WRSs) if applied.

ETS 300 765-1 [17] contains the so called "Plain Old Telephone Service (POTS)" services including analogue leased lines and 64 kbit/s bearer service. ETS 300 765-1 [17] also provides for optional mobility features by supporting Generic Access Profile (GAP) Portable Part (PP) subscriber terminals and CTAs with WRS GAP functionality.

This ETS contains telecommunication services as offered by Integrated Services Digital Network (ISDN), contemporary non-voiceband data services provided through, for example, a dedicated data port at the CTA, and support of digital leased lines. The provision of the mentioned services is not mandated by this ETS, but if provided they shall be provided as defined (provision optional, process mandatory).

An objective is to use as much as possible from existing profiles: DECT/ISDN Intermediate ISDN access Profile (IIP) as defined in ETS 300 822 [20] and the data profile A/B.2 as defined in ETS 300 701 [22], data profile C.2 as defined in ETS 300 651 [23], and data profile F.2 as defined in ETS 300 755 [24]. Therefore, most of the RAP features refer to features defined in other profiles and the necessary additional features (e.g. Operation, Administration and Maintenance (OA&M)) are listed and explained in this ETS.

In addition, this ETS defines additional features, services, procedures, etc. for the CTA and the FT, which are provision mandatory either in the CTA or in the FT, as well as some elements that are provision optional but still process mandatory. These features in particular define the operation and maintenance of CTAs in relation to the provided service (profile) in a public network.

2 Normative references

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

[1] ETS 300 175-1: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[2] ETS 300 175-2: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".

[3] ETS 300 175-3: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[4] ETS 300 175-4: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

[5] ETS 300 175-5: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

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

[7] ETS 300 175-7: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

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

[9] I-ETS 300 176: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Approval test specification".

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

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

[12] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[13] ETS 300 444: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[14] ETR 056: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); System description document".

[15] ETS 300 700: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".

[16] ETR 308: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); Services, facilities and configurations for DECT in the local loop".

[17] ETS 300 765-1: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".

[18] ETR 246: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Application of DECT Wireless Relay Station (WRS)".

[19] ETR 310: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band".

[20] ETS 300 822: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".

[21] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[22] ETS 300 701: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic frame relay service with mobility (service types A and B, class 2)".

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

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

[25] ETR 185: "Radio Equipment and Systems (RES); Digital European Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".

[26] ETS 300 297: "Integrated Services Digital Network (ISDN); Access digital section for ISDN basic access".

3 Definitions, abbreviations and symbols

3.1 DECT definitions

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

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

NOTE 1: 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 2: The DECT user-network interface corresponds to the top of the network layer (layer 3).

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

NOTE 3: The C-plane stack always contains protocol entities up to and including the network layer.

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

NOTE 4: Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

Cordless Terminal Adapter (CTA): Physical grouping that contains a DECT portable termination and a line interface.

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

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

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

DECT intermediate fixed system: A logical grouping that contains all the functions between the DECT DI reference point and the reference point on the fixed side of the DECT air interface.

NOTE 7: The DECT Intermediate Fixed System (DIFS) = FT + (local network up to the fixed side ISDN reference point (including fixed side Interworking Unit (IWU))), see ETR 056 [14].

DECT intermediate portable system: A logical grouping that contains all the functions between the DECT DI reference point and the ISDN S reference point on the portable side of the DECT air interface.

NOTE 8: The DECT Intermediate Portable System (DIPS) = Portable radio Termination (PT) + (Portable Application (PA) up to the portable side ISDN S reference point (including portable side IWU)), see ETR 056 [14].

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 9: A FT only includes elements that are defined in the DECT Common Interface (CI) standard. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

handover: The process of switching a call in progress from one physical channel to another physical channel.

NOTE 10: There are two physical forms of handover, intra-cell handover and inter-cell handover.

incoming call: A call received at a CTA.

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 reconnects 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).

interoperability: The capability of FPs and CTAs, that enable a CTA to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider).

Interworking Unit (IWU): A unit that is used to interconnect subnetworks.

NOTE 12: The IWU will contain the interworking functions necessary to support the required subnetwork 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.

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.

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

location registration: The process whereby the position of a DECT PT 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 a DECT FT.

MAC Connection (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.

mobility class 1: Local area applications, for which terminals are pre-registered off-air with one or more specific fixed parts, and establishment of service and user parameters is therefore implicit, according to a profile-defined list.

mobility class 2: Private and Public roaming applications for which terminals may move between fixed parts within a given domain and for which association of service parameters is explicit at the time of service request.

outgoing call: A call originating from a CTA.

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 PAs.

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

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

Radio Fixed Part (RFP): One physical sub-group of a 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.

service type A: Low speed frame relay, with a net sustainable throughput of up to 24 kbits/s, optimized for bursty data, low power consumption and low complexity applications such as hand-portable equipment.

service type B: High performance frame relay, with a net sustainable throughput of up to 552 kbits/s, optimized for high speed and low latency with bursty data. Equipment implementation the Type B profile shall inter-operate with Type A equipment.

service type C: Non-transparent connection of data streams requiring Link Access Protocol (LAP) services, optimized for high reliability and low additional complexity. This builds upon the services offered by the type A or B profiles.

service type E: A short message transfer or paging service which may be unacknowledged or acknowledged, optimized for small Service Data Units (SDUs), low PP complexity and ultra-low power consumption.

service type F: An application profile specifically supporting teleservices such as fax, building upon the services offered by the type A/B and C profiles, optimized for terminal simplicity, spectrum efficiency and network flexibility.

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

NOTE 18: Subscription registration is usually required before a user can make or receive calls.

Wireless Relay Station (WRS): A physical grouping that combines elements of both PTs and FTs to relay information on a physical channel from one DECT termination to a physical channel to another DECT termination.

NOTE 19: The DECT termination can be a PT or a FT or another WRS.

3.2 DECT abbreviations

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

AC	Authentication Code
ARC	Access Rights Class
ARD	Access Rights Details
ARI	Access Rights Identity
C/L	Connectionless
C/O	Connection Oriented
CC	Call Control
CI	Common Interface
CPE	Customer Premises Equipment
CTA	Cordless Terminal Adapter
DCK	Derived Cipher Key
DECT	Digital Enhanced Cordless Telecommunications
DIFS	DECT Intermediate Fixed System
DIPS	DECT Intermediate Portable System
DLC	Data Link Control
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
IE	Information Element
IIP	Intermediate ISDN access Profile
IP	Internet Protocol
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
IWU	Interworking Unit
LNW	Local Network
MAC	Medium Access Control
MBC	Multi-Bearer Control
MM	Mobility Management
MMS	Multimedia Messaging Services
NWK	Network
OA&M	Operation, Administration and Maintenance
P	Public (environment)
PA	Portable Application
PARI	Primary Access Rights Identity
PARK	Portable Access Rights Key
PHL	Physical Layer
PLI	Park Length Indicator
PP	Portable Part
PT	Portable radio Termination
PUN	Portable User Number
PUT	Portable User Type
RAP	RLL Access Profile
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
RLL	Radio in the Local Loop
RSSI	Radio Signal Strength Indicator
SDU	Service Data Unit
TE	Terminal Equipment
TI	Transaction Identifier
WRS	Wireless Relay Station

3.3 ISDN abbreviations

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

BRA	Basic Rate Access
C	C reference point
ISDN	Integrated Services Digital Network
NT1	Network Termination 1
NT2	Network Termination 2
P	P reference point
R	R reference point
S	S reference point
S/T	S/T reference point
T	T reference point
TA	Terminal Adapter
TE1	ISDN terminal

3.4 Other abbreviations

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

DTE	Data Terminal Equipment
PC	Personal Computer
PDA	Personal Digital Assistant
POT	Plain Old Telephone
POTS	Plain Old Telephone Service
PSTN	Public Switched Telephone Network
USB	Universal Serial Bus

3.5 Symbols

The symbols defined in this subclause are applied for procedures, services in this ETS if not explicitly otherwise stated. The interpretation of status columns in all tables is as follows:

M	Mandatory to support (provision mandatory, process mandatory);
O	Optional to support (provision optional, process mandatory);
I	out-of-scope (provision optional, process optional) not subject for testing;
C	Conditional to support (process mandatory);
N/A	Not Applicable (in the given context the specification makes it impossible to use this capability.

Provision mandatory, process mandatory means that the indicated feature, service or procedure shall be implemented as described in this ETS, and may be subject to testing.

Provision optional, process mandatory means that the indicated feature, service or procedure may be implemented, and if implemented, the feature, service or procedure shall be implemented as described in this ETS, and may be subject to testing.

NOTE: The used notation is based on the notation proposed in ISO/IEC 9646-7 [12].

4 Description of services

4.1 Reference model

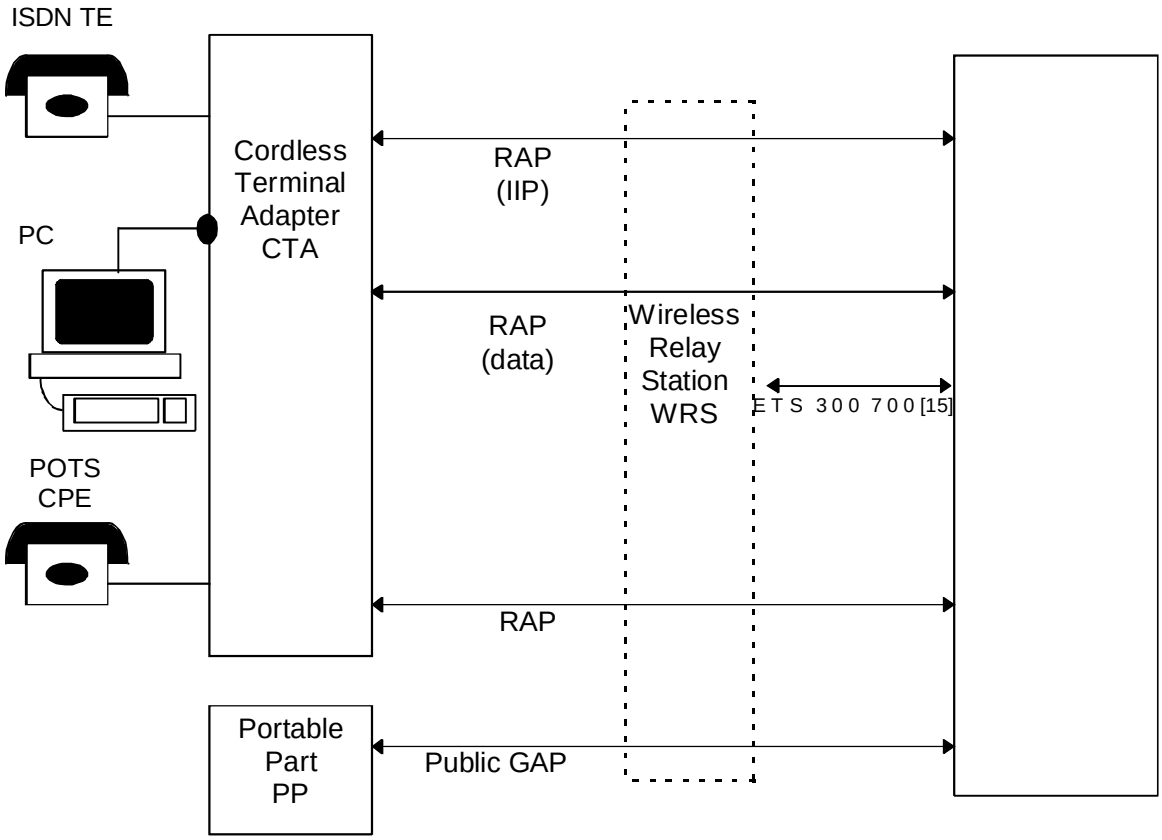


Figure 1: RAP Reference Model

4.2 Services & facilities

The Radio in the local loop Access Profile, RAP, Part 2 Advanced Telephony Services, allows the provision through DECT of a service level as currently available in the ISDN network, and extensions including non-voiceband data services and digital leased lines. Furthermore, features are added for the operation, administration, and maintenance of the equipment (CTAs) offering the mentioned services in the public RLL application.

4.2.1 ISDN services

For the definition of the ISDN services this ETS refers to ETS 300 822 [20], referred to as the IIP (Intermediate ISDN Access Profile).

The IIP applies when FP and PP together constitute a gateway between an ISDN network and an ISDN terminal. The FP and the PP have an IWU, that maps the messages between the ISDN interface and the DECT air interface.

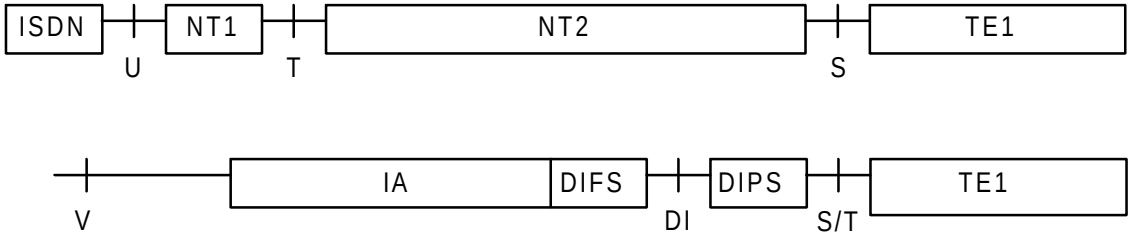
The IIP specifies how ISDN services can be provided over Digital Enhanced Cordless Telecommunications (DECT). It is based on DECT Common Interface specification ETS 300 175 [1] - [8] to enable ISDN terminals to have cordless access to an ISDN infrastructure. Both public ISDN and private ISDN are within the scope of the IIP. For mobility and security, the IIP is based on ETS 300 444 [13].

Using the IIP, the end-user has transparent access to the ISDN services and functions. In respect to bearer services, the following are supported: speech, 3,1 kHz audio, unrestricted 64 kbit/s data, packet data.

In ETS 300 822 [20], reference configurations are used to describe the functional groupings of DECT and ISDN 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 are described in ITU-T Recommendation I.411 [21] for public ISDN.

The DECT intermediate system reference configurations are used where the DECT Intermediate Fixed System (DIFS) and DECT Intermediate Portable System (DIPS) together form an intermediate system to connect an ISDN-terminal to an ISDN network.

The following figure shows the intermediate system reference configuration for public ISDN. Other reference configurations are given in the IIP, ETS 300 822 [20], but are out of scope for the RAP, as they apply to private ISDN.



DIFS DECT Intermediate Fixed System
DIPS DECT Intermediate Portable System
IA Interface Adapter

Figure 2: Intermediate system public ISDN reference configuration

4.2.2 Non-voiceband data services

This ETS defines a number of advanced non-voiceband data services, based on the data services profiles as described in ETR 185 [25]. The data services profiles specify all the DECT air interface requirements to ensure interoperability between DECT FPs and PPs, or CTAs in the RLL case. This subclause defines how certain data services which are particularly appropriate for RLL applications can be provided. However, the provision of these data services is optional.

The data services defined in this subclause are as follows:

Table 1: Data services overview

Data service	Connection type	Local network type	DECT profile
Internet access	C/L	Internet Internet Protocol (IP)	ETS 300 701 [22] (A/B.2), clause A.4
Modem	C/O	PSTN/ISDN	ETS 300 651 [23] (C.2), clause C.4
Group 3 Fax	C/O	PSTN/ISDN	ETS 300 755 [24] (F.2), annex C
NOTE: For all DECT data profiles, the Mobility Class 2 is selected as it contains CC and MM functionality required in the RLL application.			

The subclauses below define in detail the requirements for the provision of the data services as listed in table 1. Annex C provides informative information of the realization of CTA data ports.

4.2.2.1 Internet access

This subclause specifies the normative aspects of the internet access service as specified in this ETS. The specifications in this subclause are intended to ensure full interoperability between CTAs (PPs) and FPs, regardless of the CTA Data Port or FP IWU options given in annexes C and D.

To provide internet access CTA shall provide the requirements listed in ETS 300 701 [22]. CTA shall use the interworking procedures described in ETS 300 701 [22], clause A.4.

4.2.2.2 Modem

This subclause specifies the normative aspects of the modem service as specified in this ETS. The specifications in this subclause are intended to ensure full interoperability between CTAs (PPs) and FPs, regardless of the CTA data port or FP IWU options given in annexes C and D.

To provide modem service CTA shall provide the requirements listed in ETS 300 651 [23]. CTA shall use the interworking procedures described in ETS 300 651 [23], clause C.4.

4.2.2.3 Group 3 fax

This subclause specifies the normative aspects of the Group 3 (G3) fax service as specified in this ETS. The specifications in this subclause are intended to ensure full interoperability between CTAs (PPs) and FPs, regardless of the CTA Data Port or FP IWU options given in annexes C and D.

To provide Group 3 Fax service CTA shall provide the requirements listed in ETS 300 755 [24]. CTA shall use the interworking procedures described in ETS 300 755 [24], annex C.

4.2.3 Digital leased lines

The requirements of digital leased lines, and their impact on DECT systems have been described in ETR 308 [16]. However, the provisioning of this service requires further study.

5 Feature definitions

For the purposes of this ETS the feature definitions in the following subclauses apply.

The number given in square brackets after the name of a feature is the item number used in the tables of this ETS.

NOTE: The numbering is aligned with ETS 300 765-1 [17].

5.1 Network (NWK) features

The features apply only to operation and maintenance of the CTAs supporting the various types of services (ISDN, non-voiceband data, and digital leased lines) as described in clause 4.

Features in common for all CTAs, applying to the DECT part of the CTA, have been collected in subclause 5.1.1, DECT CTA Operation and Maintenance features.

Features for the operation and maintenance specifically needed in combination with a particular type of service offered at a CTA (i.e. ISDN, non voiceband data, and digital leased lines), are collected in separate subclauses.

5.1.1 DECT CTA OA&M features

Incoming maintenance transaction [N.102]: the ability of the CTA to receive, and the FP to send OA&M messages.

Outgoing maintenance transaction [N.103]: the ability of the CTA to send, and the FP to receive OA&M messages.

Maintenance using an existing connection [N.104]: the ability of the CTA and the FP to exchange OA&M messages using an existing connection.

Physical resources fault [N.107]: the ability of the CTA to indicate the location of faults in the physical resources to the FP.

Remote Test [N.108]: the ability of the FP to request the CTA to run specific tests.

Alarms [N.109]: the ability of the CTA to indicate to the FP that a significant system event occurs or is about to occur which may seriously affect the systems ability to function.

Start remote over the air subscription [N.110]: the ability of the FP to indicate to the CTA to start the over the air subscription procedure of a CTA.

Start Quality Measurement [N.111]: the ability of the FP to indicate to the CTA to start a Link Quality Measurement.

Stop Quality Measurement [N.112]: the ability of the FP to indicate to the CTA to stop a Link Quality Measurement and to read the result.

Remote configuration [N.116]: the ability of the FP to indicate to the CTA that the FP intends to provide the CTA with configuration parameters.

Incoming WRS maintenance transaction [N.121]: the ability of the WRS to receive OA&M messages from the FP.

Outgoing WRS maintenance transaction [N.122]: the ability of the WRS to send OA&M messages to the FP.

Claim [N.123]: the ability of FP to claim a CTA or WRS for maintenance purposes, thereby imposing restrictions on the normal operation of the claimed CTA or WRS.

5.1.2 ISDN CTA specific OA&M features

Management of the ISDN digital access section as normally contained in the NT1 is covered by ETS 300 297 [26].

NOTE: However, ETS 300 297 [26] are standardized for a wired ISDN network. Applying the provisions contained in the mentioned standards to a wireless DECT RLL network needs adaptation and relaxation, and this is for further standardization outside the scope of this ETS.

5.1.3 Non-voiceband data services CTA specific OA&M features

NOTE: Features specific to the management of CTAs providing non-voiceband data services require further study.

5.1.4 Digital Leased Lines CTA specific OA&M features

NOTE: Features specific to the management of CTAs providing digital leased lines require further study.

6 Interoperability requirements

6.1 General

The tables listed in this subclause define all the protocol elements i.e. features, services, and procedures which are mandatory, optional, and conditional under the provision of another protocol element, or out of the scope of this ETS, or in some context not-applicable according to the definition of the status column as defined in subclause 3.5 for the RAP FP and CTA. All optional elements shall be process mandatory according to the procedures described in this ETS.

The requirements of TBR 6 [10] shall be met by all equipment conforming to this ETS.

6.2 NWK features

6.2.1 General

The NWK features of the following profiles shall be provided if the profile is supported:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];

2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];

3) the DECT data profile C.2 as defined in ETS 300 651 [23];

4) the DECT data profile F.2 as defined in ETS 300 755 [24].

6.2.2 OA&M features

Table 2: NWK features status

Feature supported				
			Status	
Item no.	Name of feature	Ref.	CTA	FT
N.102	Incoming maintenance transaction	5.1.1	O	O
N.103	Outgoing maintenance transaction	5.1.1	O	O
N.104	Maintenance using an existing connection	5.1.1	O	O
N.107	Physical resources fault	5.1.1	O	O
N.108	Remote test	5.1.1	O	O
N.109	Alarms	5.1.1	O	O
N.110	Start remote over the air subscription	5.1.1	O	O
N.111	Start Quality measurement	5.1.1	O	O
N.112	Stop Quality measurement	5.1.1	O	O
N.116	Remote configuration	5.1.1	O	O
N.121	Incoming WRS maintenance transaction	5.1.1	O	O
N.122	Outgoing WRS maintenance transaction	5.1.1	O	O
N.123	Claim	5.1.1	O	O

6.3 DLC services

6.3.1 General

The DLC services of the following profiles shall be provided if the profile is supported:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];

2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];

3) the DECT data profile C.2 as defined in ETS 300 651 [23];

4) the DECT data profile F.2 as defined in ETS 300 755 [24].

6.4 MAC services

6.4.1 General

The MAC services of the following profiles shall be provided if the profile is supported:

1) the DECT-ISDN intermediate system as defined in ETS 300 822 [20];

2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];

3) the DECT data profile C.2 as defined in ETS 300 651 [23];

4) the DECT data profile F.2 as defined in ETS 300 755 [24].

6.4.2 Blind slot information

It is mandatory for RFPs that have blind slots, due to non-duplex bearer operation on that slot (i.e. those RFPs that have technological limitations such as a slow synthesizer), to periodically announce these blind slots (at least every 10 s). In the event the RFP announces blind slot information, such information may also include all blind slots due to an active bearer as well.

Not available (blind) slot means that the FP recommends the CTA not to attempt a set-up on this slot.

If the CTA receives blind slot information, it is mandatory for that CTA to use it in the process of channel selection. The CTA does not have to wait for the blind slot information before making the channel selection.

6.4.3 Improved channel selection rules

In addition of using the blind slot information before making the channel selection as defined in subclause 6.4.2, the CTA is mandated to follow the algorithm defined below for single slot channel selection.

Without violating the basic DECT channel selection rules, for single slot channel selection the CTA shall give priority to the following types of channels:

1) available channel candidates on even slot positions with an active channel on the adjacent slot position to the right;

2) available channel candidates on odd slot positions with an active channel on the adjacent slot position to the left.

NOTE 1: This algorithm results in packing of single slots into double slot locations (double slots are only allowed to start on even slot positions).

NOTE 2: The DECT channel rules shall not be violated. This implies that the rules described above can only be applied to the channels that are within the same Radio Signal Strength Indicator (RSSI) band.

6.5 Physical Layer (PHL) services

6.5.1 General

The PHL services of the following profiles shall be provided if the profile is supported:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24].

6.6 NWK feature to procedure mapping

Table 3: NWK feature to procedure mapping

Feature/Procedure mapping				
Feature	**Procedure**	**Ref.**	**Status**	
			CTA	**FP**
N.102, Incoming maintenance transaction		5.1.1	O	O
	Incoming maintenance call	7.1.1.1	M	M
	Sending OA&M information	7.2	M	M
N.103, Outgoing maintenance transaction		5.1.1	O	O
	Outgoing maintenance call	7.1.1.2	M	M
	Sending OA&M information	7.2	M	M
N.104, Maintenance using an existing connection		5.1.1	O	O
	Sending OA&M information	7.2	M	M
N.107, Physical resources fault		5.1.1	O	O
	Physical resources fault	7.2.1	M	M
N.108, Remote test		5.1.1	O	O
	Remote test	7.2.2	M	M
N.109, Alarms		5.1.1	O	O
	Alarms	7.2.3	M	M
N.110, Start remote over the air subscription		5.1.1	O	O
	Subscription to a new Fixed Part	7.2.4.1	M	M
	Resubscription to the same Fixed Part	7.2.4.2	M	M
	Additional subscriptions to the same Fixed Part	7.2.4.3	M	M
	Remote resynchronization	7.2.8	M	M
N.111, Start Quality measurement		5.1.1	O	O
	Start Quality measurement	7.2.5	M	M
N.112, Stop Quality measurement		5.1.1	O	O
	Stop Quality measurement	7.2.6	M	M
N.116, Remote configuration		5.1.1	O	O
	Remote configuration	7.2.7	M	M
N.121, Incoming WRS maintenance transaction		5.1.1	O	O
	Incoming WRS maintenance call	7.3.1	M	M
	Sending OA&M information	7.2	M	M
N.122, Outgoing WRS maintenance transaction		5.1.1	O	O
	Outgoing WRS maintenance call	7.3.2	M	M
	Sending OA&M information	7.2	M	M
N.123, Claim		5.1.1	O	O
	Claim Actions	7.2.9	M	M

7 NWK layer procedures

This clause specifies the NWK layer procedures, messages and information elements required in the RAP.

This profile does not prevent any CTA, PT or FT transmitting or receiving and processing any other NWK layer message or information element not specified in the profile. A PT or FT receiving an unsupported NWK layer message or information element which it does not recognize shall ignore it, as specified in clause 17 of ETS 300 175-5 [5].

7.1 Maintenance calls

7.1.1 Maintenance calls within the data profiles

For the following maintenance calls the special call class "OA&M call" is required in the Information Element (IE) <<Basic service>> of the {CC-SETUP} message.

7.1.1.1 Incoming maintenance call

The incoming call procedures as defined in GAP shall be used. The FT is not required to send the <<SIGNAL>> information element during the incoming maintenance call procedure.

7.1.1.2 Outgoing maintenance call

The outgoing call procedures as defined in GAP shall be used. The CTA is not required to send the <<KEYPAD>> information element during the outgoing maintenance call procedure.

7.1.2 Maintenance calls within the IIP

7.1.2.1 Incoming maintenance call

On request to exchange operation and maintenance information, and if no signalling link is established, the DIFS shall set up a signalling link to the DIPS as described in subclause 6.1.1.1 of ETS 300 822 [20].

Then, the DIFS shall forward the operation and maintenance information inside an <<IWU-TO-IWU>> information element in an {IWU-INFO} message, using the coding as defined in annex B.

7.1.2.2 Outgoing maintenance call

On request to exchange operation and maintenance information, and if no signalling link is established, the DIPS shall set up a signalling link to the DIFS as described in subclause 6.1.1.2 of ETS 300 822 [20].

Then, the DIPS shall forward the operation and maintenance information inside an <<IWU-TO-IWU>> information element in an {IWU-INFO} message, using the coding as defined in annex B.

7.2 Sending OA&M information

The FT and the CTA shall be capable of sending and receiving "OA&M" information which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be send with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element. {CC-INFO} messages shall be used in case no other CC-messages are being sent as part of normal call related signalling procedures. If the case no call is established, the CTA may set-up an outgoing maintenance call, and the FT may set-up an incoming maintenance call to transmit the OA&M messages.

Table 4: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Codings for OA&M information

7.2.1 Physical resources fault

If the CTA wants to inform the FT about a physical resources fault it shall send "physical resources fault" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 5: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Physical resources fault

7.2.2 Remote test

If the FT wants the CTA to perform remote controlled tests it shall send "remote test (request)" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 6: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Remote test (request)

Depending on the test to be performed the CTA may answer to the remote CTA test (request) with a remote test (confirm) which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 7: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Remote test (confirm)

7.2.3 Alarms

If the CTA wants to inform the FT about alarms it shall send "alarms" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 8: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Alarms

7.2.4 Start remote over the air subscription

7.2.4.1 Subscription to a new FP

NOTE: The procedures for subscription of a CTA to a new FP require further study.

7.2.4.2 Resubscription to the same FP

NOTE: The procedures for resubscription of a CTA to the same FP require further study.

7.2.4.3 Additional subscriptions to the same FP

If the FT wants a new port of a multiport CTA to be subscribed to itself it can send "subscription suggest" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 9: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Subscription suggest (port no.)

On reception of this message at the CTA, the CTA shall release every call at the requested port with partial release. The CTA shall then perform the obtain access rights procedure at the requested port. This obtain access rights procedure shall be carried out only to the system that invoked the subscription suggest message. The FT shall set bit a44 of the higher layer capabilities-bits to "access_rights_supported" when sending the subscription suggest message. The CTA will assume this bit to be set when starting the obtain access rights procedure and will not check if it is set.

7.2.5 Start quality measurement

If the FT wants the CTA to perform quality measurements it shall send "start quality measurement" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 10: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Start quality measurement (parameters)

Depending on the parameters given with the start quality measurement message the CTA may start sending "quality measurement value" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 11: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Quality measurement value

7.2.6 Stop Quality measurement

If the FT wants the CTA to stop quality measurements it shall send "stop quality measurement" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 12: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Stop quality measurement

7.2.7 Remote configuration

Remote configuration can be done in a manufacturers proprietary way using <<Escape to Proprietary>> information elements.

7.2.8 Remote resynchronization

If the FT wants the CTA to perform resynchronization it shall send "resynchronization request" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 13: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Resynchronization request

Remote resynchronization is necessary to be able to inform a locked CTA about new static system information or new arrangements of carriers, etc.

NOTE: The operator may wish to terminate any ongoing services, and prohibit new services at the CTA by using the Claim actions as specified in subclause 7.2.9, before issuing the resynchronization request.

7.2.9 Claim actions

If the FT wants to claim a CTA for maintenance purposes, thereby imposing restrictions on the CTAs normal operation, it shall send "claim enable/claim disable" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

This {CC-INFO} message shall be send during an established call. If no call is established the FT can set-up an incoming maintenance call to transmit this OA&M message.

Table 14: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Claim enable / Claim disable

Upon reception of the "claim disable", the CTA shall have no restrictions on the invocation of new procedures.

Upon reception of the "claim enable", the CTA shall block all new procedure invocations, but without termination of any ongoing procedures.

NOTE 1: The user of a Customer Premises Equipment (CPE) attached to a claimed CTA may be informed of the claimed situation by e.g. a congestion tone.

Once ongoing procedures have terminated, the CTA shall report this to the FP by sending "claim active" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

Table 15: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Claim active

If the FP wants to cancel the claim enable request on the CTA, it shall send "claim cancel" which shall be included in the <<IWU-TO-IWU>> information element using protocol discriminator "RAP".

NOTE 2: If the claim was already active at the CTA, the "claim cancel" shall be regarded as a "claim disable" at the CTA.

This {CC-INFO} message shall be send during an established call. If no call is established the FT can set up an incoming maintenance call to transmit this OA&M message.

Table 16: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>	See annex B	Claim cancel

7.3 WRS maintenance calls

7.3.1 Incoming WRS maintenance call

For incoming maintenance calls the FT shall use <<IWU-TO-IWU>> as defined in annex B, included in the {MM-INFO-SUGGEST} message, using the procedures as defined in ETS 300 175-5 [5], subclause 13.7.

NOTE: A special value for the <<INFO-TYPE>> shall be used, indicating "OA&M call".

7.3.2 Outgoing WRS maintenance call

For outgoing maintenance calls the WRS shall use <<IWU-TO-IWU>> as defined in annex B, included in the {MM-INFO-REQUEST} message, using the procedures as defined in ETS 300 175-5 [5], subclause 13.7. The FT shall respond according to these procedures with a {MM-INFO-ACCEPT}, which may include a <<IWU-TO-IWU>> as defined in annex B.

NOTE: A special value for the <<INFO-TYPE>> shall be used, indicating "OA&M call".

Annex A (informative): ETS 300 175-5 changes

For the purposes of this ETS, the following changes are required to ETS 300 175-5 [5].

Subclause 7.7.23:

For the <<IWU-TO-IWU>> IE, a protocol discriminator (pd) value shall be allocated, indicating "RLL Access Profile". Detailed coding for this protocol discriminator is given in annex B of this ETS.

Subclause 7.6.4:

For the <<BASIC-SERVICE>> IE, a call class shall be allocated, indicating "OA&M call set-up".

Subclause 7.7.20:

For the <<INFO-TYPE>> IE, a value shall be allocated, indicating "OA&M call".

Annex B (normative): Codings for "OA&M" messages

The FT and the CTA shall be capable of sending and receiving "OA&M" information which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP", which can be send with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element. {CC-INFO} messages shall be used in case no other CC-messages are being sent as part of normal call related signalling procedures. If the case no call is established, the CTA may set-up an outgoing maintenance call, and the FT may set-up an incoming maintenance call to transmit the OA&M messages.

Information element	Field within the information element	Standard values within the field/IE	Normative action / comment
<<IWU-to-IWU>>			
	<Protocol Discriminator>	?	RAP indication
	<IWU-to-IWU information>		Codings for OA&M

General Structure for RAP <<IWU-to-IWU>>

Bit	8	7	6	5	4	3	2	1	Octet
	0	<<IWU-TO-IWU>>							1
	Length of Contents (L)								2
	1	S/R	RAP						3
	SC			Service Type					4

Service Category (SC)

Bits	8	7	6	Meaning
	0	0	0	RAP-CC
	0	0	1	OA&M
Other values				Reserved

Service Type

if SC indicates RAP/OA&M

Bits	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	Claim enable/Claim active
	0	0	0	0	0	1	Claim disable/Claim cancel
	0	0	0	0	1	0	Physical resource fault
	0	0	0	0	1	1	Remote test activation/ Remote test information
	0	0	0	1	0	0	Alarm
	0	0	0	1	0	1	Subscription suggest
	0	0	0	1	1	0	Start quality measurement
	0	0	0	1	1	1	Quality measurement value
	0	0	1	0	0	0	Stop quality measurement
	0	0	1	0	0	1	Resynchronization request
All other values							Reserved

Physical resource fault

Bit	8	7	6	5	4	3	2	1	Octet
	Physical resource fault item								5
	EMC								6

Bits 8	7	6	5	4	3	2	1	Meaning
X	X	X	X	X	X	X	1/0	Antenna fault present/absent
X	X	X	X	X	X	1/0	X	RF unit plus logic fault present/absent
X	X	X	X	X	1/0	X	X	Line interface unit fault present/absent
X	X	X	X	1/0	X	X	X	Power supply unit fault present/absent
X	X	X	1/0	X	X	X	X	Backup battery fault present/absent
X	X	1/0	X	X	X	X	X	Network terminating unit fault present/absent
X	1/0	X	X	X	X	X	X	General unit fault present/absent
1/0	X	X	X	X	X	X	X	Escape
								X: don't care

If bit 8 is set, the EMC shall be present.

Remote test activation

Bit	8	7	6	5	4	3	2	1	Octet
	Remote test activation item 1								5
	Remote test activation item 2								6
	EMC								7

Remote test activation item 1:

Bits 8	7	6	5	4	3	2	1	Meaning
X	X	X	X	X	X	X	1/0	Detect network terminating unit test activated/deactivated
X	X	X	X	X	X	1/0	X	Detect presence of telephone test activated/deactivated
X	X	X	X	X	1/0	X	X	Check for leakage to earth test activated/deactivated
X	X	X	X	1/0	X	X	X	Detect hazardous voltage test activated/deactivated
X	X	X	1/0	X	X	X	X	Detect mains power at CTA test activated/deactivated
X	X	1/0	X	X	X	X	X	Check for dial tone from exchange at CTA test activated/deactivated
X	1/0	X	X	X	X	X	X	Link Quality test activated/deactivated
1/0	X	X	X	X	X	X	X	RSSI test activated/deactivated
								X: don't care

Remote test activation item 2:

Bits 8	7	6	5	4	3	2	1	Meaning
X	X	X	X	X	X	X	1/0	Ring/Ring trip test activated/deactivated
X	X	X	X	X	X	1/0	X	Dialled digit test activated/deactivated
X	X	X	X	X	1/0	X	X	Deliver number of failed remote call attempts made by CTA
X	X	X	X	1/0	X	X	X	Reserved
X	X	X	1/0	X	X	X	X	Reserved
X	X	1/0	X	X	X	X	X	Reserved
X	1/0	X	X	X	X	X	X	Reserved
1/0	X	X	X	X	X	X	X	Escape
								X: don't care

If bit 8 is set, the EMC shall be present.

Remote test information

Bit	8	7	6	5	4	3	2	1	Octet
	Remote test information item 1								5
	Remote test information item 2								6
	Result fields / EMC								7
									L+?

Remote test information item 1:

Bits	8	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	1	Results on test Detect network terminating unit
	0	0	0	0	0	0	1	0	Results on test Detect presence of telephone
	0	0	0	0	0	1	0	0	Results on test Check for leakage to earth
	0	0	0	0	1	0	0	0	Results on test Detect hazardous voltage
	0	0	0	1	0	0	0	0	Results on test Detect mains power at CTA
	0	0	1	0	0	0	0	0	Results on test Check for dial tone from exchange at CTA
	0	1	0	0	0	0	0	0	Results on test Link Quality
	1	0	0	0	0	0	0	0	Results on test RSSI test

Remote test information item 2:

Bits	8	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	1	Results on test Ring/Ring trip test activated/deactivated
	0	0	0	0	0	0	1	0	Results on test Dialled digit test activated/deactivated
	0	0	0	0	0	1	0	0	Delivery of number of failed remote call attempts made by CTA
	0	0	0	0	1	0	0	0	Reserved
	0	0	0	1	0	0	0	0	Reserved
	0	0	1	0	0	0	0	0	Reserved
	0	1	0	0	0	0	0	0	Reserved
	1	0	0	0	0	0	0	0	Escape

If bit 8 is set, the EMC shall be present, as first octet in the result field.

Result field(s):

The content of the result fields has to be defined after definition of the tests (annex D).

Alarm

Bit	8	7	6	5	4	3	2	1	Octet
	Alarm item								5
	EMC								7

Bits	8	7	6	5	4	3	2	1	Meaning
	X	X	X	X	X	X	X	1/0	Mains failure alarm present/absent
	X	X	X	X	X	X	1/0	X	Power supply failure alarm present/absent
	X	X	X	X	X	1/0	X	X	Low battery voltage alarm present/absent
	X	X	X	X	1/0	X	X	X	Opening of CTA enclosure alarm present/absent
	X	X	X	1/0	X	X	X	X	Reserved
	X	X	1/0	X	X	X	X	X	Reserved
	X	1/0	X	X	X	X	X	X	Reserved
	1/0	X	X	X	X	X	X	X	Escape
									X: don't care

If bit 8 is set, the EMC shall be present.

Subscription suggest

Bit	8	7	6	5	4	3	2	1	Octet
	Port-No.								5

Bits	8	7	6	5	4	3	2	1	Meaning
	X	X	X	X	X	X	X	X	Desired Port-No. (0-FFH)

Start quality measurement

Bit	8	7	6	5	4	3	2	1	Octet
	Quality measurement parameters								5
	(Quality measurement parameters)								L+?

NOTE 1: The content of the fields for quality measurement parameters is manufacturer dependent.

Quality measurement value

Bit	8	7	6	5	4	3	2	1	Octet
	Quality measurement values								5
	(Quality measurement values)								L+?

NOTE 2: The content of the fields for quality measurement values is manufacturer dependent.

Annex C (informative): CTA data port realizations

In conventional RLL configurations the Cordless Terminal Adapter (CTA) is normally configured to provide a physical interface port which, as near as possible, offers the standard PSTN/ISDN services. Therefore in order for a subscriber to access the advanced data services specified above he or she would require certain additional equipment. Typical configurations include the following:

Table C.1: Usual CTA port implementations

Data Service	CTA Port type	Communications Device	User Data Terminal (DTE) type
Internet access	PSTN/ISDN	Voiceband modem	PC, PDA, etc.
Internet access	ISDN	ISDN TA/card	PC, PDA, etc.
Modem	PSTN/ISDN	Voiceband modem	PC, PDA, etc.
Group 3 Fax	PSTN/ISDN	Voiceband fax modem (note)	Fax Machine, PC, PDA, etc.
NOTE: The fax modem would naturally be built in to a fax machine and therefore would not be a separate device.			

It is certainly possible for the data services profiles to provide these services based on standard PSTN/ISDN CTA ports. However the data being transported is already in digital format so it would not be efficient to convert it back into an analogue PSTN (or voiceband PCM) format. It is also not usually efficient to convert it to a 64 kbit/s isochronous data stream. In addition the data services profiles have been optimized to allow direct communications from PP/CTA to most DTE types, without the need for a "communications device". This therefore leads to the concept of the CTA Data Port, see figure C.1.

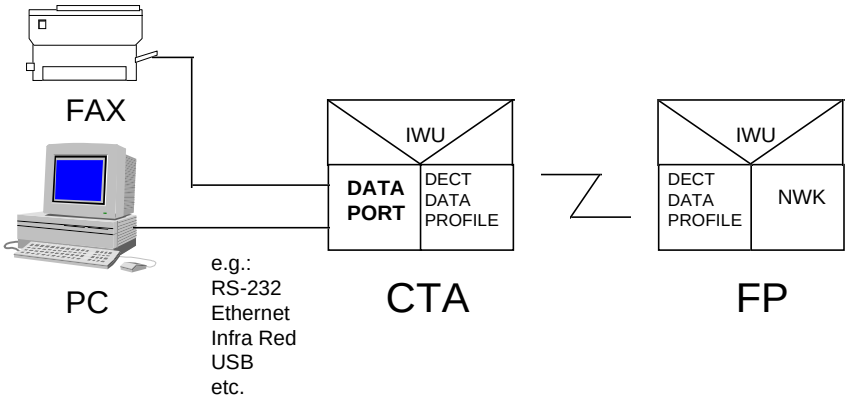


Figure C.1: The CTA Data Port concept

This type of CTA configuration takes advantage of the fact that there are industry standard data interfaces which are far more suited to data communications than either the PSTN or the ISDN. It also takes advantage of the fact that both the DECT Data Service Profiles and most common User Data Terminals (DTEs) interface easily with these industry standard interfaces.

There are many possibilities for CTA Data Port types, including RS-232, LAN (Ethernet, Token Ring), IrDA (e.g. Infra Red), Parallel Port, Universal Serial Bus (USB), etc.

Using the CTA Data Port concept the advanced data services can therefore be provided as follows:

Table C.2: CTA data port alternative implementations

Data Service	CTA Port type	Communicatios Device	User Data Terminal (DTE) type
Internet access	LAN (Ethernet, token ring)	-	PC, PDA, etc.
Internet access	Serial link (RS-232, USB)	-	PC, PDA, etc.
Modem	Serial link (RS-232, USB)	-	PC, PDA, etc.
Group 3 Fax	Serial link (RS-232, USB)	-	PC, PDA, etc.
Group 3 Fax	PSTN (note)	-	Fax machine
NOTE: The PSTN port is the standard way to communicate with fax machines.			

Annex D (normative): Interworking with WRSs

This annex describes:

- additional requirements for WRSs;

- additional requirements for FTs with respect to support of WRSs.

RAP part 2 compliance can only be obtained for the CRFP type WRS. For European approval, no more than one hop shall be allowed in a network with Wireless Relay Stations. On a national base, multihop architectures can be allowed after agreement with the national authority. In this case, to provide a RAP compliant interface to the FT, the first WRS in the chain is of the CRFP type.

D.1 Definitions of features, services and procedures

D.1.1 NWK features

Transparency between FT and PT [N.201]: the ability of the CRFP to be transparent for all DECT air interface procedures handled between the PT and FT.

Encryption of relayed connections [N.202]: the ability of the CRFP and the FT to support encryption of relayed connections.

D.1.2 MAC services

Extended Fixed Part Capabilities [M.201]: a service which indicates the extended capabilities of the FP to the PT or to the CRFP-PT.

Hop Control [M.202]: a service used by the FP to control the number of WRS hops.

Normal relay operation [M.203]: a service that only provides unencrypted relayed connections.

Dual relay operation [M.204]: a service that provides encryption of relayed connections.

Bearer handover, intra-cell of PT within CRFP [M.205]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the same CRFP while maintaining the service to the DLC layer.

Bearer handover, intra-cell of CRFP within one RFP [M.206]: internal MAC process initiated by a CRFP communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the same RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of CRFP from one RFP to a RFP [M.207]: internal MAC process initiated by a CRFP communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a CRFP to a RFP [M.208]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a RFP to a CRFP [M.209]: internal MAC process initiated by a PT communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another CRFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a CRFP to a CRFP [M.210]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the other CRFP while maintaining the service to the DLC layer.

Connection handover, inter-cell of CRFP from one RFP to a RFP [M.211]: in the MAC layer, it is the process initiated by the CRFP communicating with a RFP enabling setting up a new connection in the domain of another RFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a CRFP to a RFP [M.212]: in the MAC layer, it is the process initiated by the PT communicating with a CRFP enabling setting up a new connection in the domain of another RFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a RFP to a CRFP [M.213]: in the MAC layer, it is the process initiated by the PT communicating with a RFP enabling setting up a new connection in the domain of another CRFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a CRFP to a CRFP [M.214]: in the MAC layer, it is the process initiated by the PT communicating with a CRFP enabling setting up a new connection in the domain of another CRFP to support connection handover at the DLC layer.

D.2 Interoperability requirements

D.2.1 NWK features

There are no NWK requirements for the CRFP-FT.

For the CRFP-PT a subset of the NWK features of the following profiles shall be provided:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

For RAP part 2, additionally the following NWK features shall be supported by the CRFP-PT and the FT supporting a CRFP.

Table D.1: NWK features status

Feature supported				
			Status	
Item no.	**Name of feature**	**Ref.**	**CRFP-PT**	**FT**
N.102	Incoming maintenance transaction	5.1.1	O	See 6.2.2
N.103	Outgoing maintenance transaction	5.1.1	O	See 6.2.2
N.104	Maintenance using an existing connection	5.1.1	O	See 6.2.2
N.107	Physical resources fault	5.1.1	O	See 6.2.2
N.108	Remote test	5.1.1	O	See 6.2.2
N.109	Alarms	5.1.1	O	See 6.2.2
N.110	Start remote over the air subscription	5.1.1	O	See 6.2.2
N.111	Start Quality measurement	5.1.1	O	See 6.2.2
N.112	Stop Quality measurement	5.1.1	O	See 6.2.2
N.116	Remote configuration	5.1.1	O	See 6.2.2
N.121	Incoming WRS maintenance transaction	5.1.1	O	See 6.2.2
N.122	Outgoing WRS maintenance transaction	5.1.1	O	See 6.2.2
N.123	Claim	5.1.1	O	See 6.2.2
N.201	Transparency between FT and PT	D1.1	M	N/A
N.202	Encryption of relayed connections (procedure: Cipher key transfer to CRFP)	D1.1	C1	O
C1: IF encryption M for PT (as result of profile supported) THEN M ELSE O.				

D.2.2 DLC services

There are no DLC requirements for the CRFP-FT.

For the CRFP-PT a subset of the DLC features of the following profiles shall be provided:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

For the FT there are no additional DLC requirements for support of a CRFP.

D.2.3 MAC services

For the CRFP-PT and the CRFP-FT, the MAC services of the following profiles shall be provided:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

Additionally the following MAC features shall be supported by the CRFP-PT, CRFP-FT and the FT supporting a CRFP.

The CRFP-FT shall support the Blind slot information service as described in subclause 6.4.2.

The CRFP-PT shall provide the Improved Channel Selection Rules service as described in subclause 6.4.3.

Table D.2: MAC services status

Service supported					
			Status		
Item no.	**Name of service**	**Ref.**	**CRFP-PT**	**CRFP-FT**	**FT**
M.201	Extended Fixed Part Capabilities	D.1.2	M	M	O
M.202	Hop Control	D.1.2	M	M	O
M.203	Normal relay operation	D.1.2	M	N/A	O
M.204	Dual relay operation	D.1.2	O	N/A	O
M.205	Bearer handover, intra-cell of PT within CRFP	D.1.2	N/A	note 1	N/A
M.206	Bearer handover, intra-cell of CRFP within one RFP	D.1.2	O	N/A	note 1
M.207	Bearer handover, inter-cell of CRFP from one RFP to a RFP	D.1.2	O	N/A	note 1
M.208	Bearer handover, inter-cell of PT from a CRFP to a RFP	D.1.2	note 2	note 1	note 1
M.209	Bearer handover, inter-cell of PT from a RFP to a CRFP	D.1.2	note 2	note 1	note 1
M.210	Bearer handover, inter-cell of PT from a CRFP to a CRFP	D.1.2	note 2	note 1	N/A
M.211	Connection handover, inter-cell of CRFP from one RFP to a RFP	D.1.2	O	N/A	note 1
M.212	Connection handover, inter-cell of PT from a CRFP to a RFP	D.1.2	note 2	note 1	note 1
M.213	Connection handover, inter-cell of PT from a RFP to a CRFP	D.1.2	note 2	note 1	note 1
M.214	Connection handover, inter-cell of PT from a CRFP to a CRFP	D.1.2	note 2	note 1	N/A

NOTE 1: See FT MAC service status of the following profile if supported:

- the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
- the DECT data profile A/B.2 as defined in ETS 300 701 [22];
- the DECT data profile C.2 as defined in ETS 300 651 [23];
- the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

NOTE 2: See PT MAC service status of the following profile if supported:

- the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
- the DECT data profile A/B.2 as defined in ETS 300 701 [22];
- the DECT data profile C.2 as defined in ETS 300 651 [23];
- the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

D.2.4 PHL services

For the CRFP-PT and the CRFP-FT the PHL services of the following profiles shall be provided:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

Additionally, for the CRFP-PT and CRFP-FT the PHL requirements as specified in subclause 4.2.1 of ETS 300 700 [15] apply.

D.2.5 NWK feature to procedure mapping

Table D.3: NWK feature to procedure mapping

Feature/Procedure mapping				
Feature	**Procedure**	**Ref.**	**Status**	
			CRFP-PT	**FT**
N.102, Incoming maintenance transaction		5.1.1	O	See 6.6
	Incoming maintenance call	7.1.1.1	M	See 6.6
	Sending OA&M information	7.2	M	See 6.6
N.103, Outgoing maintenance transaction		5.1.1	O	See 6.6
	Outgoing maintenance call	7.1.1.1	M	See 6.6
	Sending OA&M information	7.2	M	See 6.6
N.104, Maintenance using an existing connection		5.1.1	O	See 6.6
	Sending OA&M information	7.2	M	See 6.6
N.107, Physical resources fault		5.1.1	O	See 6.6
	Physical resources fault	7.2.1	M	See 6.6
N.108, Remote test		5.1.1	O	See 6.6
	Remote test	7.2.2	M	See 6.6
N.109, Alarms		5.1.1	O	See 6.6
	Alarms	7.2.3	M	See 6.6
N.110, Start remote over the air subscription		5.1.1	O	See 6.6
	Subscription to a new Fixed Part	7.2.4.1	M	See 6.6
	Resubscription to the same Fixed Part	7.2.4.2	M	See 6.6
	Additional subscriptions to the same Fixed Part	7.2.4.3	M	See 6.6
	Remote resynchronization	7.2.8	M	See 6.6
N.111, Start Quality measurement		5.1.1	O	See 6.6
	Start Quality measurement	7.2.5	M	See 6.6
N.112, Stop Quality measurement		5.1.1	O	See 6.6

(continued)

Table D.3 (concluded): NWK feature to procedure mapping

Feature/Procedure mapping				
Feature	**Procedure**	**Ref.**	**Status**	
			CRFP-PT	**FT**
	Stop Quality measurement	7.2.6	M	See 6.6
N.116, Remote configuration		5.1.1	O	See 6.6
	Remote configuration	7.2.7	M	See 6.6
N.121, Incoming WRS maintenance transaction		5.1.1	O	See 6.6
	Incoming WRS maintenance call	7.3.1	M	See 6.6
	Sending OA&M information	7.3.2	M	See 6.6
N.122, Outgoing WRS maintenance transaction		5.1.1	O	See 6.6
	Outgoing WRS maintenance call	7.3.2	M	See 6.6
	Sending OA&M information	7.2	M	See 6.6
N.123, Claim		5.1.1	O	See 6.6
	Claim Actions	7.2.9	M	See 6.6
N.201, Transparency between FT and PT		D1.1	M	N/A
	Transparency between FT and PT	D.3.1	M	N/A
N.202, Encryption of relayed connections		D1.1	C1	O
	Cipher key transfer to CRFP	D.3.2	M	M
C1: IF encryption M for PP (as result of profile supported) THEN M ELSE O.				

D.2.6 DLC service to procedure mapping

D.2.7 MAC service to procedure mapping

Table D.4: MAC service to procedure mapping

Service/Procedure mapping					
			Status		
Service	**Procedure**	**Ref.**	**CRFP-PT**	**CRFP-FT**	**FT**
M.201, Extended Fixed Part Capabilities		D.1.2	M	M	O
	Extended Fixed Part Capabilities	D.4.1	M	M	M
M.202, Hop Control		D.1.2	M	M	O
	Hop Control	D.4.2	M	M	M
M.203, Normal relay operation		D.1.2	M	N/A	O
	Normal C/O bearer set-up	D.4.3	M	N/A	M
	C/O connection release	D.4.6	M	N/A	M
M.204, Dual relay operation		D.1.2	C1	N/A	O
	Dual C/O bearer set-up	D.4.4	M	N/A	M
	CRFP connection suspend and resume	D.4.5	M	N/A	M
	C/O connection release	D.4.6	M	N/A	M
M.205, Bearer handover, intra-cell of PT within CRFP		D.1.2	N/A	note 1	N/A
	Bearer handover request	D.4.7	N/A	M	N/A
M.206, Bearer handover, intra-cell of CRFP within one RFP		D.1.2	O	N/A	note 1
	Bearer handover request	D.4.7	M	N/A	M
M.207, Bearer handover, inter-cell of CRFP from one RFP to a RFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.208, Bearer handover, inter-cell of PT from a CRFP to a RFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.209, Bearer handover, inter-cell of PT from a RFP to a CRFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.210, Bearer handover, inter-cell of PT from a CRFP to a CRFP		D.1.2	note 2	note 1	N/A
	Bearer handover request	D.4.7	M	M	N/A
M.211, Connection handover, inter-cell of CRFP from one RFP to a RFP		D.1.2	O	N/A	note 1
	Connection handover request	D.4.8	M	N/A	M
M.212, Connection handover, inter-cell of PT from a CRFP to a RFP		D.1.2	note 2	note 1	note 1
	Connection handover request	D.4.8	M	M	M

(continued)

Table D.4 (concluded): MAC service to procedure mapping

Service/Procedure mapping					
			Status		
Service	**Procedure**	**Ref.**	**CRFP-PT**	**CRFP-FT**	**FT**
M.213, Connection handover, inter-cell of PT from a RFP to a CRFP		D.1.2	note 2	note 1	note 1
	Connection handover request	D.4.8	M	M	M
M.214, Connection handover, inter-cell of PT from a CRFP to a CRFP		D.1.2	note 2	note 1	N/A
	Connection handover request	D.4.8	M	M	N/A

C1: IF encryption M for PP (as a result of profile supported) THEN M ELSE O.

NOTE 1: See FT MAC service status of the following profile if supported:

1) the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
2) the DECT data profile A/B.2 as defined in ETS 300 701 [22];
3) the DECT data profile C.2 as defined in ETS 300 651 [23];
4) the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

NOTE 2: See PT MAC service status of the following profile if supported:

- the DECT-ISDN Intermediate System (IIP) as defined in ETS 300 822 [20];
- the DECT data profile A/B.2 as defined in ETS 300 701 [22];
- the DECT data profile C.2 as defined in ETS 300 651 [23];
- the DECT data profile F.2 as defined in ETS 300 755 [24];

however only if the profile is supported.

D.3 NWK layer procedures

D.3.1 NWK layer transparency between FT and PT

The CRFP shall provide full transparency for all NWK layer messages exchanged between FT and PT.

D.3.2 Cipher key transfer to CRFP

The procedure shall be performed as defined in subclauses 5.3.4.1 and 5.3.4.2 of ETS 300 700 [15].

D.4 MAC layer procedures

D.4.1 Extended Fixed Part capabilities

The procedure shall be performed as defined in subclause 4.4.2.1 of ETS 300 700 [15].

D.4.2 Hop control

The procedure shall be performed as defined in subclause 4.4.2.2 of ETS 300 700 [15].

D.4.3 Normal C/O bearer set-up

The procedure shall be performed as defined in subclause 5.3.1.1.2 of ETS 300 700 [15].

D.4.4 Dual C/O bearer set-up

The procedure shall be performed as defined in subclause 5.3.1.1.3 of ETS 300 700 [15].

D.4.5 CRFP connection suspend and resume

The procedure shall be performed as defined in subclause 5.3.1.2 of ETS 300 700 [15].

D.4.6 CRFP C/O release

The procedure shall be performed as defined in subclause 5.3.1.4 of ETS 300 700 [15].

D.4.7 Bearer handover request

The procedures for:

1) Bearer handover, intra-cell of PT within CRFP;
2) Bearer handover, intra-cell of CRFP within one RFP;
3) Bearer handover, inter-cell of CRFP from one RFP to a RFP;
4) Bearer handover, inter-cell of PT from a CRFP to a RFP;
5) Bearer handover, inter-cell of PT from a RFP to a CRFP;
6) Bearer handover, inter-cell of PT from a CRFP to a CRFP;

shall be performed as defined in subclause 5.3.1.3 of ETS 300 700 [15].

D.4.8 Connection handover request

The procedures for:

1) Connection handover, inter-cell of CRFP from one RFP to a RFP;
2) Connection handover, inter-cell of PT from a CRFP to a RFP;
3) Connection handover, inter-cell of PT from a RFP to a CRFP;
4) Connection handover, inter-cell of PT from a CRFP to a CRFP;

shall be performed as defined in subclause 5.3.2.1 of ETS 300 700 [15].

Annex E (normative): Synchronization requirements for fixed parts

Public systems shall provide intrasystem cluster synchronization and shall have either GPS synchronization and a Synchronization Output Port or a complete Synchronization Port (both input and output). This will allow absolute time synchronization via GPS or wired mutual synchronization, if an operator requires local synchronization between operators.

Table E.1: Synchronization requirements

Synchronization requirements			
			Status
Item no.	**Name of feature**	**Reference (ETS 300 175-2)**	**FT (Public)**
S.1	GPS multiframe time synchronization	C.5.1	O
S.2	DECT SYNC output port, Class 1	Annex C	M
S.3	DECT SYNC input port, Class 1	Annex C	C1
C1: IF S1 THEN O ELSE M.			

History

Document history			
January 1997	Public Enquiry	PE 9720:	1997-01-17 to 1997-05-16