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Foreword

This ETSI Technical Report (ETR) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunications services as provided by European public telecommunications operators under the Pan-European Integrated Services Digital Network (ISDN):

- Stage 1: is an overall service description, from the user's standpoint;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

This ETR details the stage 2 aspects (functional capabilities and information flows) needed to support the Freephone (FPH) supplementary service. The stage 1 and stage 3 aspects are detailed in ETS 300 208 and ETS 300 210-1, respectively.

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1 Scope

This ETSI Technical Report (ETR) defines the stage two of the Freephone (FPH) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators. Stage two identifies the functional capabilities and the information flows needed to support the stage one service description. The stage two description also identifies user operations not directly associated with a call (see CCITT Recommendation I.130 [3]).

NOTE: This stage 2 description reflects a premature status of the FPH supplementary service, i.e. the functional capabilities and information flows are not complete and may not be in full alignment with the corresponding stage 1 and stage 3 descriptions.

This ETR is specified according to the methodology specified in CCITT Recommendation Q.65 [5].

This ETR does not formally describe the relationship between this supplementary service and the basic call, but where possible this information is included for guidance.

In addition this ETR does not specify the requirements where the service is provided to the user via a private ISDN. This ETR does not specify the requirements for the allocation of defined Functional Entities (FEs) within a private ISDN; it does however define which FEs may be allocated to a private ISDN.

This ETR does not specify the additional requirements where the service is provided to the user via a telecommunications network that is not an ISDN.

The FPH supplementary service allows the served user having one or several installations to be reached from all or part of the country, or internationally as appropriate, with a Freephone number and to be charged for this kind of call.

The FPH supplementary service is applicable to all circuit switched telecommunication services.

This ETR is applicable to the stage three standards for the ISDN FPH supplementary service. The term "stage three" is also defined in CCITT Recommendation I.130 [3]. Where the text indicates the status of a requirement, i.e. as strict command or prohibition, as authorization leaving freedom as a capability or possibility, this needs to be reflected in the text of the relevant stage 3 standards.

Furthermore, conformance to this ETR is met by conforming to the stage three standards with the field of application appropriate to the equipment being implemented. Therefore, no method of testing is provided for this ETR.

2 References

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

- [1] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".
- [2] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [3] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [4] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means used to describe them".
- [5] CCITT Recommendation Q.65 (1988): "Stage 2 of the method for the characterisation of services supported by an ISDN".

- [6] CCITT Recommendation Q.71 (1988): "ISDN 64 kbit/s circuit mode switched bearer service".
- [7] CCITT Recommendation Z.100 (1988): "Specification and Description Language (SDL)".

3 Definitions

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

access arrangement: Installations and/or terminals connected to the served user's access.

freephone call: A call made to the freephone number.

freephone number: A set of digits assigned by the service provider to a served user upon subscription to the FPH supplementary service. The freephone number forms the subscriber number part of the ISDN number, and in conjunction with a service access code, the freephone number forms the national part of an ISDN number (see CCITT Recommendation E.164 [1]).

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [2], definition 308.

ISDN number: A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [1].

routing area: An area from which calls using a given freephone number are routed to one access arrangement or to a set of access arrangements according to other requirements.

served user: The customer who has subscribed to the FPH supplementary service.

service; telecommunication service: See ITU-T Recommendation I.112 [2], definition 201.

service access code: Digits assigned to the FPH supplementary service, which forms the national destination code part of an ISDN number. In conjunction with a freephone number, the service access code forms the national part of an ISDN number.

service profile: A record containing instructions for freephone call handling.

supplementary service: See ITU-T Recommendation I.210 [4], subclause 2.4.

4 Abbreviations

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

CC	Call Control
CCA	Call Control Agent
FE	Functional Entity
FEA	Functional Entity Action
FPH	Freephone
FSC	Freephone Service Centre
ISDN	Integrated Services Digital Network
LE	Local Exchange
OLE	Originating Local Exchange
PTNX	Private Telecommunication Network eXchange
SDL	Specification and Description Language
TE	Terminal Equipment
TLE	Terminating Local Exchange
TR	Transit Exchange

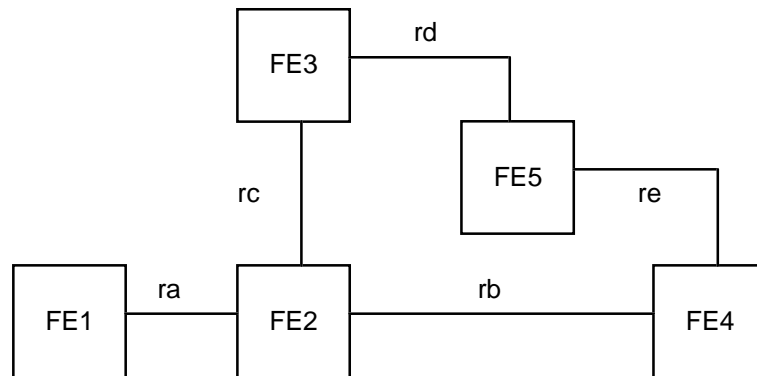
5 Description

Not applicable.

6 Derivation of the functional model

6.1 Functional model description

The functional model for the use of the FPH supplementary service is shown in figure 1.



NOTE 1: The functional entity FE5 is used only when the queuing facility is subscribed to.

NOTE 2: The charging function for the freephone call can be located either in FE2 or in FE3, depending on service provider implementation.

Figure 1: Functional model

6.2 Description of the FEs

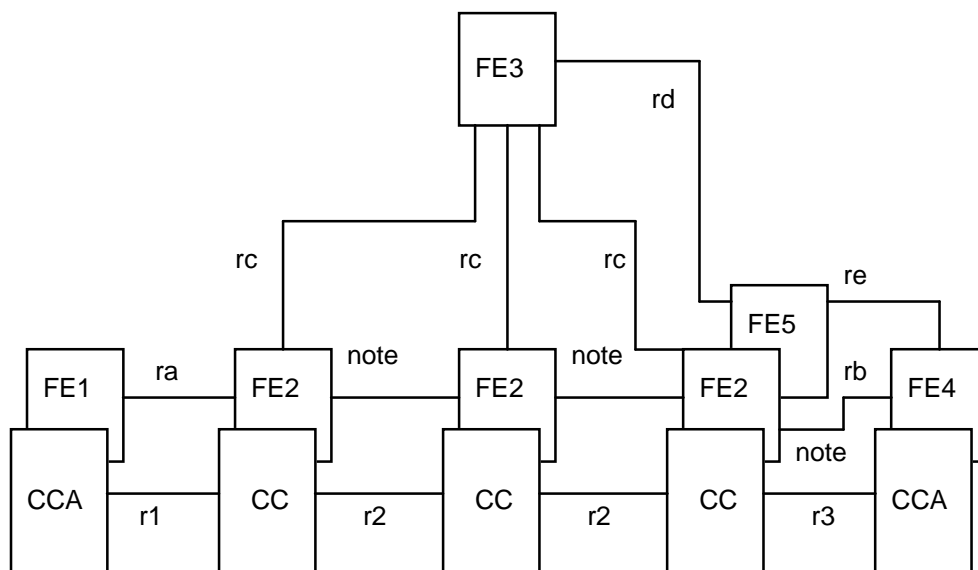
The FEs required by the FPH supplementary service in addition to those of the basic call shall be as follows:

- FE1: Originating FPH supplementary service entity;
- FE2: FPH supplementary service access entity;
- FE3: FPH supplementary service control entity;
- FE4: Terminating FPH supplementary service entity;
- FE5: FPH supplementary service busy monitoring entity.

6.3 Relationship with a basic service

The relationship of the FPH supplementary service functional model to a basic call functional model is shown in figure 2 for a "one network" service and in figure 3 for a "two network" service.

NOTE: The basic call model is defined in CCITT Recommendation Q.71 [6], subclause 2.1



NOTE: This figure shows that the functional entity FE2 can be located in every CC but only one pair FE3-FE2 exists at the same time. For certain types of calls e.g. international, two different independent pairs of FE3-FE2 can be involved in that call (see figure 3).

Figure 2

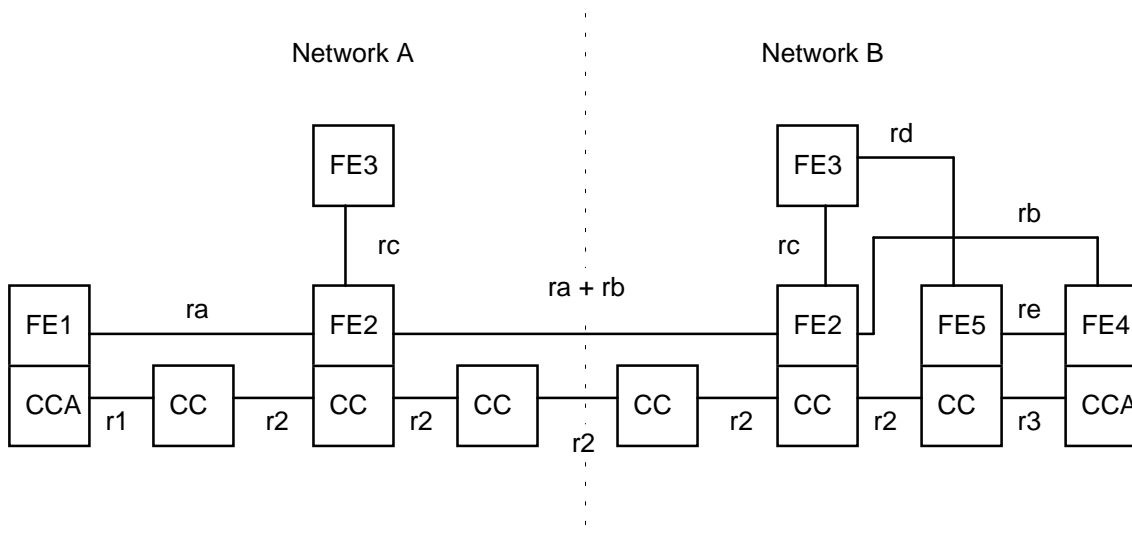


Figure 3

7 Information flows

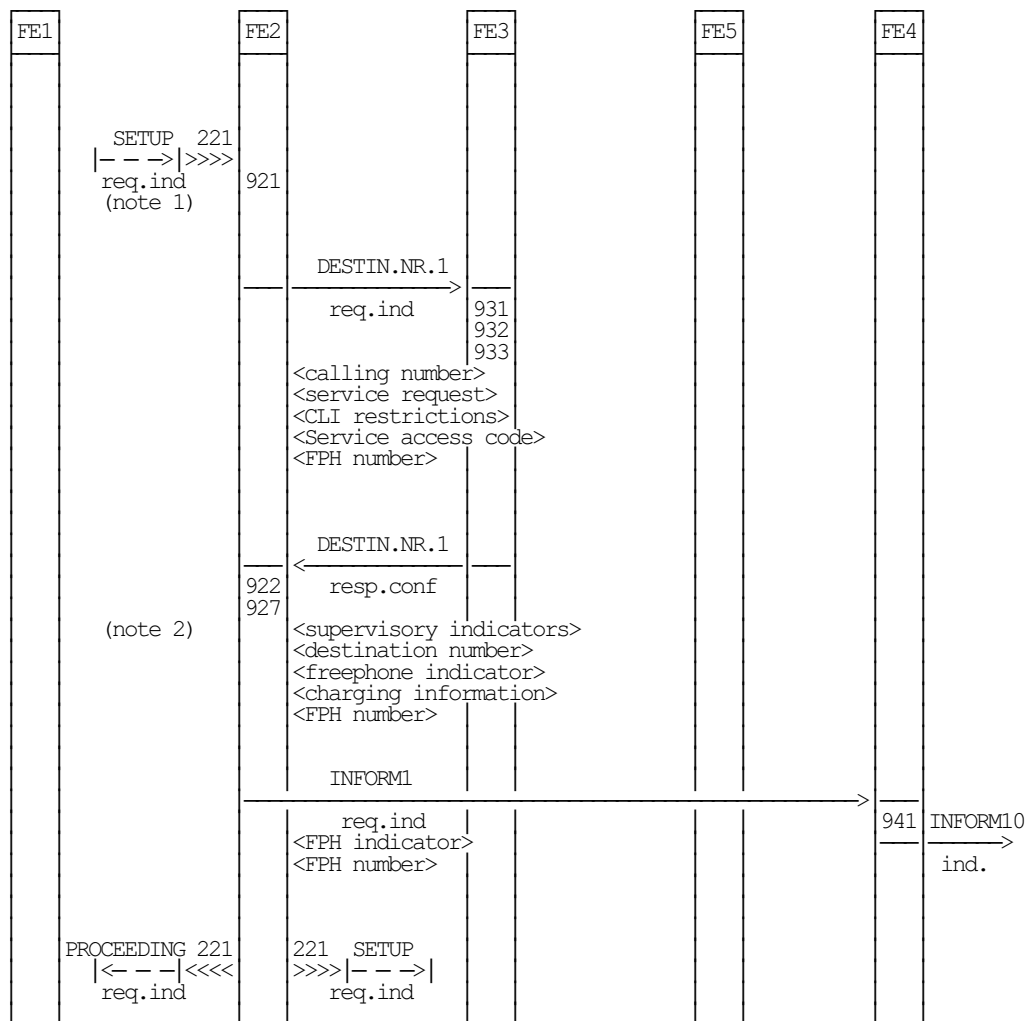
7.1 Information flow diagrams

NOTE: For the relation to the basic call, shown in the flows, FE2 is supposed to be allocated in the Originating Local Exchange (OLE). The SDL diagrams will show the relations for the other allocations.

7.1.1 Call with no facility active

7.1.1.1 Call set up to destination

The flow for the call set up to the destination is shown in figure 4.



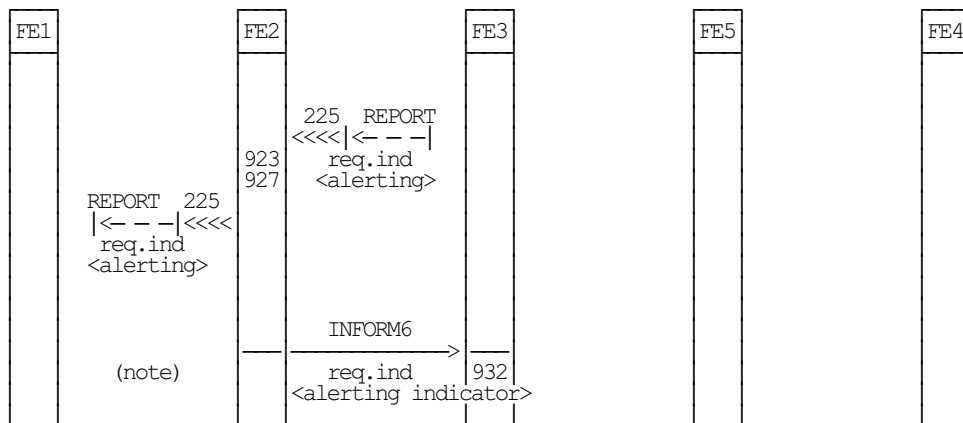
NOTE 1: For this call, the called number is composed of the service access code plus the freephone number.

NOTE 2: The supervisory flags as shown in table 17 (see subclause 7.2.6) can be set at FE2 on request by FE3.

Figure 4

7.1.1.2 Call alerting

The flow for the call completion is shown in figure 5.

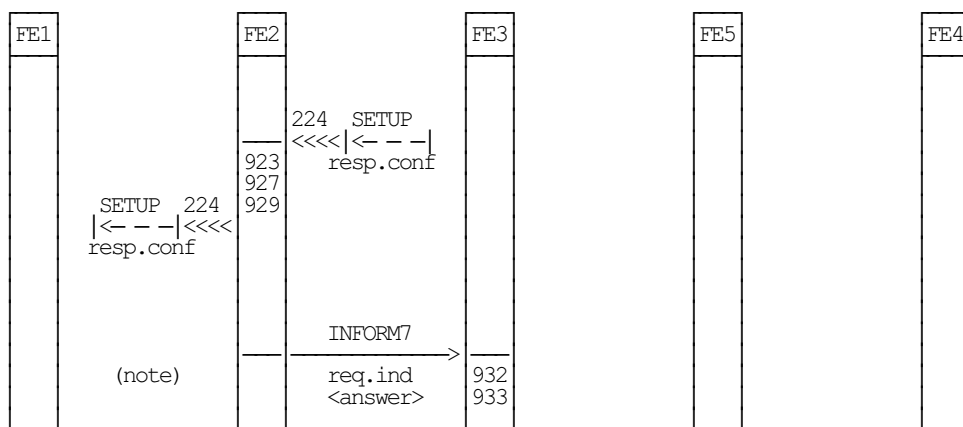


NOTE: INFORM6 is not sent if the supervisory flag for the corresponding event is OFF.

Figure 5

7.1.1.3 Call answer

The flow for the call answer is shown in figure 6.



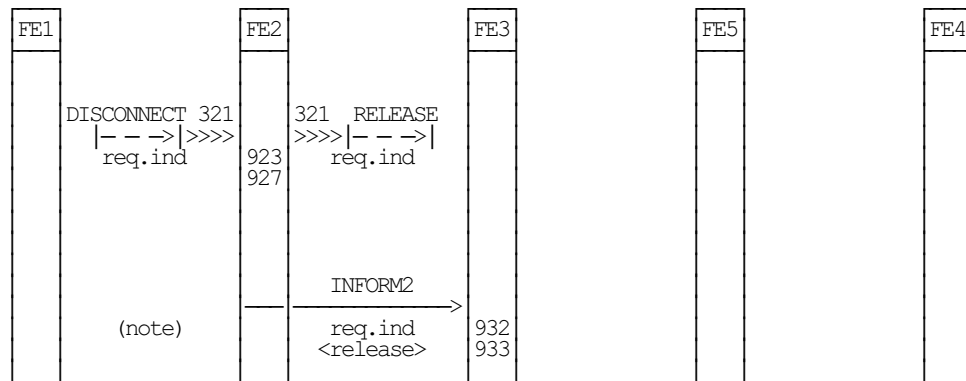
NOTE: INFORM7 is not sent if the supervisory flag for the corresponding event is OFF.

Figure 6

7.1.1.4 Call clear

7.1.1.4.1 Call clear from calling side

The flow for the call cleared from the calling side is shown in figure 7.

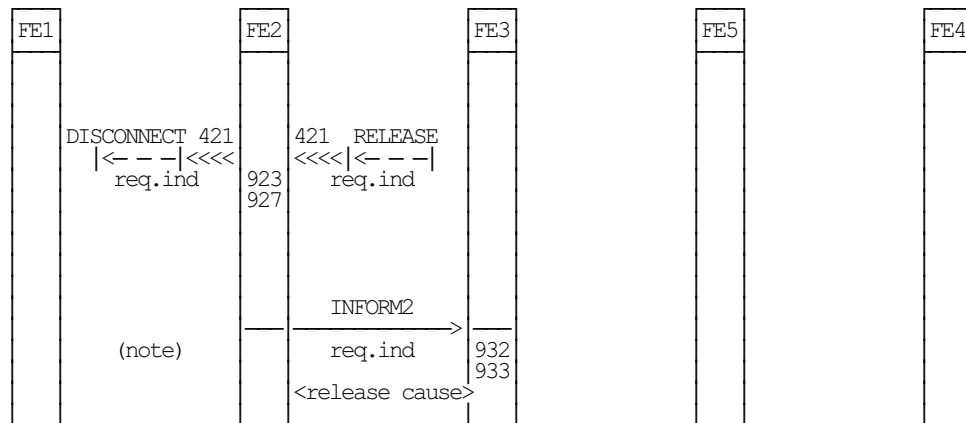


NOTE: INFORM2 is not sent if the supervisory flag for the corresponding event is OFF.

Figure 7

7.1.1.4.2 Call clear from the served user destination side

The flow for the call cleared from the destination side is shown in figure 8.

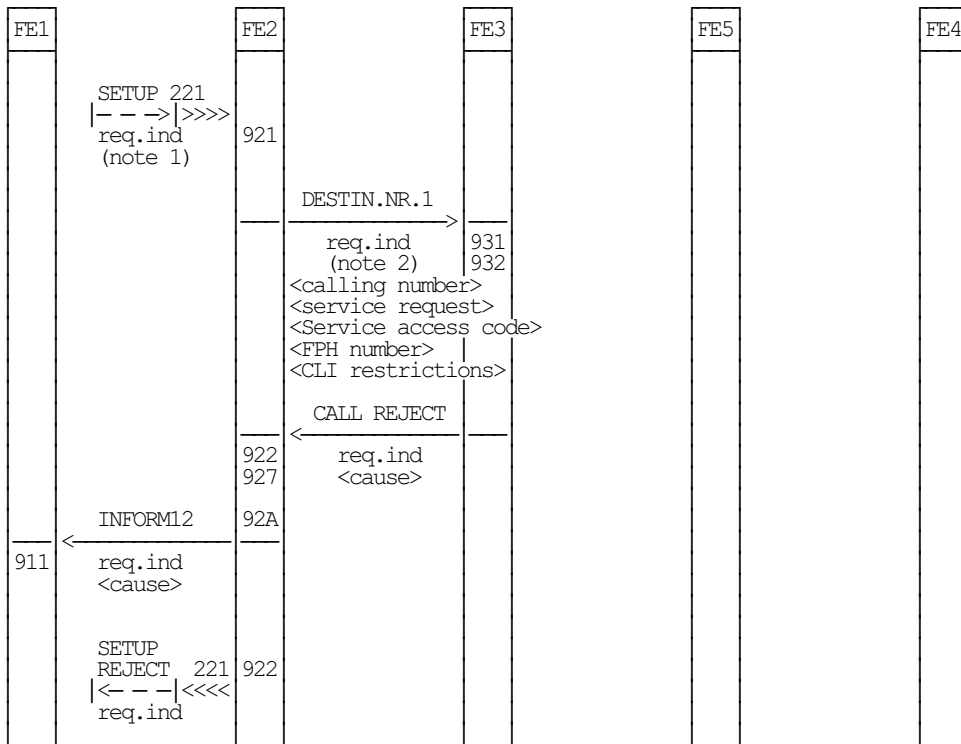


NOTE: INFORM2 is not sent if the supervisory flag for the corresponding event is OFF.

Figure 8

7.1.1.5 Immediate call rejection by FE3

The flow for the call rejected by FE3 is shown in figure 9.



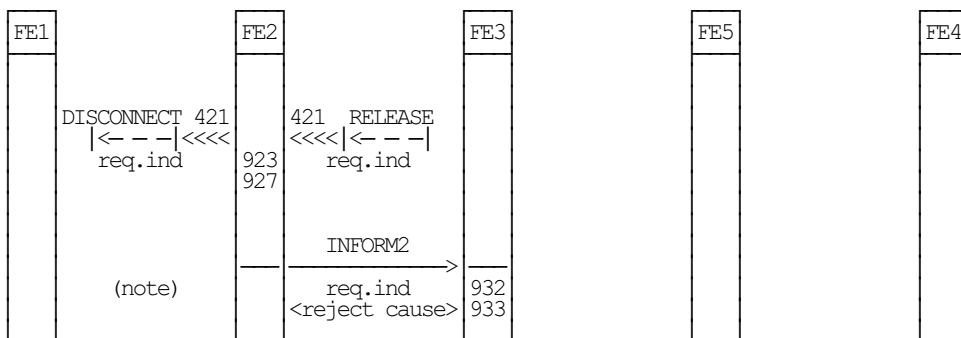
NOTE 1: For this call, the called number is composed of the service access code plus the freephone number.

NOTE 2: All the information contained in the SETUP req.ind. within the basic call shall be sent to FE3.

Figure 9

7.1.1.6 Call rejection after SETUP

The flow for the call when released in the setup state is shown in figure 10.

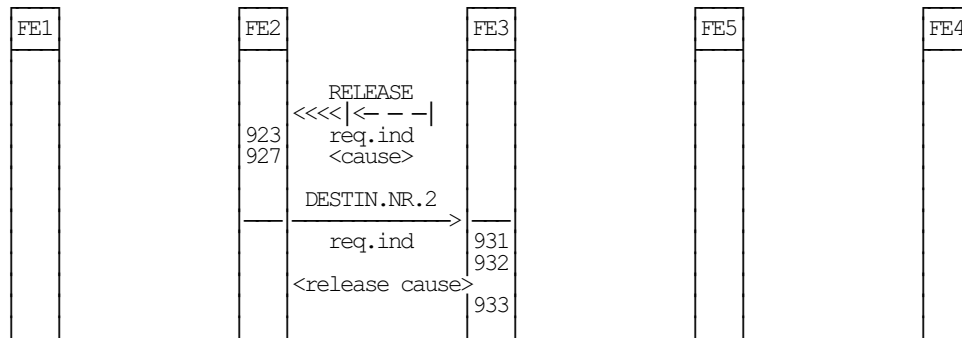


NOTE: INFORM2 is not sent if the supervisory flag for the corresponding event is OFF.

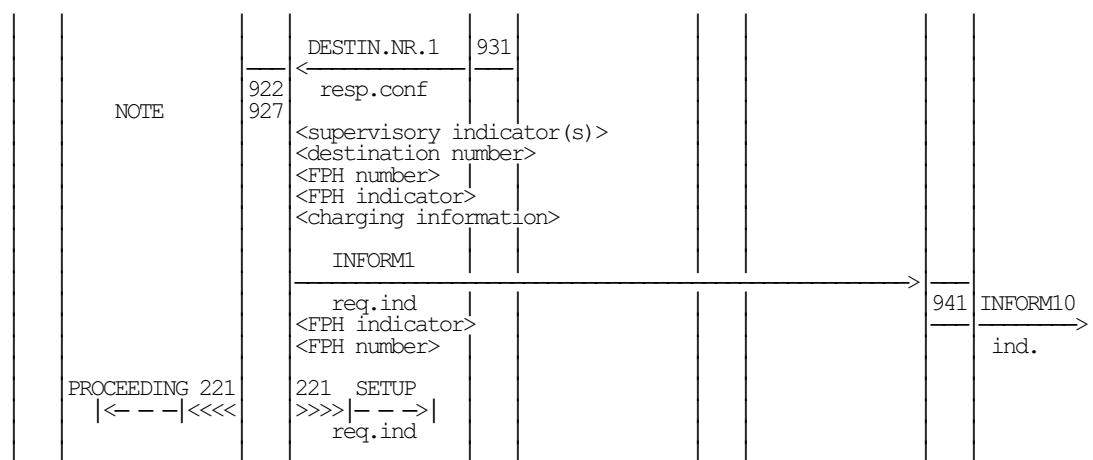
Figure 10

7.1.2 Re-routing on busy facility active for the served user destination (REJECT request flag ON in FE2)

The flow for the set up of the call to a new destination or for the call rejection is shown in figure 11.

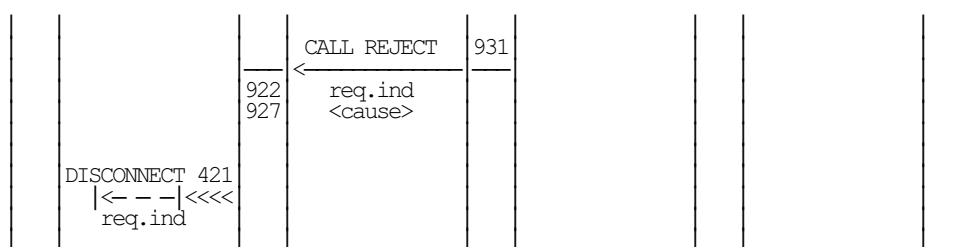


a) User busy: served user with "re-routing on busy" facility: new destination.



The call continues as one of the described cases depending on the flags set at FE2 and the facility active for this destination.

b) User busy: served user with "re-routing on busy" facility: rejection from FE3.

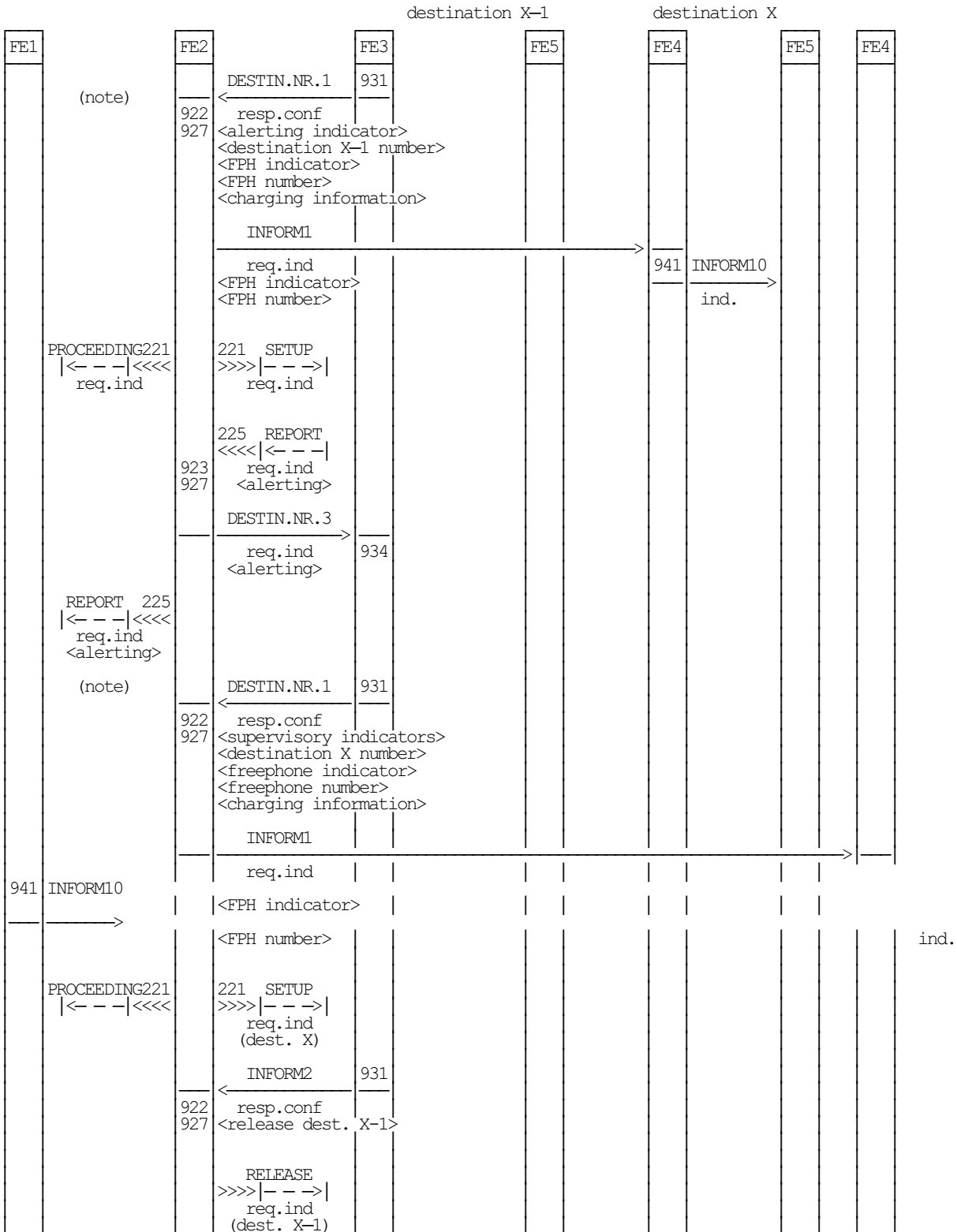


NOTE: The supervisory flags as shown in table 17 (see subclause 7.2.6) can be set at FE2 on request by FE3.

Figure 11

7.1.3 Re-routeing on no reply facility active for the served user destination

The flow for the call re-routed to a new destination after "no reply time-out" is shown in figure 12.



NOTE: The supervisory flags as shown in table 17 (see subclause 7.2.6) can be set at FE2 on request by FE3.

Figure 12

7.1.4 User busy: Queuing facility active for the served user destination

NOTE: In the case that two translations take place, the first in the country of origin of the call and the second in the country of the served user destination, the queue should relate to the last destination of the call and therefore be done in the country of destination.

7.1.4.1 Queue empty for the requested service at call set up

The flow for the call when put in queue and for the busy monitoring is shown in figures 13 through 15.

1) Call put in queue

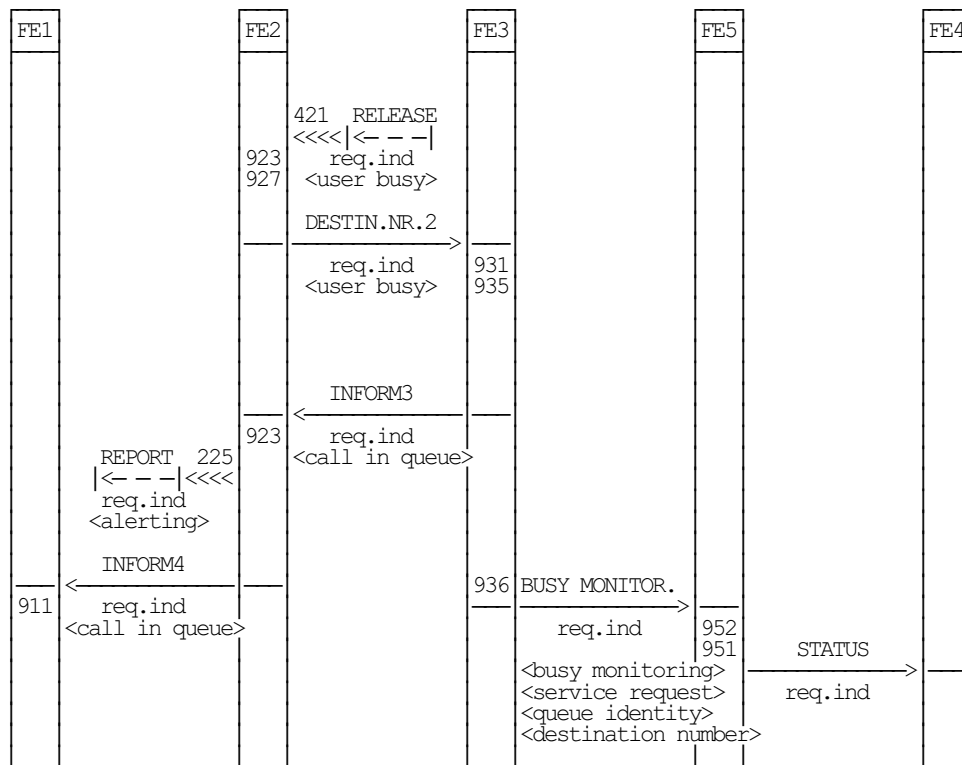
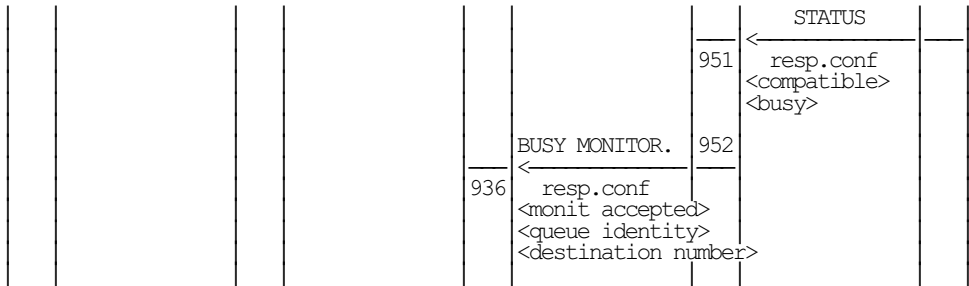


Figure 13

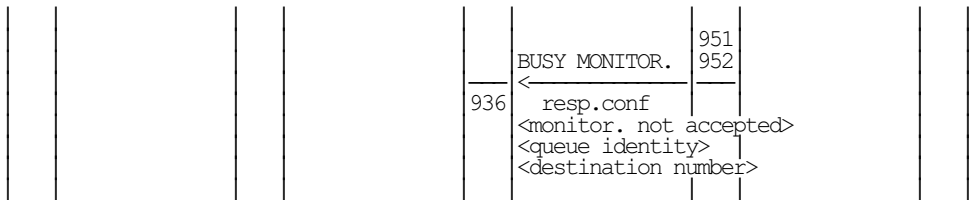
2) Terminal reaction to status request



2a) <busy monitoring> request accepted by FE5



2b) <busy monitoring> request not accepted (e.g. timer Tfph4 expires because no response from FE4 or already <busy monitoring> request stored)



2c) destination free

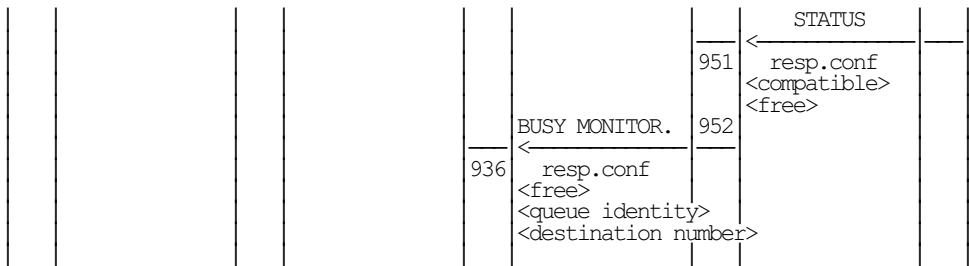


Figure 14

3) No (possible) destination accepts the <monitoring request> or timer Tfph2 expires

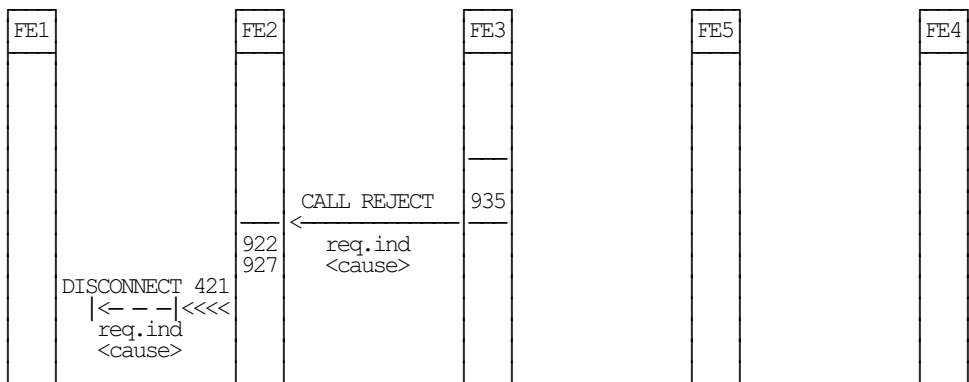
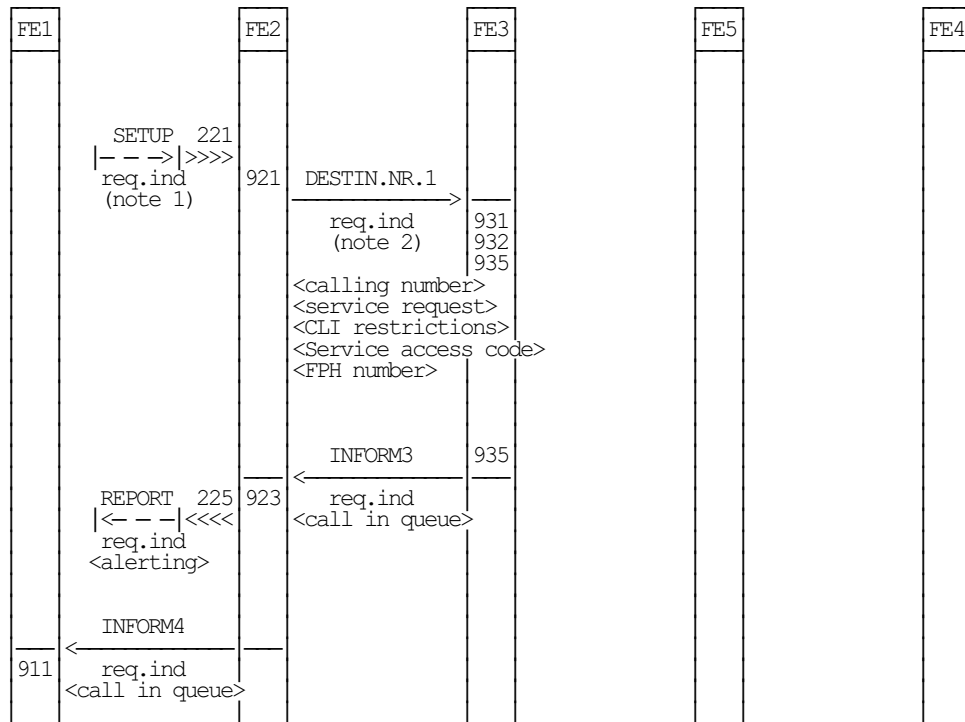


Figure 15

7.1.4.2 Queue not empty and not full at call set up for the requested service

The flow for the call put in queue when other calls are in queue is shown in figure 16.



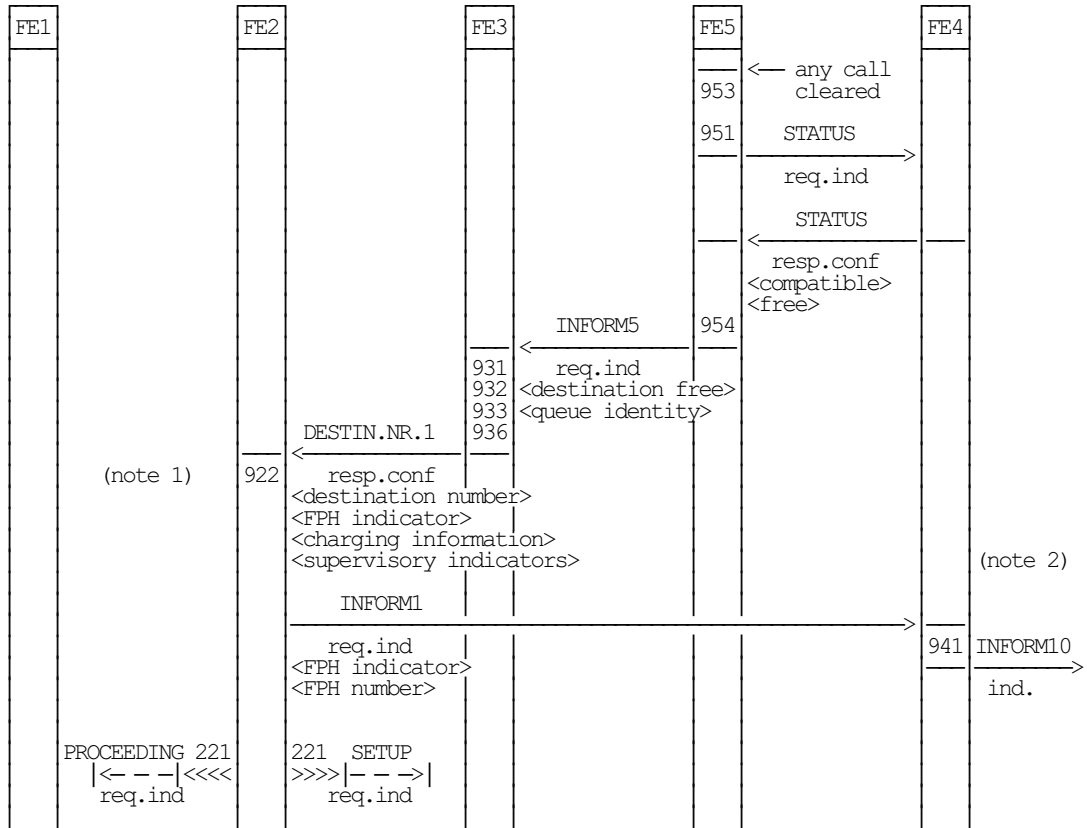
NOTE 1: For this call, the called number is composed of the service access code plus the freephone number.

NOTE 2: All the information contained in the SETUP req.ind. within the basic call shall be sent to FE3.

Figure 16

7.1.4.2.1 A served user destination becomes free

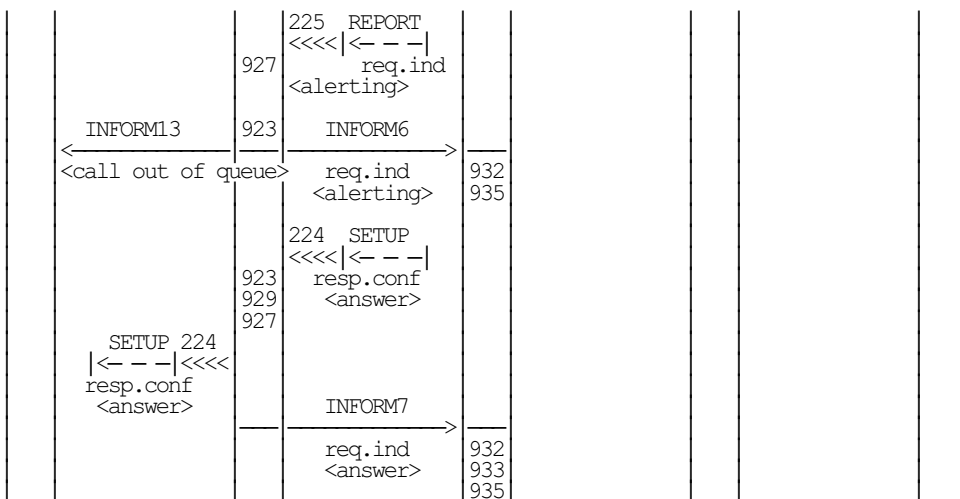
The flows for call continuation when the call is put in queue and a destination becomes free are shown in figure 17.



NOTE 1: The supervisory flags as shown in table 17 (see subclause 7.2.6) can be set at FE2 on request by FE3.

NOTE 2: The "supervisory indicators" should be per destination for which a set up has been sent.

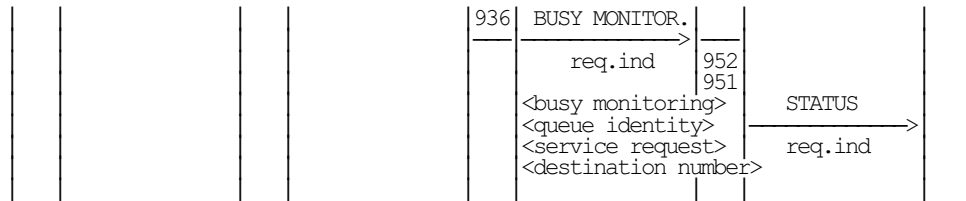
a) Served user destination free at re-attempt call SETUP



It is a decision taken by FE3 to which destinations "Busy Monitoring" and to which destinations "Cancel Busy Monitoring" is sent as shown hereafter.

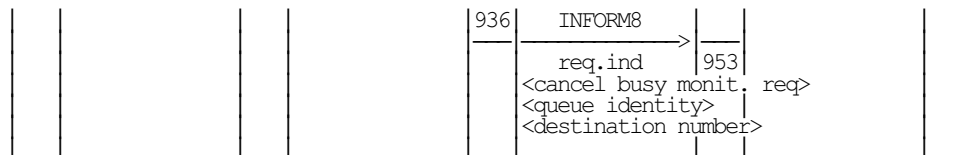
Figure 17 (sheet 1 of 2)

a1) Busy Monitoring request

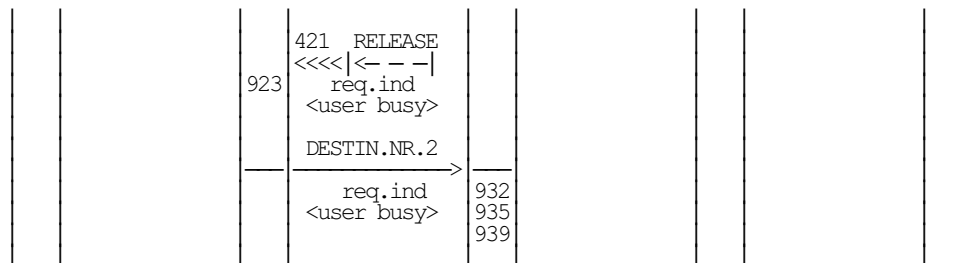


For the continuation, see figure 14.

a2) Cancel Busy Monitoring request



b) Served user busy at recall SETUP



The successful continuation depends on the situation at FE3.

- b1) When a call with a different service type is in queue, a new set up is sent.
- b2) When no call with a different service type is in queue, a new "destination free" is waited for.

Figure 17 (sheet 2 of 2)

7.1.4.2.2 Call release from the calling side during waiting phase "destination free"

The flow for the call release for a call in queue is shown in figure 18.

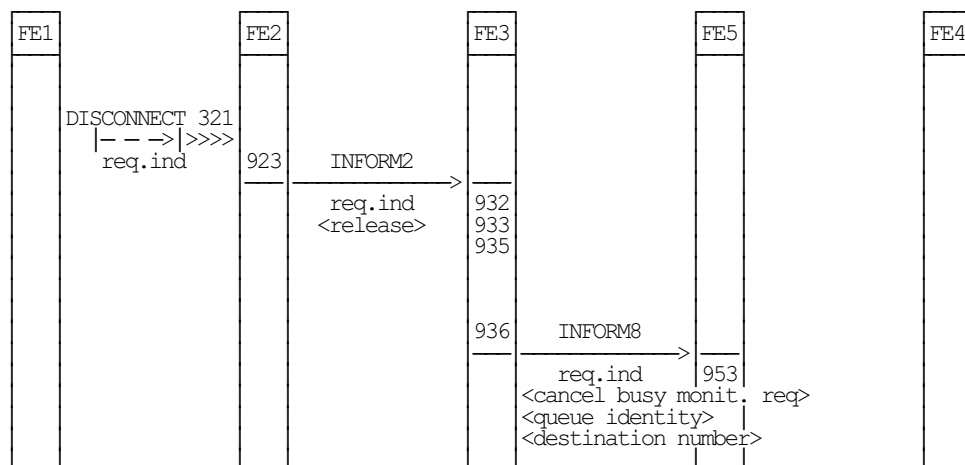


Figure 18

7.1.4.2.3 Timer Tfph3 expires

The flow for the call release by expiry of the timer Tfph3 for a call in queue is shown in figure 19.

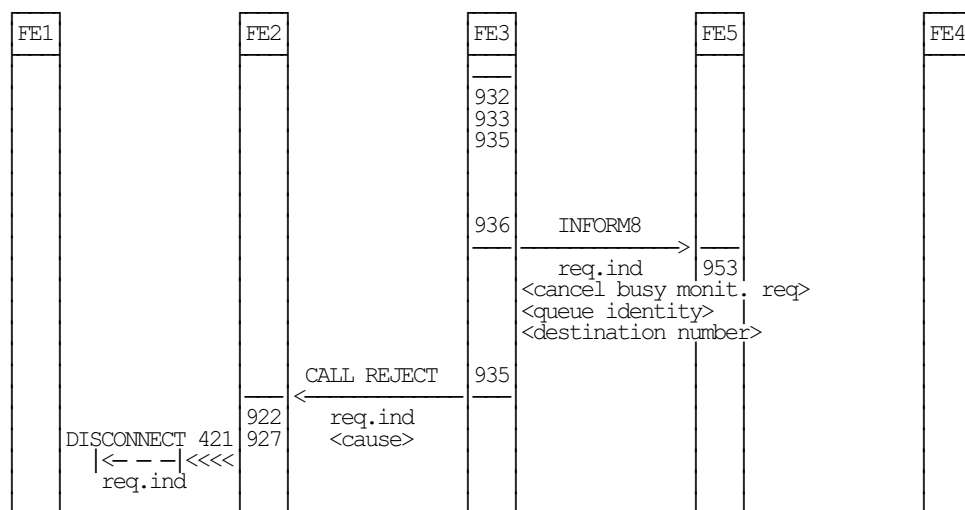


Figure 19

7.2 Definition of individual information flows

7.2.1 Relationship ra

Tables 1 and 2 give the individual information flows for the relationship ra.

Table 1: Contents of INFORM4

Parameter	req.ind
call in queue	M

Table 2: Contents of INFORM12

Parameter	req.ind
catchment area violation or call not allowed from this termination	M

7.2.2 Relationship rb

Table 3 gives the individual information flows for the relationship rb.

Table 3: Contents of INFORM1

Parameter	req.ind
FPH indicator (note 1) FPH number (note 2)	M
NOTE 1: The FPH indicator is always sent from FE2 in the SETUP in order to allow compatibility checking at CCs; the optional display of the FPH indicator is a FEA located at FE4 (associated with the terminal). NOTE 2: The original dialled FPH number is sent: <ul style="list-style-type: none"> - if the served user is subscribed to the option; or - if the served user is subscribed to MCID for this destination. 	

7.2.3 Relationship rc

Tables 4 to 7 and 9 to 12 give the individual information flows for the relationship rc.

Table 4: Contents of DESTIN.NR.1

Parameter	req.ind	resp.conf
	(note 1)	
service request	M	
calling number (note 2)	M	
CLIP indicator	M	
reference	M	M
destination number		M
supervisory indicators (note 3)		M
service access code & number	M	M
FPH indicator	O	M
charging information		O
originally dialled FPH number	O	
NOTE 1: All the information contained in the SETUP req.ind within the basic call shall be sent to FE3.		
NOTE 2: For an incoming international call, the calling number is included if received from the country of origin. This depends on bilateral agreement.		
NOTE 3: The supervisory flags as shown in table 17 can be set at FE2 on request by FE3.		

Table 5: Contents of DESTIN.NR.2

Parameter	req.ind	resp.conf
user busy	M	
reference	M	
destination number		M
supervisory indicators (note)		O
service access code & number	M	O
FPH indicator	O	M
charging information		O
NOTE: The supervisory flags as shown in table 17 can be set at FE2 on request by FE3.		

Table 6: Contents of DESTIN.NR.3

Parameter	req.ind
alerting	M
reference	M

Table 7: Contents of CALL REJECT

Parameter	req.ind
cause (see table 8)	M
reference	M

Table 8 gives an overview of the possible release reasons and the corresponding cause values to be sent to the user.

Table 8: Mapping of premature release reasons onto cause indications

Release reason	Cause indication
catchment area violation	call rejected or catchment area violation (note)
call limit exceeded	user busy
unknown freephone number	unallocated number
call gapping	congestion
freephone barred	call rejected
illegal type of call	service not available
all destinations busy	user busy
calls not allowed from calling line	call rejected or call not allowed from this termination (note)
address incomplete	address incomplete
CCBS request	facility rejected
NOTE:	These release reasons are specific for the freephone supplementary service and are called: "FPH causes".

Table 9: Contents of INFORM2

Parameter	req.ind
release	M
reference	M

Table 10: Contents of INFORM3

Parameter	req.ind
call in queue	M
reference	M

Table 11: Contents of INFORM6

Parameter	req.ind
alerting	M
reference	M

Table 12: Contents of INFORM7

Parameter	req.ind
answer	M
reference	M

7.2.4 Relationship rd

Tables 13 to 15 give the individual information flows for the relationship rd.

Table 13: Contents of BUSY MONITORING

Parameter	req.ind	resp.conf
served user destination	M	M
service request	M	
queue identity (note)	M	
called status: - "monitoring accepted"; or - "monitoring not accepted"; or - "destination free".	M	M
NOTE: The queue identity parameter contains the origin of FE3 and the queue identity in FE3.		

Table 14: Contents of INFORM8

Parameter	req.ind
served user destination	M
cancel busy monitoring request	M
queue identity (note)	M
NOTE: The queue identity parameter contains the origin of FE3 and the queue identity in FE3.	

Table 15: Contents of INFORM5

Parameter	req.ind
served user destination	M
destination free	M
queue identity (note)	M
NOTE: The queue identity parameter contains the origin of FE3 and the queue identity in FE3.	

7.2.5 Relationship re

Table 16 gives the individual information flows for the relationship rd.

Table 16: Contents of STATUS

Parameter	req.ind	resp.conf
status	M	
service request	M	
value: - "compatible - busy"; or - "compatible - free".		M

7.2.6 Supervisory flags

The following supervisory flags are defined in table 17 below.

Table 17

Event received	Use	
	Charging/Statistics (info flag)	Facility (request flag)
REJECT on SETUP	X	X
Alerting	X	X
Answer	X	X
Release	X	X

If a flag is ON for facilities, FE2 is requesting FE3 for further information; if a flag is ON for charging/statistics, FE2 is informing FE3 of the reception of the events.

If no facility is active for the served user destination, only info flags will be set ON, depending on the need for information for statistics and/or charging. If the facility "re-routeing on busy" or "queuing" is active for the destination, the "reject request flag" has to be set ON in FE2 and therefore FE3 should send the "reject request indication".

For the facility "re-routeing on no reply" the "alerting request indication" has to be sent ON in FE2.

8 SDL diagrams for FEs

All Specification and Description Language (SDL) diagrams for FEs are described according to CCITT Recommendation Z.100 [7].

8.1 FE1

The SDL diagram for FE1 is shown in figure 20.

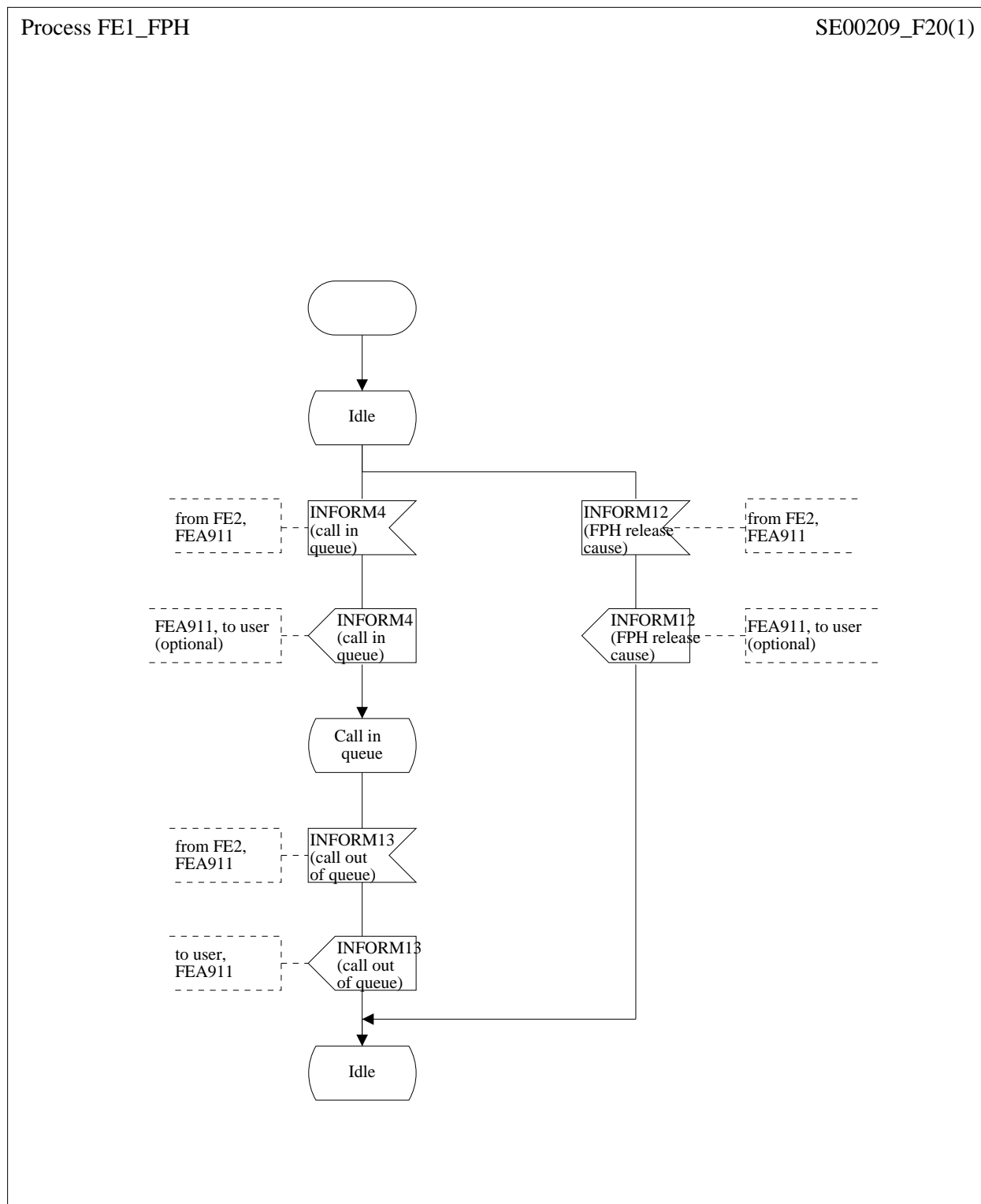


Figure 20

8.2 FE2

The SDL diagram for FE2 is split up into two parts, one for the incoming side (relations ra, rc and internal; figure 21) and one for the outgoing side (relations rb, rc and internal; figure 22).

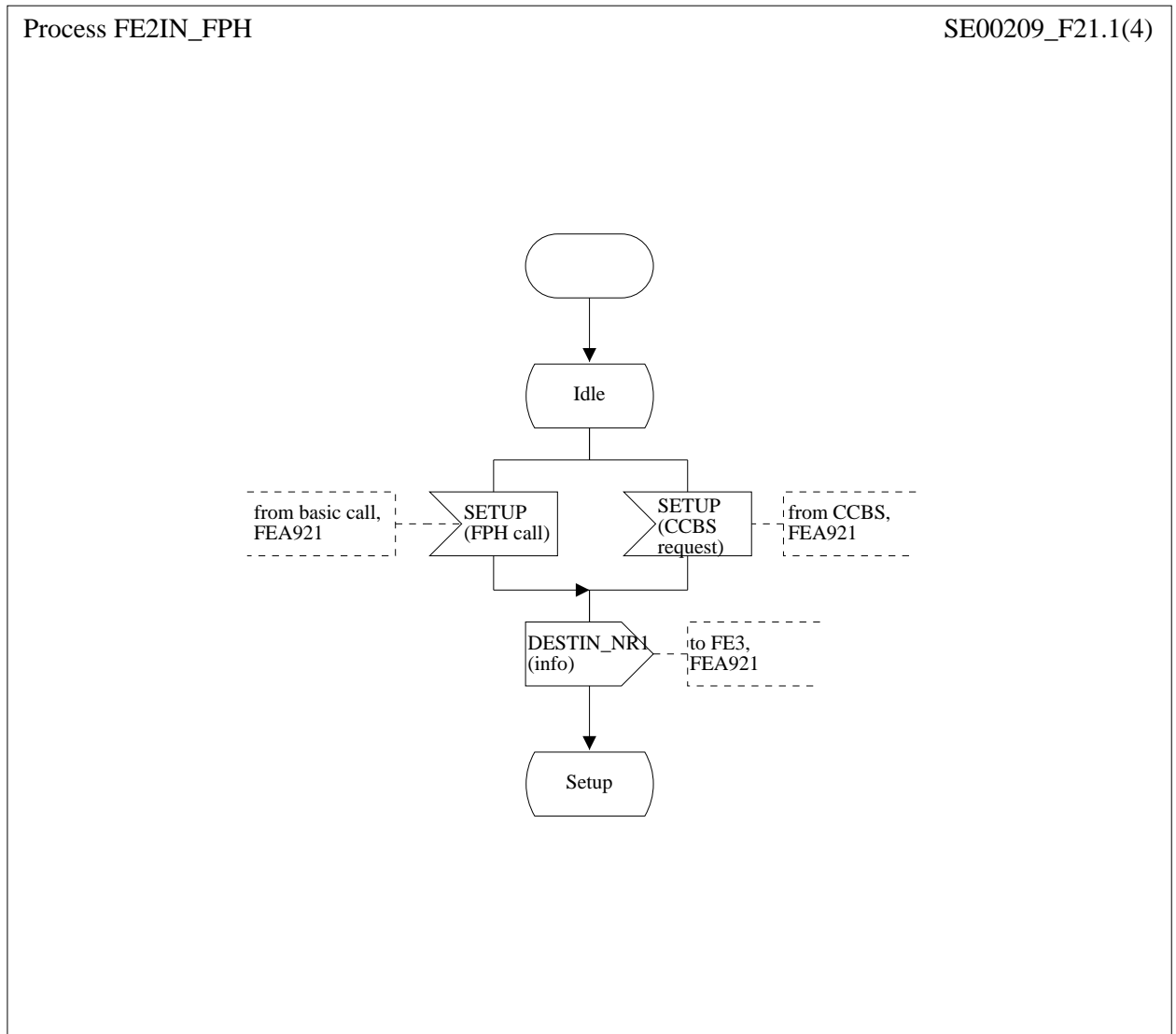


Figure 21 (sheet 1 of 4)

NOTE: The basic call SDL diagram in CCITT Recommendation Q.71 [6] is not sufficiently detailed and does not provide the possibility to make first two calls and then connect them, in order to allow the description of how the FE2 SDL diagram is connected to it.

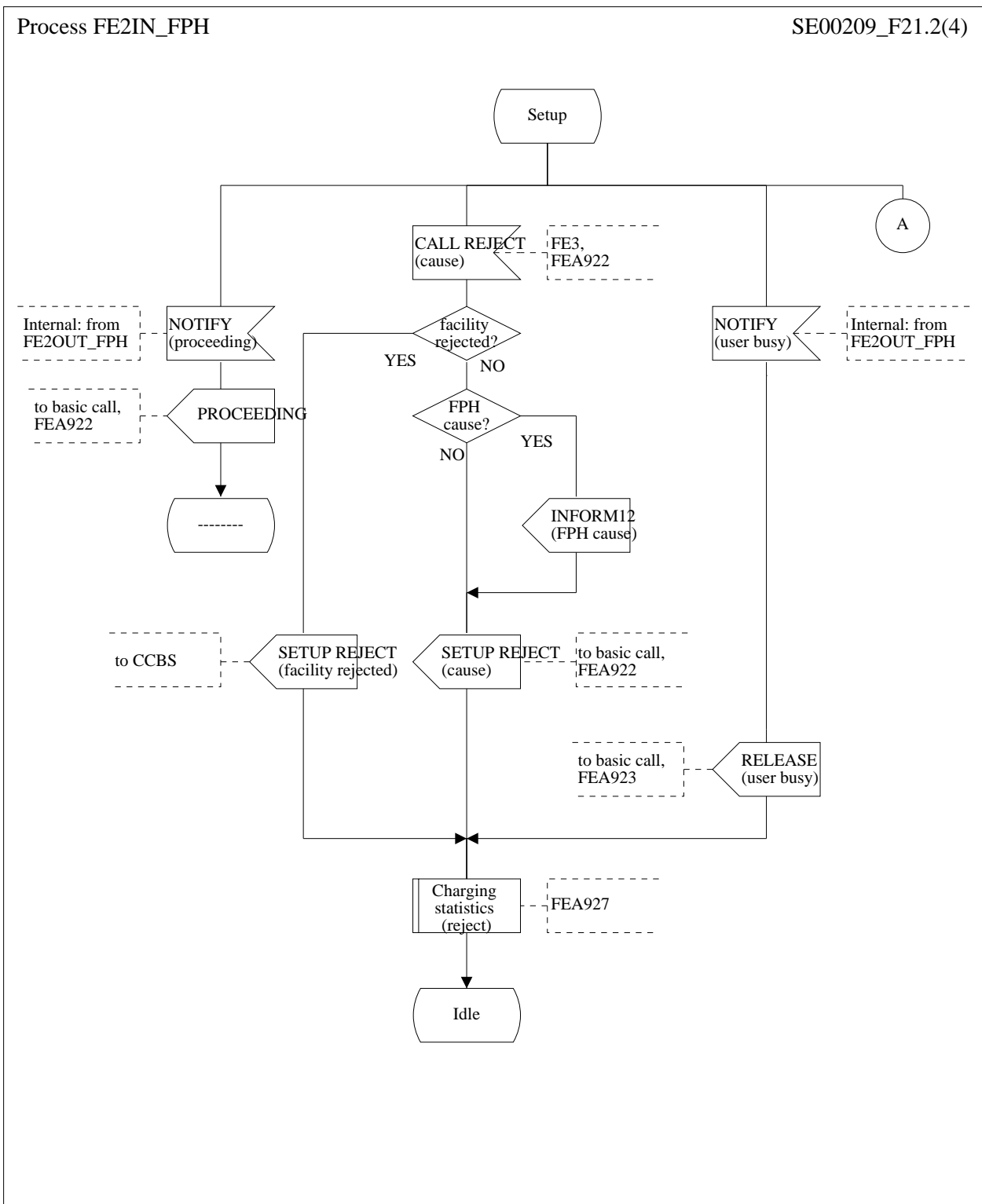


Figure 21 (sheet 2 of 4)

Process FE2IN_FPH

SE00209_F21.3(4)

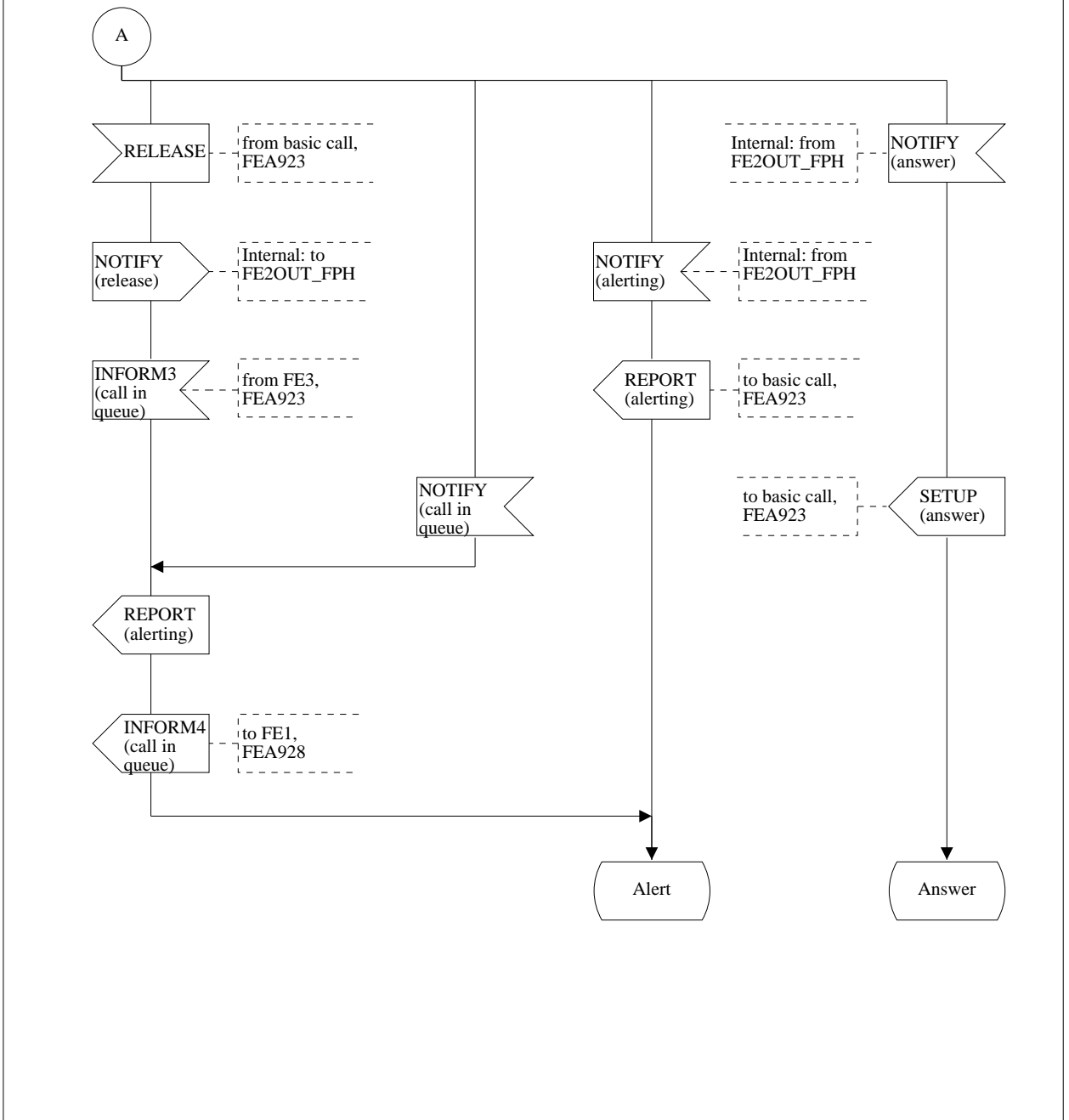


Figure 21 (sheet 3 of 4)

Process FE2IN_FPH

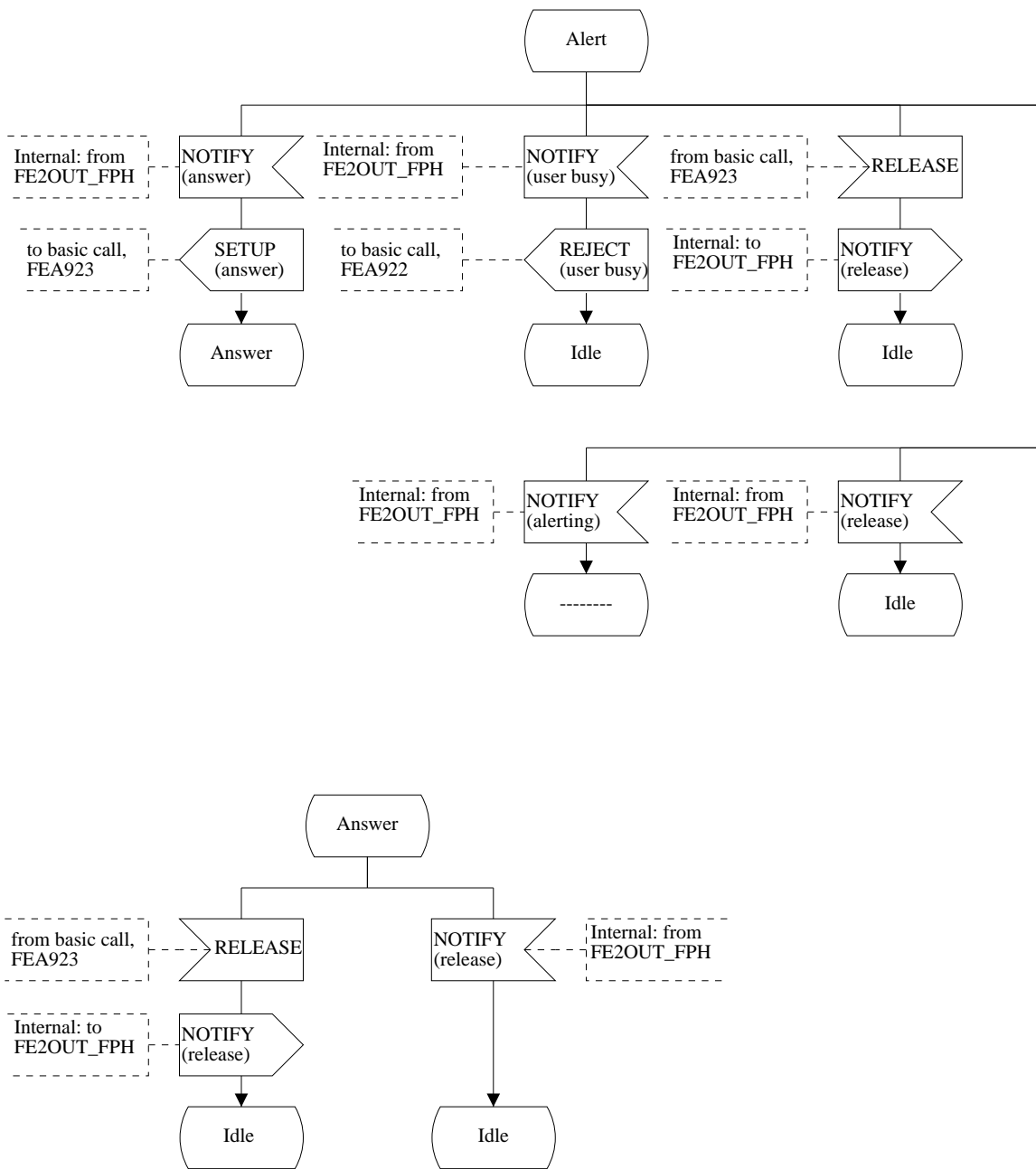


Figure 21 (sheet 4 of 4)

Process FE2OUT_FPH

SE00209_F22.1(6)

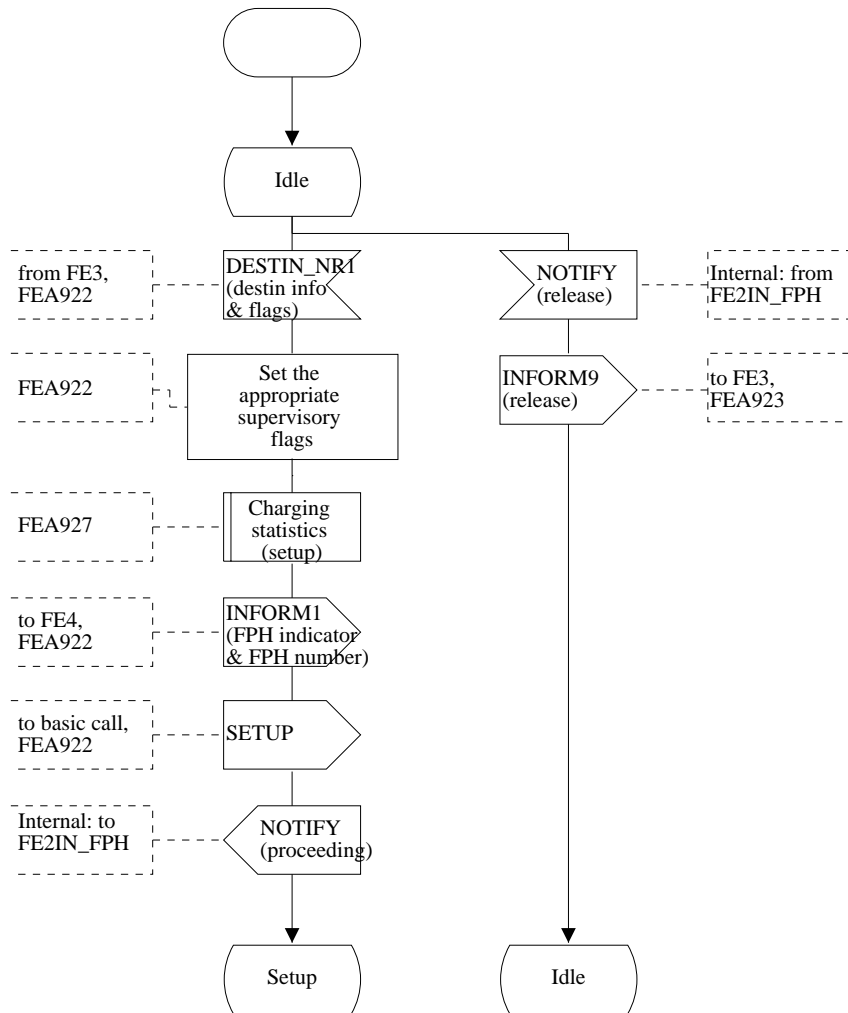


Figure 22 (sheet 1 of 6)

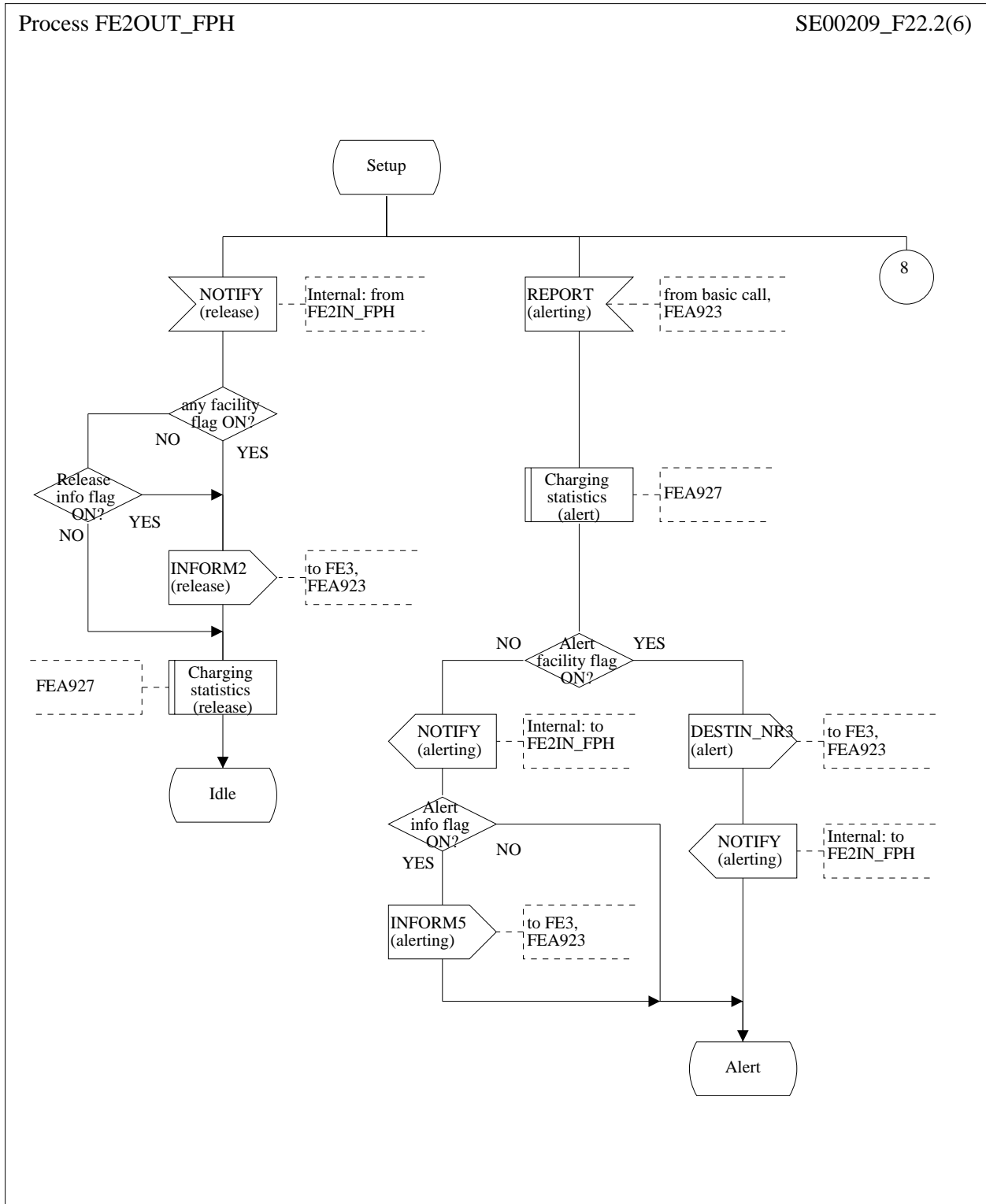


Figure 22 (sheet 2 of 6)

Process FE2OUT_FPH

SE00209_F22.3(6)

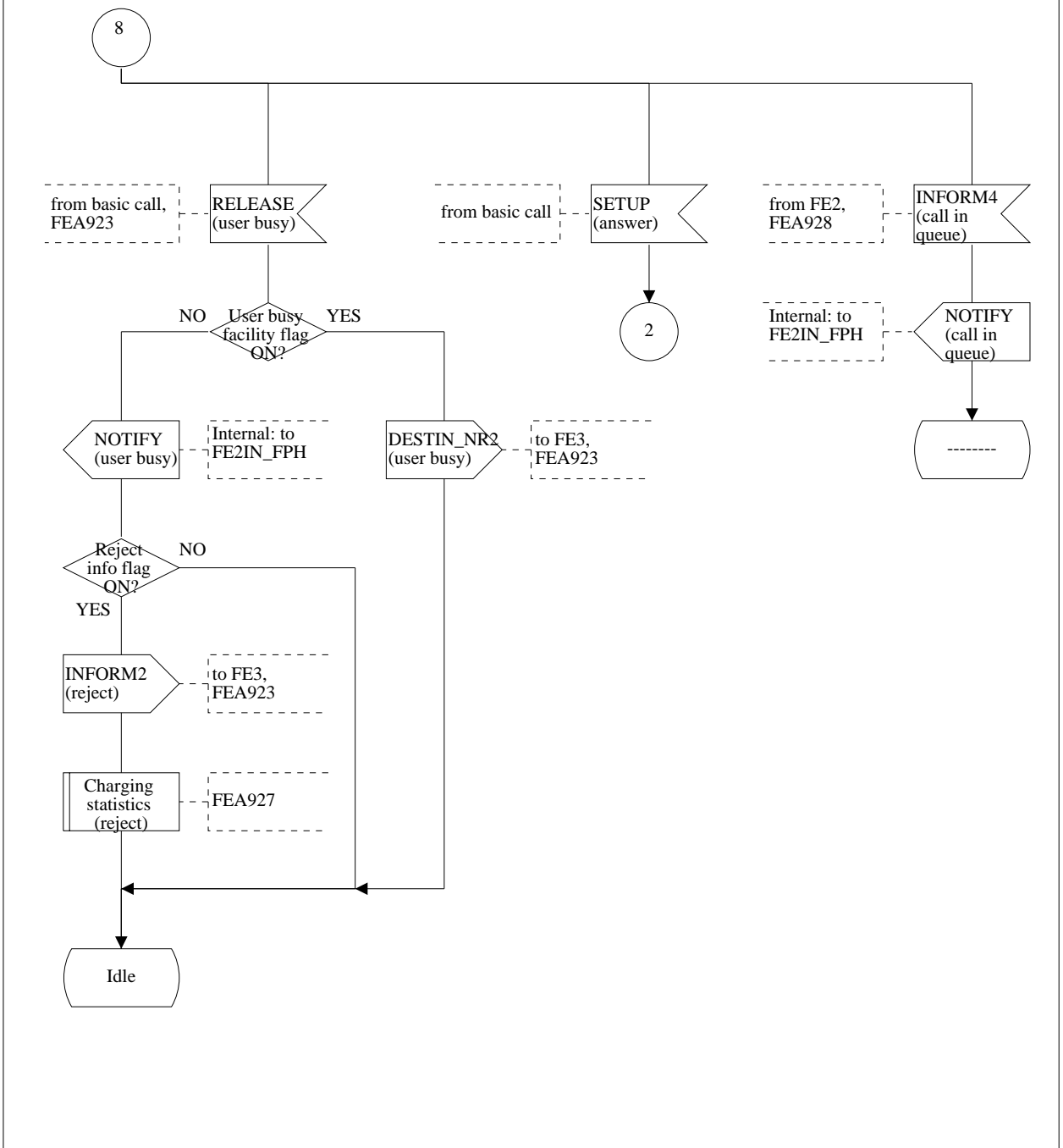


Figure 22 (sheet 3 of 6)

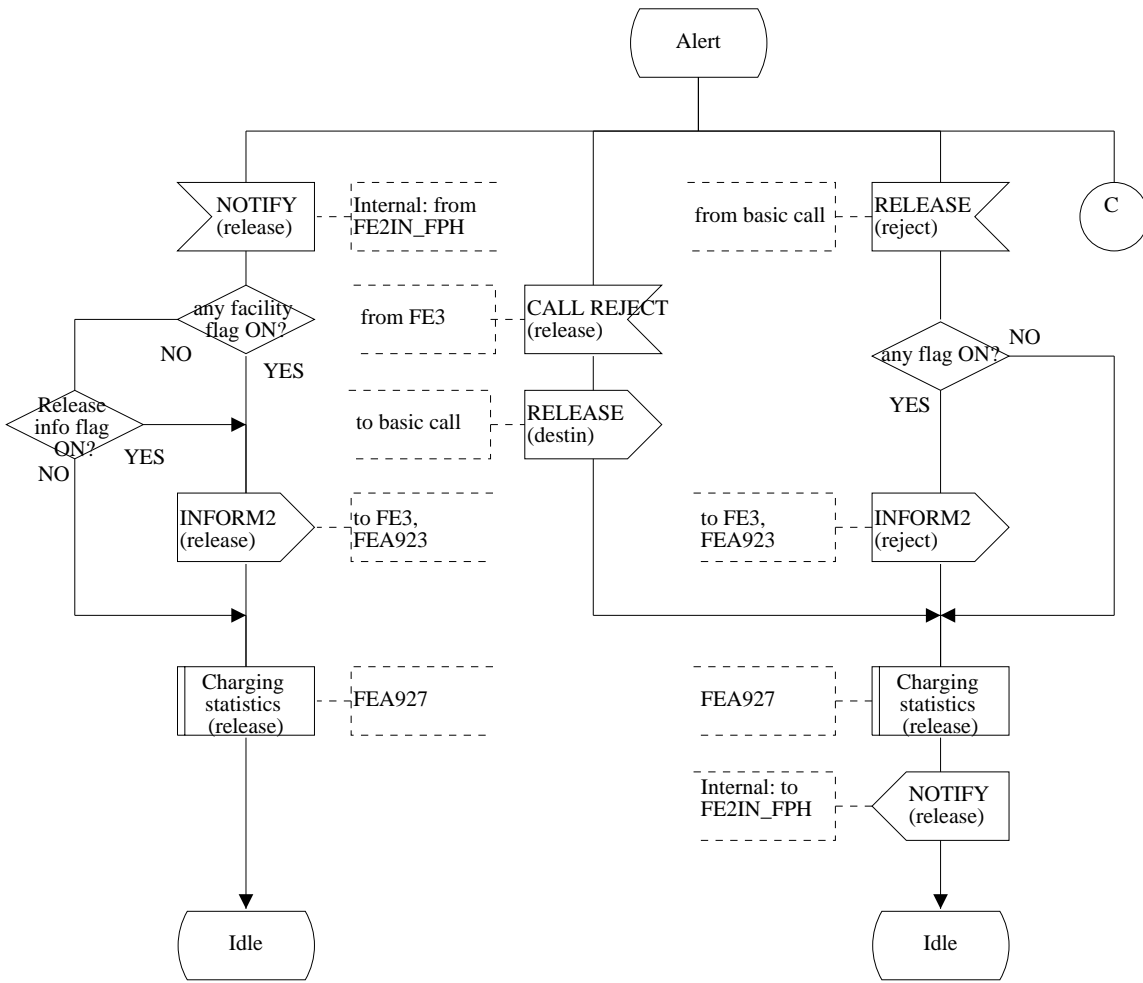


Figure 22 (sheet 4 of 6)

Process FE2OUT_FPH

SE00209_F22.5(6)

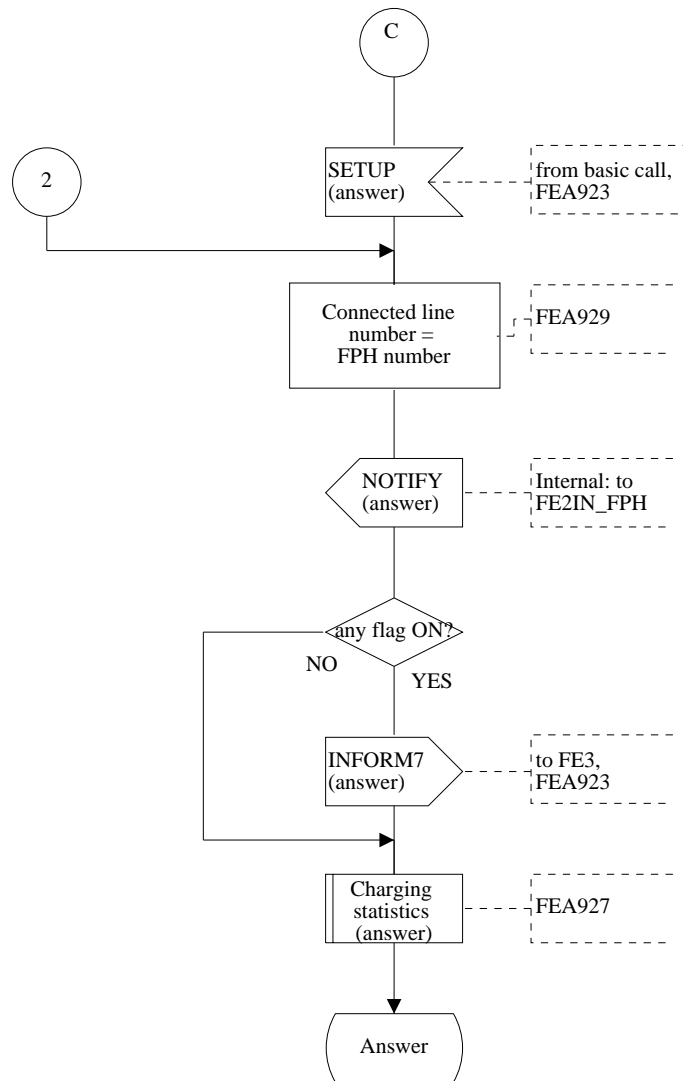


Figure 22 (sheet 5 of 6)

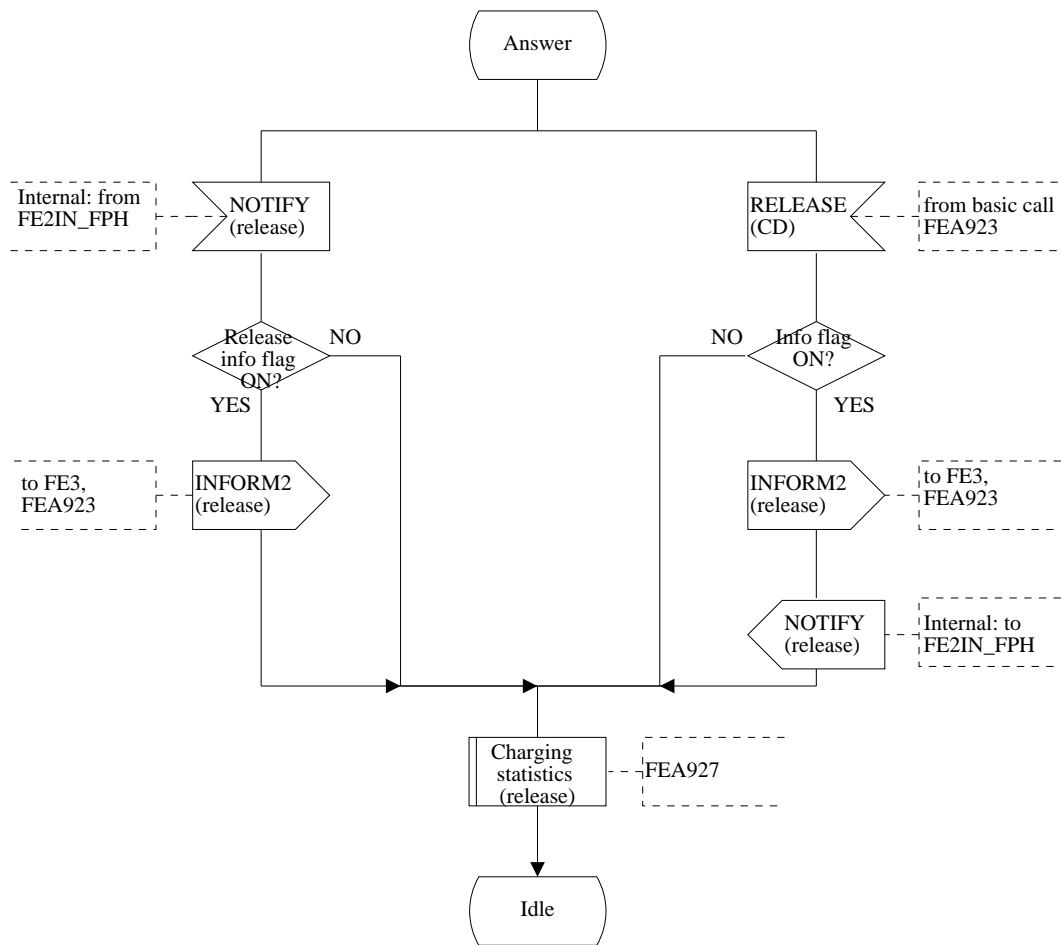


Figure 22 (sheet 6 of 6)

Macro FE2_Charging_statistics

SE00209_F23(1)

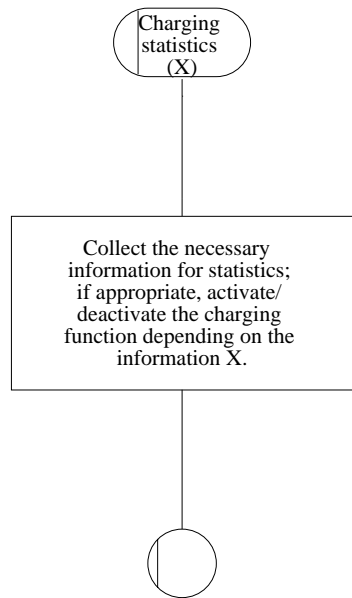


Figure 23

8.3 FE3

The SDL diagram for FE3 is split up into two parts, one for the call and queue handling (relations rc and internal; figures 24 and 25) and one for the busy monitoring (relations rd and internal; figure 26).

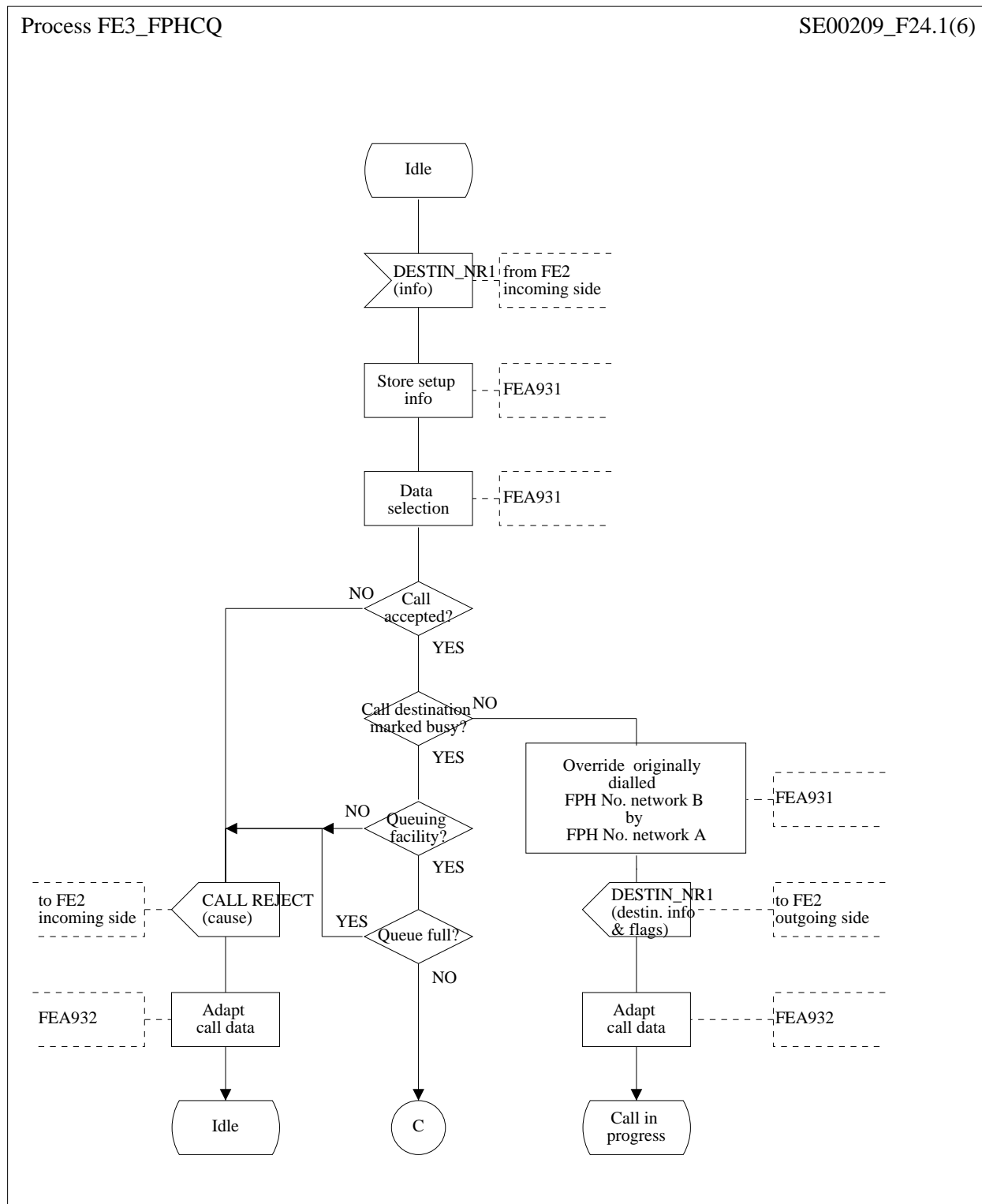


Figure 24 (sheet 1 of 6)

Process FE3_FPHCQ

SE00209_F24.2(6)

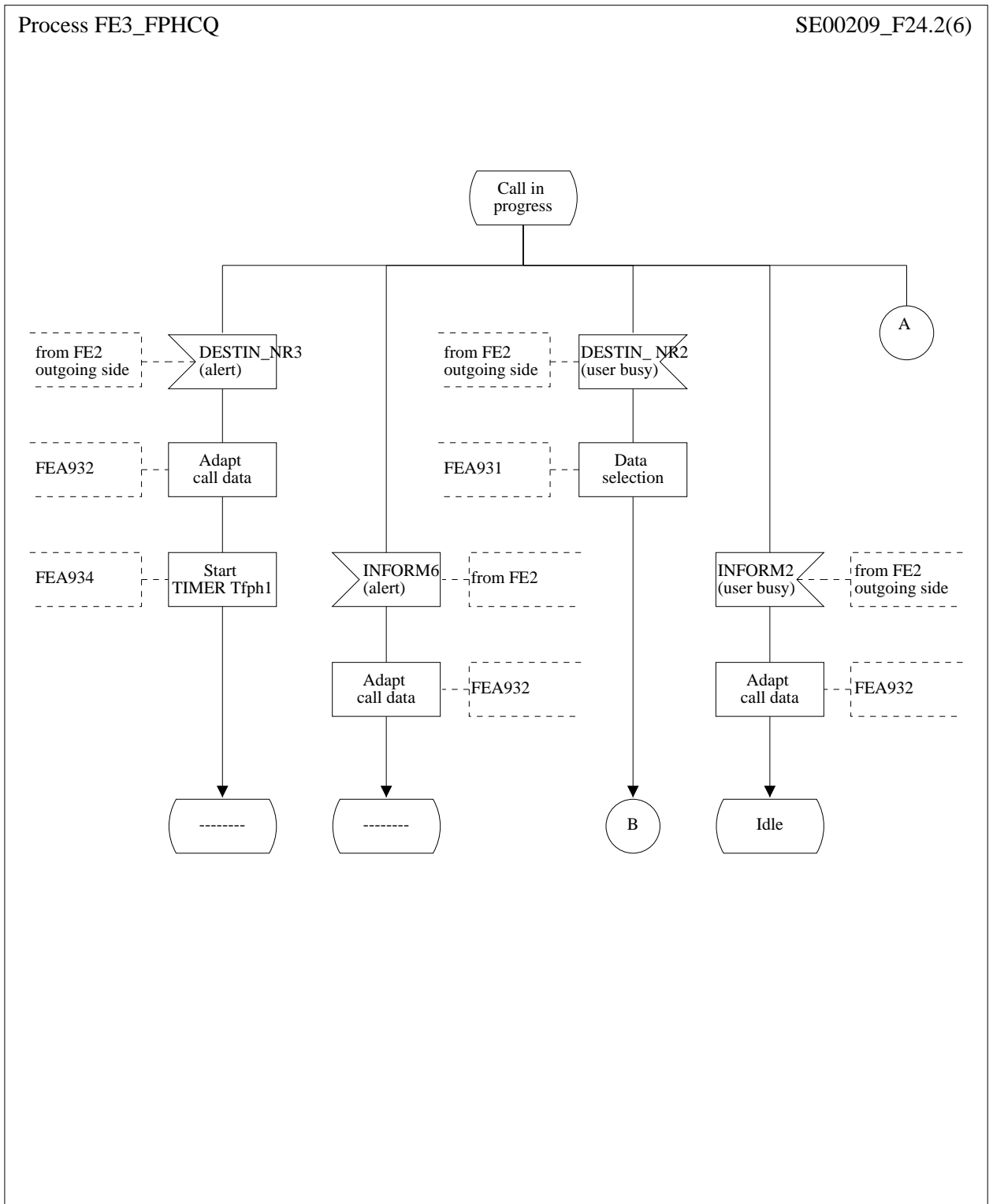


Figure 24 (sheet 2 of 6)

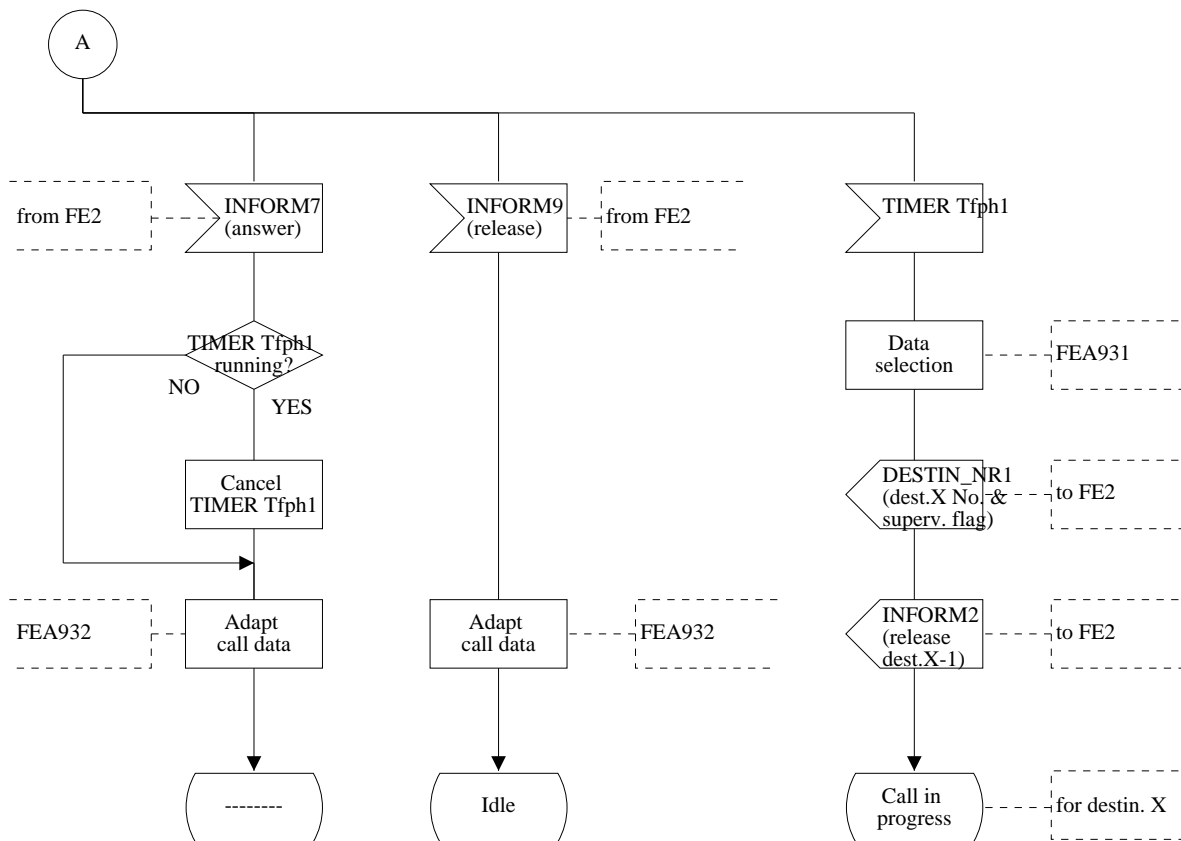


Figure 24 (sheet 3 of 6)

Process FE3_FPHCQ

SE00209_F24.4(6)

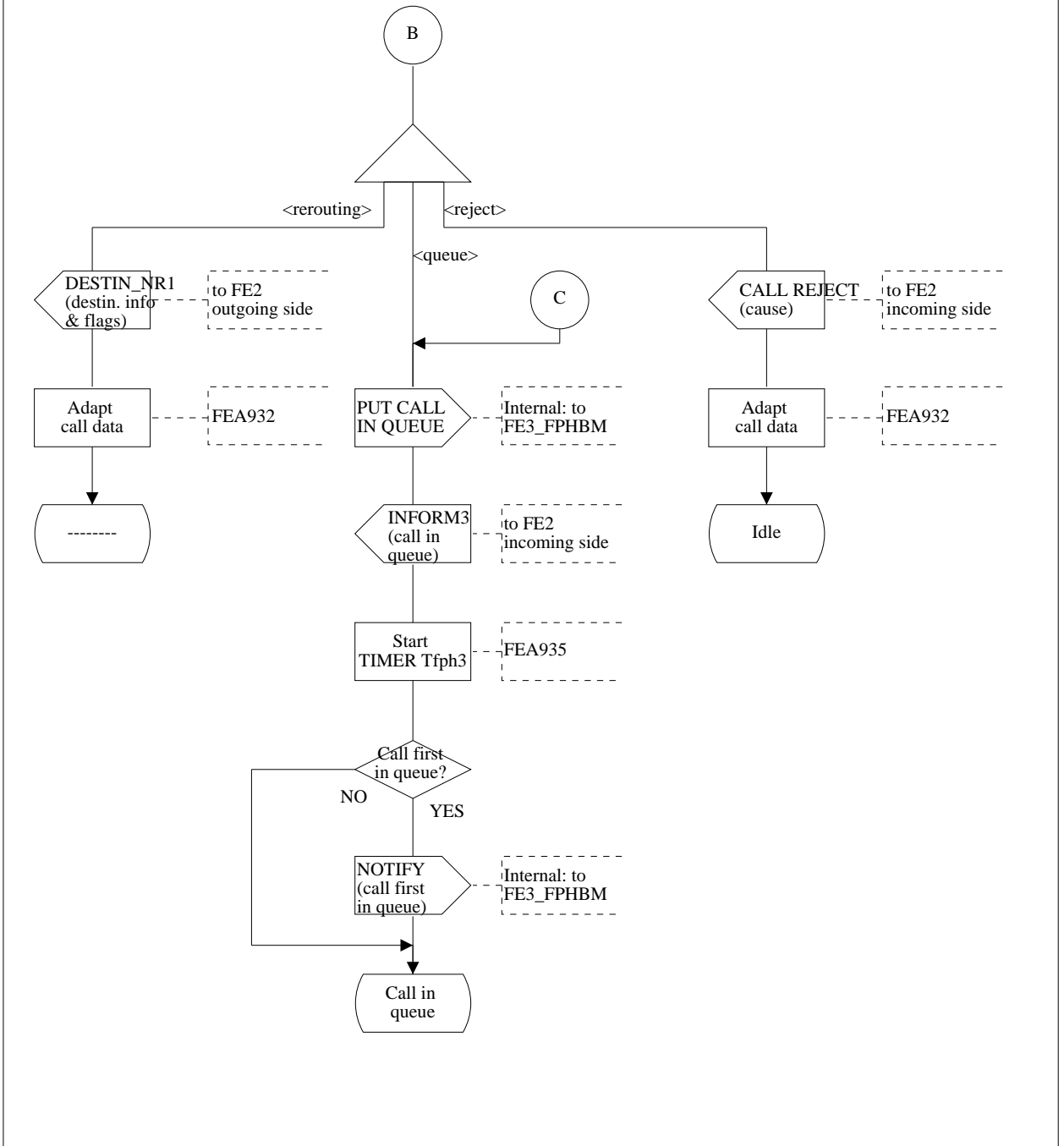


Figure 24 (sheet 4 of 6)

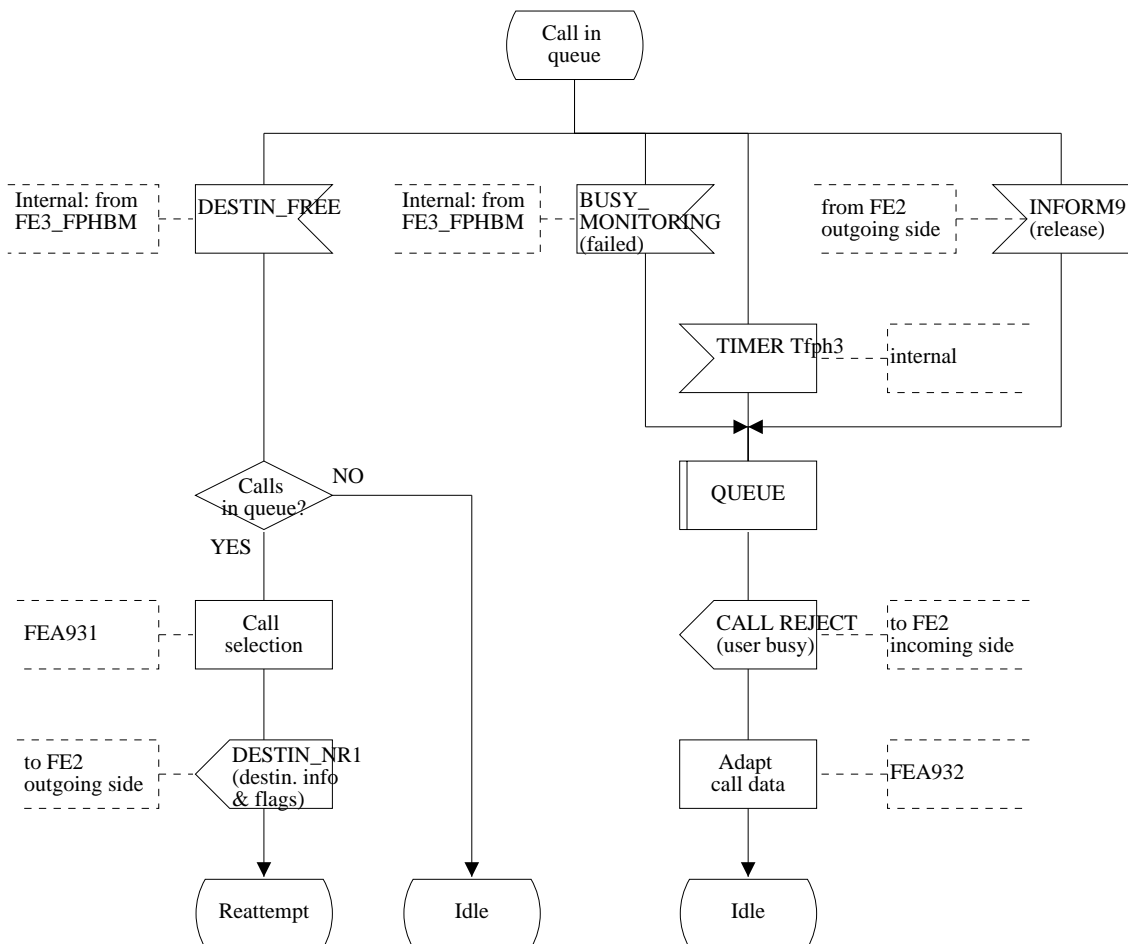


Figure 24 (sheet 5 of 6)

Process FE3_FPHCQ

SE00209_F24.6(6)

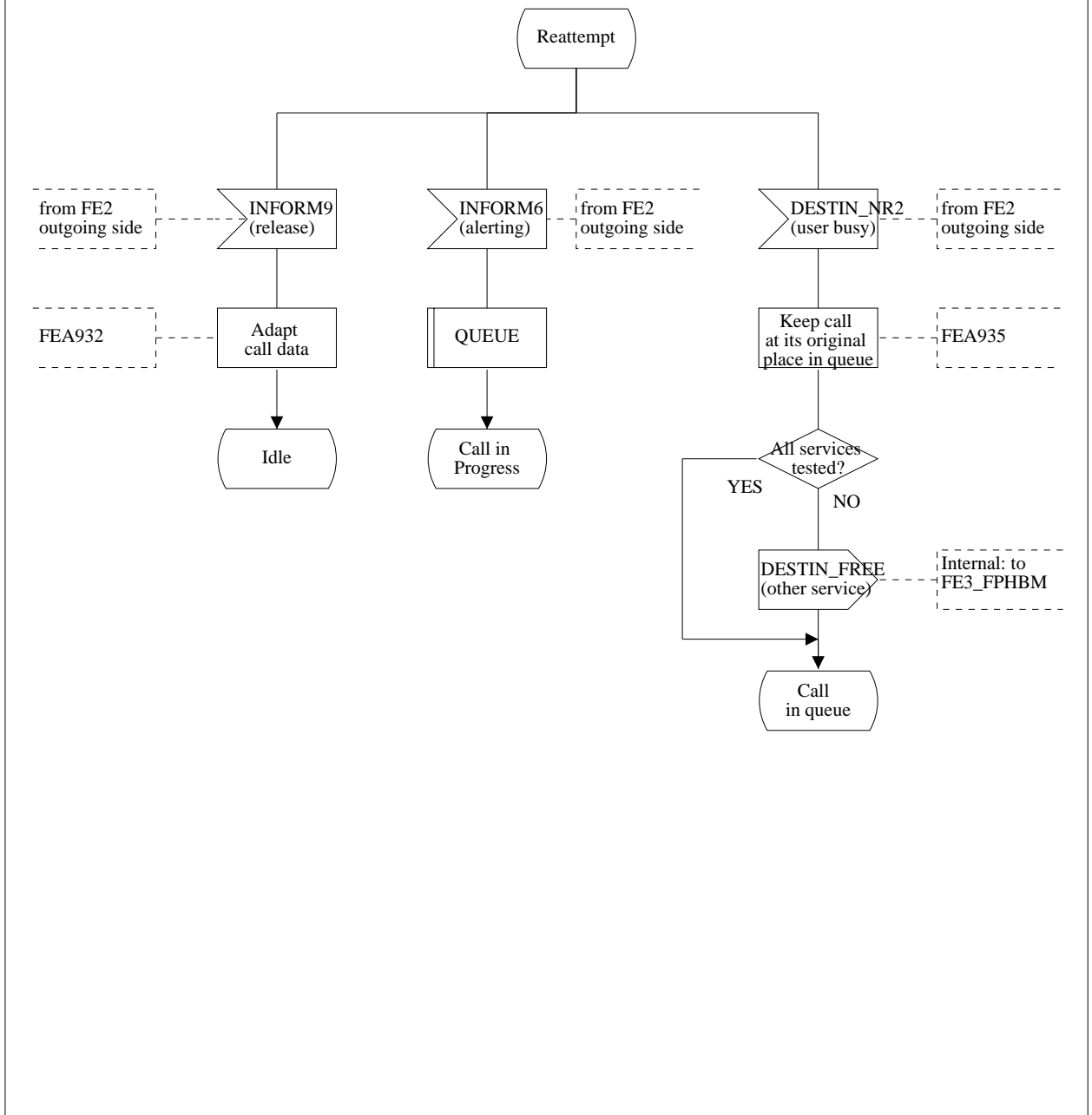


Figure 24 (sheet 6 of 6)

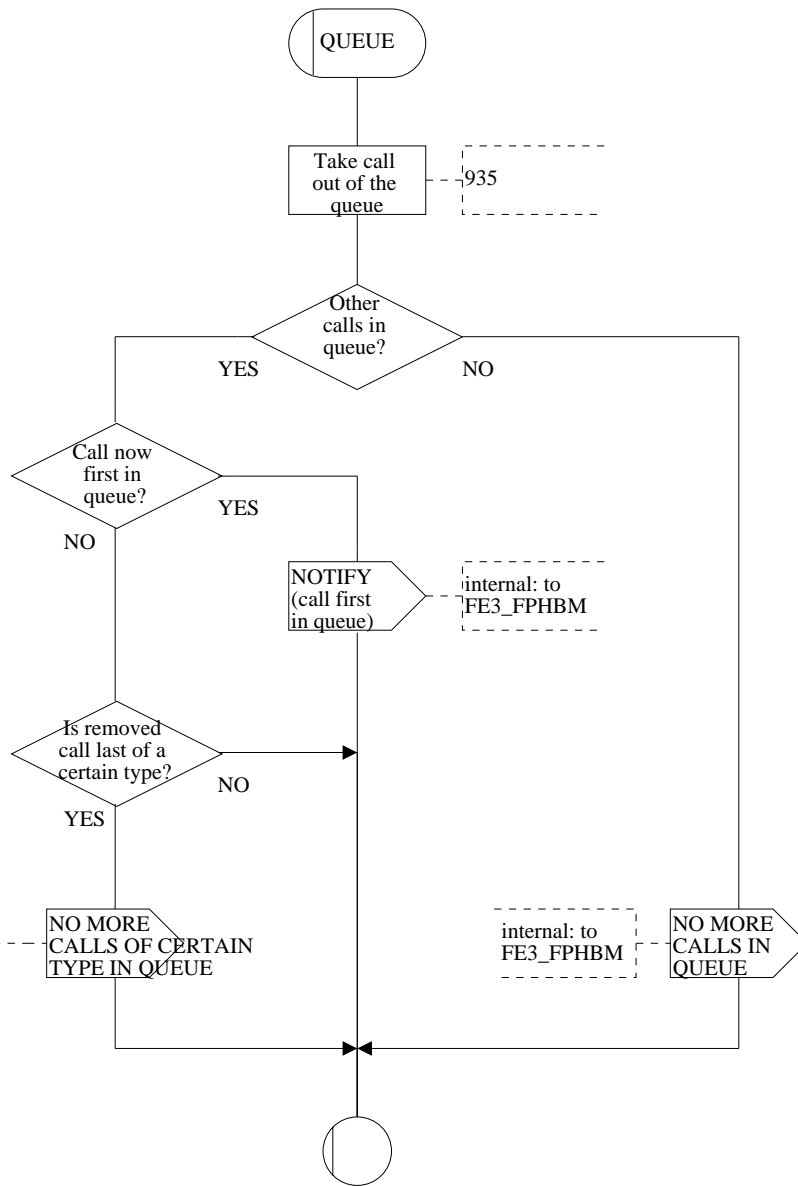


Figure 25

Process FE3_FPHBM

SE00209_F26.1(3)

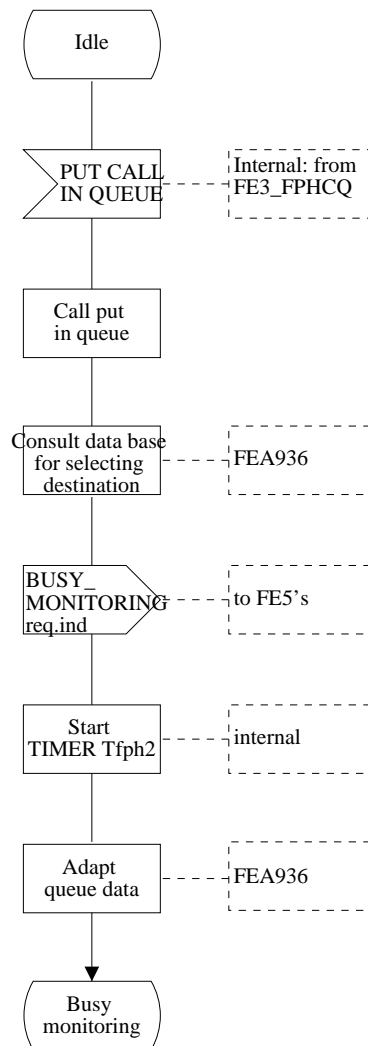


Figure 26 (sheet 1 of 3)

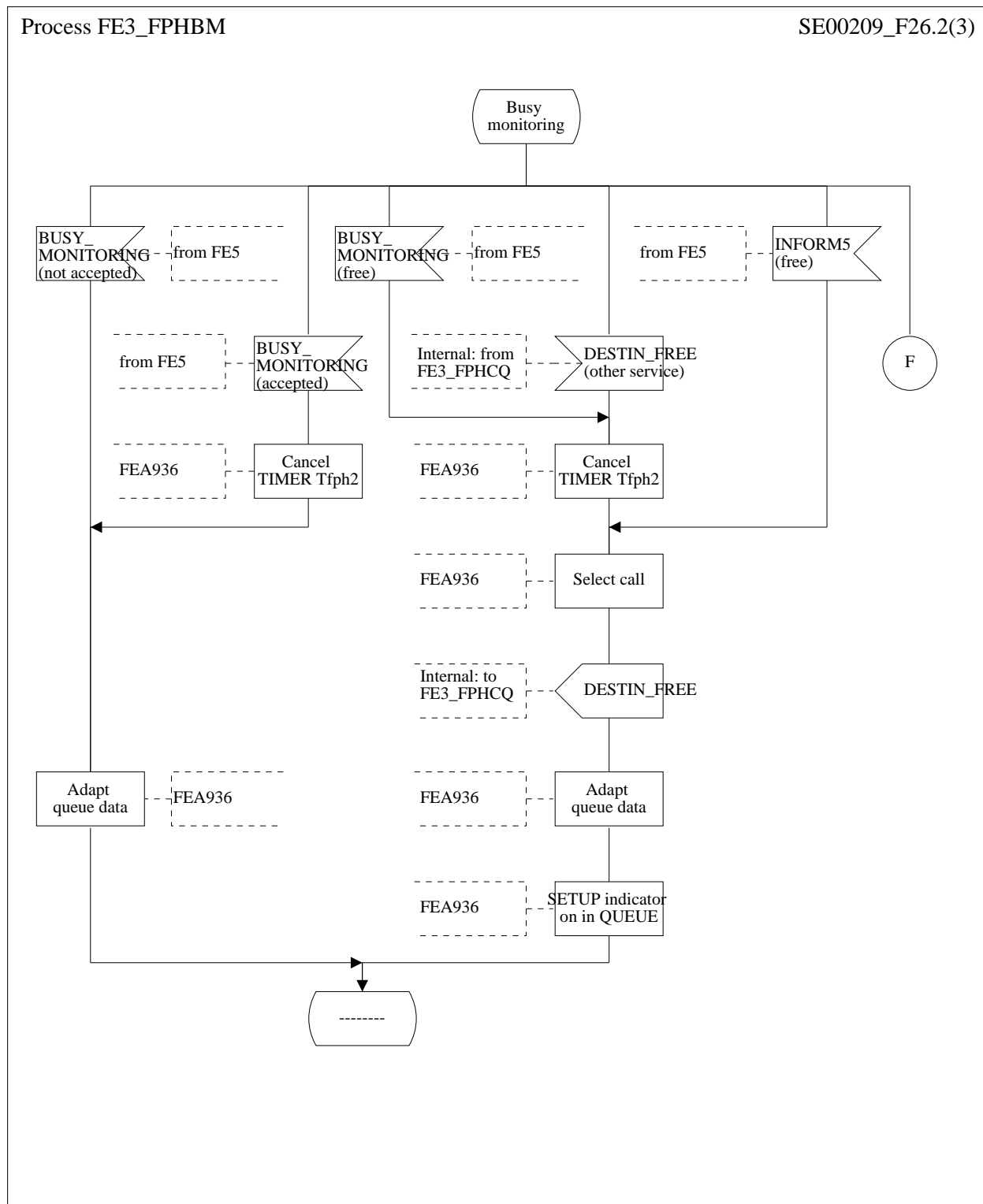


Figure 26 (sheet 2 of 3)

Process FE3_FPHBM

SE00209_F26.3(3)

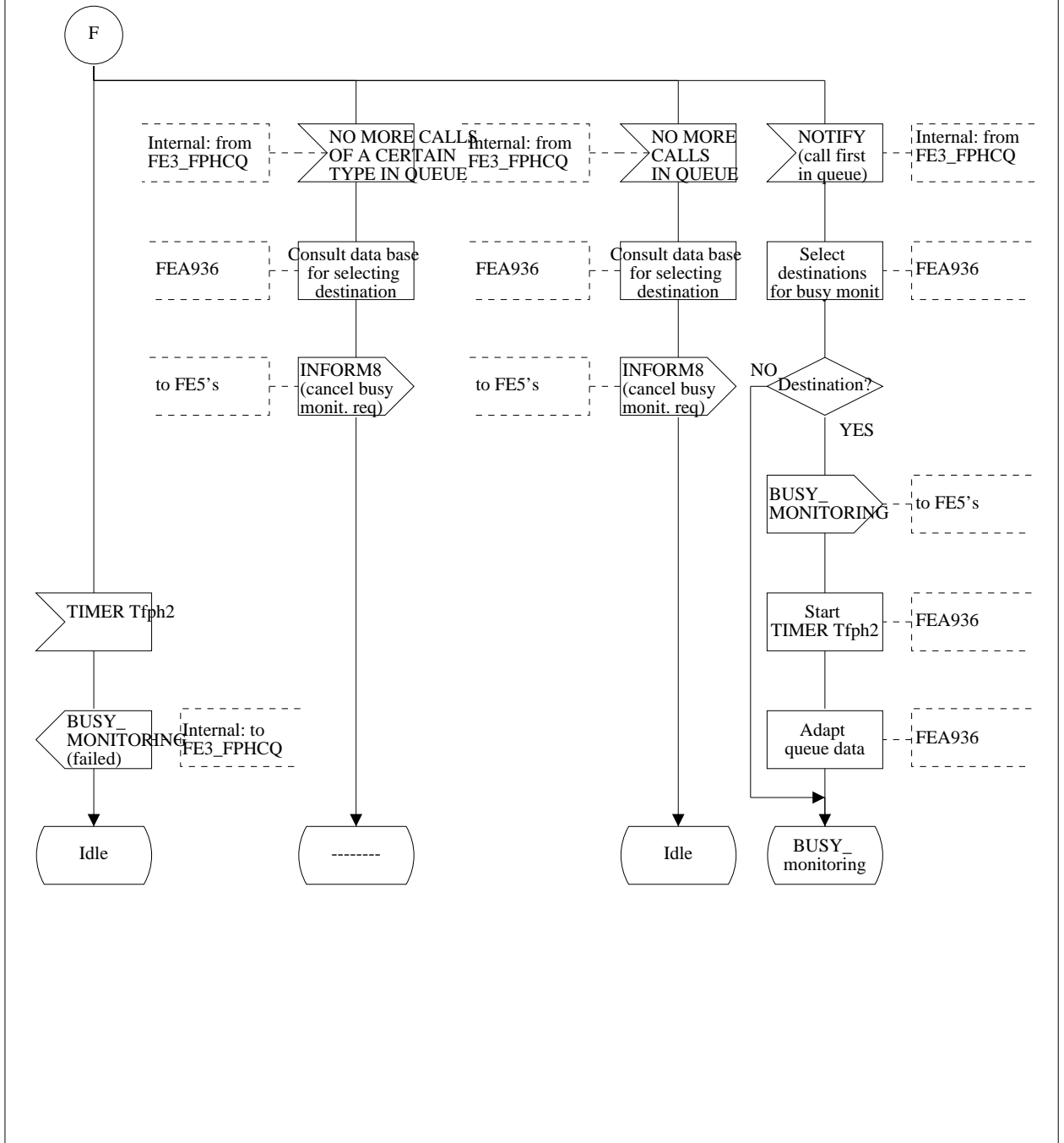


Figure 26 (sheet 3 of 3)

8.4 FE4

The SDL diagram for FE4 is shown in figure 27.

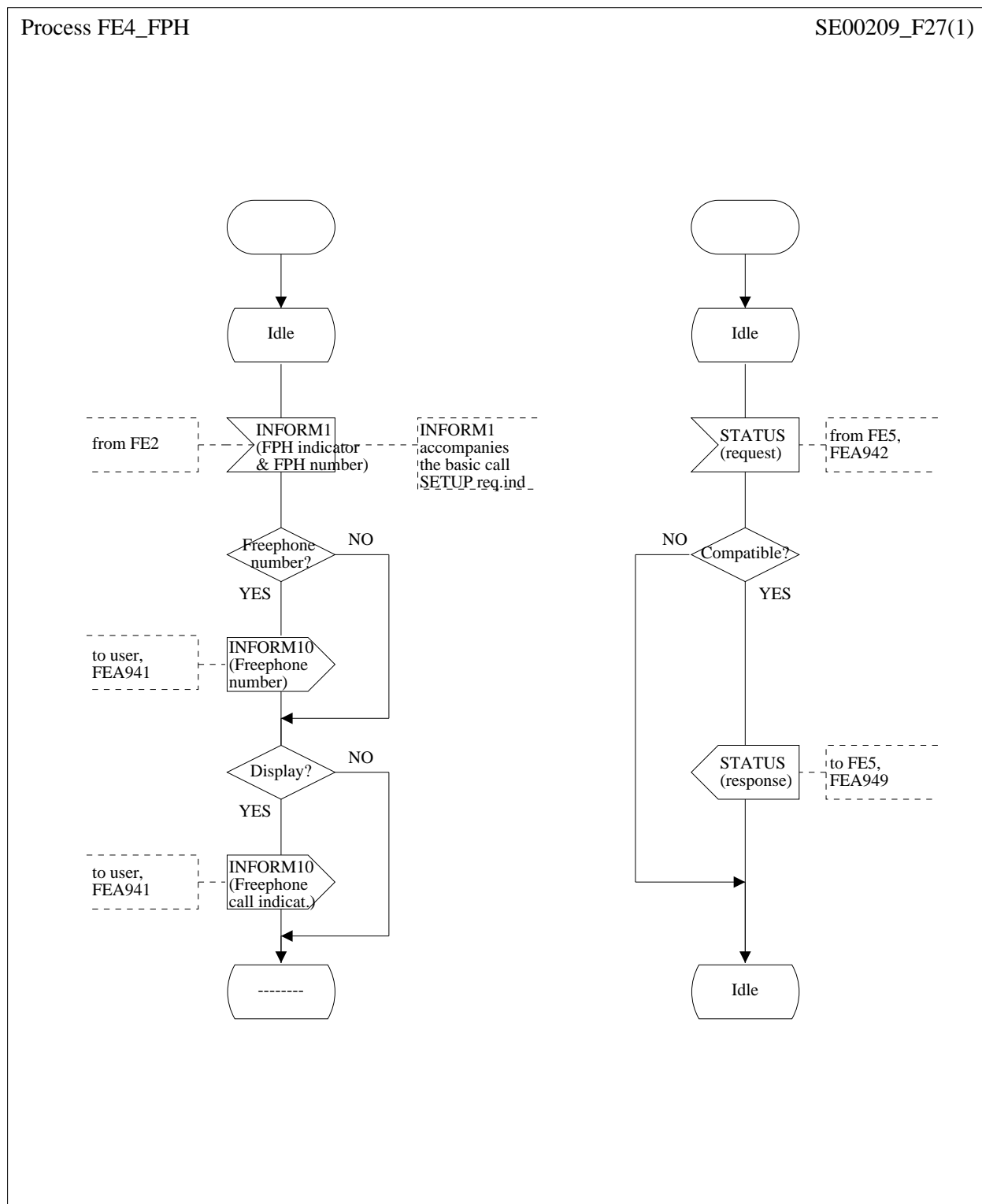


Figure 27

8.5 Functional entity FE5

The SDL diagram for FE5 is shown in figure 28.

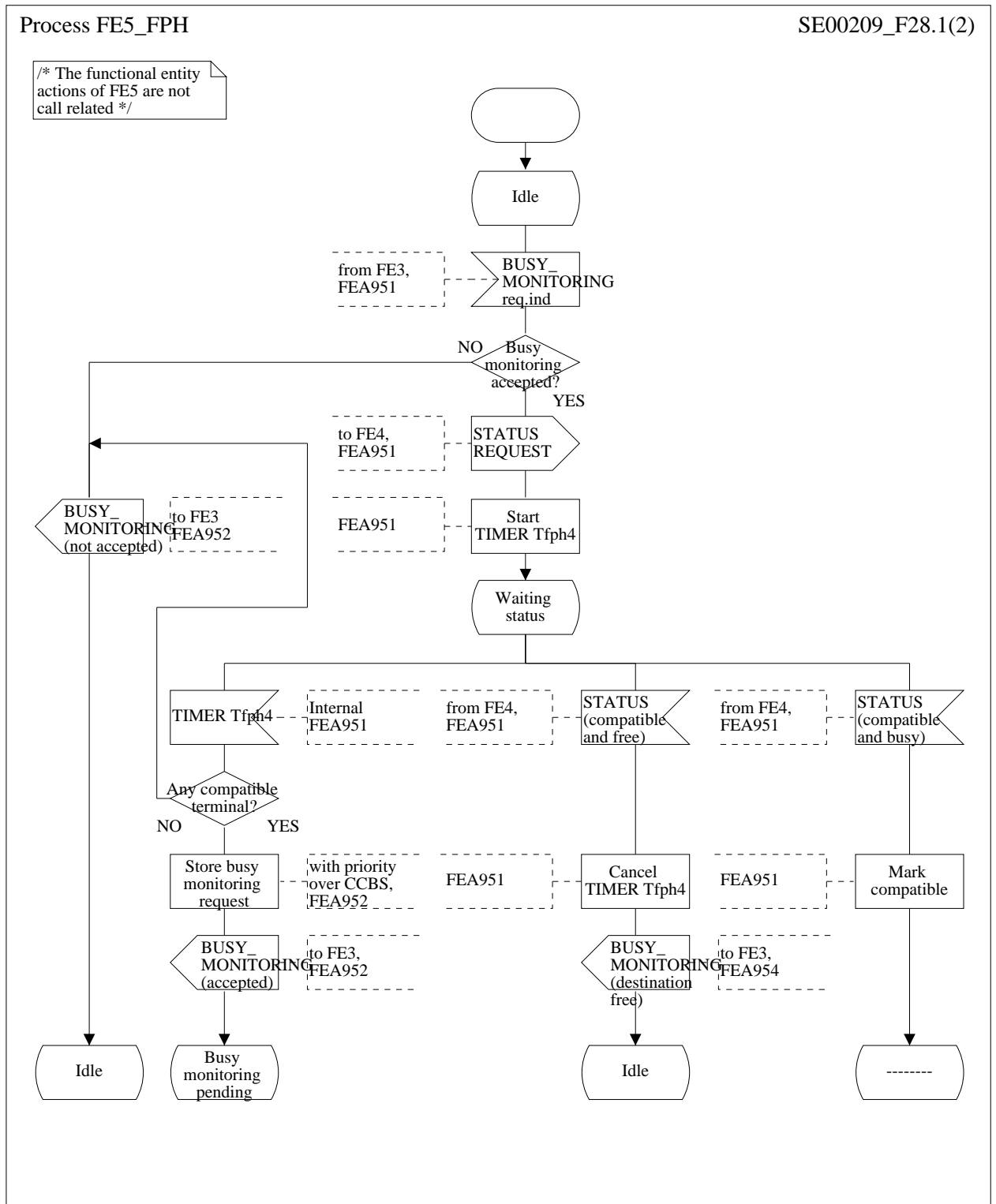


Figure 28 (sheet 1 of 2)

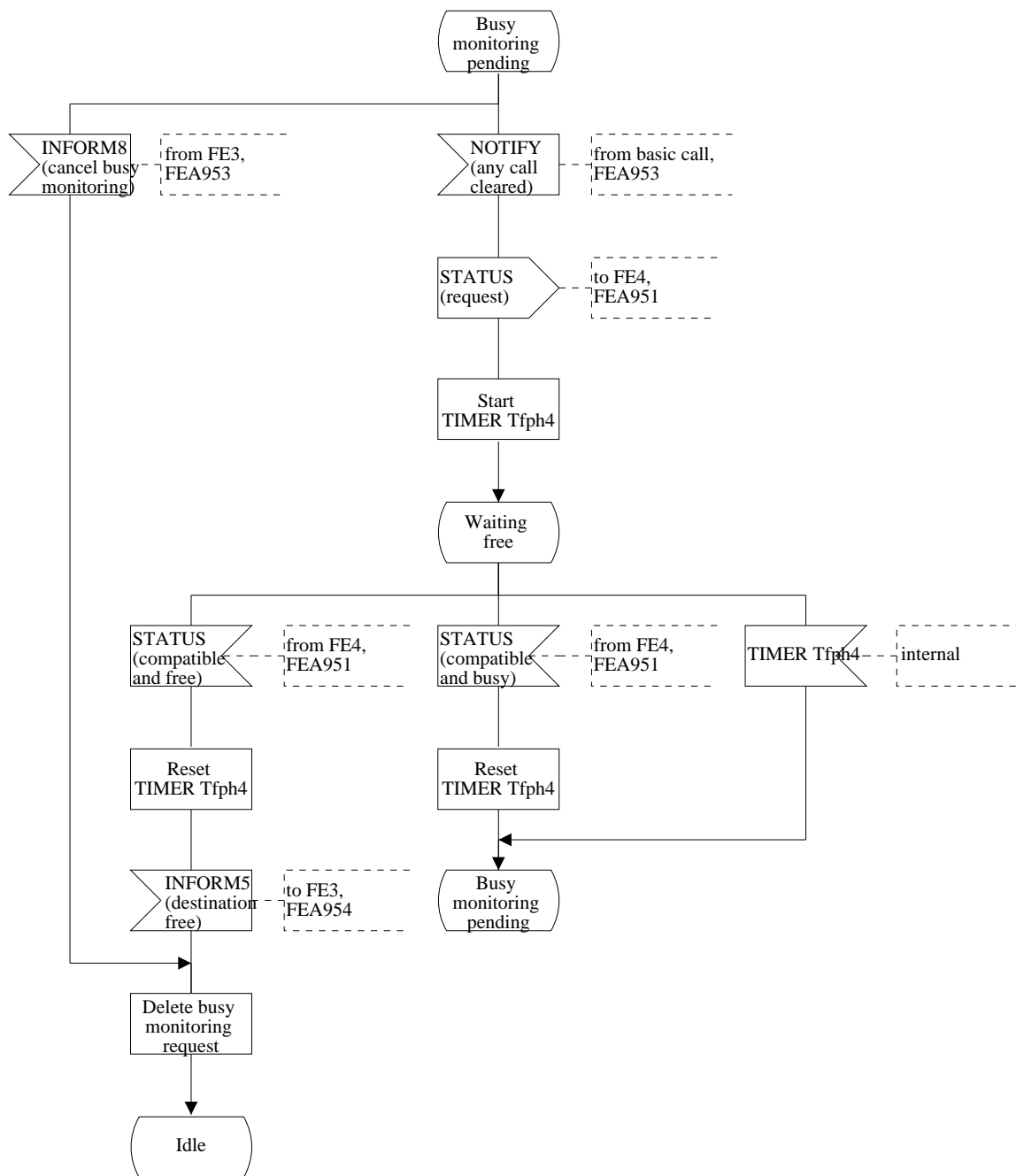


Figure 28 (sheet 2 of 2)

9 Functional entity actions (FEAs)

9.1 FEAs of FE1

911: FE1 shall:

- detect and optionally display the notifications.

9.2 FEAs of FE2

921: FE2 shall:

- detect freephone service by digit analysis of the received address information;
- take all the information from the SETUP and send it to FE3;
- send a request to the freephone database in order to receive the information for the further handling of the call.

922: FE2 shall:

- receive information for call continuation (destination selection, setup, call clear, information request);
- set the appropriate supervisory flags;
- continue call depending on data from FE3;
- send setup and proceeding if appropriate to basic call;
- send call clear or reject to basic call if appropriate;
- inform FE4 if appropriate.

923: FE2 shall:

- detect answer, alerting, call clear, user busy from basic call or from FE4;
- inform FE3 of the messages received from basic call or from FE4, taking into account the supervisory flags set at FE2;
- send inform 13 if alerting is received from the called destination;
- continue the call depending on call progress information;
- send REPORT (alerting) to BC on receipt of "call in queue";
- relay "call in queue" information if appropriate.

927: Only for the case that charging is done in FE2 (implementation dependent; see subclause 6.1, NOTE 2), it shall:

- collect charging information.

929: FE2 shall:

- insert dialled freephone number as connected line identity.

92A: FE2 shall:

- relay the release causes "catchment area violation" or "calls not allowed from this termination".

9.3 FEAs of FE3

931: FE3 shall:

- investigate facility;
- select the national or international destination number and the events to be monitored, depending on the received information (and additional information) and on the information already in the freephone database e.g. "re-routeing on no reply" or "on busy" or "on limiter value reached" or when "call queuing" is applicable;
- detect DESTINATION req.ind and store information received;
- override the original dialled FPH number in network B by the original dialled FPH number in network A if this number is included in the setup to network B.
- send back the destination number (international number or national number or recorded announcement destination number) or call rejection or call in queue and if applicable other information (e.g. supervisory flags, freephone indicator) to FE2;
- instruct FE2 to release a call being set up.

932: FE3 shall:

- collect statistical information;
- origin: calling line identity, routeing area;
- usage of additional features (call queuing, call re-routeing, statistical information, charging info);
- call result (user busy, number not allocated, number out of service, number changed, number of times queue full condition, no reply);
- store call data in the freephone date base in order to allow a new selection of a destination number.

933: For charging, FE3 shall:

- select the charging info in the case of a terminating freephone call;
- collect real time info (called number, served user destination number, start time, end time);
- charge the facility (e.g. queuing facility).

934: Only for the case that re-routeing on no reply is applicable, FE3 shall:

- start timer Tfph1 ("re-routeing on no reply" timer) on receiving "alerting";
- cancel timer Tfph1 on receiving answer;
- initiate new destination number selection when timer Tfph1 expires.

935: Only for the case that queuing is applicable, FE3 shall:

- place call in queue and inform FE2;
- start timer Tfph3 ("queuing supervision" timer):
 - starts when the service is invoked;
 - at expiry, the busy monitoring request will be cancelled;
 - duration: optional,for the call placed in the queue;
- take the call connected out of the queue and move all the other calls in queue one place forward;

- cancel timer Tfph3 on receipt of "alerting" or "answer";
- inform FE2 (user busy) when Tfph3 expires or monitoring fails.

936: Only for the case that queuing is applicable, FE3 shall:

- select the destination which should be monitored;
- send "busy monitoring request" to the selected terminations;
- handle response of the monitoring request;
- cancel timer Tfph2 ("supervision of busy monitoring request" timer):
 - the timer will expire:
 - if signalling is not possible;
 - at signalling failure;
 - if FE5 cannot respond;
 - duration: a few seconds;
- send "cancel busy monitoring" if applicable;
- start timer Tfph2.

938: Only for the case that charging is done in FE2 (implementation dependent: see subclause 6.1, NOTE 2), FE3 shall:

- send charging information to FE2.

939: Keep call at its original place in the queue.

9.4 FEAs of FE4

941: FE4 shall:

- detect and display of the freephone indicator and freephone number.

942: FE4 shall:

- detect the status request and respond to it.

9.5 FEAs of FE5

951: FE5 shall:

- store address information and monitor state and service compatibility of terminating user;
- start and cancel timer Tfph4 (waiting for response from the terminals).

952: In case of busy monitoring actions, FE5 shall:

- detect and store busy monitoring request and respond to it.

953: FE5 shall:

- cancel busy monitoring request;
- detect "any call cleared" from basic call.

954: FE5 shall:

- send "destination free" when terminating resources becomes available.

10 Allocation of functional entities to physical locations

Table 18 shows the different scenarios of the allocation of functional entities to physical locations.

Table 18

Scenario	FE1	FE2	FE3	FE4	FE5
1	TE	OLE	OLE	TE	TLE
2	TE	OLE	OLE	TE	PTNX
3 (note)	TE	OLE	TR	TE	TLE
4 (note)	TE	OLE	TR	TE	PTNX
5 (note)	TE	OLE	FSC	TE	TLE
6 (note)	TE	OLE	FSC	TE	FSC
7 (note)	TE	OLE	FSC	TE	PTNX
8	TE	TR	TR	TE	TLE
9	TE	TR	TR	TE	PTNX
10 (note)	TE	TR	FSC	TE	TLE
11 (note)	TE	TR	FSC	TE	FSC
12 (note)	TE	TR	FSC	TE	PTNX
13 (note)	TE	TLE	TR	TE	TLE
14 (note)	TE	TLE	TR	TE	PTNX
15 (note)	TE	TLE	FSC	TE	TLE
16 (note)	TE	TLE	FSC	TE	FSC
17 (note)	TE	TLE	FSC	TE	PTNX
18	TE	OLE	OLE		
			&		
		TR	TR	TE	TLE
19	TE	OLE	OLE		
			&		
		TR	TR	TE	PTNX
20	TE	OLE	OLE		
			&		
		TR	FSC	TE	TLE
21	TE	OLE	OLE		
			&		
		TR	FSC	TE	PTNX
22	TE	OLE	OLE		
			&		
		TR	FSC	TE	FSC
NOTE:	For these scenarios, provision of stage 3 ETSs for the support of relationship rc are only within the scope of intelligent networks.				

History

Document history	
March 1996	First Edition