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Private Integrated Services Network (PISN); Profile Standard for the connection of Radio Paging Equipment (RPE) to a PISN

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

Contents

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Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the European Computer Manufacturers Association (ECMA) on behalf of its members and those of the European Telecommunications Standard Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

This final draft ETS is one of a series of ECMA standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses the ISDN concepts as developed by the ITU-T (formerly CCITT) and is also within the framework of standards for open system interconnection as defined by ISO.

This final draft ETS specifies the functional profile for interconnecting Radio Paging Equipment (RPE) with PISNs to permit interoperability between equipment from different vendors.

The final draft ETS is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and various international and national standardization bodies. It represents a pragmatic and widely based consensus.

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 Profile Standard specifies the combination of base standards, together with the selection of appropriate options and parameter values, necessary to interface a Radio Paging Equipment (RPE) to a Private Integrated Services Network Exchange (PINX).

The standard provides for two methods of connection of an RPE to a PINX. With the first method, the RPE is connected in a similar manner to a TE connected at the S reference point using an ISDN basic access interface at layer 1. With the second method the RPE is connected in a similar manner to another PINX connected at the C reference point using an ISDN basic access interface or a primary rate interface at layer 1. In this case static mapping is employed between the C reference point and the Q reference point. The C, Q and S reference points are defined in ISO/IEC 11579-1 [4].

This Standard states requirements upon implementations to achieve interoperability between equipment on each side of the RPE/PINX interface.

> NOTE: Implementation of one or more profiles from this Standard does not preclude a manufacturer from offering other means of interconnection.

2   Conformance

A system conforms to this Standard if it correctly performs all the mandatory capabilities defined in the requirement list (RL) and the profile specific implementation conformance statement (ICS). Note that more capabilities may be mandatory than in the base standards (annex A and B).

3   References

[1]   ISO/IEC 9646-7 (1995): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation conformance statements - Requirements and guidance on ICS and ICS proformas".

[2]   ISO/IEC 11571 (1994): "Information technology - Telecommunications and information exchange between systems - Numbering and sub-addressing in private integrated services network".

[3]   ISO/IEC 11572 (1994): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode bearer services - Inter-exchange signalling procedures and protocol".

[4]   ISO/IEC 11579-1 (1994): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN Exchanges (PINX)".

[5]   ISO/IEC 11582 '1995): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol".

[6]   ISO/IEC 13868 (1995): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Name identification supplementary services".

[7]   ISO/IEC 13869 (1995): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call transfer supplementary service".

[8]   ISO/IEC 15054 (1996): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-Exchange Signalling Protocol - Call Interception Additional Network Feature".

[9]   ISO/IEC 13873 (1995): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call diversion supplementary services".

[10]   ISO/IEC 13874 (1995): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Path replacement additional network feature".

[11]   ETS 300 011 (1992): "Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles".

[12]   ETS 300 012 (1992): "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

[13]   ETS 300 192 (1992): "Private Telecommunication Network (PTN); Signalling protocol at the S-reference point; Circuit mode basic services".

[14]   ETS 300 362 (1994): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Call offer supplementary service".

[15]   ETS 300 364 (1994): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Do not disturb and do not disturb override supplementary services".

[16]   ETS 300 366 (1994): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Call completion supplementary services".

[17]   ETS 300 402-1 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 1: General aspects".

[18]   ETS 300 402-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification".

[19]   ETS 300 402-4 (1996): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 4: Protocol Implementation Conformance Statement (PICS) proforma specification for the general protocol".

[20]   ETS 300 426 (1995): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Call intrusion supplementary service".

[21]   CCITT Q.850 (1993): "Usage of cause and location in the Digital Subscriber Signalling System No.1 and the Signalling System No.7 ISDN User Part".

[22]   ESPA 4.4.8 (1992): "Proposal for standard supplementary services for interworking of Private ISDN and Radio Paging".

4 Definitions

4.1 External definitions

This standard uses the following terms defined in other documents:

Additional Network Feature (ANF): see ISO/IEC 11582 [5]

Call, Basic call: see ISO/IEC 11582 [5]

Private Integrated Services Network Exchange (PINX): see ISO/IEC 11579 [4]

Transferring PINX: see ISO/IEC 13869 [7]

Transit PINX: see ISO/IEC 11572 [3]

Terminating PINX: see ISO/IEC 11572 [3]

4.2 Internal definitions

For the purpose of this standard, the following definitions apply:

Meet-me answer: A procedure for the paged user, after he has been paged, to answer a call (i.e. to get a speech connection with the calling user) by calling a specific destination in the PISN.

Meet-me (answer) destination: A PISN-number which is called in a meet-me answer.

Meet-me service: A service in a PISN to allow a called user to be connected to a calling user by making a meet-me answer.

Paging (call): A basic call where the destination is a pager rather than a terminal.

Pager: A pocket receiver in a paging system.

Pager number: PISN-number which identifies a pager.

Speech paging: A paging where a speech connection is established to the pager.

5 List of acronyms

ANF	Additional Network Feature
CD	Call Deflection
CFB	Call Forwarding on Busy
CFNR	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CI	Call Intrusion
CINT	Call Interception
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CNIP	Calling Name Identification Presentation
CO	Call Offer
COLP	Connected Line Identification Presentation
CONP	Connected Name Identification Presentation
CT	Call Transfer
CW	Call Waiting
DND	Do Not Disturb
DNDO	DND Override
ICS	Implementation Conformance Statement
PICS	Protocol ICS
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network

RL	Requirements List
RPE	Radio Paging Equipment
TE	Terminal Equipment

6 Addressing

Addressable entities are:

- Pagers;
- Meet-me answer destinations;
- optionally the RPE fixed part.

Pager numbers shall be part of the native numbering plan as defined in ISO/IEC 11571 [2] and shall uniquely identify the pagers. All pager numbers shall be allocated to the RPE. For the S reference point this means that all pager numbers will have to be assigned to the access where the RPE is connected. This results in an MSN arrangement. For the Q reference point this means that all paging calls are routed to the RPE in the same way as to another PINX.

> NOTE: This means that in general the same number cannot be used for a telephone and a pager.

In the case of the Q reference point all meet-me destinations shall have numbers which are part of the native numbering plan and shall be allocated to the RPE. There could either be a fixed relationship between the pager number and the meet-me answer number, or a dynamic allocation of the meet-me answer number on a per call basis. The relationship between the pager number and meet-me answer number is an RPE matter and implementation dependant.

In the case of the S reference point the meet-me destination numbers are implementation dependant and the definition of them is therefore outside the scope of this Standard.

The RPE fixed part may, but need not, be an addressable entity. If it is, its number shall be part of the native numbering plan.

7 Profile for the S reference point

An RPE acts as a TE when connected to an interface at the S reference point. Only the basic access interface is covered by this Standard.

7.1 Paging services

The following paging services are covered:

- Paging call with or without a speech connection to the pager, with or without explicit acknowledgement from the pager;
- Diversion to paging;
- Paging with meet-me answer (implementation dependant).

7.1.1 Paging call with or without a speech connection to the pager

This type of call is a basic call where the called number identifies a pager rather than a terminal. The paging calls are routed to the RPE by the PISN.

If CLIP is provided the paged user may call the calling user back. This is then a normal basic call and is outside the scope of this Standard.

> NOTE: The pager may send an explicit acknowledgement after receipt of the paging call.

7.1.2 Diversion to paging

Diversion to paging is a normal CFU or CFNR where the diverted-to-number is the number of a pager. The paging calls are routed to the RPE by the PISN.

If CLIP is provided the paged user may call the calling user back. This is then a normal basic call and is outside the scope of this Standard.

NOTE: The pager may send an explicit acknowledgement after receipt of the paging call.

7.1.3 Paging with meet-me answer

Support of the meet-me service is implementation dependant and may be implemented either in the PINX or in the RPE. The meet-me service requires that the call originating from the meet-me answer is joined with the original call. Procedures how this is achieved are outside the scope of this Standard.

If the PINX has implemented a meet-me service the RPE may be required to reach a certain call state and remain there while waiting for meet-me answer, or the meet-me answer may be independent of the state of the paging call. In the first case the meet-me implementation may either require the RPE to wait in the call received state, or to send a CONNECT and wait in the active state.

If the meet-me service is implemented in the RPE then it has no impact on the PINX. The original call is joined together locally in the RPE with the meet-me answer call.

NOTE 1: The RPE local meet-me service requires two B-channels per call. It may be improved e.g. by using a call transfer procedure to re-route the two calls and thereby release the RPE for new calls. The procedure for this is outside the scope of this Standard.

NOTE 2: The meet-me service may be limited to meet-me answer from the local PINX.

7.2 Basic access interface (S0)

7.2.1 Layer 1 requirements

The layer 1 of the interface shall comply with ETS 300 012 [11].

7.2.2 Layer 2 requirements

The layer 2 protocol shall conform to ETS 300 402-2 [17]. The services provided to layer 3 shall be as specified in ETS 300 402-1 [16]. The connection should be point-to-multipoint.

7.2.3 Layer 3 requirements for basic call procedures

The procedures of ETS 300 192 [12] for call establishment at the destination interface shall apply with the qualifications specified below. Only messages with a special meaning to this Standard are mentioned.

NOTE 1: If in addition to the RPE other compatible terminals (e.g. telephones) are connected to the same interface at the S reference point, care should be taken that all the equipment can evaluate called party number information to prevent incorrect answers.

NOTE 2: If the RPE has the capability to setup calls this may be done according to subclause 8.1 of ETS 300192 [12] "call establishment at the originating interface". This is outside the scope of this Standard.

7.2.3.1 SETUP

A call to a pager is established by sending a SETUP message to the RPE. The full pager number shall be sent in the Called party number information element in the SETUP message.

7.2.3.2 CALL PROCEEDING

CALL PROCEEDING shall be sent from the RPE as response to a SETUP if the RPE accepts the call but is not able to send an ALERTING within expiry of timer T303.

7.2.3.3 ALERTING

ALERTING shall be sent from the RPE to the PINX as an indication to the calling party that the paged user will be alerted in a proper way.

NOTE: The exact definition of "alerted in a proper way" is outside the scope of this Standard and is implementation dependant. Examples of "not alerted in a proper way" may be: pager in storage rack, no relevant display message (e.g. due to CLIR activated) or undefined or erroneous pager number (i.e. in the RPE).

7.2.3.4 CONNECT

CONNECT shall be sent from the RPE in the following cases:

- The call is a speech paging and the speech channel is available;
- The call is a speech call and the RPE is equipped with a voice message facility to give information to the calling user;
- The call is explicitly acknowledged by the pager. In this case it is recommended to provide a special tone or announcement if possible;
- The call is a data call and the RPE has the possibility to receive B-channel data;
- The meet-me answer implementation requires the call to be in the active state.

In all other cases an active call state is not required and CONNECT should not be sent.

7.2.3.5 DISCONNECT

In the case of a successful paging the RPE shall send a DISCONNECT message with cause 16, "Normal call clearing". If DISCONNECT is sent as the first message after ALERTING it should be sent after a suitable delay to allow the calling user to receive the alerting indication.

If the meet-me service is applicable the delay time (regardless of which state the call is in) should allow the called user to make a meet-me answer.

When DISCONNECT is sent in the case where the call is not successful the cause values specified in subclause 7.2.5.4 shall be used.

NOTE: In certain failure situations a RELEASE COMPLETE message will be sent instead of DISCONNECT as a direct response to SETUP.

7.2.3.6 RELEASE COMPLETE

A RELEASE COMPLETE message shall be sent in unsuccessful cases with the cause values specified in subclause 7.2.5.4, if no other response to SETUP has been sent.

7.2.4 Supplementary services requirements

7.2.4.1 CLIP

CLIP shall be used to send the calling party number to the RPE.

NOTE: Calling party number information element may not be present or may have no valid information, e.g. due to restrictions. The RPE may then reject the call with cause value # 21.

7.2.4.2 COLP

The RPE may include a connected number information element in the CONNECT message in the case when the RPE has forwarded a paging call from one pager to another. The connected number has to be an MSN number from the range allocated to the RPE access.

7.2.4.3   Diversion supplementary services

If diversion is supported, the PISN shall treat the RPE as a valid diverted-to-destination for telephone calls and shall also allow diversion to and from a pager for the basic service telephony.

7.2.4.4   Do not disturb

A PINX may allow a pager user to invoke do not disturb in the PISN.

7.2.5   Layer 3 coding requirements

7.2.5.1   Bearer capability

Information transfer capability shall be speech or 3.1 kHz audio. In addition unrestricted digital information may be used.

7.2.5.2   Called party number

The called party number is mandatory in the SETUP message to the RPE to specify the called pager.

7.2.5.3   Calling party number

The calling party number may be required for a paging call to be successful.

7.2.5.4   Cause

The following cause values shall be used from RPE to PINX with the following meaning:

- cause value #27, "destination out of order", if the RPE is not working properly;
- cause value #21, "call rejected", with diagnostics "information element missing" if an information element required for a successful paging (e.g. Calling party number) is missing;
- cause value #20, "subscriber absent", if the paged user is absent from, or currently not reachable at, the RPE;
- cause value #17, "user busy", if the paging is a speech paging and the paged number is already busy in a speech paging;
- cause value #34, "no circuit/channel available", if the paging is a speech paging and no speech channel is available;
- cause value #47, "resources unavailable, unspecified", if the paging is a meet-me paging and no meet-me answer destination is available.

The location field shall be set to "User".

7.2.5.5   High layer compatibility

High layer compatibility may be ignored by the RPE.

7.2.5.6   Low layer compatibility

Low layer compatibility may be ignored by the RPE.

8   Profile for the Q reference point

An RPE acts as a node in a PISN when connected via an inter-PINX link (i.e. at the Q reference point). Mapping of the signalling at the Q reference point onto both the basic access interface and primary rate interface are covered by this Standard.

8.1 Paging services

The following paging services are covered:

- Paging call with or without a speech connection to the pager, with or without explicit acknowledgement from the pager;
- Diversion to paging;
- Paging with meet-me answer.

8.1.1 Paging call with or without a speech connection to the pager

See subclause 7.1.1.

8.1.2 Diversion to paging

See subclause 7.1.2.

8.1.3 Paging with meet-me answer

Paging with meet-me answer shall make use of the call transfer supplementary service as specified in ISO/IEC 13869 [7].

The meet-me answer is a basic call to a specific PISN number allocated to the RPE. The RPE will then join the paging call with the meet-me answer call by a call transfer. This call transfer may be with or without rerouting depending on the capabilities of the PISN.

The meet-me answer destination is defined in the numbering plan as a normal destination located in the RPE.

8.2 Applicable scenarios

This Standard shall be applicable to continuous bit stream scenarios. Other scenarios are outside the scope of this Standard.

8.2.1 Layer 1 requirements

The link between the RPE and its adjacent PINX shall comply with ETS 300 011 [10] for primary rate (S2) or with ETS 300 012 [11] for basic access interface (S0). For ETS 300 012 [11] only the point-to-point configuration shall apply.

8.2.2 Layer 2 requirements

The layer 2 protocol shall conform to ETS 300 402-2 [17], as modified for inter-exchange use by annex ZA of that ETS. The services provided to layer 3 shall be as specified in ETS 300 402-1 [16], modified for inter-exchange use by annex ZA of that ETS.

8.2.3 Channel numbering

For primary rate interface the D-channel shall be mapped to time slot 16, B-channel 1-15 shall be mapped to time slot 1-15 and B-channel 16-30 to time slot 17-31.

8.3 Layer 3 requirements for basic call procedures

The PINX shall fulfil the requirements of ISO/IEC 11572 [3] for the outgoing side of an inter-PINX link and the RPE shall fulfil the requirements for the incoming side of an inter-PINX link. The RPE shall be capable of acting as a terminating PINX.

The capability of the RPE to act as an originating PINX is outside the scope of this Standard.

8.3.1 Messages

8.3.1.1 SETUP

A call to a pager is established by sending a SETUP message to the RPE.

> NOTE: In case of overlap sending the pager number will be sent in one or more INFORMATION messages.

8.3.1.2 ALERTING

See subclause 7.2.3.3.

8.3.1.3 CONNECT

CONNECT may be sent from the RPE in the following cases:

- The call is a speech paging and the speech channel is available;
- The call is a speech call and the RPE is equipped with a voice message facility to give information to the calling user;
- The call is explicitly acknowledged by the pager. In this case it is recommended to provide a special tone or announcement if possible;
- The call is a data call and the RPE has the possibility to receive B-channel data;
- The paging call is to be the active call for the meet-me service call transfer.

In all other cases, an active call state is not required and CONNECT should not be sent.

8.3.1.4 DISCONNECT

In the case of a successful paging the RPE shall send DISCONNECT with cause 16, "Normal call clearing". If DISCONNECT is sent as the first message after ALERTING, it should be sent after a suitable delay to allow the calling user to receive the alerting indication.

For cause values in the case where the call is not successful see subclause 7.2.5.4.

> NOTE: If in this case the RPE is to send a special tone or announcement it will send a PROGRESS message instead of DISCONNECT according to normal basic call procedures.

8.3.2 Information element coding

The RPE specific usage of information elements shall be the same as specified in subclause 7.2.5, except that the location field in the Cause information element can be set to either "User" or "Private network serving the remote user".

8.4 Supplementary services and ANF requirements

8.4.1 Generic Procedures

The RPE has to fulfil those parts of the procedures of ISO/IEC 11582 [5] that are required by the supplementary services implemented by the RPE.

The PINX adjacent to the RPE has to fulfil the transit PINX requirements of ISO/IEC 11582 [5].

> NOTE: The RPE has also to obey the requirements for the access, e.g. it must not display a restricted number or name unless the paged user has override capability.

8.4.2 Name supplementary services (CNIP, CONP)

The RPE may be able of receiving a calling name and/or to send a connected name in accordance with ISO/IEC 13868 [6].

8.4.3 Call Diversion (CFU, CFNR, CFB)

The RPE shall be capable of acting as the diverted-to-PINX for all types of call diversions. It may also be capable of acting as the served user PINX and in the case of forward switching from one pager to another, as a rerouting PINX.

This shall be done in accordance with ISO/IEC 13873 [8].

8.4.4 Call Transfer (CT)

If the meet-me service is implemented in the RPE the RPE shall act as transferring PINX in accordance with ISO/IEC 13869 [7].

8.4.5 Unsuccessful call supplementary services (CCBS, CO, CI, DNDO)

If paging with speech applies the RPE may act as the terminating PINX for any of these services according to ETS 300 366 [15], ETS 300 362 [13], ETS 300 426 [19], ETS 300 364 [14], respectively.

8.4.6 Call waiting (CW)

The RPE may include a notification "call is a waiting call" in the ALERTING message.

8.4.7 Do Not Disturb (DND)

The RPE may act as the served user PINX for DND according to ETS 300 364 [14].

8.4.8 Call Interception (CINT)

The RPE may act as terminating PINX with regard to CINT or as intercepted-to PINX according to ISO/IEC 15054 [9].

Annex A (normative)   : Profile Requirements List (RL)

A.1   General

Use of this Standard imposes requirements on the implementation that go beyond those of the base standards referred to by this Standard. These result in modifications to the requirements expressed in the PICS proformas for the base standards. This Annex specifies the modifications (the Requirements List - RL) that apply to the status of the items affected in each PICS proforma, with consequently modified requirements on the answers to be provided.

The layout and content of this annex is guided by ISO/IEC 9646-7 [1].

The Requirements List in this Annex shall be used to restrict the permitted support answers in the corresponding PICS.

A.2   Relationship between RL and corresponding PICS proformas

In the context of the profile specification contained in this Standard, PICS proformas of the base protocol standards contain tables in 3 categories. The 3 categories are:

- those proforma tables where this profile does not restrict the permitted support answers;
- those proforma tables where this profile restricts the permitted support answers;
- those proforma tables that are not relevant to this profile.

The Requirements List consists of the tables falling into the second category, with an indication of the modified items in that table.

A.3   Requirement List for PINX

A.3.1   Tables for the physical layer

A.3.1.1   S reference point

The profile described by this Standard places no extra requirements to the ones in ETS 300 012 [11].

A.3.1.2   Q reference point

The profile described by this Standard places no extra requirements to the ones in ETS 300 011 [10] or ETS 300 012 [11].

A.3.2   Tables for the link layer: D-channel

A.3.2.1   S reference point

The profile described by this Standard places no restrictions on the support answers requested by the PICS proforma contained in ETS 300 402-4 [18].

A.3.2.2   Q reference point

The profile described by this Standard places no restrictions on the support answers requested by the PICS proformas contained in ETS 300 402-4 [18].

A.3.3 Tables for the network layer

A.3.3.1 S reference point

Item numbers refer to annex G.3 of ETS 300 192 [12].

Item	Question/Feature	Reference	Protocol Status	Profile Status
Z1	Support of 64 kbps unrestricted bearer	ETS 300 192 12.5 5	o.1	o
Z2	Support of 64 kbps bearer with speech transfer capability	ETS 300 192 12.5 5	o.1	o.1
Z3	Support of 64 kbps bearer with 3.1 kHz audio transfer capability	ETS 300 192 12.5 5	o.1	o.1
Z5	Support of multipoint configuration for basic access	ETS 300 192	o	m
B17	Sending of Calling party number information element in a SETUP message	ETS 300 192 12.5 5	o	m

A.3.3.2 Q reference point

Item numbers refer to annex D of ISO/IEC 11572 [3].

Item	Question/Feature	Reference	Protocol Status	Profile Status
Z1	Support of the 64 kbps unrestricted bearer	ISO/IEC 11572 14.5.5	o.1	o
Z2	Support of the 64 kbps bearer with speech transfer capability	ISO/IEC 11572 14.5.5	o.1	o.1
Z3	Support of the 64 kbps bearer with 3.1 kHz audio transfer capability	ISO/IEC 11572 14.5.5	o.1	o.1
J16	Support of Calling party number in a SETUP message	ISO/IEC 11572 11.2.10	o	m

A.3.4 Tables for Supplementary Services and ANFs

No extra requirements.

A.4 Requirement List for RPE

A.4.1 Tables for the physical layer

A.4.1.1 S reference point

The profile described by this standard places no extra requirements to the ones in ETS 300 012 [11].

A.4.1.2 Q reference point

The profile described by this standard places no extra requirements to the ones in ETS 300 011 [10] or ETS 300 012 [11].

A.4.2   Tables for the link layer: D-channel

A.4.2.1   S reference point

The profile described by this Standard places no restrictions on the support answers requested by the PICS proforma contained in ETS 300 402-4 [18].

A.4.2.2   Q reference point

The profile described by this Standard places no restrictions on the support answers requested by the PICS proforma contained in ETS 300 402-4 [18].

A.4.3   Tables for the network layer

A.4.3.1   S reference point

Item numbers refer to annex G.4 of ETS 300 192 [12].

Item	Question/Feature	Reference	Protocol Status	Profile Status
Z1	Support of 64 kbps unrestricted bearer	ETS 300 192 12.5.5	o.1	o
Z2	Support of 64 kbps bearer with speech transfer capability	ETS 300 192 12.5.5	o.1	m
Z3	Support of 64 kbps bearer with 3.1 kHz audio transfer capability	ETS 300 192 12.5.5	o.1	m
Z5	Support of multipoint configuration for basic access	ETS 300 192	o	m
Z7	Support of outgoing calls	ETS 300 192	o.3	o
Z8	Support of incoming calls	ETS 300 192	o.3	m

A.4.3.2   Q reference point

Item numbers refer to annex D of ISO/IEC 11572 [3].

Item	Question/Feature	Reference	Protocol Status	Profile Status
Z1	Support of the 64kbps unrestricted bearer	ISO/IEC 11572 14.5.5	o.1	o
Z2	Support of the 64 kbps bearer with speech transfer capability	ISO/IEC 11572 14.5.5	o.1	m
Z3	Support of the 64 kbps bearer with 3.1 kHz audio transfer capability	ISO/IEC 11572 14.5.5	o.1	m

A.4.4   Tables for Supplementary Services and ANFs

No extra requirements.

Annex B (normative): Profile specific ICS proforma

Notwithstanding the provisions of the copyright clause related to the text of this ETR, ETSI grants that users of this ETR may freely reproduce the ICS template in this annex so that it can be used for its intended purpose.

B.1   Introduction

The layout and content of this annex is guided by ISO/IEC 9646-7 [1].

The supplier of a profile implementation which is claimed to conform to this Standard shall complete one of the following Profile specific Implementation Conformance Statement (ICS) proformas. The ICS proforma in clause B.3 is for a PINX. The ICS proforma in clause B.4 is for an RPE.

A completed Profile specific ICS proforma is the ICS for the implementation in question. The ICS is a statement of which capabilities and options of the profile have been implemented. The ICS can have a number of uses, including use:

-       by the profile implementor, as a check list to reduce the risk of failure to conform to the standard through oversight;
-       by the supplier and acquirer (or potential acquirer) of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard ICS proforma;
-       by the user (or potential user) of the implementation, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking cannot be guaranteed, failure to interwork can often be predicted from incompatible ICS);
-       by a protocol tester, as the basis for selecting appropriate test suites against which to assess the claim for conformance of the implementation.

B.2   Instruction for completing the ICS proforma

B.2.1   General structure of the ICS proforma

The ICS proforma is a fixed format questionnaire divided into subclauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered), and the reference(s) to either the base standard, or a specific clause in a base standard, or specifying the item in the main body of this Standard (if no base standard is listed in the reference column).

The "Status" column indicates whether an item is applicable and if so whether support is mandatory or optional. The following terms are used:

m   mandatory (the capability is required for conformance to the profile);
o   optional (the capability is not required for conformance to the profile but if the capability is implemented it is required to conform to the profile specification);
o.<n>   optional, but support of at least one of the group of options labelled by the same numeral <n> is required;
<item>:m   simple-conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;
<item>:o   simple-conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable;
x   prohibited;
c.<cond>   conditional requirement, depending on support for the item listed in condition <cond>.

Answers to the questionnaire items are to be provided in the "Support" column, by simply marking an answer to indicate a restricted choice (Yes or No), or in the "Not Applicable" column (N/A).

B.2.2   Additional Information

Items of Additional information allow a supplier to provide further information intended to assist the interpretation of the ICS. It is not intended or expected that a large quantity will be supplied, and an ICS

can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of Additional Information may be entered next to any answer in the questionnaire, and may be included in items of Exception Information.

B.2.3   Exception Information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirements, No pre-printed answer will be found in the Support column for this. Instead, the supplier is required to write into the support column an x.<i> reference to an item of Exception Information, and to provide the appropriate rationale in the Exception item itself.

An implementation for which a Exception item is required in this way does not conform to this Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

B.3   ICS proforma for PINX implementation

B.3.1   Implementation Identification

Supplier	
Contact point for queries about the ICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	
Have any exception items been required?	No[ ] Yes[ ] (The answer Yes means that the implementation does not conform to this Standard)
Date of Statement	

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g., Type, Series, Model).

B.3.2   Supported interfaces for RPE connection

Item	Question/Feature	Reference	Status	N/A	Support
RPEA1	Support of basic access at the S reference point	7.2	o.1		Yes[ ] No[ ]
RPEA2	Support of mapping of the Q reference point to a basic access	8.2, 8,3, 8.4	o.1		Yes[ ] No[ ]
RPEA3	Support of mapping of the Q reference point to a primary rate access	8.2, 8.3,.8.4	o.1		Yes[ ] No[ ]

B.3.3 Supported standards for RPE connection

Item	Question/Feature	Reference	Status	N/A	Support
RPEB1	Does the implementation comply with ETS 300 012.	ETS 300 012	c.1	[ ]	m:Yes[ ]
RPEB2	Does the implementation comply with ETS 300 011	ETS 300 011	RPEA3:m	[ ]	m:Yes[ ]
RPEB3	Does the implementation comply with ETS 300 402-1 and ETS 300 402-2	ETS 300 402-1 ETS 300 402-2	RPEA1:m	[ ]	m:Yes[ ]
RPEB4	Does the implementation comply with ETS 300 402-1, as modified by annex ZA of that ETS, and ETS 300 402-2, as modified by annex ZA of that ETS	ETS 300 402-1 ETS 300 402-2	c.2	[ ]	m:Yes[ ]
RPEB5	Does the implementation comply with ISO/IEC 11572 for the outgoing side of an inter-PINX link.	ISO/IEC 11572	c.2	[ ]	m:Yes[ ]
RPEB6	Does the implementation comply with ETS 300 192.	ETS 300 192	RPEA1:m	[ ]	m:Yes[ ]

c.1: if RPEA1 or RPEA2 then m else N/A.
c.2: if RPEA2 or RPEA3 then m else N/A.

B.3.4 Requirements for the S reference point

This section is only applicable if the answer to RPEA1 in clause B.3.2 was Yes.

B.3.4.1 Layer 3 requirements in addition to ETS 300 192

Item numbers refer to annex G.3 of ETS 300 192 [12].

Item	Question/Feature	Reference	Status	N/A	Support
Z1	Support of the 64kbps unrestricted bearer	ETS 300 192 12.5.5	o		Yes[ ] No[ ]
Z2	Support of the 64kbps bearer with speech transfer capability	ETS 300 192 12.5.5	o.1		Yes[ ] No[ ]
Z3	Support of the 64kbps bearer with 3.1 kHz audio transfer capability	ETS 300 192 12.5.5	o.1		Yes[ ] No[ ]
Z5	Support of multipoint configuration for basic access	ETS 300 192	m		Yes[ ]
B17	Sending of Calling party number information element in a SETUP message	ETS 300 192 12.5.5	m		Yes[ ]

B.3.4.2 **Additional items**

The following questions are in addition to the PICS of the related base standards.

Item	Question/Feature	Reference	Status	N/A	Support
RPEC1	Maximum number of MSN for the RPE access	this ETS	m		No. of MSN [ ]
RPEC2	Meet-me service supported	7.1.3	o		Yes[ ] No[ ]
RPEC3	Meet-me answer expected in call received state of the paging call	7.1.3	RPEC2:o.1	[ ]	o:Yes[ ] No[ ]
RPEC4	Meet-me answer expected in call active state of the paging call	7.1.3	RPEC2:o.1	[ ]	o:Yes[ ] No[ ]
RPEC5	Meet-me answer independent of the state of the paging call	7.1.3	RPEC2:o.1	[ ]	o:Yes[ ] No[ ]
RPEC6	Support of a call diversion Supplementary Service for paging		o		Yes[ ] No[ ]
RPEC7	Are all pager numbers valid destinations for call diversion unconditional	7.2.4.3	RPEC6:o.2	[ ]	o:Yes[ ] No[ ]
RPEC8	Are all pager numbers valid destinations for call diversion on no reply	7.2.4.3	RPEC6:o.2	[ ]	o:Yes[ ] No[ ]
RPEC9	Support of Do Not Disturb Supplementary Service for pager numbers		o		Yes[ ] No[ ]
RPEC10	Sending of Called party number information element in a SETUP message	ETS 300 192 12.5.5	m		Yes[ ]

B.3.5 **Requirements for the Q reference point**

This section is only applicable if the answer to RPEA2 or RPEA3 in subclause B.3.2 was Yes.

B.3.5.1 **Layer 3 requirements in addition to ISO/IEC 11572**

Item numbers refer to annex D of ISO/IEC 11572 [3].

Item	Question/Feature	Reference	Status	N/A	Support
Z1	Support of the 64kbps unrestricted bearer	ISO/IEC 11572 14.5.5	o		Yes[ ] No[ ]
Z2	Support of the 64kbps bearer with speech transfer capability	ISO/IEC 11572 14.5.5	o.1		Yes[ ] No[ ]
Z3	Support of the 64kbps bearer with 3.1 kHz audio transfer capability	ISO/IEC 11572 14.5.5	o.1		Yes[ ] No[ ]

B.3.5.2 Additional questions

The following questions are in addition to the PICS of the related base standards.

Item	Question/Feature	Reference	Status	N/A	Support
RPED1	Support of Diversion supplementary services according to ISO/IEC 13873	ISO/IEC 13873	o		Yes[ ] No[ ]
RPED2	Support of Call transfer supplementary service according to ISO/IEC 13869	ISO/IEC 13869	o		Yes[ ] No[ ]
RPED3	Inclusion of Calling party number in a SETUP message	ISO/IEC 11572 13.2.10	m		Yes[ ]

B.4 ICS proforma for RPE implementation

B.4.1 Implementation Identification

Supplier	
Contact point for queries about the ICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	
Have any exception items been required?	No[ ] Yes[ ] (The answer Yes means that the implementation does not conform to this Standard)
Date of Statement	

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g., Type, Series, Model).

B.4.2 Supported interfaces for PINX connection

Item	Question/Feature	Reference	Status	N/A	Support
RPEE1	Support of basic access at the S reference point	7.2	o.1		Yes[ ] No[ ]
RPEE2	Support of mapping of the Q reference point to a basic access	8.2, 8,3, 8.4	o.1		Yes[ ] No[ ]
RPEE3	Support of mapping of the Q reference point to a primary rate access	8.2, 8.3,.8.4	o.1		Yes[ ] No[ ]

B.4.3   Supported standards for PINX connection

Item	Question/Feature	Reference	Status	N/A	Support
RPEF1	Does the implementation comply with ETS 300 012.	ETS 300 012	c.1	[ ]	m:Yes[ ]
RPEF2	Does the implementation comply with ETS 300 011	ETS 300 011	RPEE3:m	[ ]	m:Yes[ ]
RPEF3	Does the implementation comply with ETS 300 402-1 and ETS 300 402-2	ETS 300 402-1 ETS 300 402-2	RPEE1:m	[ ]	m:Yes[ ]
RPEF4	Does the implementation comply with ETS 300 402-1, as modified by annex ZA of that ETS, and ETS 300 402-2, as modified by annex ZA of that ETS	ETS 300 402-1 ETS 300 402-2	c.2	[ ]	m:Yes[ ]
RPEF5	Does the implementation comply with ISO/IEC 11572 for the incoming side of an inter-PINX link.	ISO/IEC 11572	c.2	[ ]	m:Yes[ ]
RPEF6	Does the implementation comply with ETS 300 192.	ETS 300 192	RPEE1:m	[ ]	m:Yes[ ]

c.1:   if RPEE1 or RPEE2 then m else N/A.
c.2:   if RPEE2 or RPEE3 then m else N/A.

B.4.4   Requirements for the S reference point

This section is only applicable if the answer to RPEE1 in clause B.4.2 was Yes.

B.4.4.1   Layer 3 requirements in addition to ETS 300 192

Item numbers refer to annex G.4 of ETS 300 192 [13].

Item	Question/Feature	Reference	Status	N/A	Support
Z1	Support of the 64kbps unrestricted bearer	ETS 300 192 12.5.5	o		Yes[ ] No[ ]
Z2	Support of the 64kbps bearer with speech transfer capability	ETS 300 192 12.5.5	m		Yes[ ]
Z3	Support of the 64kbps bearer with 3.1 kHz audio transfer capability	ETS 300 192 12.5.5	m		Yes[ ]
Z5	Support of multipoint configuration for basic access	ETS 300 192	m		Yes[ ]
Z8	Support of incoming calls	ETS 300 192	m		Yes[ ]

B.4.4.2 Additional items

The following questions are in addition to the PICS of the related base standards.

Item	Question/Feature	Reference	Status	N/A	Support
RPEG1	Support of Calling party number in a received SETUP message	7.2.5.3	o		Yes[ ] No[ ]
RPEG2	Maximum number of MSN for the interface.	6	m		No. of MSN [ ]
RPEG3	Meet-me service supported with meet-me answer locally in the PINX	7.1.3	o		Yes[ ] No[ ]
RPEG4	Support of meet-me answer expected in call received state	7.1.3	RPEG3:m	[ ]	m:Yes[ ]
RPEG5	Support of meet-me answer expected in the call active state	7.1.3	RPEG3:m	[ ]	m:Yes[ ]
RPEG6	Meet-me service locally handled in RPE by joining two calls.	7.1.3	o		Yes[ ] No[ ]

B.4.5 Requirements for the Q reference point

This section is only applicable if the answer to RPEE2 or RPEE3 in clause B.4.2 was Yes.

B.4.5.1 Layer 3 requirements in addition to ISO/IEC 11572

Item numbers refer to annex D of ISO/IEC 11572 [3].

Item	Question/Feature	Reference	Status	N/A	Support
Z1	Support of the 64kbps unrestricted bearer	ISO/IEC 11572 14.5.5	o		Yes[ ] No[ ]
Z2	Support of the 64kbps bearer with speech transfer capability	ISO/IEC 11572 14.5.5	m		Yes[ ]
Z3	Support of the 64kbps bearer with 3.1 kHz audio transfer capability	ISO/IEC 11572 14.5.5	m		Yes[ ]

B.4.5.2 Additional questions

The following questions are in addition to the PICS of the related base standards.

Item	Question/Feature	Reference	Status	N/A	Support
RPEH1	Support of Meet-me service	8.1.3	o		Yes[ ] No[ ]
RPEH2	Does the implementation comply with ISO/IEC 13869 for a transferring PINX	ISO/IEC 13869	RPEH1:m	[ ]	m:Yes[ ]

Annex C (informative): RPE/PINX services

The table in this annex contains an overview of different paging services and how they are covered by this Standard. More information on paging services may be found in ESPA recommendation 4.4.8 [22].

Service number	Paging service	Covered by this standard by:	Notes
1	Beep-only paging with meet-me answer	S ref. point: Basic call + meet-me according to 7.1.3 Q ref. point: Basic call + meet-me according to 8.1.3	
2	Display paging with call back from paged user	S & Q ref point: Basic call + CLIP	
3	Display paging with meet-me answer	Combination of service numbers 1 & 2	
4	Speech paging	S & Q ref. point: Basic call, speech or 3.1 kHz audio	
5	Calling user display paging	This service is not covered by this Standard	Note
6	Explicit acknowledge from pager/paged user	S & Q ref. point: Basic call with special tone or voice announcement	
7	Absent status indication to calling user	S & Q ref point: Calling user notified by sending cause value #20 from RPE	
8	Call diversion to pager	Normal call diversion services, e.g. CFU or CFNR	
9	RPE programming	Not covered	Note
10	Meet-me answer timeout resulting in diversion to e.g. attendant	S ref. point: Not covered, implementation dependant Q ref point: Call Interception	

NOTE: These services may be implemented making use of a B-channel, e.g. by sending DTMF tones or 64 kbps data.

Annex D (informative):   Information flow diagrams, examples

D.1   Successful call to pager, no speech connection

PINX   RPE

SETUP →

CALL PROCEEDING ←   Optional message at S

ALERTING ←

                                              Suitable delay

DISCONNECT ←

RELEASE →

RELEASE COMPLETE ←
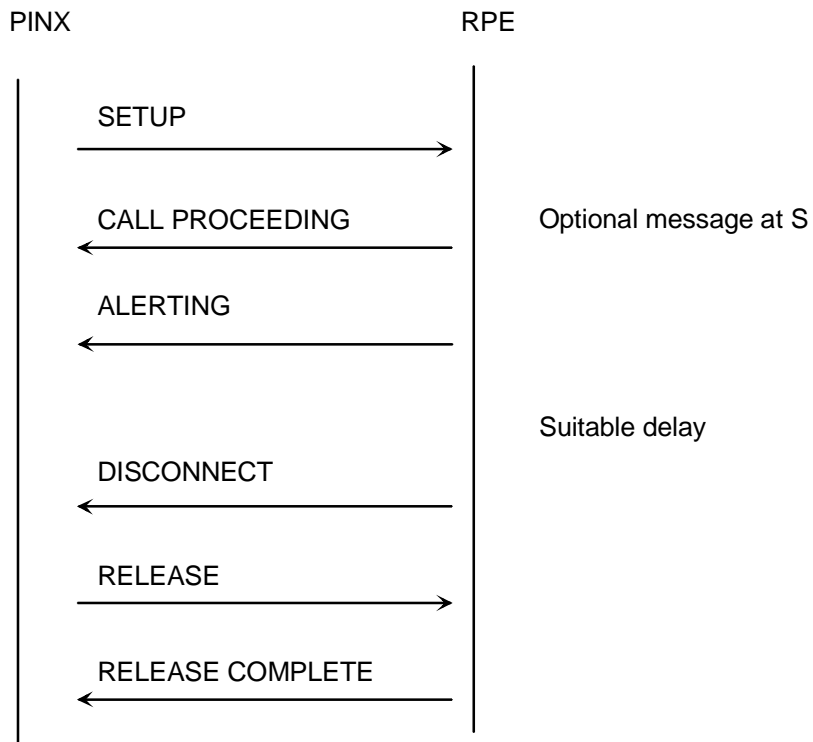
D.2   Successful call to pager, speech connection or voice message

```
         PINX                              RPE

              SETUP
          ──────────────────────────►

              CALL PROCEEDING                    Optional message at S
          ◄──────────────────────────

              ALERTING
          ◄──────────────────────────

              CONNECT
          ◄──────────────────────────

              CONNECT ACK
          ──────────────────────────►


              Speech connection

              DISCONNECT
          ◄──────────────────────────

              RELEASE
          ──────────────────────────►

              RELEASE COMPLETE
          ◄──────────────────────────
```
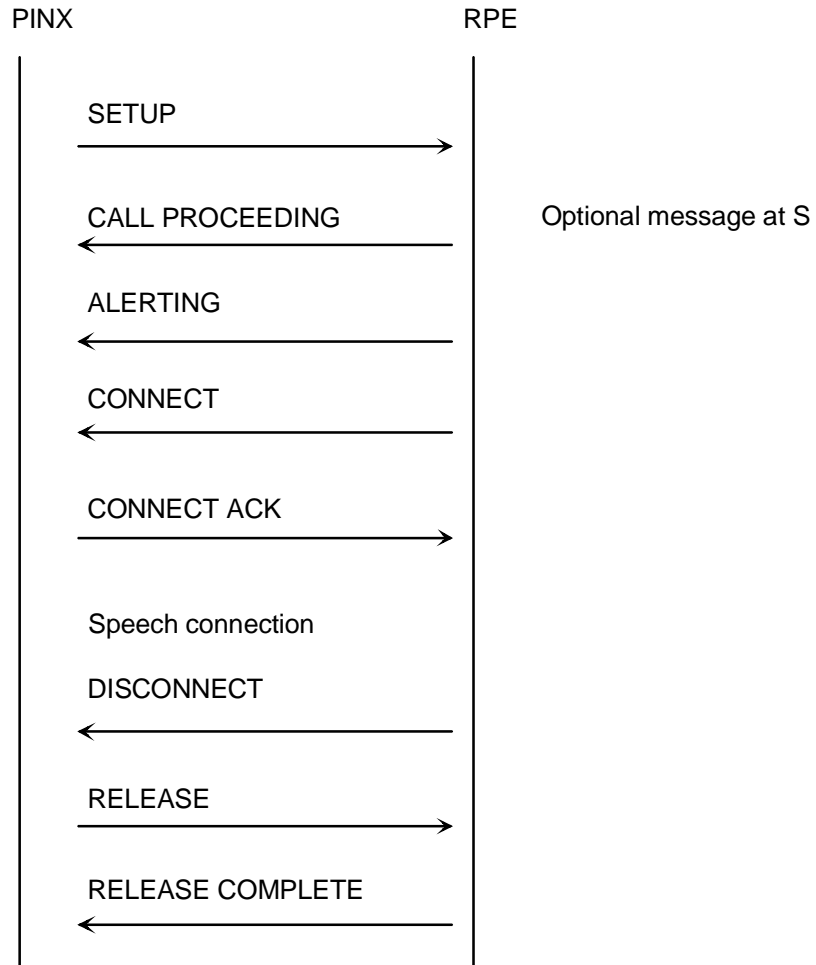
NOTE: The DISCONNECT may also come from the PINX.

D.3   Unsuccessful call to pager due to absence

```
      PINX                                RPE
        │                                  │
        │            RELEASE               │
        │─────────────────────────────────▶│
        │                                  │
        │                                  │
        │         RELEASE COMPLETE         │
        │◀─────────────────────────────────│      cause value #20
        │                                  │      subscriber absent
        │                                  │
```
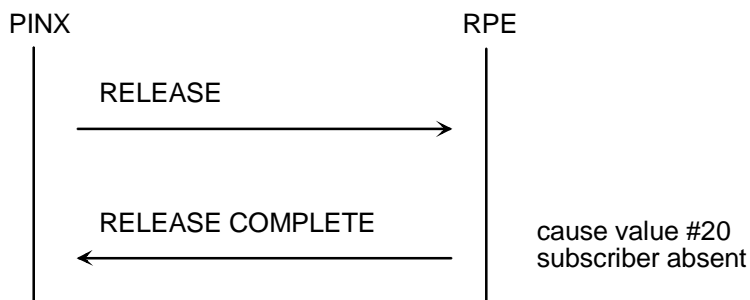
D.4   Unsuccessful call to pager due to absence. Voice message implemented

```
      PINX                                RPE
        │                                  │
        │             SETUP                │
        │─────────────────────────────────▶│
        │                                  │
        │         CALL PROCEEDING          │
        │◀─────────────────────────────────│      Optional message at S
        │                                  │
        │            CONNECT               │
        │◀─────────────────────────────────│
        │                                  │
        │          CONNECT ACK             │
        │◀─────────────────────────────────│
        │                                  │
        │                                  │
        │       Speech connection          │      Voice message given to
        │                                  │      the calling user
        │                                  │
        │           DISCONNECT             │
        │◀─────────────────────────────────│      cause value #20
        │                                  │      subscriber absent
        │            RELEASE               │
        │─────────────────────────────────▶│
        │                                  │
        │         RELEASE COMPLETE         │
        │◀─────────────────────────────────│
        │                                  │
```
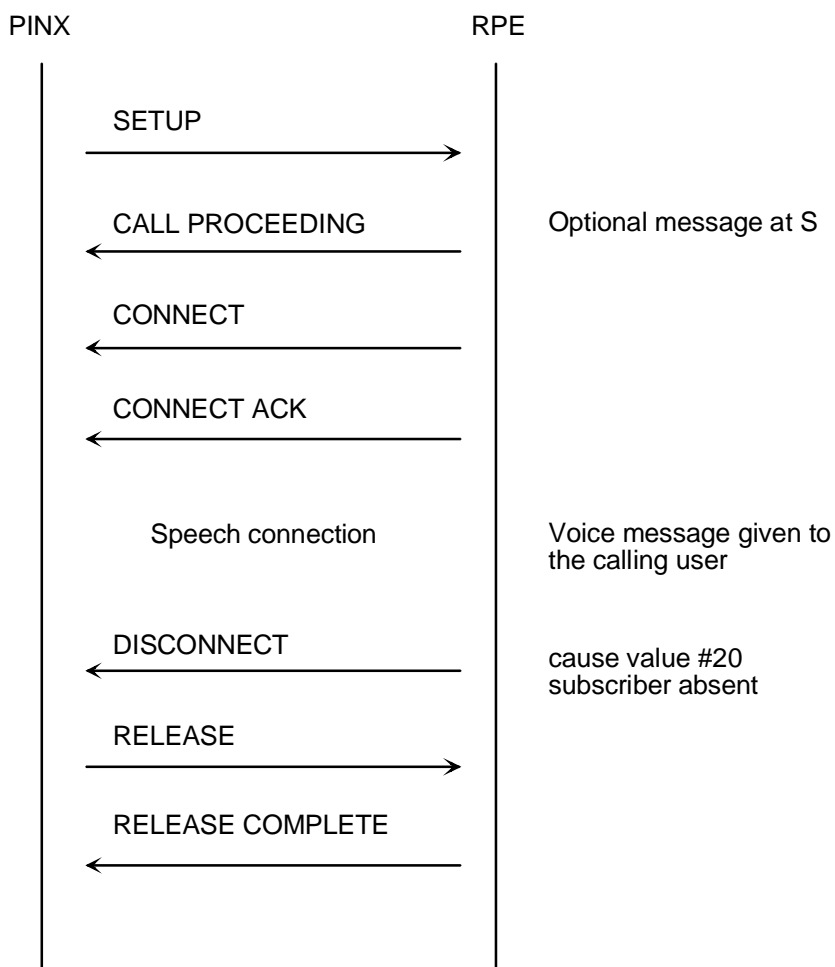
History

Document history			
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