INTERNATIONAL TELECOMMUNICATION UNION

CCITT

Q.83

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN

STAGE 2 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES

SECTION 2 – CALL HOLD (REV.1)

Modifications to:
Recommendation Q.83

Geneva, 1992

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation Q.83, § 2 was prepared by Study Group XI and was approved under the Resolution No. 2 procedure on the 4th of February 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication Administration and a recognized private operating agency.

Recommendation Q.83

STAGE 2 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES

(revised 1991)

2 Call Hold

2.1 *Scope*

This Recommendation defines the stage 2 of the Call Hold (CH) supplementary service. Stage 2 identifies the functional capabilities and the information flows needed to support the service as described in stage 1. The stage 2 description also identifies user operations not directly associated with a call (see Recommendation I.130 [1]).

This Recommendation is specified according to the methodology specified in Recommendation Q.65 [2].

In addition, this Recommendation does not specify the requirements where the service is provided to the user via a private ISDN. This Recommendation does not specify the requirements for the allocation of defined functional entities within a private ISDN, it does however define which functional entities may be allocated to a private ISDN.

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

The Call Hold service allows a user to interrupt communications on an existing call/connection[1)] and then subsequently, if desired, re-establish communications. A B-channel[2)] may or may not be reserved after the communication is interrupted to allow the origination or possible termination of other calls. Reservation must be provided by the service provider as a user option. The Call Hold service includes the retrieve operation which re-establishes communication on a B-channel between the served user and the held party.

This supplementary service is not applicable to non-voice services.

This Recommendation is applicable to the stage 3 Recommendations for the integrated services digital network.

2.2 *References*

This Recommendation incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate place 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 Recommendation only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] CCITT Rec. I.130 – *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*, 1988.

[2] CCITT Rec. Q.65 – *Stage 2 of the method for the characterization of services supported by an ISDN*, 1988.

---

1) The applicability of the hold service to a “call” versus a “connection” requires further study.

2) The applicability of this service definition to other access resources (e.g. H-channels, logical channels) for other services requires further study.

[3] CCITT Rec. I.112 – *Vocabulary of terms for ISDNs*, 1988.

[4] CCITT Rec. E.164 – *Numbering plan for the ISDN era*, 1991.

[5] CCITT Rec. I.253.2 – *Call Hold*.

[6] CCITT Rec. Q.71[3)] –*ISDN 64 kbit/s circuit mode switched bearer service*, 1993.

[7] CCITT Rec. I.210 – *Principles of telecommunication services supported by an ISDN and the means used to describe them*, 1988.

[8] CCITT Rec. Z.100 – *Specification and description language (SDL)*, 1988.

2.3 *Definitions*

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

Integrated services digital network (ISDN)

See Recommendation I.112 [3], § 2.3, definition 308.

Service: telecommunications service

See Recommendation I.112 [3], § 2.2, definition 201.

Supplementary service

See Recommendation I.210 [7], § 2.4.

ISDN number

A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

2.4 *Symbols and abbreviations*

CC	Call control
CCA	Call control agent
FE	Functional entity
FEA	Functional entity action
ISDN	Integrated services digital network
LE	Local exchange
PNX	Private network exchange
SDL	Specification and description language
TE	Terminal equipment

2.5 *Description*

The general description of the CH supplementary service is specified in Recommendation I.253.2 [5].

---

3) Recommendation Q.71 will be submitted for approval at the CCITT Plenary Assembly in March, 1993.

2.6 *Definition of functional model*

2.6.1 *Functional model description*

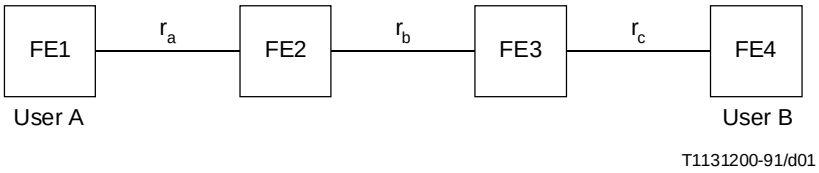


FIGURE 2-1/Q.83

Functional model

r, along with its subscripts, represents different information flow relationships between functional entities.

2.6.2 *Description of functional entities*

The functional entities required by the Call Hold supplementary service in addition to those of the basic call are as follows:

FE1 users service agent;

FE2 originating hold service control entity;

FE3 terminating hold service control entity;

FE4 held party agent.

2.6.3 *Relationship with a basic service*

The relationship with a basic service is shown in Figure 2-2/Q.83. The basic service model is defined in Recommendation Q.71 [6].

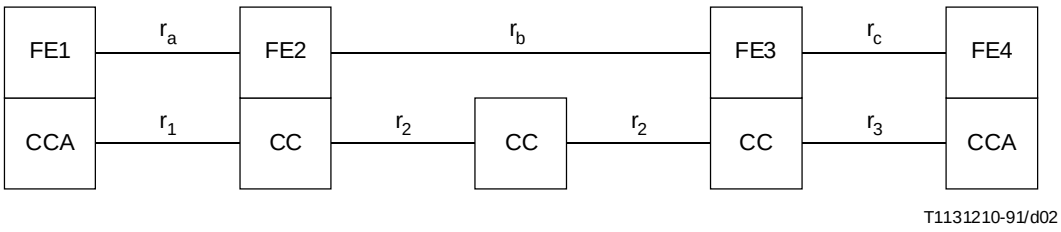


FIGURE 2-2/Q.83

Relationship to basic service

The call control agent (CCA) is the functional entity that serves the user and is responsible for initiating functional requests and interacting with the network. Call control (CC) is performed by functional entities within the network to provide the services requested by the CCA.

2.7 *Information flows*

2.7.1 *Information flow diagram for Call Hold service*

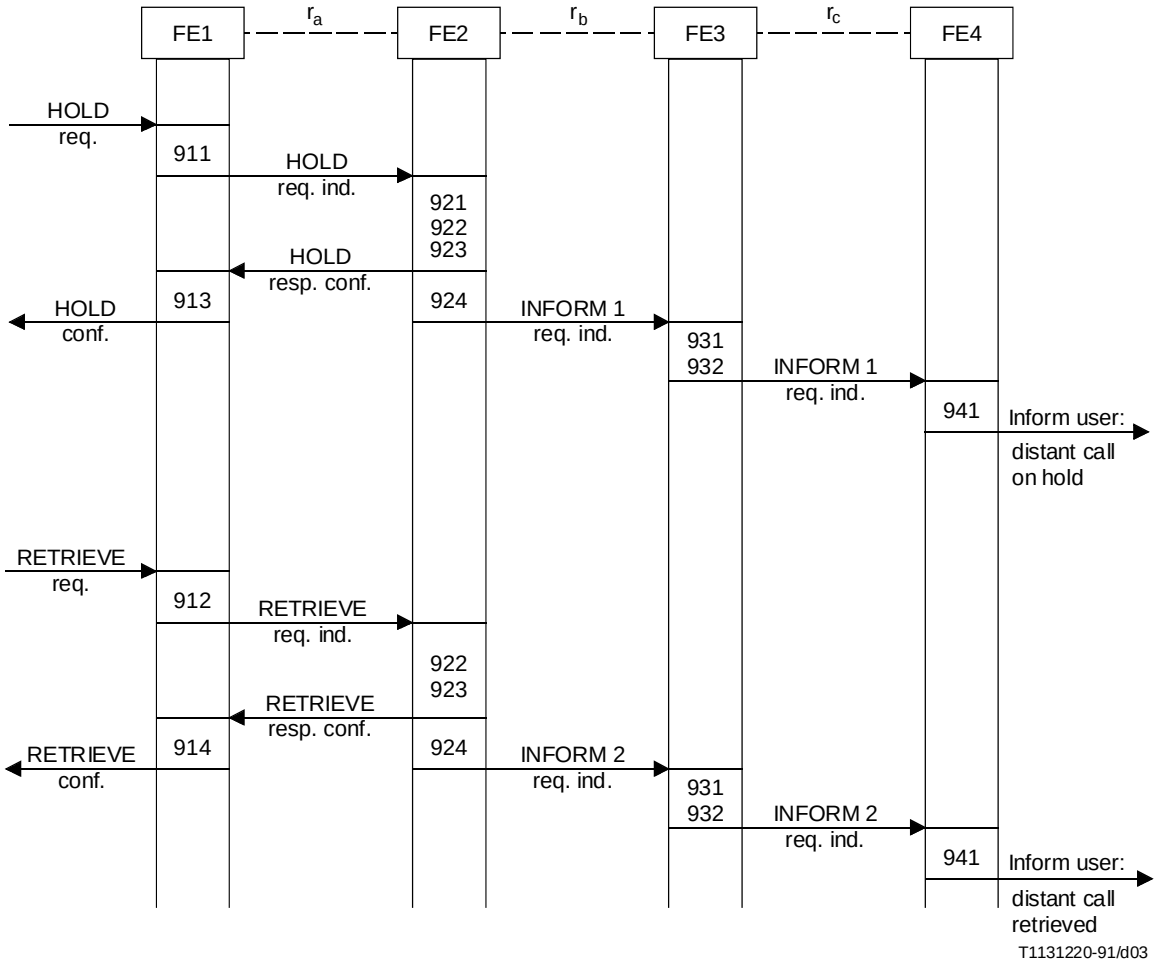


FIGURE 2-3/Q.83

Information flow diagram for Call Hold service

2.7.2 *Definition of individual information flows*

2.7.2.1 *Relationship r_a*

2.7.2.1.1 *HOLD req. ind.*

HOLD req. ind. is the information sent from FE1 which is co-located with a CCA to FE2 to request that a call be placed on hold by the network.

The following information is contained in the HOLD req. ind.:

– an identifier of the call to which the HOLD req. ind. applies.

2.7.2.1.2 *HOLD resp. conf.*

HOLD resp. conf. is the information sent from FE2 to FE1 that confirms that a call has been put on hold for the user by the network.

The following information is contained in the HOLD resp. conf.:

– an identifier of the call to which the HOLD resp. conf. applies.

2.7.2.1.3 *HOLD REJECT req. ind.*

The HOLD REJECT req. ind. is information sent from FE2 to FE1 to indicate that the HOLD REQUEST req. ind. for the identified call has been rejected.

The following information is contained in the HOLD REJECT req. ind.:

– an identifier of the call in the HOLD REJECT req. ind.;

– a reason indicating the cause for rejection.

2.7.2.1.4 *RETRIEVE req. ind.*

RETRIEVE req. ind. is the information sent from FE1 to FE2 to request the reconnection of a held call.

The following information is contained in the RETRIEVE req. ind.:

– an identifier of the call to which the RETRIEVE req. ind. applies;

– an optional indication that:

1) any channel is acceptable for retrieval, or

2) a specified channel is preferred for retrieval, or

3) a specified channel is exclusively required for retrieval.

2.7.2.1.5 *RETRIEVE resp. conf.*

RETRIEVE resp. conf. is the information sent from FE2 to FE1 that confirms that communication was able to be re-established and that the held call is now reconnected. If an optional indication concerning the B-channel over which communication was to have been re-established was included in the RETRIEVE req. ind., then the RETRIEVE resp. conf. serves as an acknowledgement that retrieval was carried out as requested.

The following information is contained in the RETRIEVE resp. conf.:

– an identifier of the call to which the RETRIEVE resp. conf. applies;

– optionally an identifier of the channel over which the held call is reconnected.

2.7.2.1.6 *RETRIEVE REJECT req. ind.*

The RETRIEVE REJECT req. ind. is information sent from FE2 to FE1 to indicate that the RETRIEVE REQUEST req. ind. for the identified call has been rejected.

The following information is contained in the RETRIEVE REJECT req. ind.:

– an identifier of the call in the RETRIEVE REQUEST req. ind.;

– a reason indicating the cause for rejection.

2.7.2.2 *Relationship r_b*

INFORM 1 req. ind. shall be used to keep the A party informed when party B has been put on HOLD, INFORM 2 req. ind. shall be used to indicate to the held party that the call has been retrieved.

2.7.2.2.1 *Optional INFORM 1 req. ind.*

Optional INFORM 1 req. ind. is the information sent from FE2 to FE3 indicating that the call between FE1 and FE2 has been placed on hold.

The following information is contained in the optional INFORM 1 req. ind.:

– an identifier of the call to which the optional INFORM 1 req. ind. applies.

2.7.2.2.2 *Optional INFORM 2 req. ind.*

Optional INFORM 2 req. ind. is the information sent from FE2 to FE3 indicating that the B-channel between FE1 and FE2 has been reconnected.

The following information is contained in the optional INFORM 2 req. ind.:

– an identifier of the call to which the optional INFORM 2 req. ind. applies.

2.7.2.3 *Relationship r_c*

INFORM 1 req. ind. shall be used to keep the A party informed when party B has been put on HOLD, INFORM 2 req. ind. shall be used to indicate to the held party that the call has been retrieved.

2.7.2.3.1 *Optional INFORM 1 req. ind.*

Optional INFORM 1 req. ind. is the information sent from FE3 to FE4 indicating that the call between FE1 and FE2 has been placed on hold.

The following information is contained in the optional INFORM 1 req. ind.:

– an identifier of the call to which the optional INFORM 1 req. ind. applies.

2.7.2.3.2 *Optional INFORM 2 req. ind.*

Optional INFORM 2 req. ind. is the information sent from FE3 to FE4 indicating that the B-channel between FE1 and FE2 has been reconnected.

The following information is included in the optional INFORM 2 req. ind.:

– an identifier of the call to which the optional INFORM 2 req. ind. applies.

2.8 *SDL diagrams for functional entities*

The SDL diagrams for functional entities FE1, FE2, FE3 and FE4 are shown in Figures 2-4/Q.83 to 2-11/Q.83. The SDLs provided are consistent with Recommendation Z.100 [8].

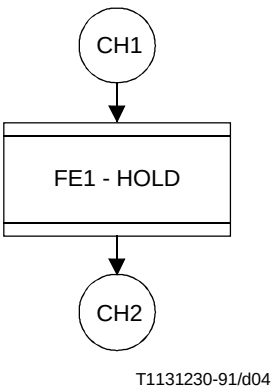


FIGURE 2-4/Q.83

Process FE1

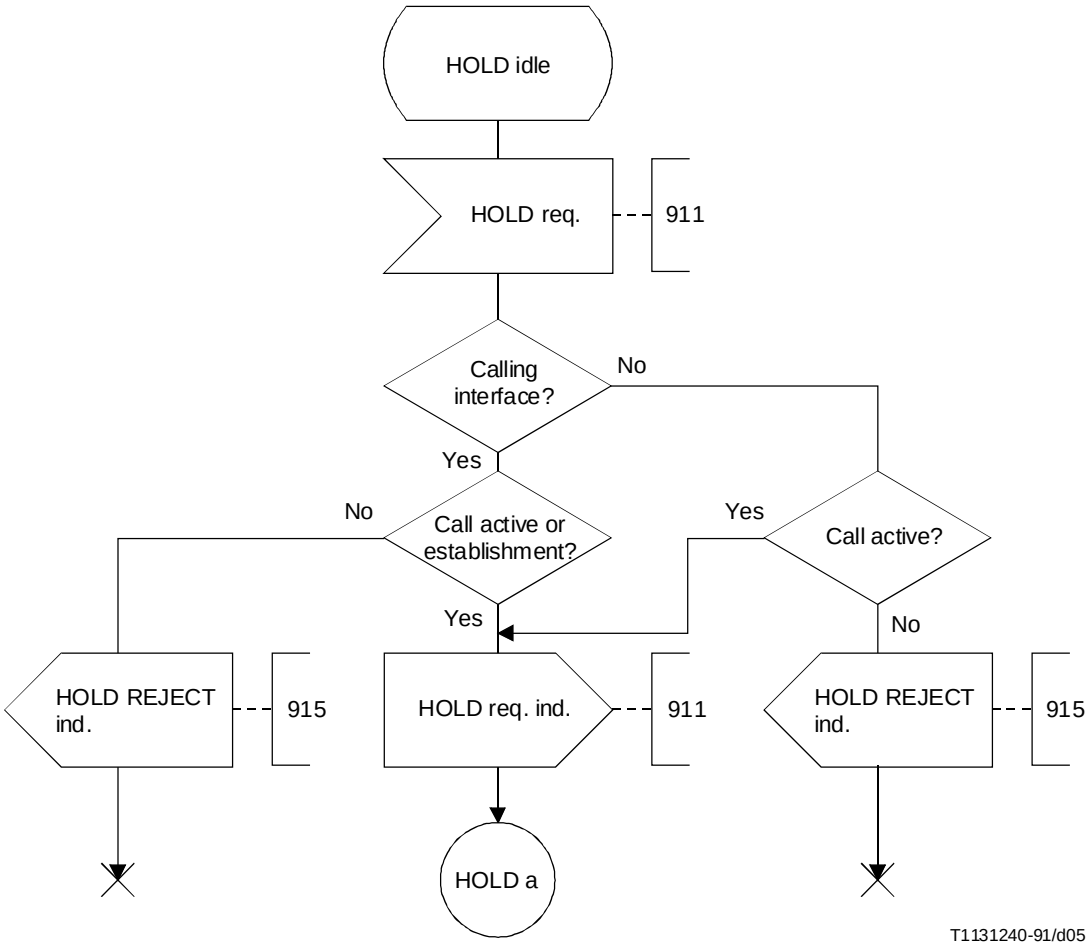


FIGURE 2-5/Q.83 (sheet 1 of 4)

FE1

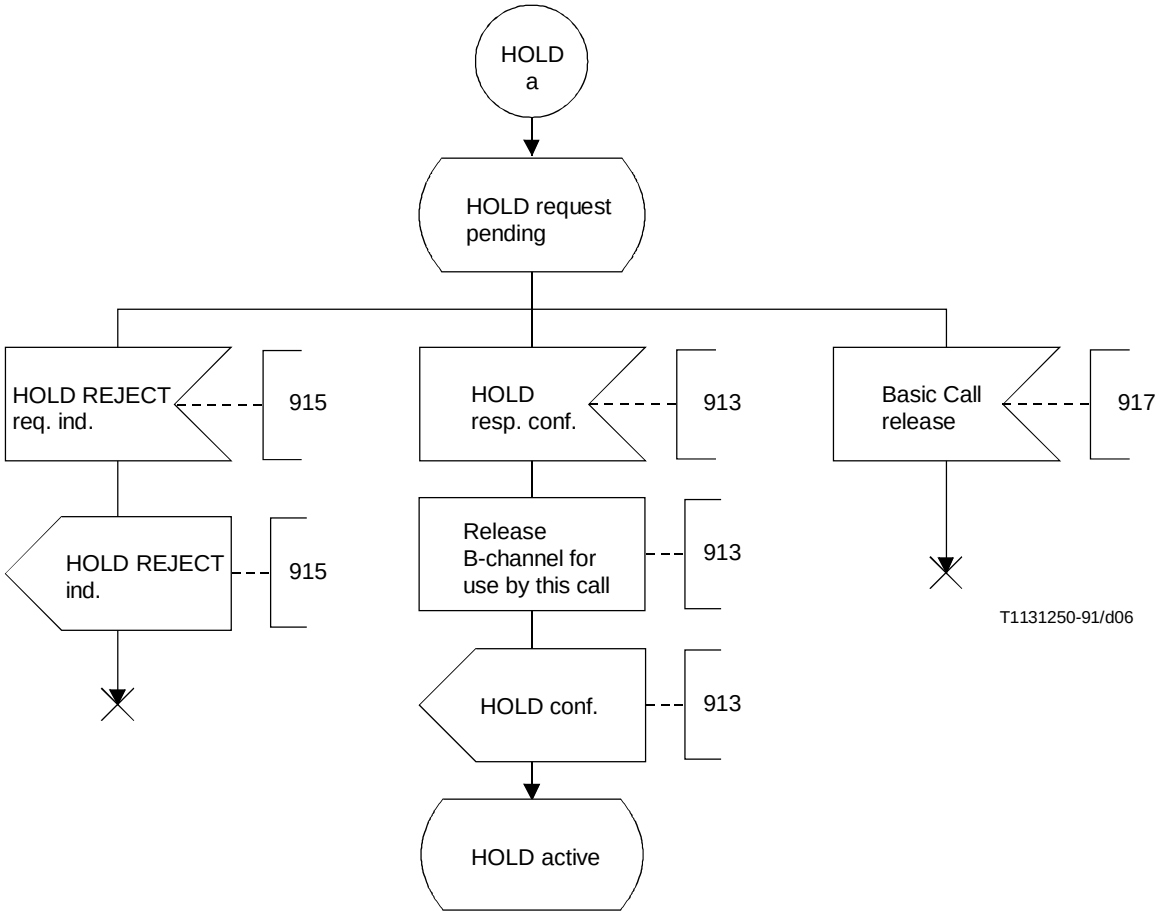


FIGURE 2-5/Q.83 (sheet 2 of 4)

FE1

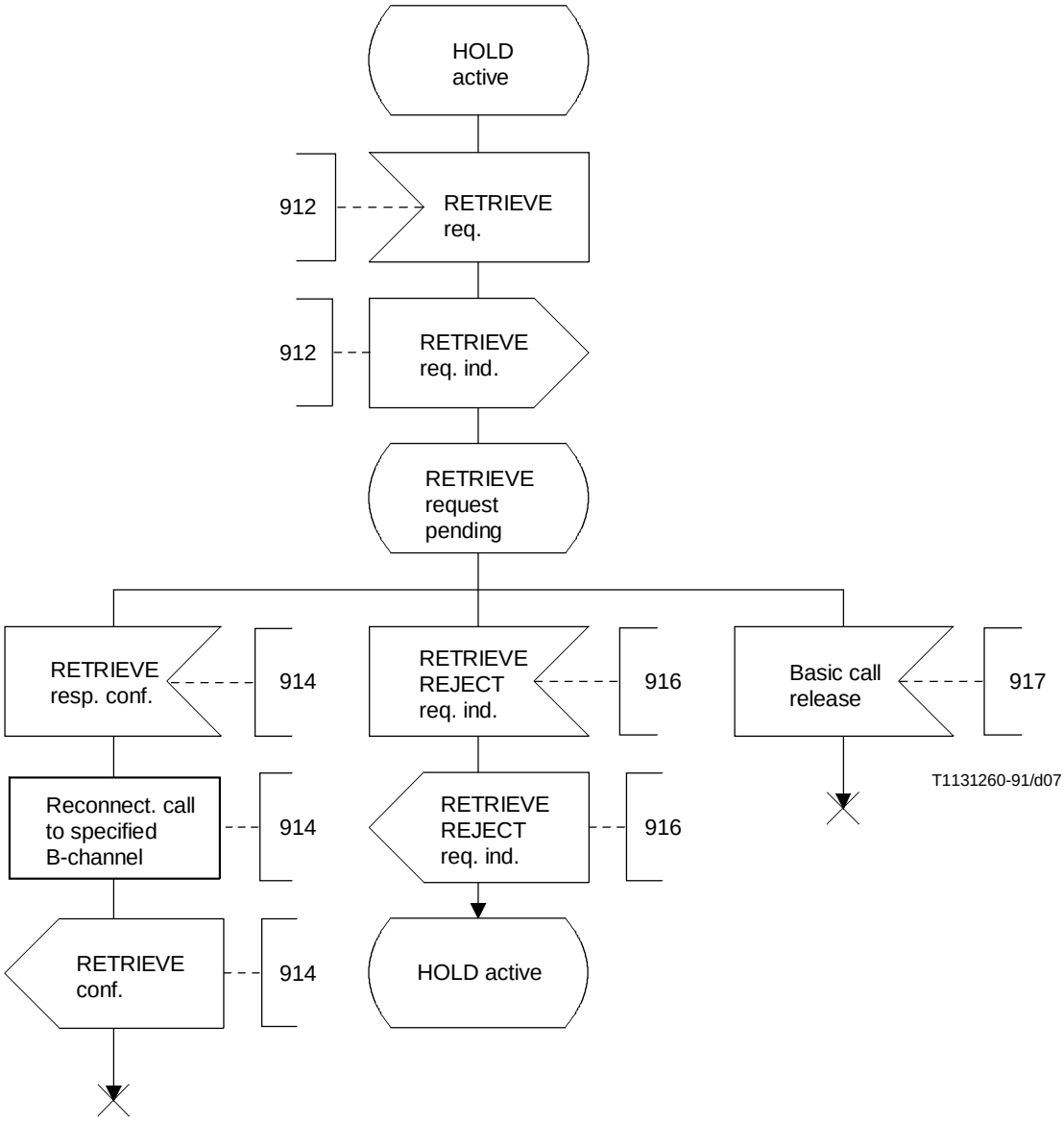
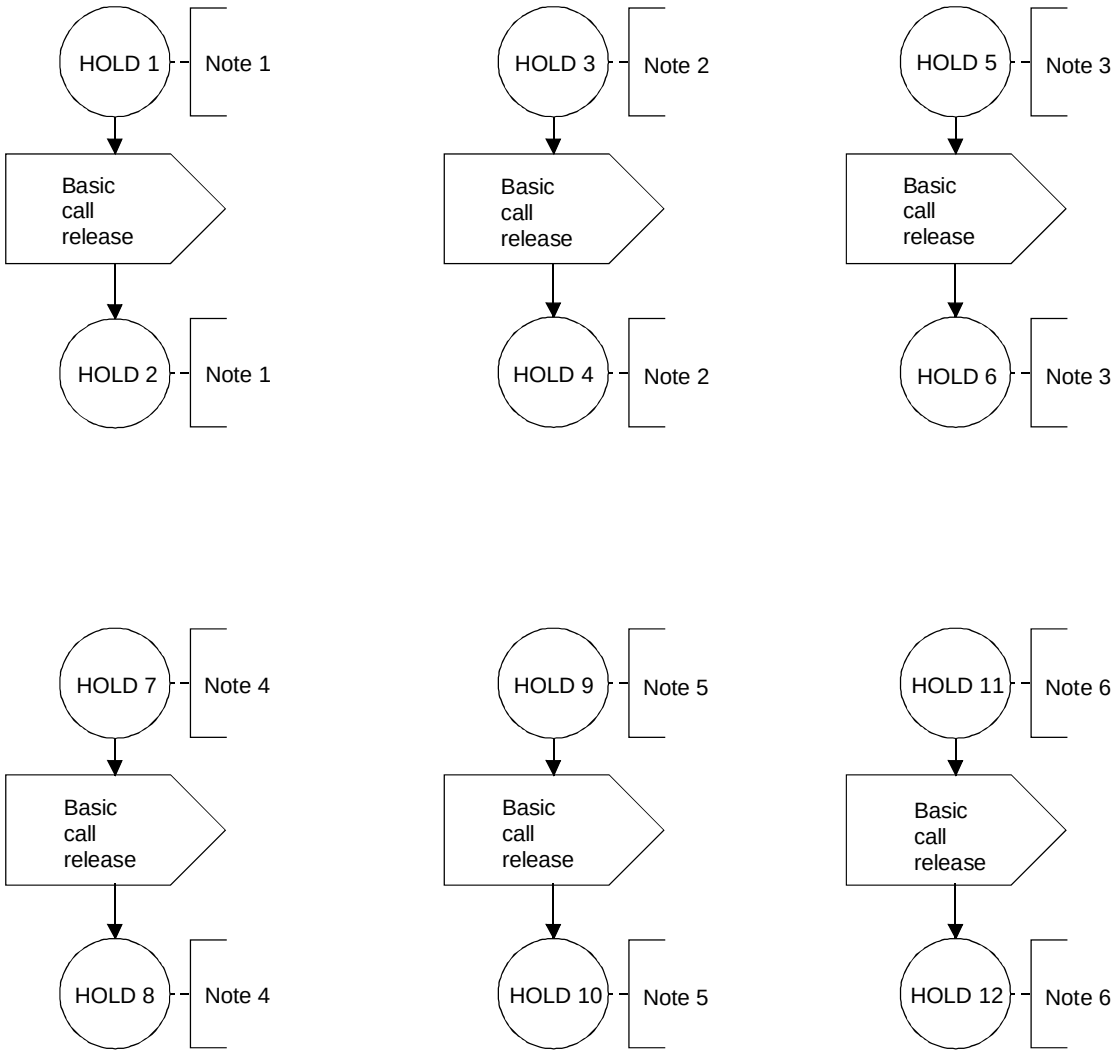


FIGURE 2-5/Q.83 (sheet 3 of 4)

FE1



NOTES

1 HOLD 1 and HOLD 2 break the basic call between connectors S1/5 and S1/6. See Recommendation Q.71 [6].

2 HOLD 3 and HOLD 4 break the basic call between connectors S1/7 and S1/8. See Recommendation Q.71 [6].

3 HOLD 5 and HOLD 6 break the basic call between connectors S1/9 and S1/10. See Recommendation Q.71 [6].

4 HOLD 7 and HOLD 8 break the basic call between connectors S5/8 and S5/9. See Recommendation Q.71 [6].

5 HOLD 9 and HOLD 10 break the basic call between connectors S5/10 and S5/11. See Recommendation Q.71 [6].

6 HOLD 11 and HOLD 12 break the basic call between connectors S5/12 and S5/12. See Recommendation Q.71 [6].

FIGURE 2-5/Q.83 (sheet 4 of 4)

FE1

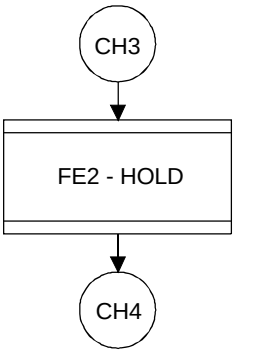


FIGURE 2-6/Q.83

Process FE2

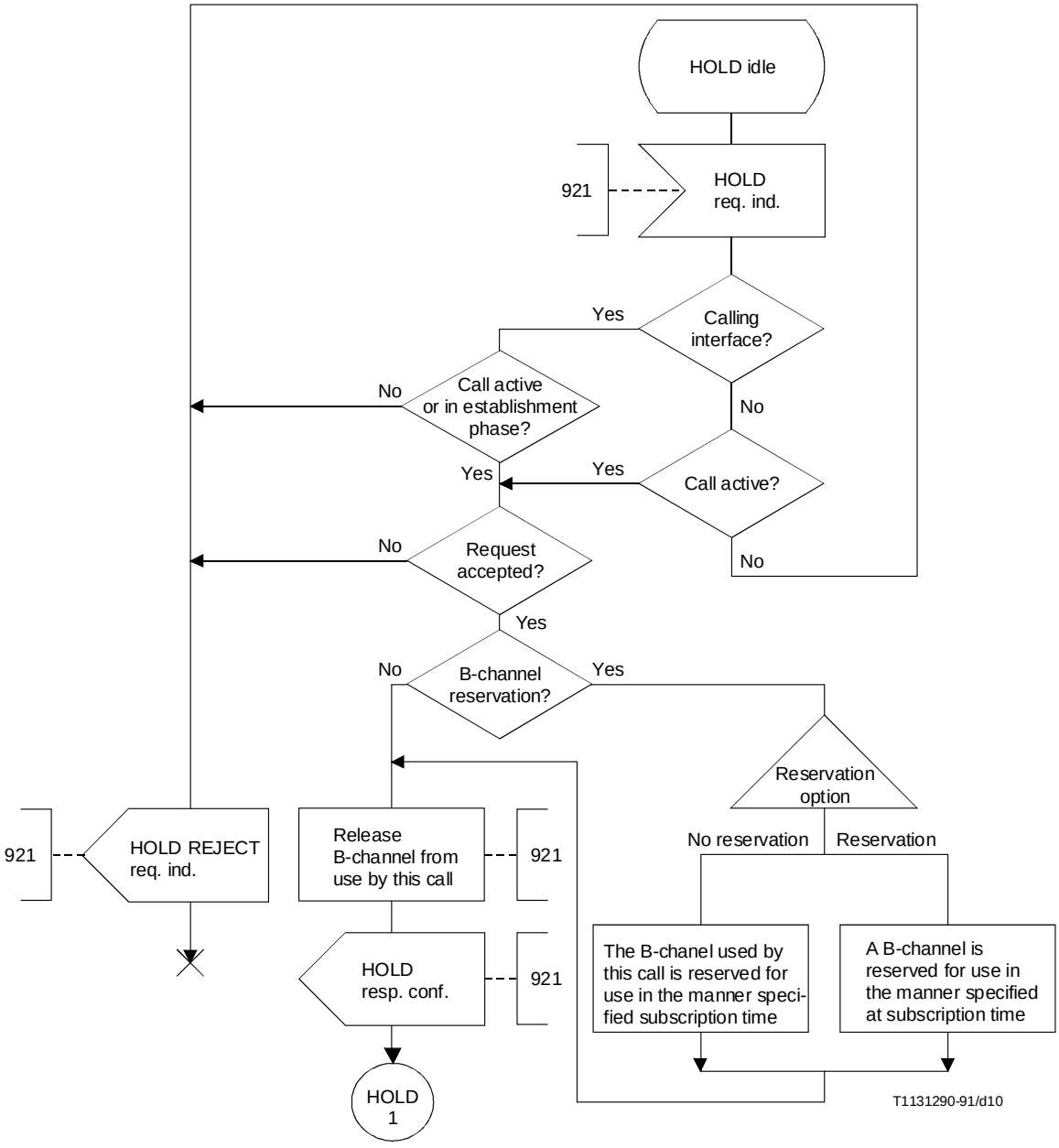


FIGURE 2-7/Q.83 (sheet 1 of 5)

FE2

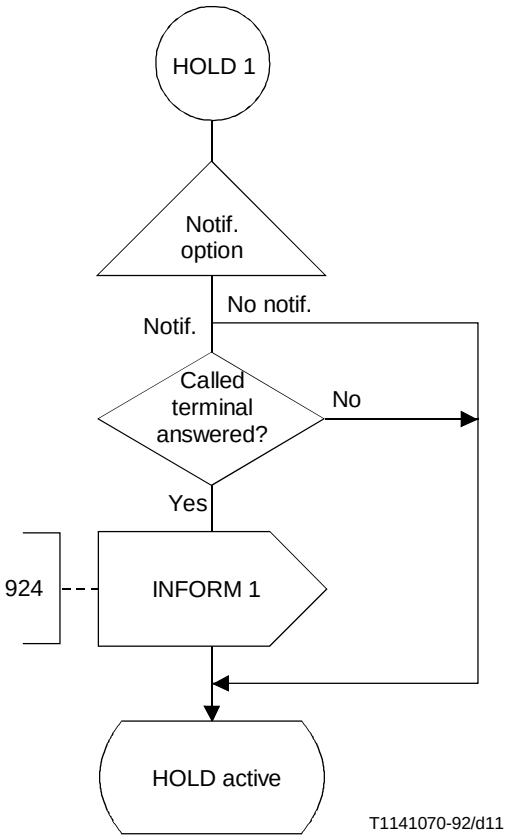


FIGURE 2-7/Q.83 (sheet 2 of 5)

FE2

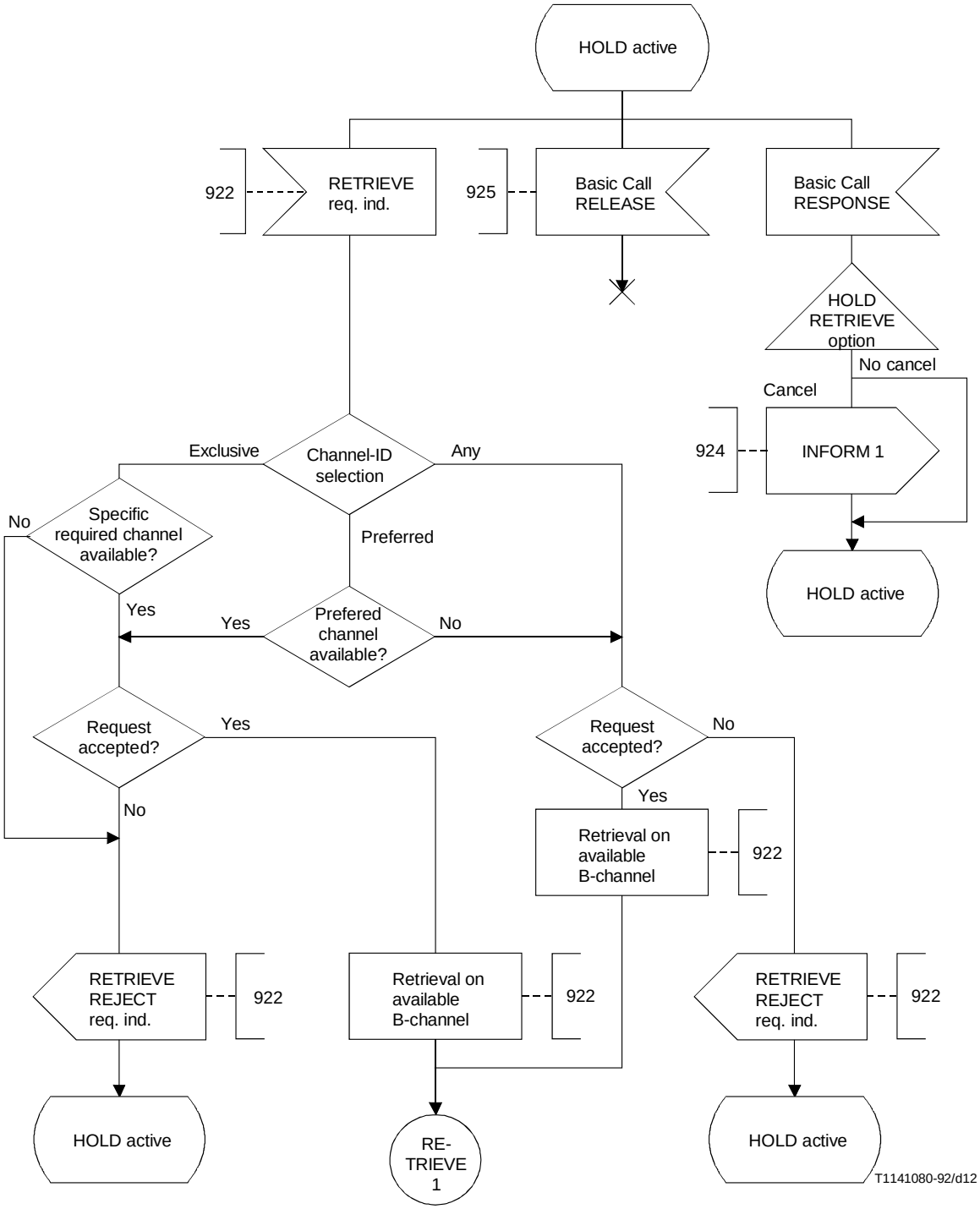


FIGURE 2-7/Q.83 (sheet 3 of 5)

FE2

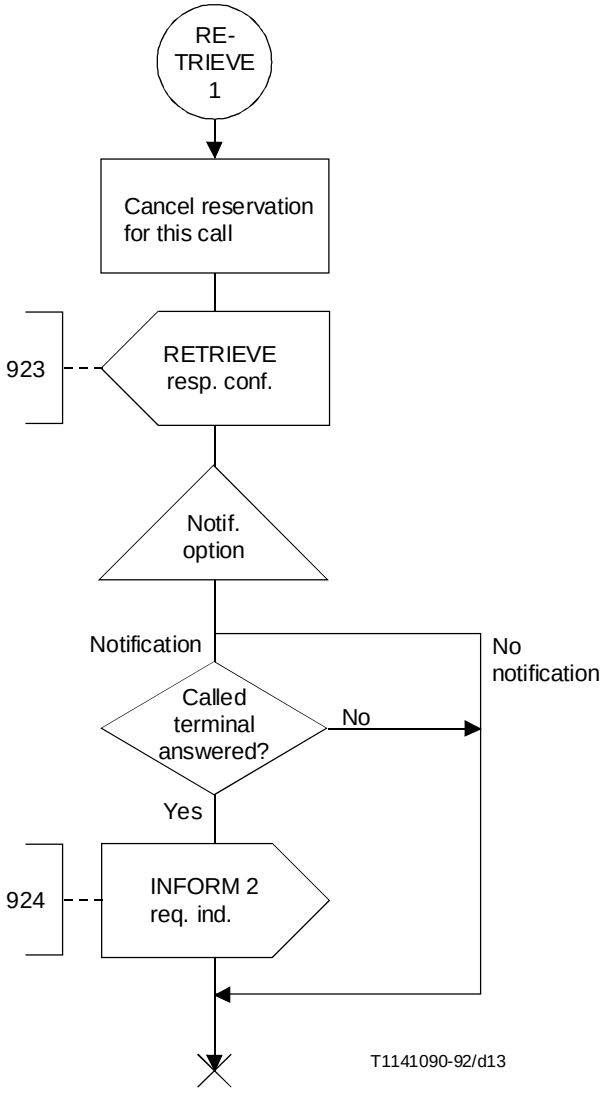
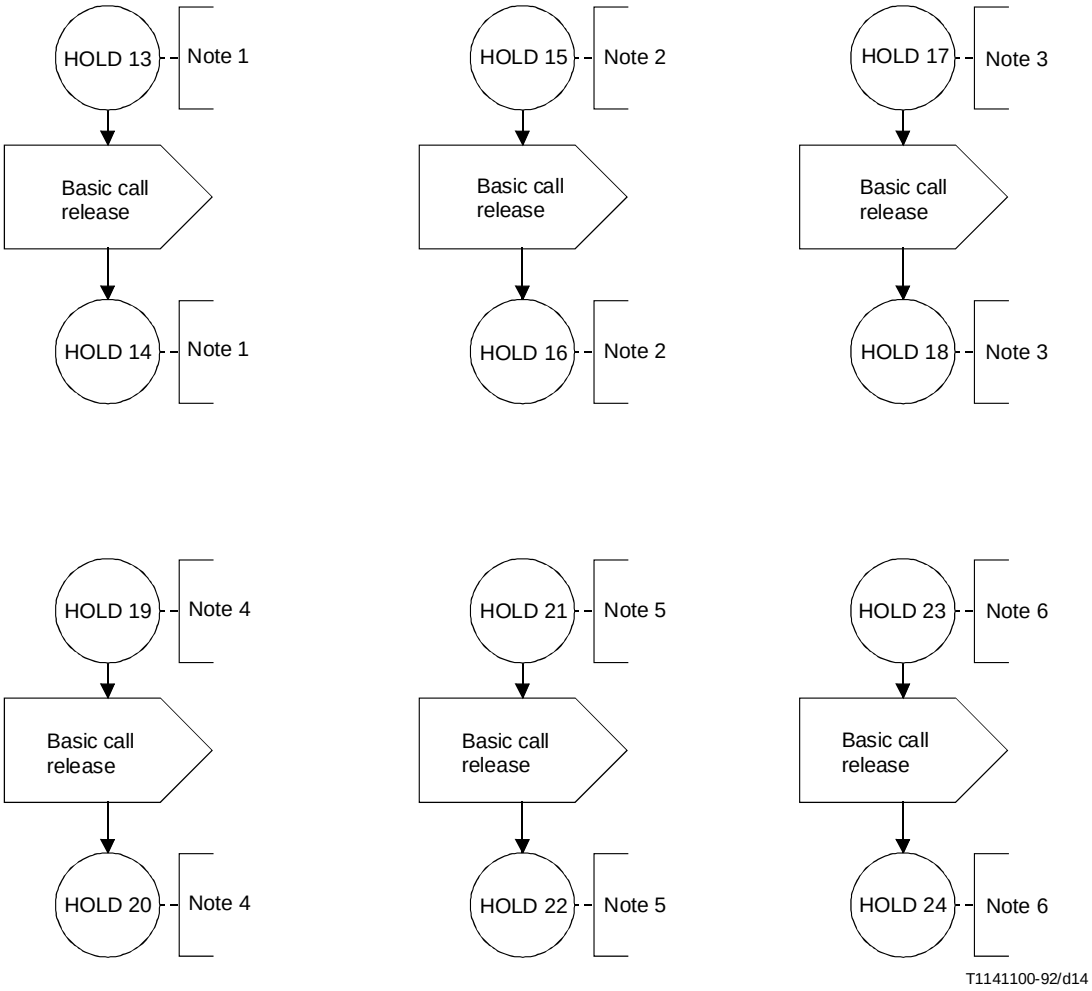
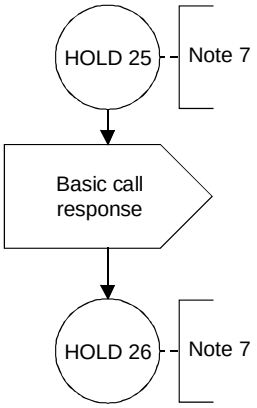


FIGURE 2-7/Q.83 (sheet 4 of 5)

FE2





NOTES

1 HOLD 13 and HOLD 14 break the basic call between connectors S2/3 and S2/4. See Recommendation Q.71 [6].

2 HOLD 15 and HOLD 16 break the basic call between connectors S2/7 and S2/8. See Recommendation Q.71 [6].

3 HOLD 17 and HOLD 18 break the basic call between connectors S2/13 and S2/14. See Recommendation Q.71 [6].

4 HOLD 19 and HOLD 20 break the basic call between connectors S4/21 and S4/22. See Recommendation Q.71 [6].

5 HOLD 21 and HOLD 22 break the basic call between connectors S4/23 and S4/24. See Recommendation Q.71 [6].

6 HOLD 23 and HOLD 24 break the basic call between connectors S4/25 and S4/26. See Recommendation Q.71 [6].

7 HOLD 25 and HOLD 26 break the basic call between connectors S2/25 and S2/26. See Recommendation Q.71 [6].

FIGURE 2-7/Q.83 (sheet 5 of 5)

FE2

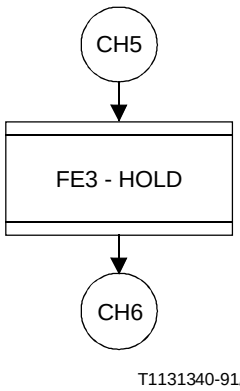


FIGURE 2-8/Q.83

Process FE3

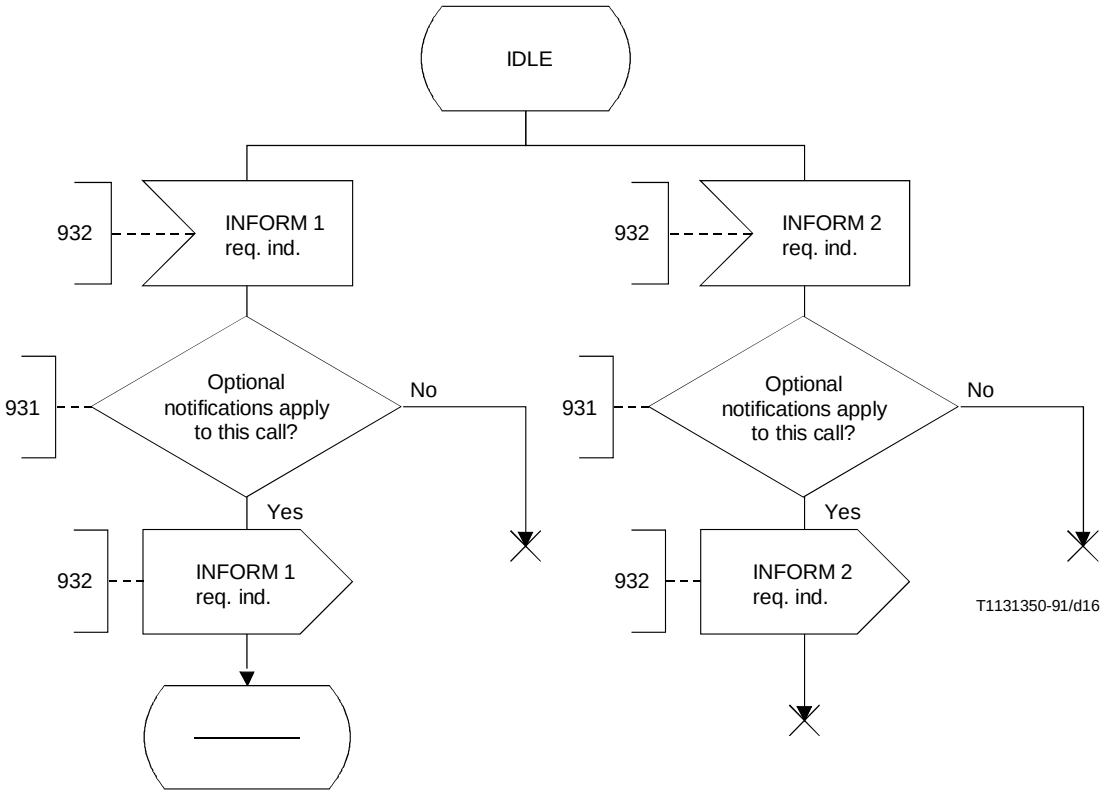


FIGURE 2-9/Q.83

FE3

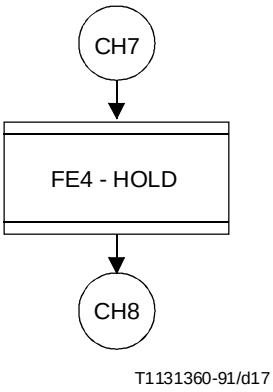


FIGURE 2-10/Q.83

Process FE4

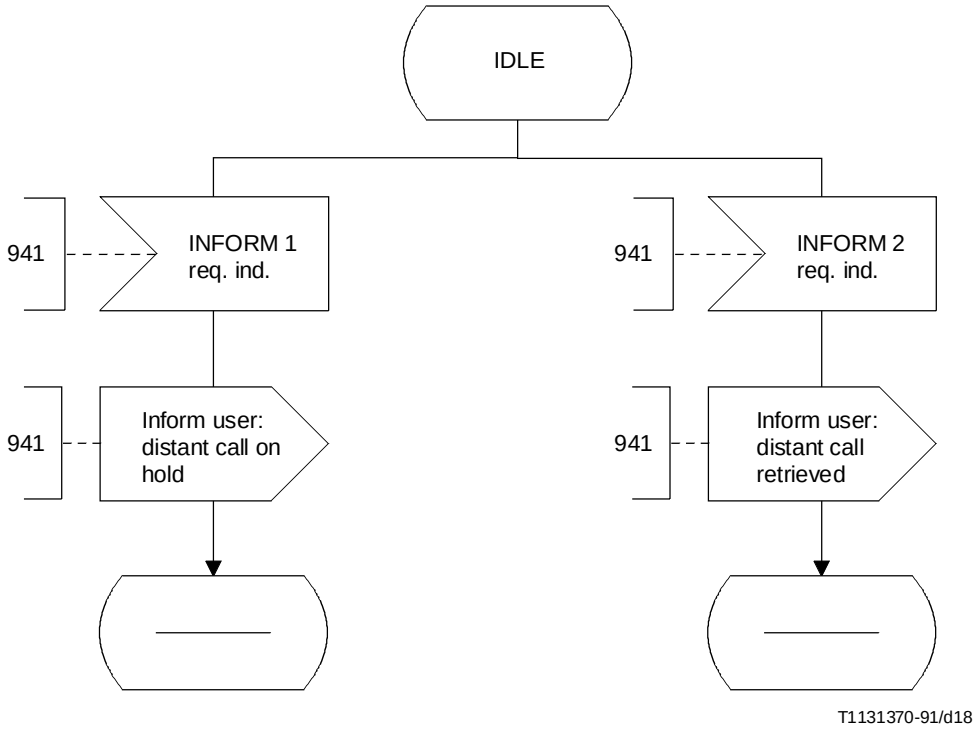


FIGURE 2-11/Q.83

FE4

2.9 *Functional entity actions*

2.9.1 *FEAs of FE1*

911: The functional entity shall accept the user's request to hold the call, verify that the call is in a valid state and send the HOLD appropriate req. ind. information flow to FE2.

912: The functional entity shall accept the user's request to retrieve the call and SEND RETRIEVE req. ind. to FE2.

913: The functional entity shall receive the HOLD resp. conf. information flow, release the B-channel, and inform the user of success.

914: The functional entity shall receive the RETRIEVE resp. conf. information flow, reconnect the call to the specified B-channel and inform the user of success.

915: The functional entity shall receive the HOLD REJECT req. ind. information flow and inform the user of failure.

916: The functional entity shall receive the RETRIEVE REJECT req. ind. information flow and inform the user of failure.

917: The functional entity shall recognize a basic call release indication.

2.9.2 *FEAs of FE2*

921: The functional entity shall receive the HOLD req. ind. information flow check and validate subscription options, perform the hold function and generate the appropriate response.

922: The functional entity shall receive the RETRIEVE req. ind. information flow, perform the retrieve function and generate the appropriate response.

923: The functional entity shall perform the reservation function.

924: The functional entity shall optionally provide the notification function to the distant party.

925: The functional entity shall recognize a basic call release indication.

2.9.3 *FEAs of FE3*

931: The functional entity shall determine whether optional notifications apply to this call.

932: The functional entity shall relay INFORM 1 req. ind. and INFORM 2 req. ind. to FE4.

2.9.4 *FEAs of FE4*

941: The functional entity shall receive the INFORM 1 req. ind. or INFORM 2 req. ind. and provide the appropriate indication to the held party.

2.10 *Network physical allocation scenarios*

	FE1	FE2	FE3	FE4
Scenario 1	TE	LE	LE	TE
Scenario 2	TE	PNX	PNX	TE
Scenario 3	TE	LE	PNX	TE
Scenario 4	TE	PNX	LE	TE

Note – FE1 and FE2 are always allocated at opposite ends of the same access.