ATIS-1000653.1996(R2015)

Integrated Services Digital Network (ISDN) – Call Park Supplementary Service

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ATIS-1000653.1996(R2015), *Integrated Services Digital Network (ISDN) – Call Park Supplementary Service*

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American National Standard
for Telecommunications–

Integrated Services Digital Network (ISDN) – Call Park Supplementary Service

1 Scope, purpose, and application

1.1 Scope

This standard specifies the service capabilities of the Call Park service within the context of an Integrated Services Digital Network (ISDN). Call Park is a Circuit-Switched service that allows a user to interrupt a voice or voice-band data communication on an existing call, and then reestablish communications from the same or different terminal equipment within the same Call Park Subscriber Group. The associated switching, signaling specifications, subscription options, and interactions with services defined in other American National Standards are also provided.

1.2 Purpose

The purpose of this standard is to allow maximum compatibility among public- and user-owned telecommunications equipment in order to increase the attractiveness and usefulness of ISDN-based capabilities.

1.3 Application

This standard applies to ISDN basic rate accesses and is intended to supplement the Basic Circuit Mode call procedures described in *American National Standard for Telecommunications – Integrated services digital network (ISDN) – Layer 3 signaling specification for circuit-switched bearer service for digital subscriber signaling system number 1 (DSS1),* ANSI T1.607-1990. It should be used in conjunction with other American National Standards for ISDN supplementary services for a complete understanding of the interactions between this and other services. This supplementary service is applicable to the Speech and 3.1-kHz audio (Voice-Band Data) Circuit-mode bearer services identified in *American National Standard for Telecommunications – Integrated services digital network (ISDN) – Minimal set of bearer services for the ISDN basic rate interface*, ANSI T1.604-1990.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI T1.604-1990, *Telecommunications – Integrated services digital network (ISDN) – Minimal set of bearer services for the basic rate interface*

ANSI T1.607-1990, *Telecommunications – Integrated services digital network (ISDN) – Layer 3 signaling specification for circuit-switched bearer service for digital subscriber signaling system number 1 (DSS1)*

ANSI T1.607a-1996, *Telecommunications – Digital subscriber signaling system number 1 (DSS1) – Layer 3 signaling specification for circuit-switched bearer services*

ANSI T1.610-1994, *Telecommunications – Generic procedures for the control of ISDN supplementary services*

ANSI T1.620-1991, *Telecommunications – Integrated services digital network (ISDN) – Circuit-mode bearer service category description*

ANSI T1.625-1993, *Telecommunications – Integrated services digital network (ISDN) – Calling line identification presentation and restriction supplementary services*

ANSI T1.650-1995, *Telecommunications – Integrated services digital network (ISDN) – Usage of the cause information element in digital subscriber signaling system number 1 (DSS1)*

3 Definitions and acronyms

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

3.1 Definitions

3.1.1   call park subscriber group: A Call Park Subscriber Group is a group of Call Park subscribers who are allowed to park and retrieve calls to and from any DN within their group. Subscribers are not allowed to park or retrieve calls to or from DNs outside of their group. Call Park subscribers may select their group at subscription time. Each DN that is subscribed to Call Park can belong to one and only one Call Park Subscriber Group.

3.1.2   network (ANSI T1.620): Network refers to all telecommunications equipment which has any part in processing a call or supplementary service for the user. It may include Local Exchanges, Transit Exchanges, and NT2s, but does not include the ISDN terminal and is not limited to "Public" network or any other particular set of equipment.

3.1.3   parked DN: The Parked DN represents the Directory Number (DN) that a call is parked against. This is a DN that is defined in the local exchange, but need not have any physical terminal associated with it.

3.1.4   parked party: The Parked Party represents the user (call) who has been put in a parked state by a Parking Party.

3.1.5   parking DN: The Parking DN represents the DN from which the served user (Parking Party) has parked a call.

3.1.6   parking party: The Parking Party represents the served user who parks a call via Call Park.

3.1.7   service provider (ANSI T1.620): This is a company, organization, administration, business, etc., which sells, administers, maintains, charges for, etc., the service. The Service Provider may or may not be the provider of the network.

3.1.8   terminal service profile (ANSI T1.610): This is information the Service Provider maintains for a given user to characterize the services offered by the network to that user. A TSP may be allocated to an interface or to a particular user equipment or a group of user equipment.

3.1.9   unpark: Unpark is a function performed by the network if a call remains parked longer than a predesignated time limit, or if the Parked Party disconnects.

3.2 Acronyms

CCAF   Call Control Agent Function
CCF   Call Control Function
CP   Call Park
CPR   Call Park Retrieve
CPSG   Call Park Subscriber Group
DN   Directory Number
DSS1   Digital Subscriber Signaling System No. 1
FE   Functional Entity
ISDN   Integrated Services Digital Network
LE   Local Exchange
R*n*   Relationship "*n*"
SCF   Service Control Function
SDF   Service Data Function
SDL   Specification and Description Language
SSF   Service Switching Function
TE   Terminal Equipment
TSP   Terminal Service Profile

4 Description of the Call Park service from the user's perspective

Call Park is a Circuit-Switched Voice service with characteristics similar to Call Hold. Call Park allows a user to interrupt communications on an existing call (Speech or 3.1-kHz Audio), and then reestablish communications from the same or different terminal equipment. The Service Provider shall restrict parking and unparking to users within the same Call Park Subscriber Group. The network clears the Parking Party's end of the call and "stores" the call in a "parking lot" area. The far end of the call is connected to the "parking lot." The Call Park service includes the Call Park Retrieve operation, which reestablishes communications between the user performing Call Park Retrieve and the Parked Party. It also includes a Ring-back Timer that alerts the Parking DN if a parked call has not been reconnected within a specified length of time.

This clause further defines the Call Park service in terms of procedures and other aspects visible to the user or users without regards to the means of implementation. This clause does not suggest how the required functions should be divided between public- and customer-owned equipment. It provides a prose description and a diagrammatic description of the Call Park service in the form of a Specification and Description Language (SDL) diagram.

4.1 Description

The Call Park service has several feature capabilities defined as follows:

- *Call Park:* Call Park allows a Parking Party to park a call against their own DN, by use of an abbreviated indication, or direct the call to be parked against another directory number (the Parking and Parked DNs are required to belong to the same CPSG). The call may be reconnected from any terminal within the CPSG via a Call Park Retrieve request. After parking the call, the Parking Party may go on hook and is free to receive incoming calls or originate outgoing calls;

- *Call Park Retrieve:* Call Park Retrieve allows a user to recover a call from any DN by specifying that Parked DN in the Call Park Retrieve procedures (the Parked DN and Retrieving DN are required to belong to the same CPSG). After invoking Call Park Retrieve, the user may retrieve calls parked against their own DN by the use of an abbreviated indication, for example, pressing the # key;

- *Ring-back After Time-out:* Ring-back After Time-out allows the network to offer a parked call to the Parking Party if the call is not unparked within a specified period of time.

At any given time, only one call shall be allowed to be parked against a DN.

Call Park is useful when a Parking Party on an active call wishes to physically move to another location for convenience or to locate information. For example, the party may Park the call, walk down to another office, and then recover the Parked call. In this way Call Park serves as an alternative to call transfer – perhaps when the user does not know the extension to which to transfer the call. Call Park is also useful in loudspeaker paging applications, and in situations where a secretarial station providing call coverage wishes to park a call, locate the desired party for the call, and have that party recover the Parked call.

4.2 Procedures

4.2.1 Provision/withdrawal

Call Park services shall be provided on a subscription basis. As a service provider option, Call Park service shall be offered with several subscription options. The Service Provider shall group subscriber lines into Call Park Subscriber Groups, as defined in 3.1.1. Options that shall apply separately to each DN/bearer service, to each TSP, to each DN/bearer service per TSP, or to a Call Park Subscriber Group (CPSG) are shown in table 1. Withdrawal of the service shall be made by the service provider upon request by the subscriber or for service provider reasons.

Table 1 – Subscription options for Call Park service

Subscription options	Values	Basis
Call Park assigned	Yes or No	Per DN/Bearer Service, TSP, DN/Bearer Service/TSP, or CPSG
Ring-back Timer value	30 seconds to 6 minutes in increments of 15 seconds	Per CPSG
Ring-back failure treatment	– Clear parked call – Forward to specified DN	Per CPSG
Call Park Subscriber Group identifier	Identifier	DN/Bearer Service
Call Park Retrieve indicator	Yes or No	Per DN/Bearer Service/TSP

4.2.2 Normal procedures

4.2.2.1 Activation/deactivation

Call Park service shall be active whenever provided on a subscription basis. There are no user procedures to activate or deactivate Call Park.

4.2.2.2 Invocation and operation

The following list identifies the normal procedures for the invocation and operation of the Call Park service:

– *Call Park request:* At any time while the served user (Parking Party) has a call in the active state, the served user shall be able to indicate to the network that the call on the interface (the active call) is to be parked, and then shall specify a DN that the call is to be parked against (the Parking and Parked DNs shall belong to the same CPSG). The Parking Party may indicate their own DN as the Parked DN. Instead of indicating a specific DN, the Parking Party may provide an abbreviated indication of the Parked DN in order to park the call

against their own DN. The network shall allow a call to be parked any time it is in the active state. The network shall acknowledge this action, and park the call against the DN specified by the Parking Party. The communication on the Parking Party's interface shall then be cleared, and the associated channel shall be made available for other uses. The call shall no longer be associated with the Parking Party's channel, nor shall it be associated with the Parked DN's channel (see figure 1, part 1). If the Parked DN has a Call Park Retrieve indicator assigned, then the user at that DN shall receive an indication that the call was parked against the DN. After a call has been successfully parked, the Ring-back timer shall be started;

–   *Call Park Retrieve request:* To unpark a call, the served user (Retrieving DN) shall indicate to the network that a call parked against a DN (Parked DN, possibly the same as the Retrieving DN) is to be reconnected. The user shall provide the Parked DN during the service request procedures. If the user is unparking a call against their own DN, they may provide an abbreviated indication to the network. The DN of the served user shall be required to belong to the same CPSG as the specified Parked DN. If the network can satisfy the request, the network shall reestablish communications for the call on the requesting user's interface, and send an indication to all terminals that have a Call Park Retrieve indicator assigned for the Parked DN (see figure 1, part 2);

–   *Ring-back After Time-out:* When a call is successfully parked, the Ring-back timer (T-Rbt) shall be started. If a parked call is not retrieved before timer T-Rbt expires, the network shall attempt to offer the call to the Parking Party as a ring-back call termination. If the Parking Party is busy, then the network shall restart the timer for a second time. This procedure continues up to three times. If the Parking Party is busy on the third offering, the call shall be cleared or forwarded based on a subscription option.

If the Parking Party is idle when timer T-Rbt expires, the call shall be offered to the Parking Party as a ring-back call termination and timer T-Arb shall be started. The Parking Party may reestablish communications with the Parked Party by answering the ring-back call. If the Parking Party does reestablish communications with the Parked Party, timer T-Arb is stopped. If T-Arb expires before the Parking Party answers the ring-back call, or if the call is rejected by the Parking Party, and timer T-Rbt has not expired three times, then the call shall be reparked against the Parked DN and timer T-Rbt started. If T-Arb expires and timer T-Rbt has expired three times, the call shall be cleared or forwarded based on the "Ring-back failure treatment" subscription option. An in-band indication may be provided to the Parked Party during ring-back (see figure 1, part 3).

4.2.3   Exceptional procedures

4.2.3.1   Activation/deactivation

No exceptional procedures for activation or deactivation have been identified.

4.2.3.2   Invocation and operation

The following list identifies the exceptional procedures for the invocation and operation of the Call Park service:

–   *Call Park request:* If any of the following actions are taken by the Parking Party, the network shall provide an indication to the Parking Party giving the reason for failure (see figure 1, part 1):

   –   Call Park is attempted, but there is no call in the active (i.e., talking) state;

   –   Call Park is attempted, but the Parked DN is not valid (for example, it is not properly formatted, is not in service, vacant code, is not a number in the served user's local exchange, etc.);

   –   Call Park is attempted, but the Parked DN and Parking DN are not in the same Call Park Subscriber Group;

   –   Call Park is attempted, but there is already a call parked against the Parked DN.

– *Call Park Retrieve request:* If any of the following actions are taken by the Call Park Retrieving party, the network shall provide an indication to the user giving the reason for failure (see figure 1, part 2):

– Call Park Retrieve is attempted, but the user is not subscribed to the service;

– Call Park Retrieve is attempted, but the Parked DN is not valid (for example, it is not properly formatted, is not in service, vacant code, is not a number in the served user's local exchange, etc.);

– Call Park Retrieve is attempted, but the Parked DN and Retrieving DN are not in the same Call Park Subscriber Group;

– Call Park Retrieve is attempted, but there is no call parked against the Parked DN.

– *Ring-back After Time-out:* No exceptional procedures for Ring-back After Time-out have been identified.

4.2.4 Alternative procedures

No alternative procedures have been identified.

4.3 Interworking considerations

The operation of this service is not affected by the nature (ISDN or non-ISDN) of the far end of the connection.

4.4 Network capabilities for charging

It shall be possible for the service provider to charge accurately for this service.

4.5 Interactions with other supplementary services

4.5.1 Call Waiting

If a Call Waiting indication is received during an active call, the active call may be parked so that the Call Waiting call may be answered. The network shall allow Call Waiting to be used to reoffer a parked call when timer T-Rbt expires (i.e., during ring-back).

4.5.2 Call Hold

The network shall not allow a call that has been put on Hold to be parked until it has been retrieved from the Held state and is again active.

4.5.3 Multi-Level Precedence and Preemption

There are no interactions between Call Park and Multi-Level Precedence and Preemption (MLPP), as defined in ANSI T1.619. The Parked Party is still considered active at their serving exchange while the call is parked, and so normal MLPP procedures apply to the Parked Party.

4.5.4 User-to-User Signaling

There are no interactions between Call Park and User-to-User Signaling, as defined in ANSI T1.621.

4.5.5 Message Waiting Indicator Control and Notification

There are no interactions between Call Park and Message Waiting Indicator Control and Notification, as defined in ANSI T1.622.

4.5.6 Calling Line Identification Presentation

If Calling Line information was delivered during call establishment, the network shall save the information and redeliver it during Ring-back After Time-out, following the procedures defined in ANSI T1.625 for presenting the information. The network may also deliver this information during Call Park Retrieve.

4.5.7 Calling Line Identification Restriction

If Calling Line Identification Restriction applied when the call was originally established, then the same restriction shall apply if the network redelivers the information during Call Park Retrieve or Ring-back After Time-out, following the procedures defined in ANSI T1.625 for presenting the information.

4.5.8 Routing, Bridging, and Transfer of Emergency Service Calls (RBTESC)

There are no interactions between Call Park and RBTESC, as defined in ANSI T1.628.

4.5.9 Normal Call Transfer

There are no interactions between Call Park and Normal Call Transfer, as defined in ANSI T1.632. A parked call is not present at any user's terminal, and so is not available for transfer. The network shall not allow a ring-back call termination to be transferred until after the call has been answered.

4.5.10 Calling Name Identification Restriction

If Calling Name Identification Restriction applied when the call was originally established, then the same restriction shall apply if the network redelivers the name information during Call Park Retrieve or Ring-back After Time-out, following the procedures defined in ANSI T1.639 for presenting the name information.

4.5.11 Calling Name Identification Presentation

If Calling Name information was delivered during call establishment, the network shall save the information and redeliver it during Ring-back After Time-out, following the procedures defined in ANSI T1.641 for presenting the information. The network may also deliver this information during Call Park Retrieve.

4.5.12 Call Deflection

If a parked call is retrieved or answered during Ring-back After Time-out, and was originally an incoming call, the network shall allow the call to be deflected as defined in ANSI T1.642. The network shall not allow a ring-back call termination to be deflected until after it has been answered.

4.5.13 Explicit Call Transfer

There are no interactions between Call Park and Explicit Call Transfer, as defined in ANSI T1.643. A parked call is not present at any user's terminal, and so is not available for transfer. The network shall not allow a ring-back call termination to be transferred until after the call has been answered.

4.5.14 Conference Calling

The network shall allow a conferee of a conference call to park their leg of the call. The network shall not allow the conference controller to park the conference. The network shall allow a call to be parked against the conference controller's DN. If the conference controller's DN has a feature indicator assigned for Call Park Retrieve, then the network shall send feature indication information as described in 4.2.2. Call Park Retrieve may be used to unpark a call (i.e., the Parked Party) to be added as a conferee to a conference. Once the call is unparked, it may be added to an active conference using Conference Calling procedures. Conference Calling procedures are defined in ANSI T1.647. The network shall allow a parked call to be added to a conference after it has been reestablished from the Ring-back state, but shall not be allowed to be added during ring-back.
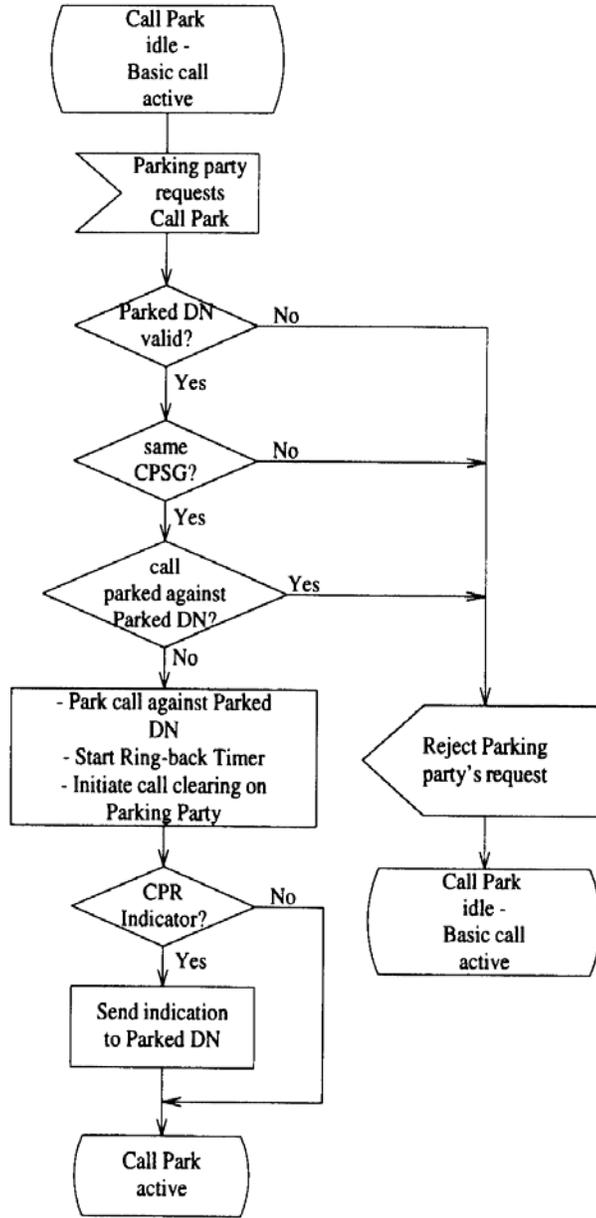
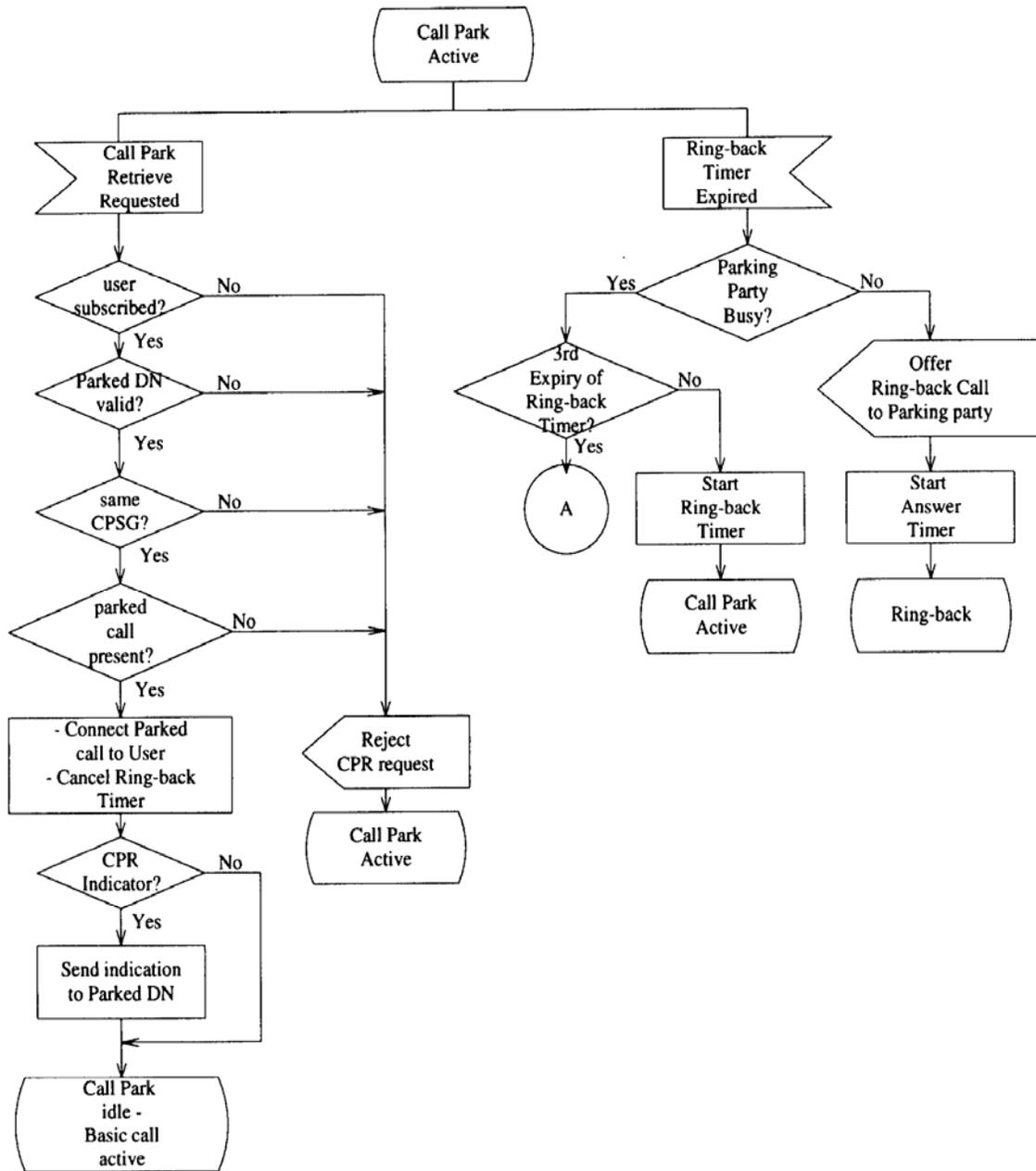**Figure 1 – Overall SDL for the Call Park service** (part 1 of 3)

Figure 1 – Overall SDL for the Call Park service (part 2 of 3)
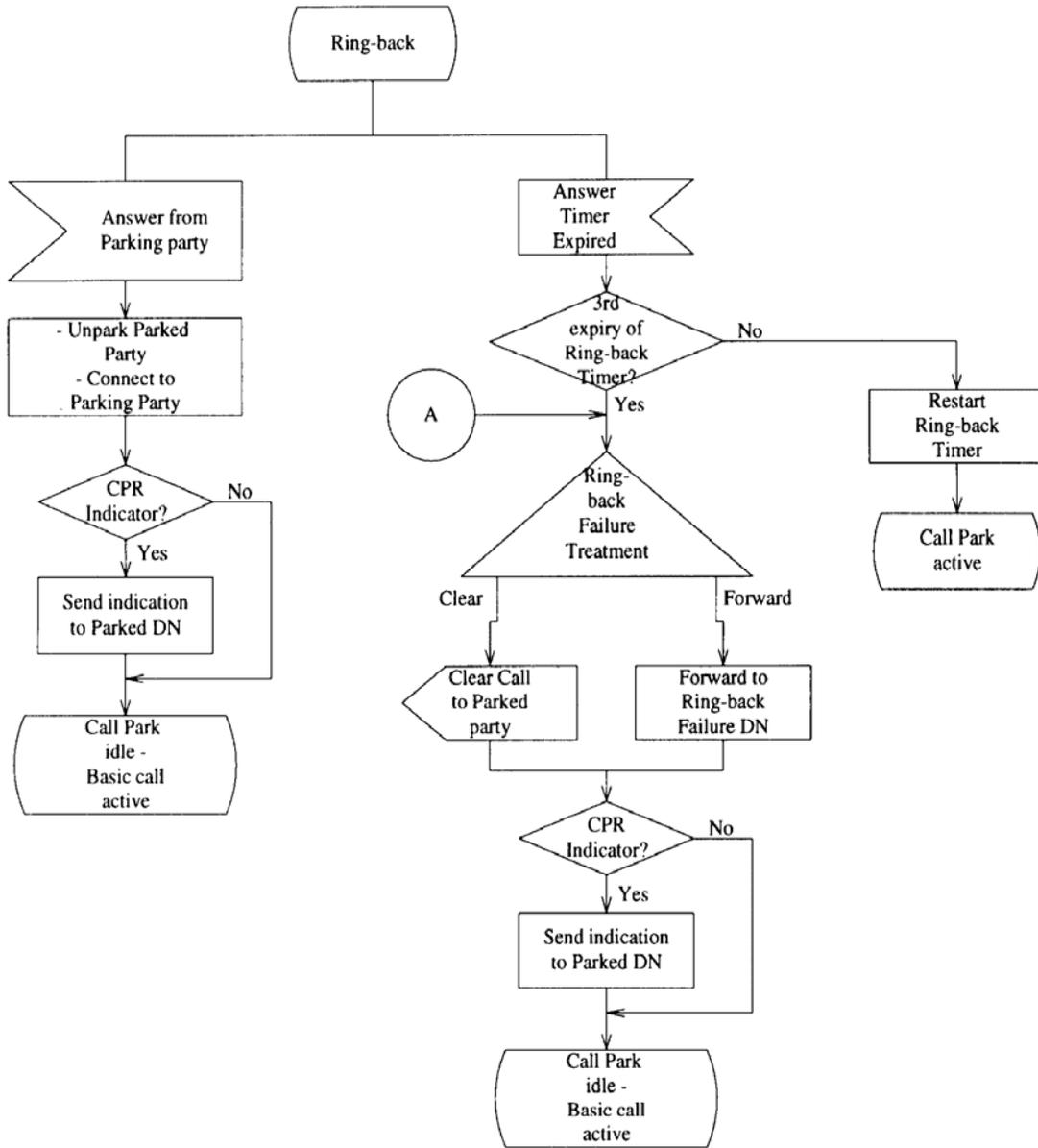
Figure 1 – Overall SDL for the Call Park service (part 3 of 3)

5 Functional capabilities and information flows needed for Call Park

This clause identifies a way of dividing the overall functionality for the Call Park service into functional units, each of which could be placed in one location. The overall functionality results from communication between the functional units (called "entities") using information flows, which are also identified in this clause. An information flow is an abstraction which is subsequently realized in clauses 6 through 8 by means of additions to existing signaling system messages or by new messages. Finally, this clause identifies several ways in which the functional entities of the Call Park service can be located in specific network or user equipment.

5.1 Functional entity model

This subclause identifies a way of partitioning the Call Park service functionality into functional entities and identifies actions that occur in each functional entity. Each functional entity is an abstract representation that could be implemented in more than one kind of telecommunication equipment (e.g., in terminal equipment, in a local switching machine, or in a database). Functional entities may be combined in a single piece of telecommunications equipment and, for some scenarios, may not exist at all. The functional entity model is shown in figure 2.
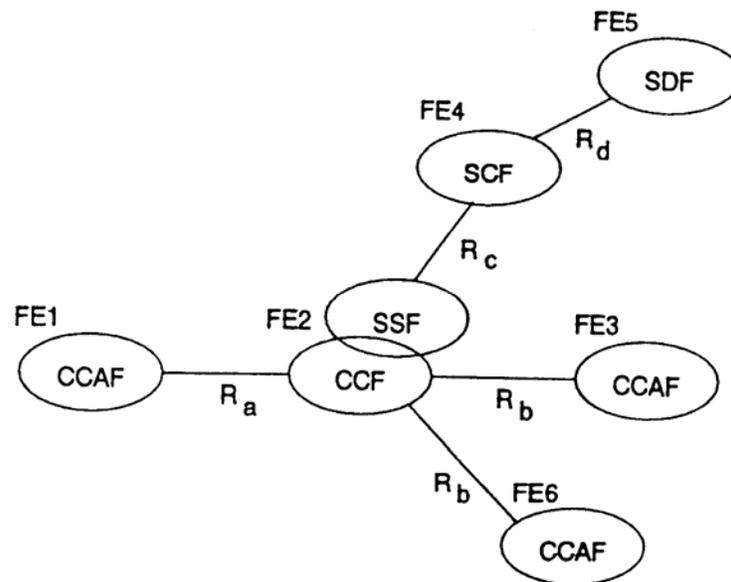
Figure 2 – Functional entity model for the Call Park service

The functional entities required by the Call Park service over and above those of basic call are:

- *FE1:* Parking Party's service agent;
- *FE2:* Parking and Retrieving Party's switching entity;
- *FE3:* Parked DN's service agent;
- *FE4:* Call Park service control entity;
- *FE5:* Call Park service database entity;
- *FE6:* Retrieving Party's service agent.

5.2 Information flow model for the Call Park service

Figures 3 through 7 provide a high-level view of the possible sequence of and types of information passed between functional entities, and the actions performed within the functional entities to support Call Park. Note that whenever Call Park or Call Park Retrieve is requested, the

Parked DN may be provided at the same time as the service request. These scenarios show the Parked DN being provided in a separate exchange of messages.

The numbers in the columns under the functional entity number (e.g., FE1) identify actions to be taken as a result of receiving an input at that functional entity. All of the listed actions should be understood to occur upon receipt of the stimulus indicated in the information flows (figures 3 through 7). Where two actions are indicated in the information flow, the top action shall be taken before the bottom action. See 5.3 for the definition of the individual functional entity actions.

Two additional abbreviations are used in figures 3 through 7:

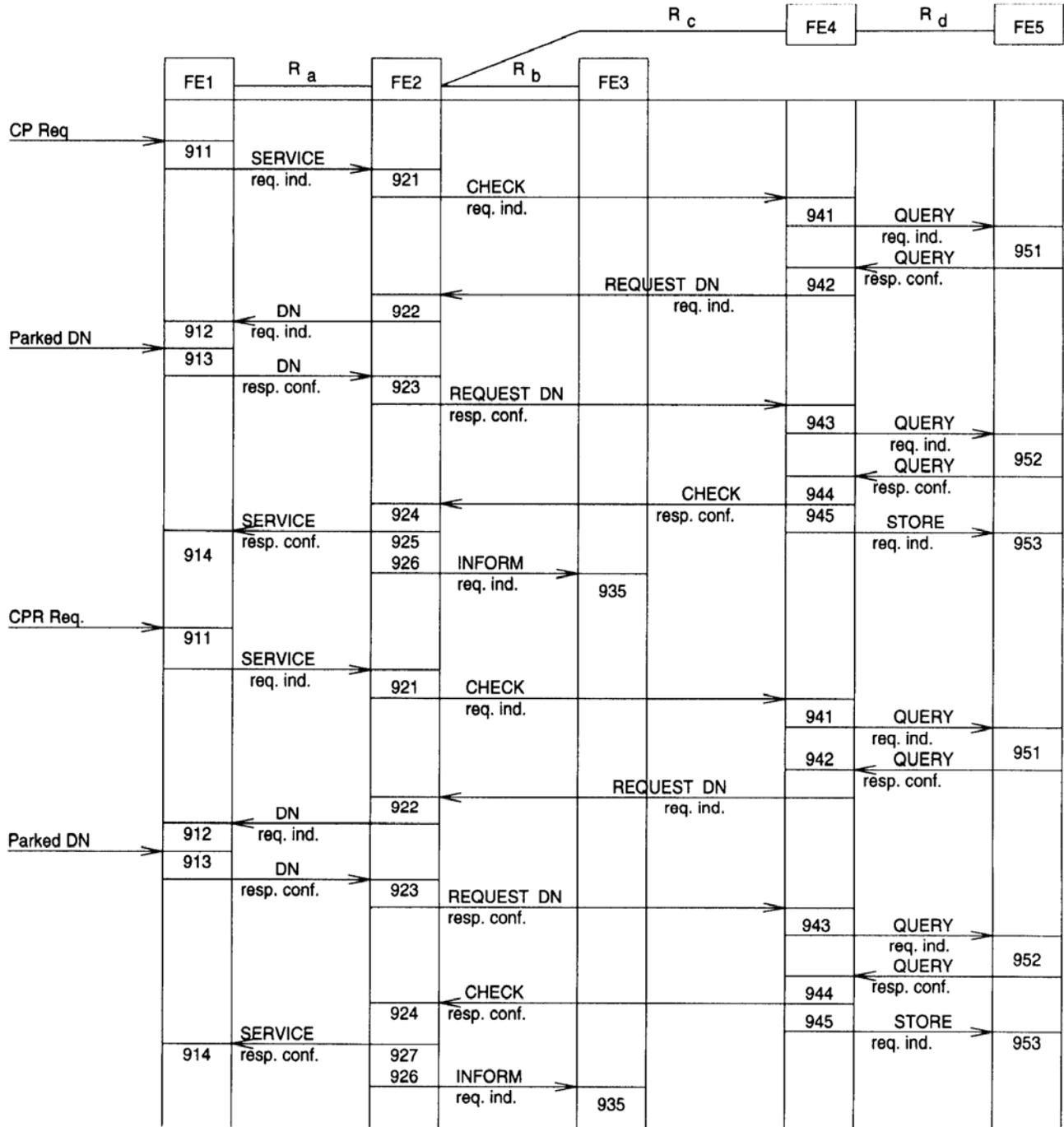| req. ind.	=	request indication
resp. conf.	=	response confirmation

Figure 3 – Successful Call Park with Call Park Retrieve from Parking Party
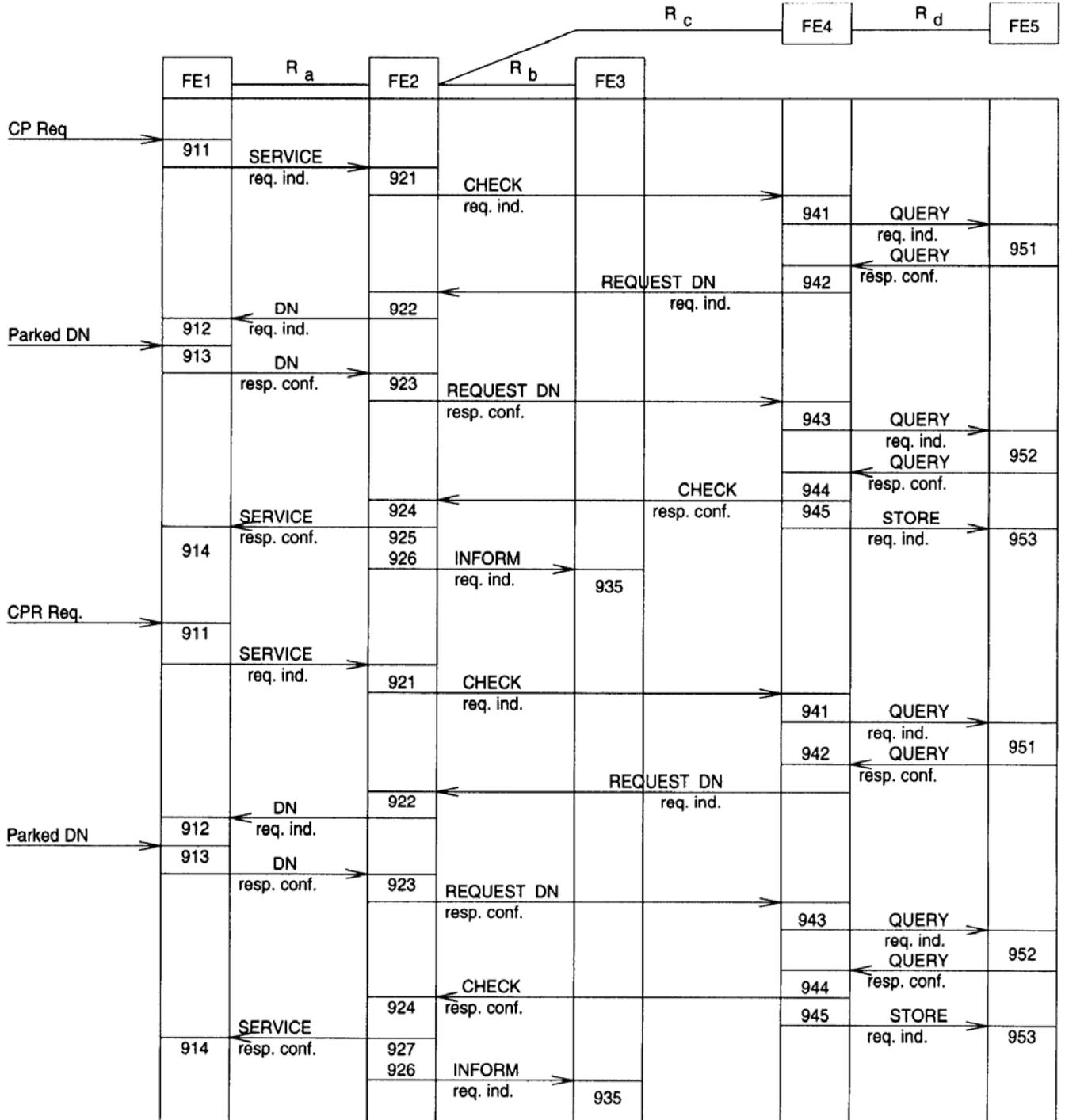
Figure 4 – Successful Call Park with Call Park Retrieve from Parked DN
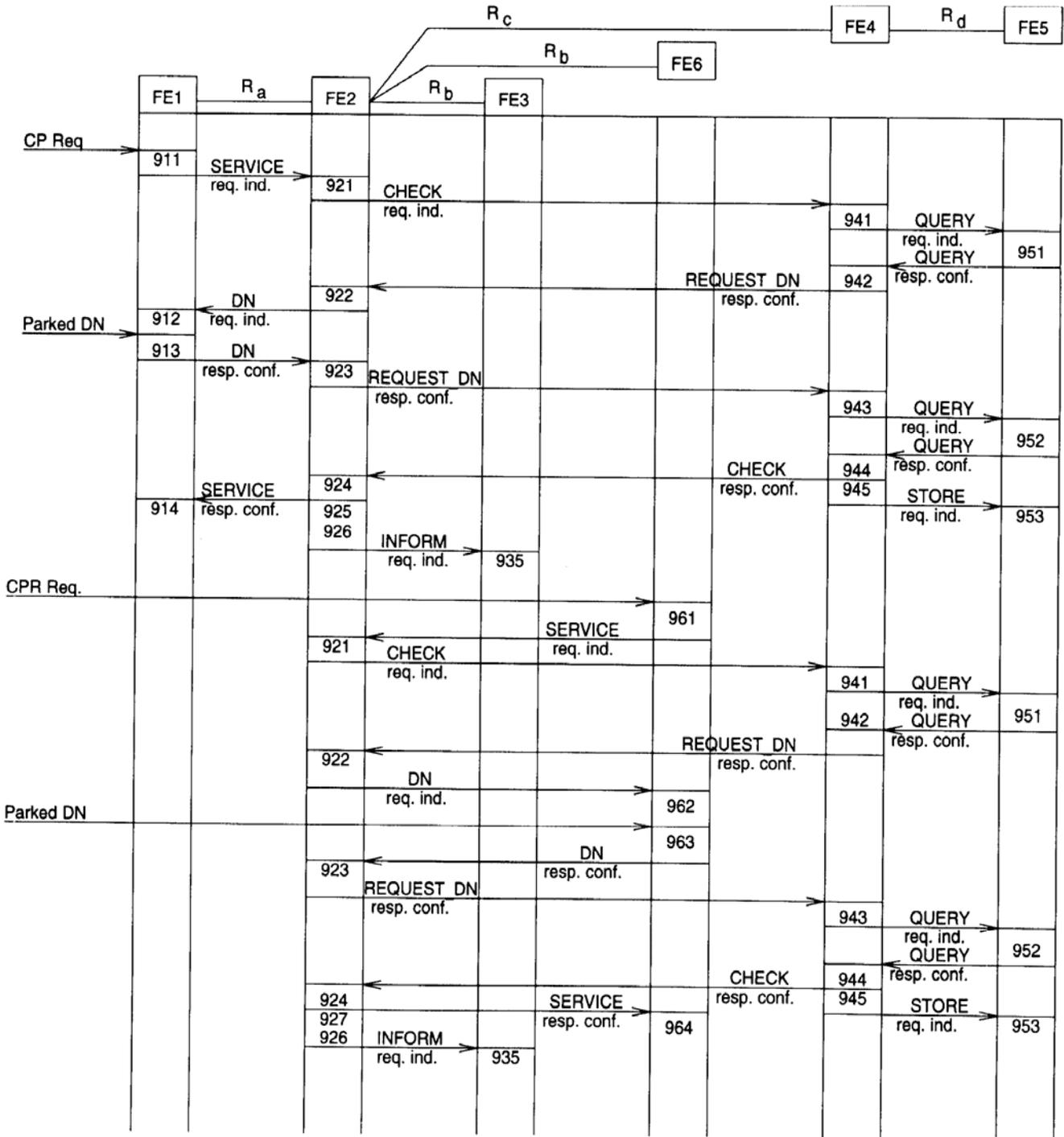
Figure 5 – Successful Call Park to a second party with Call Park Retrieve from a third party
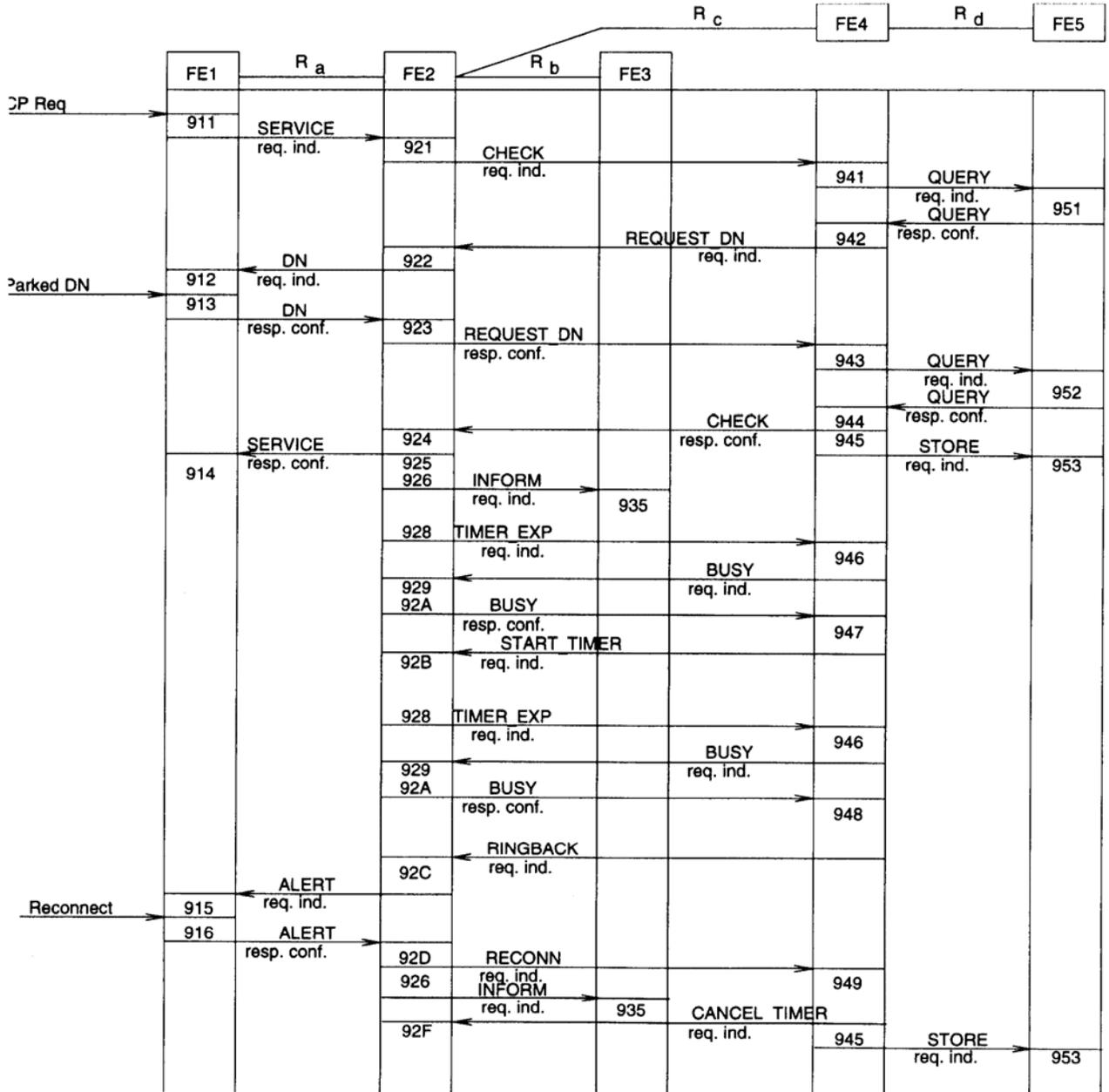
Figure 6 – Successful Ring-back after Ring-back Timer expiry

FE1	Ra	FE2	Rb	FE3	Rc	FE4	Rd	FE5

CP Req →

911 SERVICE req. ind. →

921 CHECK req. ind. →

941 QUERY req. ind. →

951 QUERY resp. conf.

← REQUEST_DN req. ind. 942

Parked DN →

912 DN req. ind. ←

913 DN resp. conf. →

923 REQUEST_DN resp. conf. →

943 QUERY req. ind. →

952 QUERY resp. conf.

← CHECK resp. conf. 944

924 945 STORE req. ind. →

953

914 SERVICE resp. conf. ←

925
926 INFORM req. ind. →

935

928 TIMER_EXPIRY req. ind. →

← BUSY req. ind. 946

929
92A BUSY resp. conf. →

← START_TIMER req. ind. 947

92B

928 TIMER_EXPIRY req. ind. →

← BUSY req. ind. 946

929
92A BUSY resp. conf. →

← RING-BACK req. ind. 948

915 ALERT req. ind. ← 92C

928 TIMER_EXPIRY req. ind. →

← START_TIMER req. ind. 94B

92B

928 TIMER_EXPIRY req. ind. →

← BUSY req. ind. 946

929
92A BUSY resp. conf. →

← RING-BACK req. ind. 948

915 ALERT req. ind. ← 92C

928 TIMER_EXPIRY req. ind. →

945 STORE req. ind. →

← TIMER_EXPIRY resp. conf. 94A

953

92E
926 INFORM req. ind. →

935

**Figure 7 – Unsuccessful Ring-back after Ring-back Timer expiry,
Parking Party not responding to alerting**

5.2.1   Definition of relationship Ra

In addition to the information flows defined for ISDN 64-kbit/s Circuit Mode Switched Bearer Services (ITU-T Q.71), relationship Ra consists of the information flows shown in table 2.
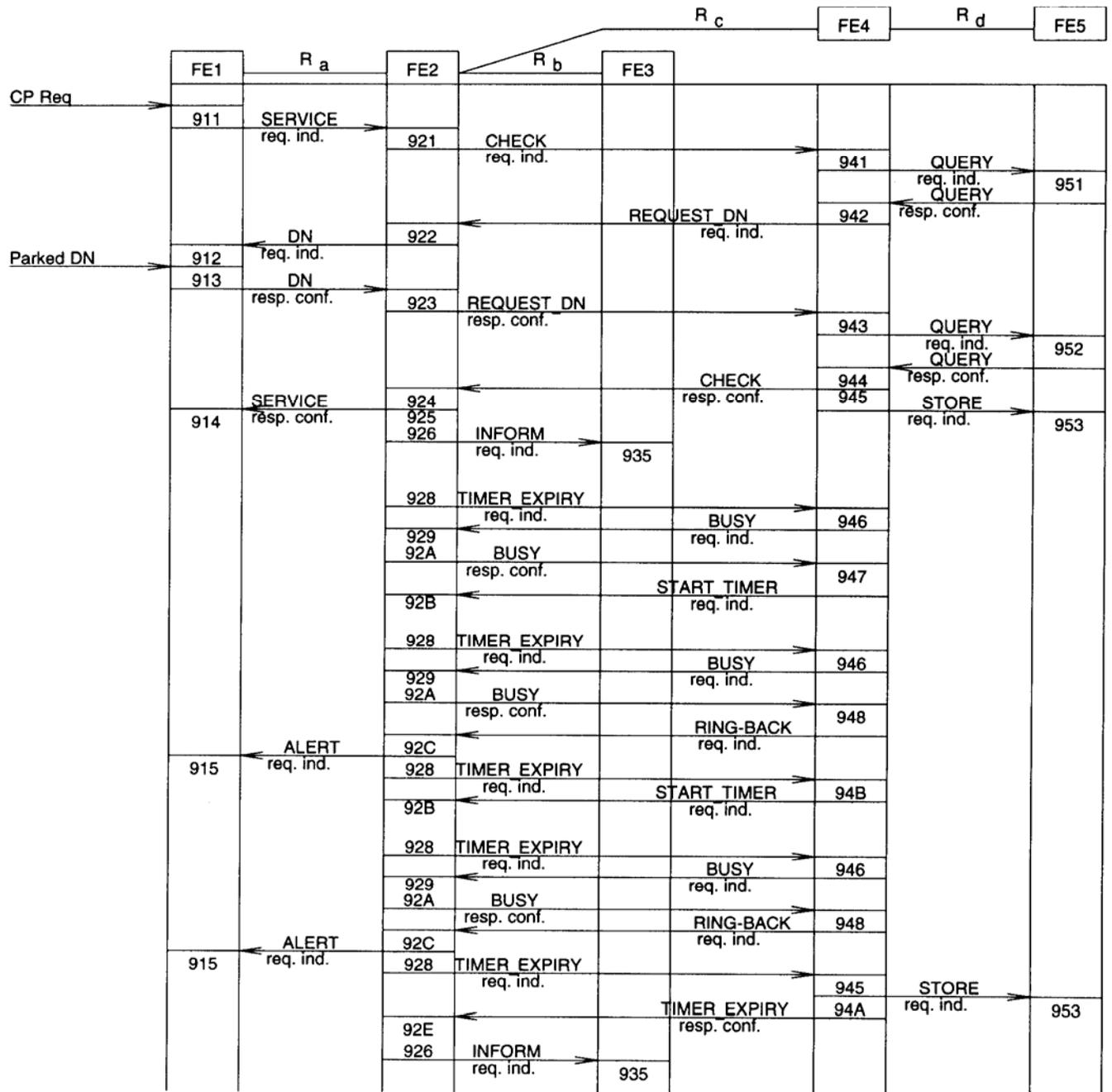
Table 2 – Information flows for relationship Ra

Service invocation request	
Service identifier	Mandatory
Parked DN	Optional
Service invocation response	
Service identifier	Mandatory
Service invocation status	Mandatory
Notification	
Indication of call parked against DN	Mandatory
DN request	
DN response	
Parked DN	Mandatory
Alerting indication	
Alerting response	
NOTE – Information shown as "Mandatory" shall be exchanged between FEs whenever the message is sent.	
Information shown as "Optional" shall be included only when necessary.	

5.2.2 Definition of relationship Rb

In addition to the information flows defined for ISDN 64-kbit/s Circuit Mode Switched Bearer Services (ITU-T Recommendation Q.71), relationship Rb consists of the information flows shown in table 3.

Table 3 – Information flows for relationship Rb

Service invocation request	
Service identifier	Mandatory
Parked DN	Optional
Service invocation response	
Service identifier	Mandatory
Service invocation status	Mandatory
Notification	
Indication of call parked against DN	Mandatory
DN request	
DN response	
Parked DN	Mandatory
NOTE – Information shown as "Mandatory" shall be exchanged between FEs whenever the message is sent.	
Information shown as "Optional" shall be included only when necessary.	

19

5.2.3 Definition of relationship Rc

In addition to the information flows defined for ISDN 64-kbit/s Circuit Mode Switched Bearer Services (ITU-T Recommendation Q.71), relationship Rc consists of the information flows shown in table 4. (This standard does not define protocol associated with relationship Rc; therefore the use of "Mandatory" and "Optional" in this clause should be understood to refer to a possible, future use of this relationship for other protocol definitions.)

Table 4 – Information flows for relationship Rc

Check service invocation request	
Bearer capability information	Mandatory
Service identifier	Mandatory
Invoking DN	Mandatory
Parked DN	Optional
Check service invocation response	
Service allowed indicator	Mandatory
Parked DN for notification	Optional
Notification contents	Optional
Ring-back Timer start/cancel	Optional
Ring-back Timer identifier	Optional
Ring-back Timer value	Optional
Error value	Optional
Request for Parked DN	
Request for Parked DN response	
Parked DN	Mandatory
Start timer	
Timer identifier	Mandatory
Timer value	Mandatory
Timer expired indication	
Timer identifier	Mandatory
Busy/idle status request	
DN to be checked	Mandatory
Busy/idle status response	
DN busy/idle status	Mandatory
Ring-back request	
Parking Party DN	Mandatory
Reconnect indication	
Parking Party DN	Mandatory
Cancel timer	
Timer identifier	Mandatory
Timer expired response	
Parked Party treatment	Mandatory
Parked DN for notification	Optional
Notification contents	Optional
NOTE – Information shown as "Mandatory" shall be exchanged between FEs whenever	

the message is sent.

Information shown as "Optional" shall be included only when necessary.

5.2.4 Definition of relationship Rd

In addition to the information flows defined for ISDN 64-kbit/s Circuit Mode Switched Bearer Services (ITU-T Recommendation Q.71), relationship Rd consists of the information flows shown in table 5. (This standard does not define protocol associated with relationship Rd; therefore the use of "Mandatory" and "Optional" in this clause should be understood to refer to a possible, future use of this relationship for other protocol definitions.)

Table 5 – Information flows for relationship Rd

Query	
Service identifier	Mandatory
Invoking DN	Mandatory
Parked DN	Optional
Query response	
Requested service subscribed	Mandatory
Parked call present at Parked DN	Optional
Invoking DN CPSG identifier	Optional
Parked DN CPSG identifier	Optional
CPSG Ring-back Timer value	Optional
CPSG Ring-back failure treatment	Optional
Parked DN for notification	Optional
Store request	
Parked DN	Mandatory
Parked call present	Mandatory
NOTE – Information shown as "Mandatory" shall be exchanged between FEs whenever the message is sent. Information shown as "Optional" shall be included only when necessary.	

5.3 Functional entity actions

In the scope of the functional entity actions, the served user always refers to the user who invoked the active service. In most cases, one user is the served user during the parking phase, and another user is the served user during the unparking phase.

5.3.1 Functional entity actions for FE1

The functional entity actions for FE1 are as follows:

– *911:* FE1 receives and processes a service request from the served user and issues the appropriate service request to FE2 (i.e., Call Park or Call Park Retrieve);

– *912:* FE1 receives a request for a DN from FE2, and relays the information to the served user;

– *913:* FE1 receives a Parked DN (or an abbreviated indication) from the served user, and relays the information to FE2;

– *914:* FE1 receives and processes an indication from FE2 relating to a service request, and relays to the served user either an indication that the service invocation was accepted, or an indication that the service invocation failed;

– *915:* FE1 receives an Alerting indication from FE2, and relays it to the served user;

– *916:* FE1 receives a Reconnection request indication from the served user, and relays it to FE2.

5.3.2 Functional entity actions for FE2

The functional entity actions for FE2 are as follows:

– *921:* FE2 receives a service request from the FE serving a served user, and relays the request to FE4;

– *922:* FE2 receives a request for a DN from FE4, and relays the request to the FE serving the served user;

– *923:* FE2 receives a DN (or an abbreviated indication) from the FE serving the served user, and relays the information to FE4;

– *924:* FE2 receives a service response from FE4, and relays the response to the FE serving the served user. FE2 starts or cancels the ring-back timer, using the timer identifier provided. The timer value is received from FE4;

– *925:* FE2 parks the Parked Party, and clears the call at the served user;

– *926:* FE2 sends an optional notification (containing information concerning calls parked against a DN) to the DN indicated in the service response from FE4;

– *927:* FE2 connects the FE serving the served user to the Parked Party;

– *928:* FE2 sends an indication of an expired Call Park timer to FE4 upon the expiration of the identified timer;

– *929:* FE2 receives a request from FE4 for the busy/idle status of a served user;

– *92A:* FE2 determines the busy/idle status of the served user indicated in a request from FE4, and relays that status to FE4;

– *92B:* FE2 receives a request from FE4 to start a timer, and starts the identified timer;

– *92C:* FE2 receives a request from FE4 to start alerting at the Parking Party, and relays the alerting request to FE1;

– *92D:* FE2 receives an alerting response from FE1, indicating a request to reconnect the call, and reconnects the served user at FE1 with the Parked Party;

– *92E:* FE2 receives a timer expiry response from FE4, and cancels the alerting request to FE1;

– *92F:* FE2 receives a timer cancellation request from FE4, and cancels the indicated Call Park timer.

5.3.3 Functional entity actions for FE3

The functional entity actions for FE3 are as follows:

– *931:* FE3 receives and processes Call Park Retrieve service requests from the served user and issues the appropriate service request to FE2;

– *932:* FE3 receives a request for a DN from FE2, and relays the information to the served user;

– *933:* FE3 receives a DN (or an abbreviated indication) from the served user, and relays the information to FE2;

– *934:* FE3 receives and processes an indication from FE2 relating to a service request, and relays to the served user either an indication that the service invocation was accepted, or an indication that the service invocation failed;

– *935:* FE3 receives an optional notification from FE2 containing information concerning calls parked against a DN (i.e., either a call has been parked or a call is no longer parked) and relays that information towards the served user.

5.3.4 Functional entity actions for FE4

The functional entity actions for FE4 are as follows:

– *941:* FE4 receives a service request from FE2, and sends a query to FE5 to retrieve information on the served user and the service requested;

– *942:* FE4 receives a query response from FE5, checks the subscription parameters, and sends a request for the Parked DN to FE2;

– *943:* FE4 receives a Parked DN from FE2, validates the DN, and sends a query to FE5 to retrieve information on the Parked DN;

– *944:* FE4 receives a query response from FE5, checks for common CPSG membership (of the served user and Parked DN), and sends a service response to FE2 containing, optionally, a notification to be sent to the Parked DN;

– *945:* FE4 sends a store request to FE5 indicating if a call is parked against the Parked DN;

– *946:* FE4 receives a ring-back timer expiration indication from FE2, and sends a request to FE2 for the busy/idle status of the Parking DN;

– *947:* FE4 receives the busy/idle status of the Parking DN from FE2, and sends a start ring-back timer indication to FE2;

– *948:* FE4 receives the busy/idle status of the Parking DN from FE2, and sends to FE2 an indication to start ring-back procedures to the Parking DN;

– *949:* FE4 receives an indication from FE2 that the Parking DN has reconnected to the Parked Party, and sends a cancel answer timer indication to FE2;

– *94A:* FE4 receives an answer timer expiration indication from FE2, and sends a timer expiration response to FE2 indicating the treatment to be applied to the Parked Party and, optionally, a notification to be sent to the Parked DN;

– *94B:* FE4 receives an answer timer expiration indication from FE2, and sends a start ring-back timer indication to FE2.

5.3.5 Functional entity actions for FE5

The functional entity actions for FE5 are as follows:

– *951:* FE5 receives a query from FE4 containing a request for subscription information for an indicated service for a DN, retrieves the subscription information, and sends a query response to FE4;

– *952:* FE5 receives a query from FE4 containing request for information on a Parked DN, retrieves the information, and sends a query response to FE4;

– *953:* FE5 receives a store request from FE4 to update information concerning if a call is parked against a Parked DN.

5.3.6 Functional entity actions for FE6

The functional entity actions for FE6 are as follows:

– *961:* FE6 receives and processes a Call Park Retrieve service request from served user and issues the appropriate service request to FE2;

– *962:* FE6 receives a request for a DN from FE2, and relays the information to the served user;

– *963:* FE6 receives a Parked DN from the served user, and relays the DN to FE2;

– *964:* FE6 receives and processes an indication from FE2 relating to a service request, and relays to the served user either an indication that the service invocation was accepted, or an indication that the service invocation failed.

5.4 Allocation of functions to equipment

The equipment configurations supported by this standard are depicted in figure 8. In each case in which an NT2 is shown, any configuration of equipment "behind" the NT2 is possible, including other NT2s or no additional equipment.
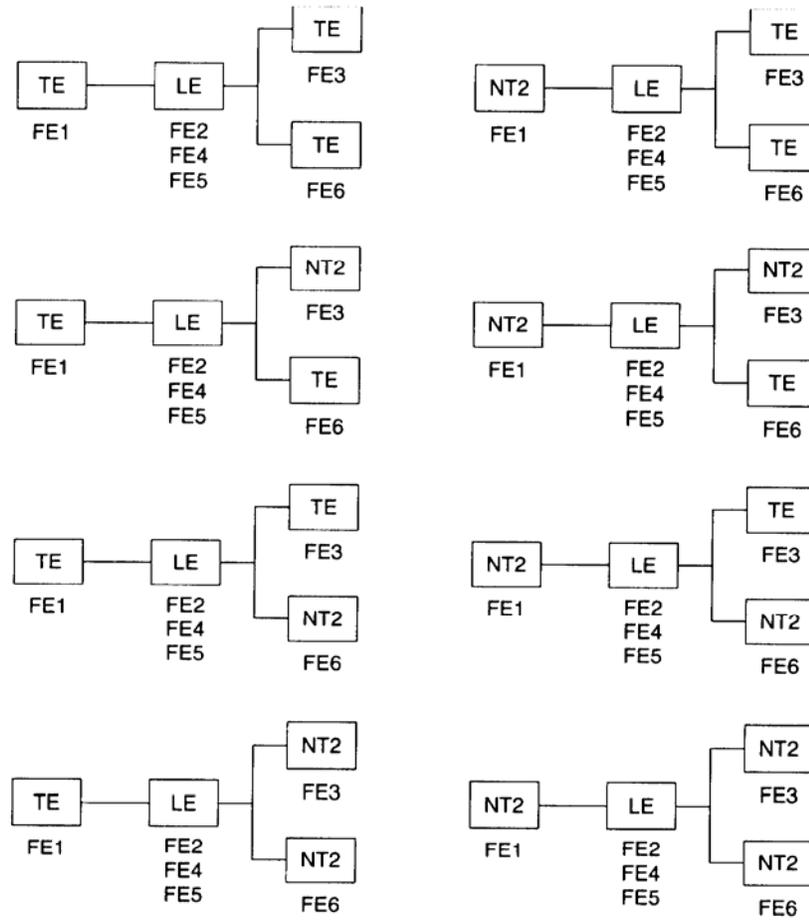
Figure 8 – Allocation of functions to equipment

6 Switching and signaling specifications for Call Park at the user/network interface

This clause contains the detailed specifications of switching and signaling capabilities for the Call Park service. This clause identifies the Digital Subscriber Signaling System No. 1 (DSS1) messages and procedures needed to support the functional entity actions for the scenarios described in clause 5.

6.1 Formats and codings

This subclause identifies the D-channel call control messages, information elements, and codepoints needed for the Call Park service.

6.1.1 Messages

6.1.1.1 INFORMATION message

Table 6 shows the specific information elements required for the invocation of Call Park and Call Park Retrieve.

Table 6 – INFORMATION message structure

Message type: INFORMATION
Significance: Local
Direction: Both

Information elements	Reference	Direction	Type	Length
Protocol discriminator	4.2/ANSI T1.607	both	M	1
Call reference	4.3/ANSI T1.607	both	M	1 – 3
Message type	4.4/ANSI T1.607	both	M	1
Cause	4.5/ANSI T1.607	n->u	O	4 – 32
Information request	8.2.5/ANSI T1.610	n->u	O	3
Feature activation	8.2.3/ANSI T1.610	u->n	O	3 – 4
Feature indication	8.2.4/ANSI T1.610	n->u	O	4 – 5
Other information elements as described in 3.1.6 of ANSI T1.607 and clause 8 of ANSI T1.610.				

Refer to 3.1.6 of ANSI T1.607 for the definition and coding of this message. The Cause Information Element has been added to the INFORMATION message to support the Call Park procedures described in 6.3.2.2. The Feature Activation, Feature Indication, and Information Request information elements are added to support the Call Park procedures described in 6.3.2.1.

6.1.1.2 Other messages

The following call control messages, which are defined in ANSI T1.607, are used for the Call Park service: SETUP, SETUP ACKNOWLEDGE, CALL PROCEEDING, PROGRESS, ALERTING, CONNECT, CONNECT ACKNOWLEDGE, DISCONNECT, RELEASE, RELEASE COMPLETE.

6.1.2 Information elements

The following information elements, which are defined in ANSI T1.607, are used for the Call Park service: Protocol Discriminator, Call Reference, Message Type, Cause, and Signal.

The following information elements, which are defined in ANSI T1.610, are used for the Call Park service: Feature Activation, Feature Indication, and Information Request.

6.1.3 Codepoints

The National Specific cause values listed in table 7 are referenced in other documents, as indicated.

Table 7 – National specific cause values

Information element	Codepoint value	Description	Reference
Cause IE	51	Call type incompatible with service request	ANSI T1.650
Cause IE	53	Service operation violated	ANSI T1.650

A diagnostic may be sent along with national-specific cause #53, and if included, shall be coded as defined in table 8.

Table 8 – Cause #53 diagnostic value coding

Cause	Description	Diagnostics	Diagnostic Value	Reference
53	Service operation violated	Short-term denial Long-term denial	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1	ANSI T1.650

6.2 Support assumptions

6.2.1 Assumptions on the terminal equipment

This standard assumes that the Terminal Equipment:

– supports the Feature Key management protocol for Call Park;

– supports information request procedures for Call Park and Call Park Retrieve:

  – After the terminal receives the Information Request information element coded with "prompt for additional information, address digits," it is assumed that the terminal will send information that the user selects with the digit input mechanism (e.g., keypad) as IA5 characters coded in either the Keypad or Called Party Number information element (and not as DTMF);

  – After the terminal receives the Information Request information element coded with "information request completed," it is assumed that the terminal will send information that the user selects with the digit input mechanism (e.g., keypad) as DTMF.

– is capable of uniquely associating a Feature Activator with a specific Feature Indicator.

6.2.2 Assumptions on the network

6.2.2.1 Originating network

The calling party (the party whose call is to be parked) may be ISDN or non-ISDN.

6.2.2.2 Terminating network

It is assumed that the terminating network supports ISDN (DSS1) signaling.

6.2.3 Service states and timers

6.2.3.1 States

No states beyond those defined in ANSI T1.607 are needed for the Call Park service. No auxiliary states beyond those defined in ANSI T1.610 are needed for the Call Park service.

6.2.3.2 Timers

The timers summarized in tables 9 and 10 shall be used for the Call Park service. The value of timer T-Rbt shall be subscribable on a per-Call Park Subscriber Group basis (see table 1). Timer T-Arb is not subscribable. The precise details for these timers are found in 6.3, which shall be considered the definitive description.

Table 9 – Timer T-Rbt for Call Park service

Timer name	Range	Default value	Cause for start	Normal stop	At first expiry	At second expiry	At third expiry
T-Rbt (defined in table 1)	30 sec to 6 min	1 min	When call is successfully parked	Parked call is successfully Call Park Retrieved	Attempt to offer call to Parking Party (start timer T-Arb). If busy or not answered, repark call and restart T-Rbt.	Attempt to offer call to Parking Party (start timer T-Arb). If busy or not answered, repark call and restart T-Rbt.	Attempt to offer call to Parking Party (start timer T-Arb). If busy, clear or forward call based on subscription option.

Table 10 – Timer T-Arb for Call Park service

Timer name	Range	Default value	Cause for start	Normal stop	At expiry
T-Arb	30 sec (fixed)	30 sec	When a call is offered to the Parking DN as a Ring-back call	When the Parking Party sends a CONNECT or clearing message in response to the ring-back	If T-Rbt has not expired three times, park call against previous Parked DN and restart T-Rbt; else clear or forward call based on subscription option.

6.3 Procedures for Call Park

At any given time, at most one call shall be permitted to be parked against a DN. As indicated in 6.3.2.1(a) and 6.3.2.2(a), an attempt to park a call for a DN that already has a call parked against it shall be rejected by the network.

6.3.1 Activation and deactivation

Call Park shall only be activated or deactivated via a service order with the Service Provider. Call Park shall be active after the Service Provider provisions the service. Call Park shall be inactive after the Service Provider removes the service from the subscriber's line.

6.3.2 Invocation and operation

6.3.2.1 Normal procedures

This subclause describes the normal procedures for Call Park, Call Park Retrieve, and Ring-back After Time-out:

a) *Call Park request:* To invoke Call Park, there must be at least one call in the active state and connected to a B-channel associated with the served user's terminal. The served user shall invoke Call Park by sending an INFORMATION message to the network that contains the Feature Activation information element coded to "feature identifier = call park." The call reference value in the INFORMATION message shall contain either the null call reference or the call reference of the active call that is to be parked. If the null call reference is used, then there shall be one and only one call active and connected to a B-channel associated with the served user's terminal, and the network shall attempt to park this call.

When requesting the Call Park service, the feature identifier value, sent in the Feature Activation information element, and subsequent Parked DN (or possible abbreviated indication) shall be sent utilizing feature key procedures described in ANSI T1.610. If a complete Parked DN was not received, then the network shall interrupt the communication path and return an idle pattern to both users. If the network requests address digits from the retrieving user, the network shall include the Feature Indication information element coded to "feature identifier = call park, status = prompt" in the information request procedures.

When the network receives the complete Parked DN, or a valid abbreviated indication to park the call against the user's (Parking Party's) DN, it shall return an INFORMATION message that contains the Information Request information element coded with "information request completed" and the Feature Indication information element coded to "feature identifier = call park, status = idle." The abbreviated indication shall be the receipt of an end of dialing indication before any digits are received, in which case the network shall use the Parking DN as the Parked DN.

When the network determines that the complete DN (or valid abbreviated indication) has been dialed, it shall determine if the Parked DN is valid, and check if the Parking DN and the Parked DN (i.e., the number just entered if an abbreviated indication was not used) are members of the same Call Park Subscriber Group (CPSG). If the DN is valid, and the DNs belong to the same CPSG, the network shall determine if there is already a call parked against the Parked DN. If no call is already parked against the DN, the network shall park the active call and start timer T-Rbt. The network shall continue to send idle pattern to the Parked Party until the Parked Party is retrieved, cleared, or forwarded.

The network shall send an INFORMATION message that includes a Feature Indication information element coded to "feature identifier = call park retrieve, status = active," to each terminal with a Call Park Retrieve feature indicator assigned for the Parked DN, if the indicator is in the "idle" state.

The network shall then initiate call clearing to the parking party as specified in ANSI T1.607. Prior to sending the DISCONNECT message, the network shall send a PROGRESS message that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," and the Signal information element coded to "confirmation tone on." The network shall apply an in-band confirmation tone.

b) *Call Park Retrieve request:* The served user shall invoke Call Park Retrieve by means of either feature key management procedures or keypad feature invocation procedures:

–   *Feature key management:* When requesting the Call Park Retrieve service, the feature identifier value, sent in the Feature Activation information element, and subsequent Parked DN (or possible abbreviated indication) shall be sent utilizing feature key procedures described in ANSI T1.610. If the network requests address digits from the retrieving user, the network shall include the Feature Indication information element

coded to "feature identifier = call park retrieve, status = prompt" in the information request procedures.

When the network receives the complete Parked DN, or a valid abbreviated indication of the Parked DN, it shall return an INFORMATION message that contains the Information Request information element coded with "information request completed" and the Feature Indication information element coded to "feature identifier = call park retrieve, status = idle." The abbreviated indication shall be the receipt of an end of dialing indication before any digits are received, in which case the network shall use the Retrieving DN as the Parked DN.

When the network determines that the complete Parked DN (or valid abbreviated indication) has been dialed, it shall determine if the Parked DN is valid, and shall check if the Parked DN and Retrieving DN (the DN associated with the Call Park Retrieve request) are members of the same CPSG. The network shall also check if there is a call parked against the Parked DN. If these checks pass, the network shall send the user a CALL PROCEEDING message followed by a CONNECT message and shall connect the user to the parked call. If there is no call parked against the Retrieving DN or if the Retrieving Party is retrieving a call parked against their own DN, the CALL PROCEEDING message shall include the Feature Indication information element coded to "feature identifier = call park retrieve, status = idle." If there is a call parked against the Retrieving DN, the CALL PROCEEDING message shall include the Feature Indication information element coded to "feature identifier = call park retrieve, status = active." The network shall stop timer T-Rbt.

The network shall send an INFORMATION message that includes a Feature Indication information element coded to "feature identifier = call park retrieve, status = idle," to each terminal with a feature identifier assigned for the Parked DN, if the indicator is in the "active" state.

– *Keypad feature invocation:* This clause contains the keypad feature invocation procedures that apply to the invocation of Call Park Retrieve. It is assumed for these procedures that a dial access code (DAC) has been assigned for the Call Park Retrieve service in the served user's dialing plan.

When requesting the Call Park Retrieve service, the Call Park Retrieve DAC, sent in either the Keypad Facility or the Called Party Number information element, and subsequent Parked DN (or abbreviated indication) shall be sent utilizing keypad procedures described in ANSI T1.610.

If the network requests address digits from the retrieving user, the network shall include the Feature Indication information element coded to "feature identifier = call park retrieve, status = prompt" in the information request procedures, if a feature indicator is assigned. When the network determines that a complete Parked DN or valid abbreviated indication has been dialed, it shall determine if the Parked DN is valid, and check if the Parked DN and Retrieving DN (the DN associated with the Call Park Retrieve request) are members of the same CPSG. The network shall also check if there is a call parked against the Parked DN. If these checks pass, the network shall send the user a CALL PROCEEDING message followed by a CONNECT message and shall connect the user to the parked call. If there is no call parked against the Retrieving DN, or if the Retrieving Party is retrieving a call parked against their own DN, the CALL PROCEEDING message shall include the Feature Indication information element coded to "feature identifier = call park retrieve, status = idle." If there is a call parked against the Retrieving DN, the CALL PROCEEDING message shall include the Feature Indication information element coded to "feature identifier = call park retrieve, status = active." The network shall stop timer T-Rbt.

The network shall send an INFORMATION message that includes a Feature Indication information element coded to "feature identifier = call park retrieve, status = idle," to each

terminal with a feature identifier assigned for the Parked DN, if the indicator is in the "active" state.

c) *Ring-back After Time-out:* If timer T-Rbt expires, and the Parking DN is idle, then the network shall send a SETUP message to the Parking Party coded with the following information elements:

–   The Signal information element shall be included and coded to "alerting pattern 2";

–   The Calling Party Number information element shall be coded with the DN information of the Parked Party (if Calling Line Identification is delivered to Parking Party);

–   The Called Party Number information element shall be coded with the Parking DN;

–   The Redirecting Number information element shall be coded with the Parked DN.

The network shall also start timer T-Arb. This Ring-back call shall be handled as a normal call termination as described in ANSI T1.607.

If the Parking DN does not answer the call, and T-Rbt has not expired three times, the network shall repark the call against the Parked DN and restart timer T-Rbt. If T-Rbt has expired three times and the Parking DN does not answer the call, the network shall apply the treatment indicated by the subscription parameter "Ring-back failure treatment" (see table 1). If the parameter is set to clear the Parked Call, then the network will initiate clearing towards the Parked Party with cause value #102, timer expiry (location: public network serving the remote user). If the parameter is set to Forward to Specified DN, then the network will forward the Parked Party to a preselected DN. The preselected DN is established and stored by the network when the service is subscribed.

If the network receives a CONNECT message with the call reference of the Ring-back call before timer T-Arb expires, the network shall connect the Parked Party to the Parking Party. If the call is answered by the Parking Party before timer T-Arb expires, or is forwarded or cleared after the third Ring-back attempt, the network shall send an INFORMATION message that includes a Feature Indication information element coded to "feature identifier = call park retrieve, status = idle," to each terminal with a feature identifier assigned for the Parked DN, if the indicator is in the "active" state.

If timer T-Arb expires, and the network determines that T-Rbt has not expired three times, the network shall park the call against the previous Parked DN and restart timer T-Rbt. If T-Arb expires and the network determines that T-Rbt has expired three times, the network shall apply the treatment indicated by the subscription parameter "Ring-back failure treatment" (see table 1).

6.3.2.2 Exceptional procedures

The following exceptional procedures shall apply for the Call Park service:

a) *Call Park request:*   If the network receives a Call Park service request for a call that is not Speech or 3.1-kHz Audio, the network shall retain the B-channel connection for the call, abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to national-specific cause #51, "call type incompatible with service request."

If the network receives a Call Park service request for a call that is not in the active call state and connected to a B-channel, the network shall retain the B-channel connection for the call

(if appropriate), abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to national-specific cause #53, "service operation violated." If the INFORMATION message contained the null call reference and there are no calls in progress or in the active call state, then the diagnostic is coded "long-term denial;" otherwise, the diagnostic is coded "short-term denial."

If the network receives from a user a Call Park service request with a null call reference, and there are two or more Speech or 3.1-kHz Audio calls active for the user, then the network shall abort the service request, and send an INFORMATION message to the served user that contains the null call reference, and the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "short-term denial."

If the network receives a Call Park service request, and the Parked DN indicated by the service request is not a valid DN, the network shall retain the B-channel connection for the call, reestablish the communication path between the users (if interrupted), abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to cause #29, "facility rejected." If an Information Request information element was previously sent to request address digits, then the INFORMATION message shall also contain the Information Request information element coded with "information request completed." The INFORMATION message shall also contain the Feature Indication information element coded to "feature identifier = call park, status = idle."

If the network receives a Call Park service request, and the Parked DN indicated by the service request identifies a DN that is not in the same Call Park Subscriber Group as the served user's DN, the network shall retain the B-channel connection for the call, reestablish the communication path between the users (if interrupted), abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to cause #29, "facility rejected." If an Information Request information element was previously sent to request address digits, then the INFORMATION message shall also contain the Information Request information element coded with "information request completed." The INFORMATION message shall also contain the Feature Indication information element coded to "feature identifier = call park, status = idle."

If the network receives a Call Park service request, and determines that there is already a call parked against the Parked DN indicated by the service request, the network shall retain the B-channel connection for the call, reestablish the communication path between the users (if interrupted), abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to cause #29, "facility rejected." If an Information Request information element was previously sent to request address digits, then the INFORMATION message shall also contain the Information Request information element coded with "information request completed." The INFORMATION message shall also contain the Feature Indication information element coded to "feature identifier = call park, status = idle."

If the network receives a Call Park service request, and determines that network resources are unavailable to allow the call to be parked, the network shall retain the B-channel for the call, abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to cause #34, "no circuit or channel available." The INFORMATION message shall also contain the Feature Indication information element coded to "feature identifier = call park, status = idle."

b)   *Call Park Retrieve request:*   If the network receives a Call Park Retrieve service request using the keypad protocol, and determines that the DN originating the request is not subscribed to the Call Park Retrieve service, then the network shall send a PROGRESS message to the served user that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," the Signal information element coded to "network congestion tone on," and the Cause information element coded to cause #50, "requested facility not subscribed." The network shall consider the originating DN to be the DN derived for the call during call establishment for feature key or keypad invocation within the context of a call. If a B-channel has not been established, then the network shall first send a CALL PROCEEDING message that contains a Channel Identification information element coded to indicate an available B-channel. The network shall apply reorder tone in-band. Subsequent to this, the network shall initiate call clearing if the user has not already done so.

If the network receives a Call Park Retrieve service request that indicates a bearer capability that is not Speech or 3.1-kHz Audio, the network shall abort the service request, and send a RELEASE COMPLETE message (or DISCONNECT message if a SETUP ACKNOWLEDGE message was returned) to the served user that contains the Cause information element coded to national-specific cause #51, "call type incompatible with service request."

If the network receives a Call Park Retrieve service request, and the Parked DN indicated by the service request is not a valid DN, the network shall abort the service request and send a PROGRESS message to the served user that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," the Signal information element coded to "network congestion tone on" and the Cause information element coded to cause #29, "facility rejected." If a B-channel has not been established, then the network shall first send a CALL PROCEEDING message that contains a Channel Identification information element coded to indicate an available B-channel. The network shall apply reorder tone in-band. Subsequent to this, the network shall initiate call clearing if the user has not already done so. The network shall also send to the served user an INFORMATION message that shall contain the Feature Indication information element coded to "feature identifier = call park retrieve," and the status coded to "idle" if there is no call parked against the Retrieving DN (the DN from which the request is coming), or "active" if there is a call parked against the Retrieving DN.

If the network receives a Call Park Retrieve service request, and the Parked DN indicated by the service request identifies a DN that is not in the same Call Park Subscriber Group as the served user's DN, the network shall abort the service request and send a PROGRESS message to the served user that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," the Signal information element coded to "network congestion tone on," and the Cause information element coded to cause #29, "facility rejected." If a B-channel has not been established, then the network shall first send a CALL PROCEEDING message that contains a Channel Identification information element coded to indicate an available B-channel. The network shall apply reorder tone in-band. Subsequent to this, the network shall initiate call clearing if the user has not already done so. The network shall also send to the served user an INFORMATION message that shall contain the Feature Indication information element coded to "feature identifier = call park retrieve," and the status coded to "idle" if there is no call parked against the Retrieving DN (the DN from which the request is coming), or "active" if there is a call parked against the Retrieving DN.

If the network receives a Call Park Retrieve service request, and determines that there is no call parked against the Parked DN indicated by the service request, the network shall abort the service request and send a PROGRESS message to the served user that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," the Signal information element coded to "network congestion tone

on," and the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "short-term denial." If a B-channel has not been established, then the network shall first send a CALL PROCEEDING message that contains a Channel Identification information element coded to indicate an available B-channel. The network shall apply reorder tone in-band. Subsequent to this, the network shall initiate call clearing if the user has not already done so. The network shall also send to the served user an INFORMATION message that shall contain the Feature Indication information element coded to "feature identifier = call park retrieve," and the status coded to "idle" if there is no call parked against the Retrieving DN (the DN from which the request is coming), or "active" if there is a call parked against the Retrieving DN.

If the network receives a Call Park Retrieve service request, and if for any other reason the network is unable to allow the call to be call park retrieved, the network shall abort the service request and send a PROGRESS message to the served user that contains the Progress Indicator information element coded to #8, "in-band information or appropriate pattern is now available," the Signal information element coded to "network congestion tone on," and the Cause information element coded to cause #34, "no circuit or channel available." If a B-channel has not been established, then the network shall first send a CALL PROCEEDING message that contains a Channel Identification information element coded to indicate an available B-channel. The network shall apply reorder tone in-band. Subsequent to this, the network shall initiate call clearing if the user has not already done so. The network shall also send to the served user an INFORMATION message that shall contain the Feature Indication information element coded to "feature identifier = call park retrieve," and the status coded to "idle" if there is no call parked against the Retrieving DN (the DN from which the request is coming), or "active" if there is a call parked against the Retrieving DN.

If the network receives a Call Park Retrieve request outside the context of a call, then the network shall abort the service request, and send an INFORMATION message to the served user that contains the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "long-term denial."

c) *Ring-back After Time-out:* No exceptional procedures for Ring-back After Time-out have been identified.

6.3.3 Interworking with private ISDNs

The operation of this service is not affected by the nature (ISDN or non-ISDN) of the far end of the connection.

6.4 Interactions with other supplementary services

6.4.1 Call Waiting

The DSS1 procedures for the Call Waiting service may be used to offer a Ring-back call to the Parking Party. The Calling Party Number, Called Party Number, and Redirecting Number information elements in the Call Waiting SETUP message shall be coded in accordance with 6.3.2.1(c).

6.4.2 Call Hold

If the network receives a Call Park service request for a call that is in the Call Held auxiliary state, the network shall reject the service request and send an INFORMATION message to the served user containing the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "short-term denial." The held call shall remain in the Call Held auxiliary state.

6.4.3 Multi-Level Precedence and Preemption

The DSS1 procedures for Call Park do not interact with the DSS1 procedures for the Multi-Level Precedence and Preemption service, as defined in ANSI T1.619.

6.4.4 User-to-User Signaling

If a clearing message containing a User–User information element is received from a call that is parked, the User–User information element is discarded, and normal call clearing is applied.

6.4.5 Message Waiting Indicator Control and Notification

The DSS1 procedures for Call Park do not interact with the DSS1 procedures for the Message Waiting Indicator Control and Notification service, as defined in ANSI T1.622.

6.4.6 Calling Line Identification Presentation

If Calling Line information was delivered during call establishment, the network shall save the information and may redeliver it during Call Park Retrieve and Ring-back After Time-out (see 6.3.2.1(c)). For Ring-back After Time-out, the procedures described in ANSI T1.625 for presenting the information shall be followed. For Call Park Retrieve, the information may be sent in a Display Text information element sent in an appropriate message (e.g., CONNECT). As a network option, the information may also be sent in the Connected Number information element included within the CONNECT message. The codings for the Connected Number information element are defined in 4.5.13 of ANSI T1.607.

6.4.7 Calling Line Identification Restriction

If Calling Line information was delivered during call establishment, and presentation of that information was restricted, then the same restriction shall apply when the network redelivers the information during Ring-back After Time-out or Call Park Retrieve.

6.4.8 Normal Call Transfer

The DSS1 procedures for Call Park do not interact with the DSS1 procedures for the Normal Call Transfer service, as defined in ANSI T1.632. If the network receives a Normal Call Transfer request for a ring-back call termination before the ring-back call is answered, the network shall reject the service request and send an INFORMATION message to the served user containing the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "short-term denial."

6.4.9 Calling Name Identification Restriction

If Calling Name information was delivered during call establishment, and presentation of that information was restricted, then the same restriction shall apply when the network redelivers the name information during Ring-back After Time-out or Call Park Retrieve.

6.4.10 Calling Name Identification Presentation

If Calling Name information was delivered during call establishment, the network shall save the information and redeliver it during Call Park Retrieve or Ring-back After Time-out, using the Display Text information element in the appropriate message.

6.4.11 Call Deflection

If the network receives a Call Deflection request (as defined in ANSI T1.642) for a ring-back call termination, the network shall reject the service request by sending a Return Error component with the error value proceduralError in a FACILITY message to the served user.

6.4.12 Explicit Call Transfer

The DSS1 procedures for Call Park do not interact with the DSS1 procedures for the Explicit Call Transfer service, as defined in ANSI T1.643. If the network receives a Explicit Call Transfer request for a Ring-back call termination before the Ring-back call is answered, the network shall

36

reject the service request by sending a Return Error component with the error value invalidCallState in a FACILITY message to the served user in accordance with 6.3.22 of ANSI T1.643.

6.4.13 Conference Calling

The conference controller may not park the conference. If the network receives from a conference controller an INFORMATION message containing a Feature Activation information element with a feature identifier coded as "call park," and the message includes either the call reference of a conference, or a null call reference value and the active call is a conference, then the network shall send to the user an INFORMATION message containing the Cause information element coded to national-specific cause #53, "service operation violated," with diagnostic "long-term denial," using the appropriate call reference.

7   Switching and signaling specifications for Call Park at interexchange/network interface

No ISDN User Part or Transaction Capabilities Application Part procedures are required to support this service.

8   Specifications for protocol interworking

The parked user may be non-ISDN. There is no protocol interworking required to support this service.

Annex A
(informative)

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ANSI T1.643-1995, *Telecommunications – Integrated services digital network (ISDN) – Explicit call transfer supplementary service*

ANSI T1.647-1995, *Telecommunications – Integrated services digital network (ISDN) – conference calling supplementary service*

ITU-T Recommendation Q.71 (1993), *Circuit mode switched bearer services*[1]

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[1] Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.