INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
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CONSULTATIVE COMMITTEE

Q.85.1

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SERIES Q: SWITCHING AND SIGNALLING

Functions and information flows for services in the ISDN – Supplementary services

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COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES – CLOSED USER GROUP

Reedition of CCITT Recommendation Q.85.1 published in the Blue Book, Fascicle VI.1 (1988)

NOTES

1 CCITT Recommendation Q.85.1 was published in Fascicle VI.1 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

Recommendation Q.85.1

COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES

1 Closed user group

1.1 *Introduction*

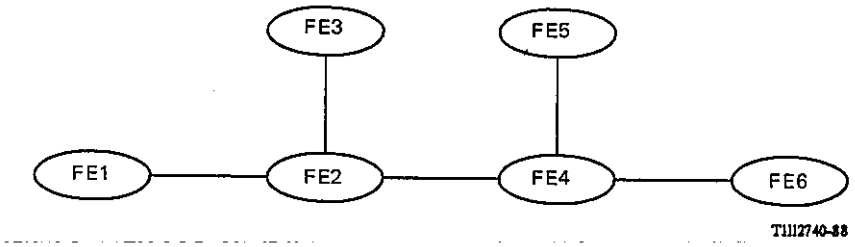
The supplementary service çclosed user group (CUG) makes provision for a group of users to meet security requirements of certain applications by providing restrictions, which prevent non-members from reaching these applications.

The basic facility provides, via the ISDN, the CUG members with controlled intercommunication exclusively amongst themselves and denies access into or outside the group. This facility can be extended to include outgoing and/or incoming access for specified CUG members.

1.2 *Definition of functional model*

1.2.1 *Functional model description*

The high level functional model for the CUG service contains the network addressable functional entities described in Figure 1-1/Q.85.



FE1 Originating CUG agent
FE2 Outgoing CUG determination
FE3 Outgoing CUG control
FE4 Incoming CUG determination
FE5 Incoming CUG control
FE6 Destination CUG agent

FIGURE 1-1/Q.85
CUG service functional model

1.2.2.1 *Outgoing CUG determination entity (FE2)*

It has the ability:

- to identify a CUG call;
- to check the CUG subscription of the calling user;
- to access the outgoing CUG control entity.

1.2.2.2 *Outgoing CUG control entity (FE3)*

It performs:

- the validation checks of CUG information of a calling user;
- the conversion of the CUG index to an interlock code.

1.2.2.3 *Incoming CUG determination entity (FE4)*

It has the ability:

– to identify a CUG call;

– to check the CUG subscription of the called user;

– to access the incoming CUG control entity.

1.2.2.4 *Incoming CUG control entity (FE5)*

It performs:

– the conversion of the interlock code to CUG index;

– the validation checks of CUG information of a called user (including the compatibility with the called user class - CUG IA - in case of an ordinary incoming call).

Note – FE3 and FE5 are coupled in the sense that they handle a common set of data (interlock codes).

1.2.3 *Relationship to basic service*

Refer to § 1.6 for the physical location of each entity residing in Figure 1-2/Q.85.

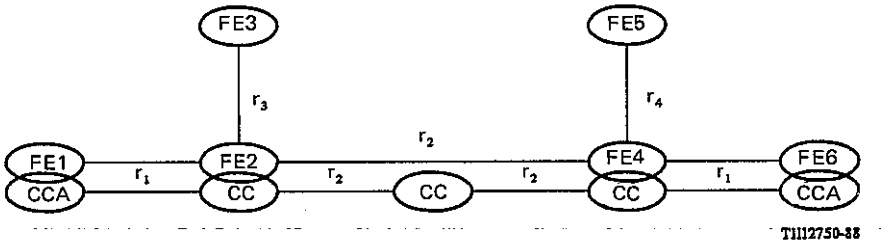
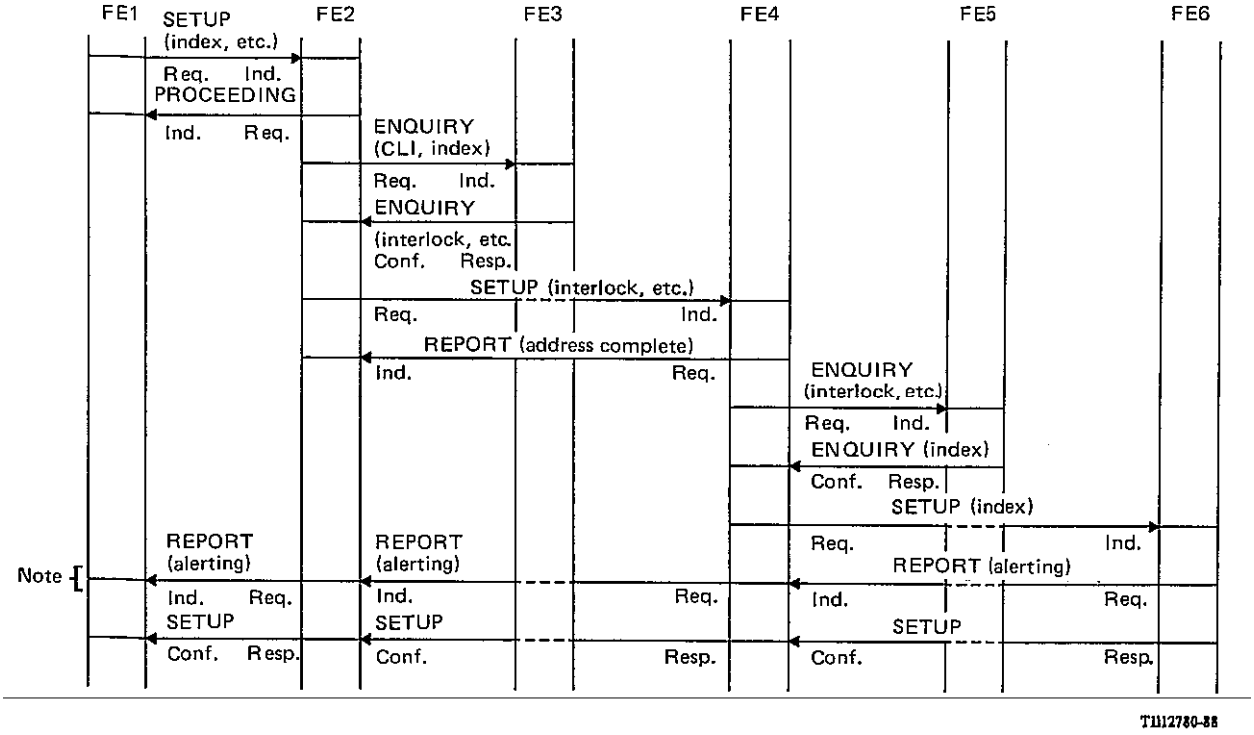


FIGURE 1-2/Q.85
Relationship to basic service model
First case: type A of scenario

1.3 *Information flow description*

1.3.1 *Information flow diagrams*



Note – This information flow may be omitted.

FIGURE 1-3/Q.85
Successful CUG calls

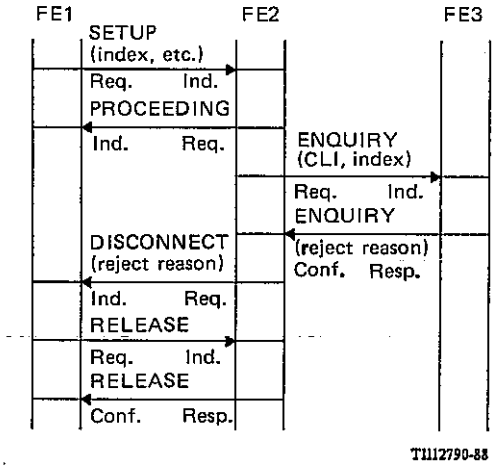


FIGURE 1-4/Q.85
Unsuccessful CUG calls – Case 1

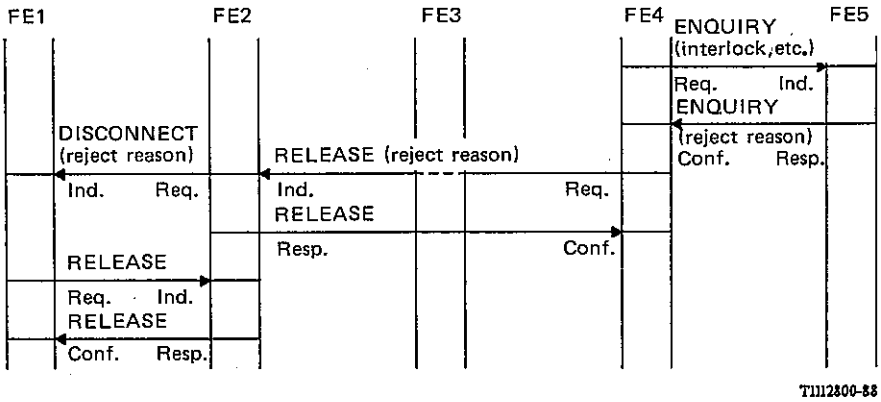


FIGURE 1-5/Q.85
Unsuccessful CUG calls – Case 2

1.3.2 *Definition of individual information flows*

The parameters that are carried on the information flows in the successful case are as follows:

1.3.2.1 SETUP (FE1-FE2) – In addition to called party number and CLI

– nothing, or
– index, or
– index + OA indication.

1.3.2.2 ENQUIRY (FE2-FE3) – Carries the same information as SETUP (FE1-FE2) except called party number.

1.3.2.3 ENQUIRY (FE3-FE2):

– nothing, or
– interlock code, or
– interlock code + OA indication.

1.3.2.4 SETUP (FE2-FE4) - In addition to called party number

– nothing, or
– interlock code, or
– interlock code + OA indication.

1.3.2.5 ENQUIRY (FE4-FE5) - Carries exactly the same information as SETUP (FE2-FE4).

1.3.2.6 ENQUIRY (FE5-FE6):

– nothing, or
– index, or
– index + OA indication.

1.4 *Functional entity actions*

FE1 – A user initiates call SETUP request with the CUG index code (when a preferential CUG is used, no index code is designated).

FE2 – identify a CUG call and receive CUG information,

– CUG subscription check of the calling user.

FE3 – Outgoing validation check:

1) CUG index code check of a calling user (when no index code is designated, preferential CUG is used);

2) outgoing barring check within CUG;when any logical contradiction is detected in the above procedure, a call is rejected (see Table 1-1/Q.85).

– conversión of the index code to an interlock code.

FE4 – identify an incoming CUG call and receive CUG information;

– CUG subscription check of the called user.

FE5 – incoming validation check:

1) incoming barring check within CUG;

2) if interlock codes do not match between a calling user and a called user, a call is rejected;

3) ordinary incoming call check (CUG IA); when any logical contradiction is detected in the above procedure, a call is rejected (see Table 1-2/Q.85).

– an index code corresponding to the designated interlock code is extracted from CUG data of a called user.

FE6 – a user checks whether or not the designated index code exists in the index code list of his own. A user shall give proper responses.

1.5 *SDL diagrams for functional entities*

1.5.1 *FE1 originating CUG agent*

FE1 has the same SDL diagram as the CCA FE (basic call) except that the SETUP information flow to the FE2 must carry additional information (index or index + OA or nothing).

1.5.2 *FE2 outgoing CUG determination*

Refer to the Figure 1-6/Q.85.

1.5.3 *FE3 outgoing CUG control*

Refer to Figure 1-7/Q.85.

1.5.4 *FE4 incoming CUG determination*

Refer to Figure 1-8/Q.85.

1.5.5 *FE5 incoming CUG control*

Refer to Figure 1-9/Q.85.

1.5.6 *FE6 destination in CUG agent*

FE6 has the same SDL diagram as the CCA FE (basic call) except that the SETUP information flow to the FE6 must carry additional information (index or index + OA mark or nothing).

1.5.7 *Basic call hooks*

See Figure 1-10/Q.85.

TABLE 1-1/Q.85

CUG interpretation table (outgoing side)

Calling user class \ SETUP presentation							
CUG	CUG + OA (E)	CUG + OA (I)	pCUG	CUG with index OA = OFF	CUG with index OA = ON	CUG with index OA = ON	No. CUG INFO. Ordinary subcriber
Yes				Specified CUG [a]	Specified CUG [a]	Rejected	Rejected
	Yes			Specified CUG [a]	Specified CUG with OA [b]	Ordinary call	Rejected
		Yes		Specified CUG with with OA [a]	Specified CUG with OA [b]	Ordinary call	Ordinary call
Yes			Yes	Specified CUG [a]	Specified CUG [a]	pCGU [a]	pCGU [a]
	Yes		Yes	Specified CUG [a]	Specified CUG with OA [b]	pCUG with OA [b]	pCUG [b]
		Yes	Yes	Specified CUG with OA [a]	Specified CUG with OA [a]	Specified with OA [a]	pCUG with OA [b]
Calling user is NOT CUG				REJECT			Ordinary call

Calling user is a CUG user — EF3

EF2

a) In case of OCB (CUG), a call is rejected

b) In case of OCB (CUG), a call is interpreted as an ordinary call

OA (E) Outgoing access explicit

AS (IM) Outgoing access implicit

OA Outgoing access allowed

OCB Outgoing access barred within the CUG

pCUG Preferential call

Note 1 – When an illegal index code is received, the outgoing call is rejected.

Note 2 – All the user classes are not necessarily supported by all the networks. User classes to be supported are network dependent.

TABLE 1-2/Q.85

CUG checking in incoming sode

Called user's class / SETUP presentation	Called user is CUG				Called user is not CUG
	CUG with or without pCUG		CUG IA with or without pCUG		
	No ICB	ICB	No ICB	ICB	
CUG	M (1)	REJ	M (1)	REJ	REJ
	NM REJ		NM REJ		
CUG and OA	M (1)	REJ	M (2)	(3)	(3)
	NM REJ		NM (3)		
Ordinary	REJ	REJ	(3)	(3)	(3) a)

a) Performed in FE4.

ICB Incoming access barred within CUG

Note 1 – Since CUG OA user class is not concerned in the incoming case, it is not shown in the above list. It shall be regarded that CUG OA user class is the same as class CUG, and CUG OA/IA is the same as user class CUG IA in this table.

Most of the table is performed in FE5.

Note 2 – (1)-(3) shows CUG parameter to be used in the SETUP to the called user.

(1): CUG (index),

(2): CUG + OA (index + OA mark AS),

(3): No CUG (ordinary call).

Note 3 – ICB means incoming calls barred within the CUG. The interpretation logic is changed in this case as shown in each column in the table.

For example:

No ICB	ICB
M (1)	REJ

This means that when the interlock codes are matched and no ICB is applied for the CUG, then (1) is used. However, when ICB is applied for the CUG, the incoming call is rejected even if interlock codes are matched.

Note 4 – M means that the interlock code is matched with the CUG of the called user.

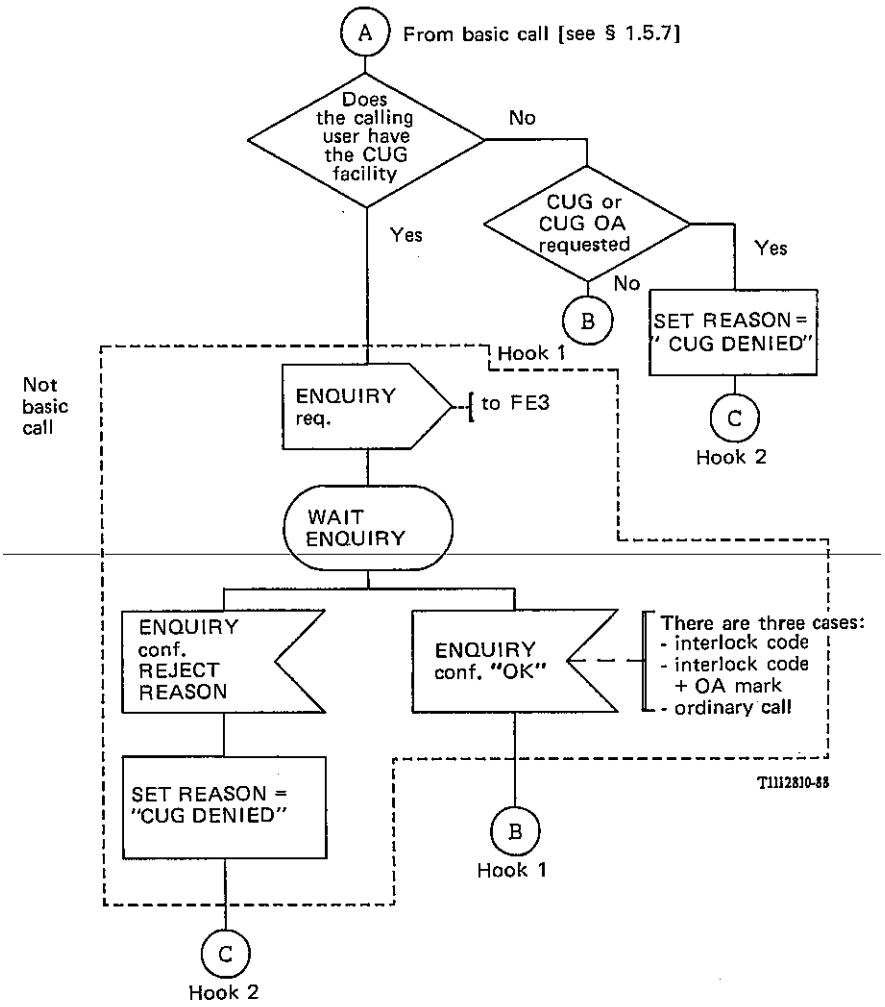
Note 5 – NM means " not matched".

Note 6 – REJ means that an incoming call is rejected.

Note 7 – Interpretation logic, e.g.:

$$\begin{bmatrix} M \\ (3) \end{bmatrix}$$

means that when matched with CUG, no CUG selection facility field is set in the SETUP to the called user.



Hooks: back to basic call (see § 1.5.7).

FIGURE 1-6/Q.85
SDL diagram for FE2

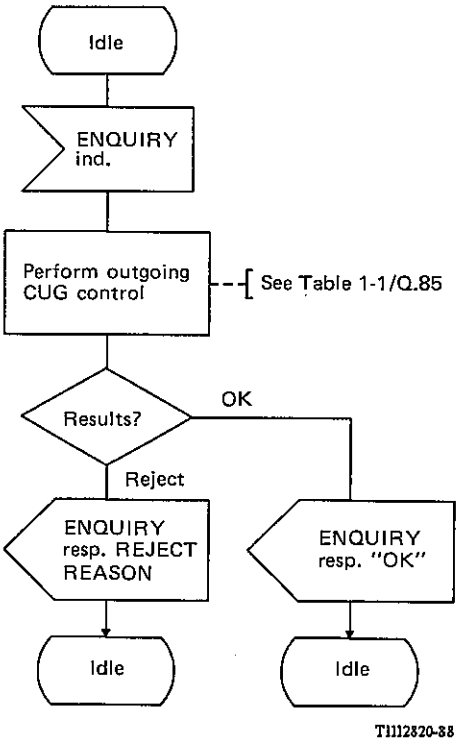


FIGURE 1-7/Q.85
FE3

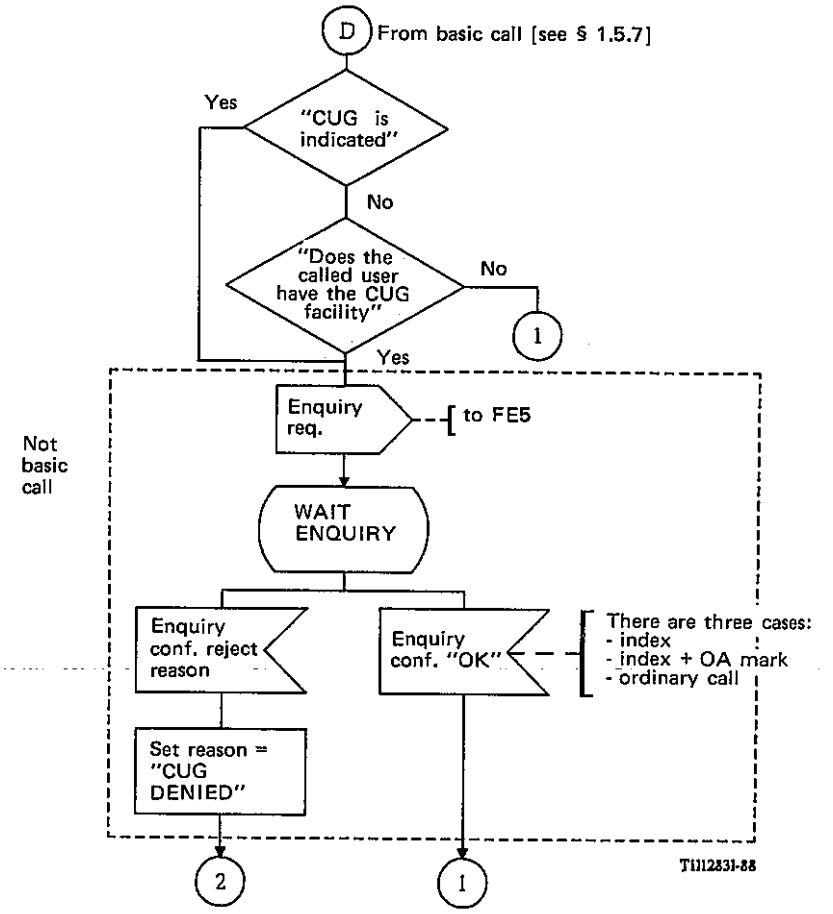


FIGURE 1-8/Q.85 (sheet 1 of 2)
FE4

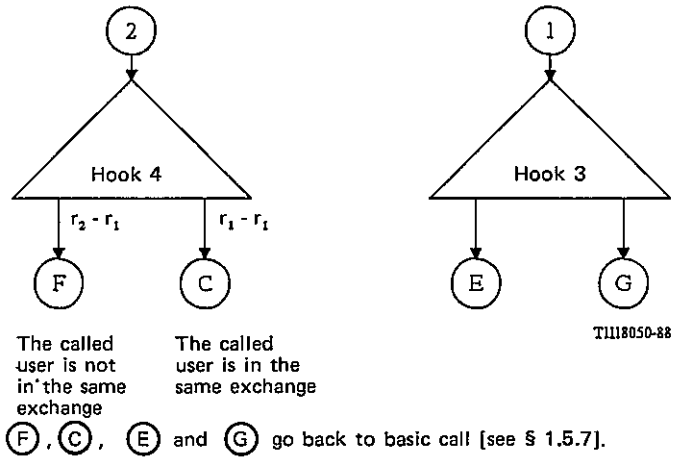


FIGURE 1-8/Q.85 (Sheet 2 of 2)
FE4

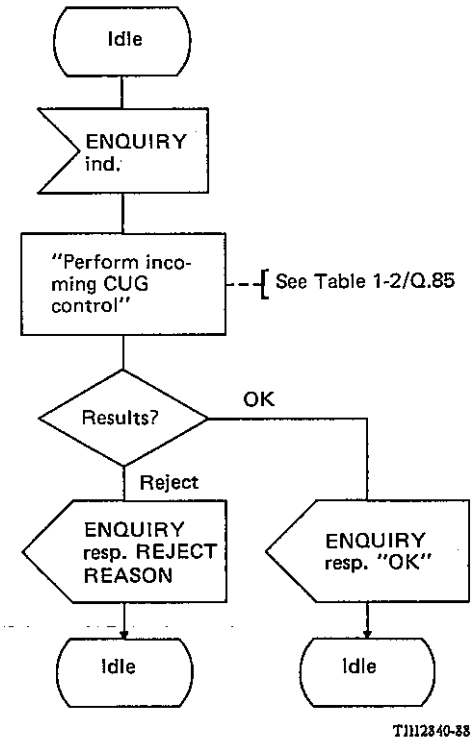
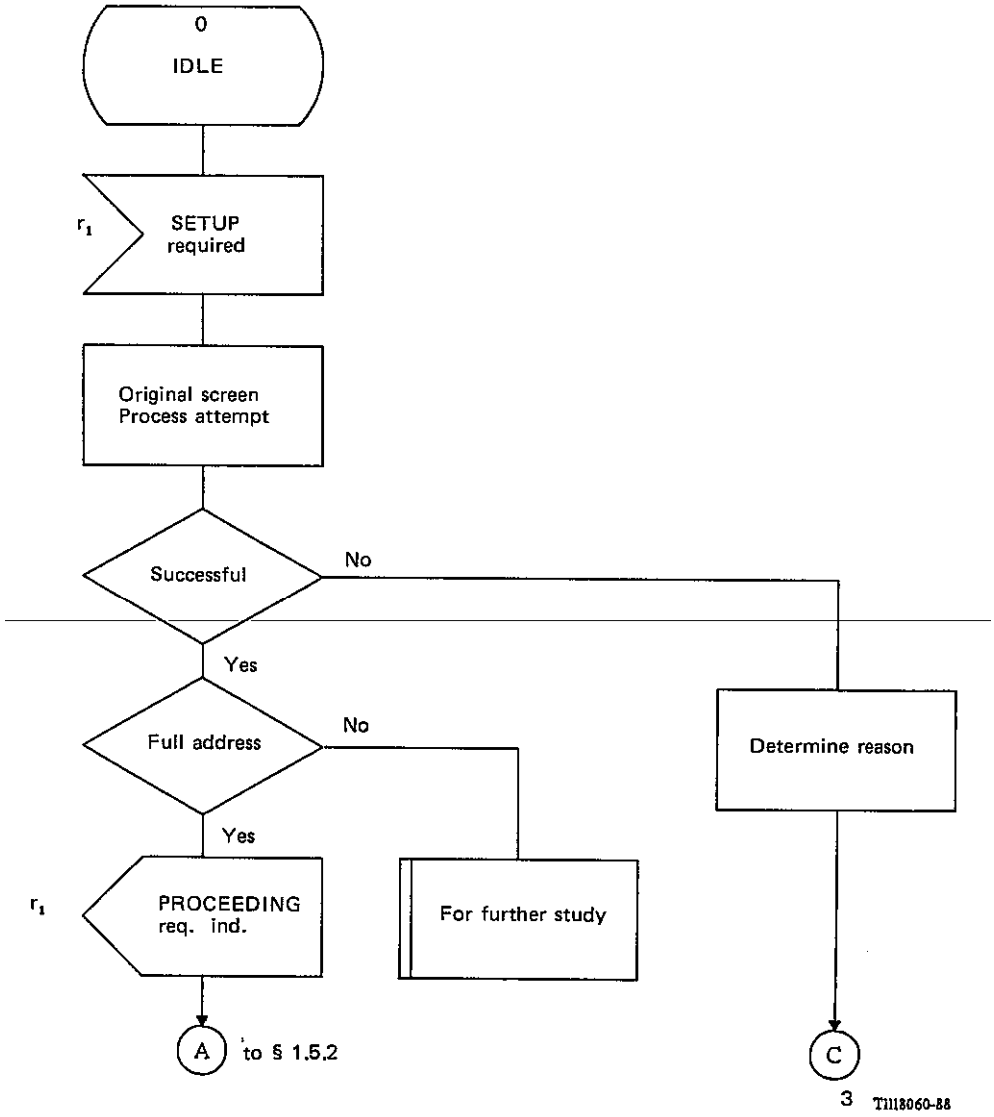


FIGURE 1-9/Q.85
FE5



Note – If cause of call failure is to be conveyed by in-band tones, a B Channel must be established.

FIGURE 1-10/Q.85 (Sheet 1 of 5)
CC functional entity (r_1-r_i) i = 1, 2
(based on Recommendation Q.71)

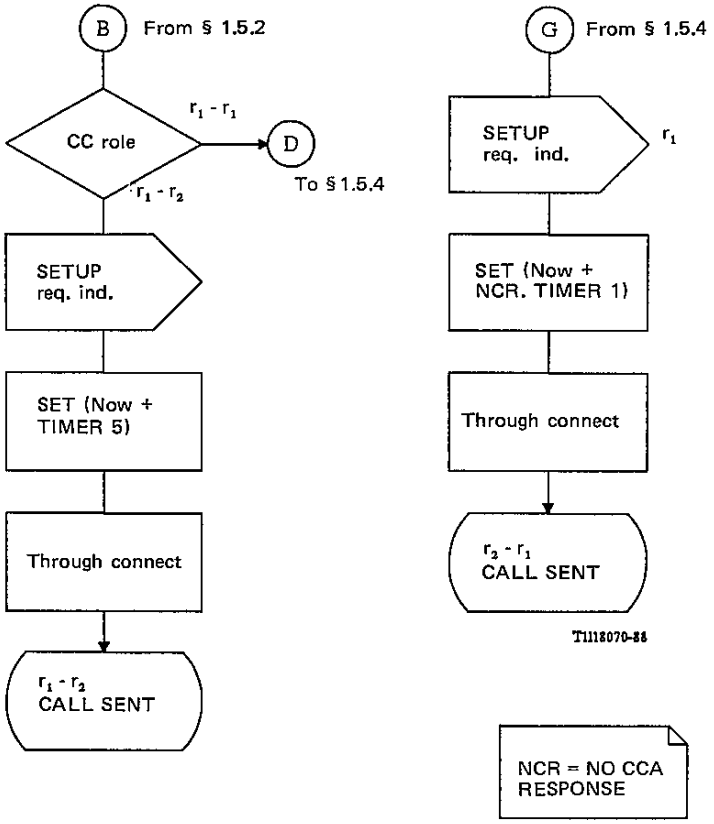


FIGURE 1-10/Q.85 (Sheet 2 of 5)
CC functional entity (r_1-r_i) i = 1, 2
(based on Recommendation Q.71)

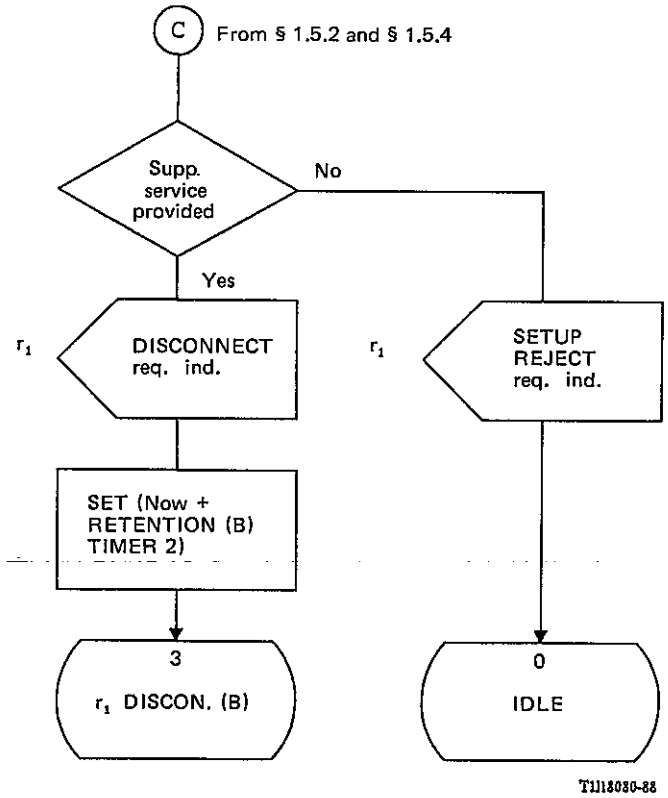


FIGURE 1-10/Q.85 (Sheet 3 of 5)
CC functional entity (r_1-r_i) i = 1, 2
(based on Recommendation Q.71)

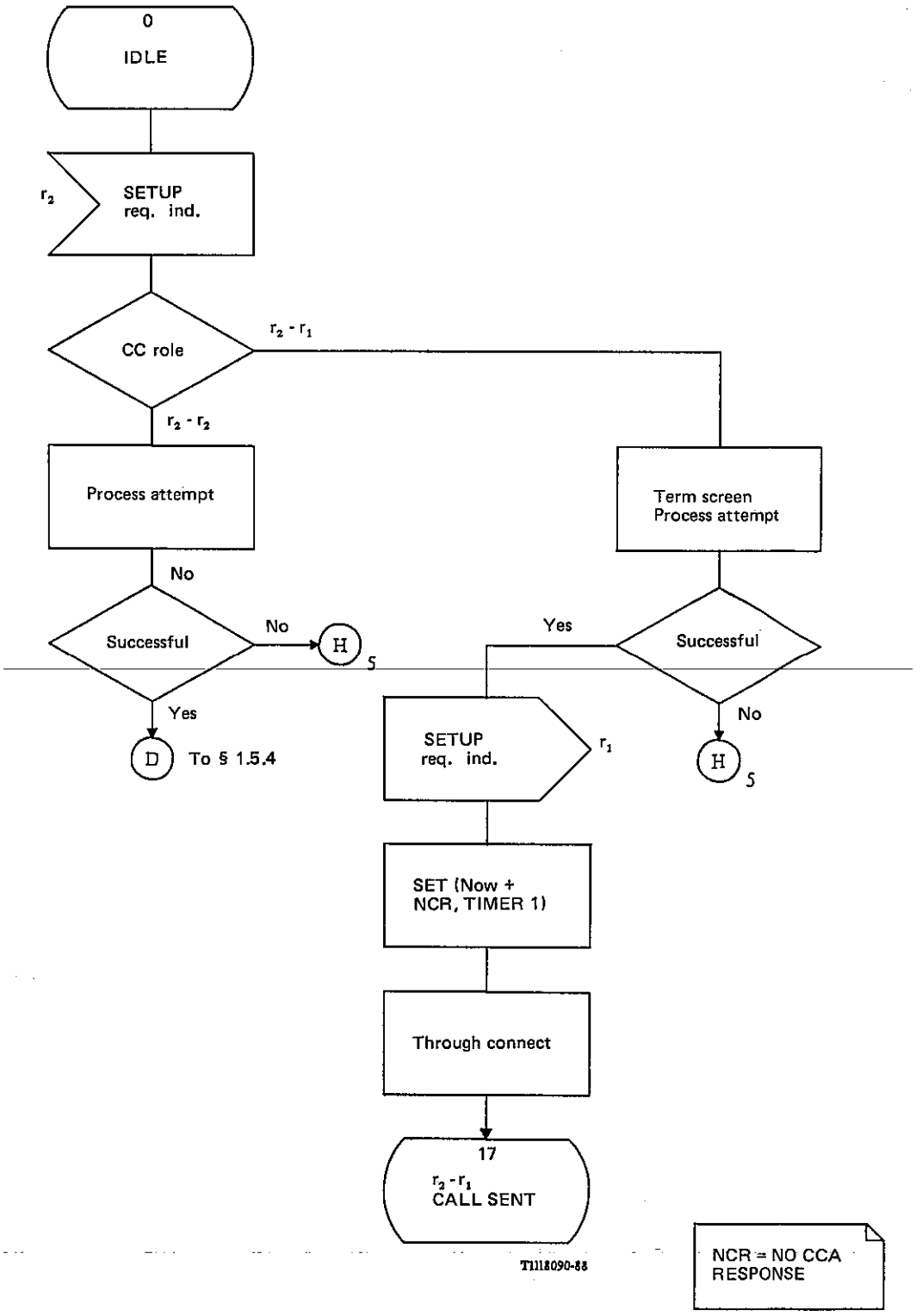


FIGURE 1-10/Q.85 (Sheet 4 of 5)
CC functional entity (r_1-r_i) i = 1, 2
(based on Recommendation Q.71)

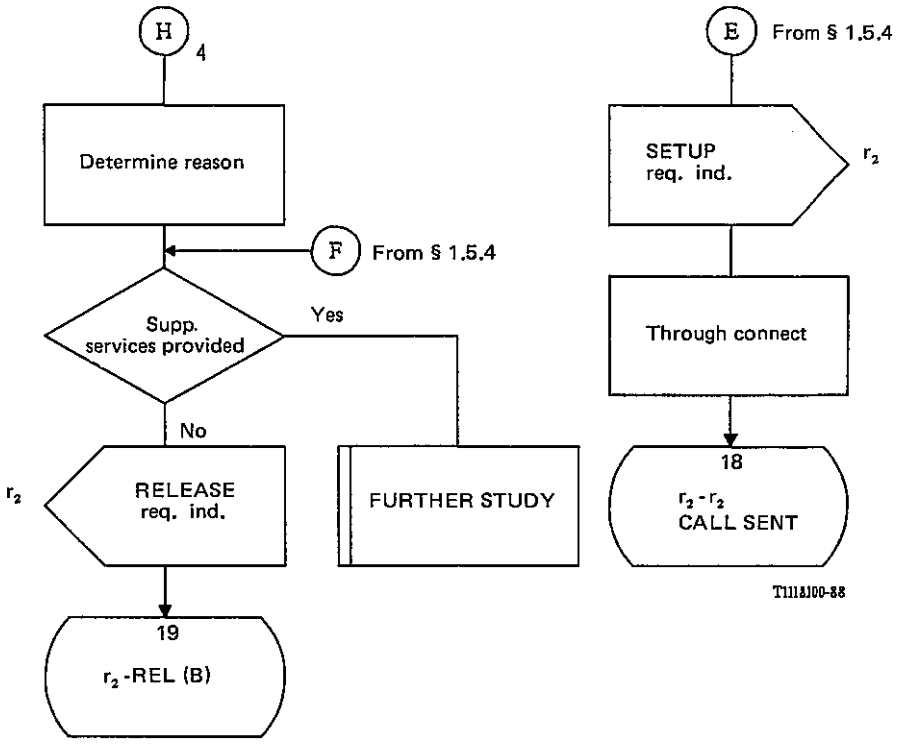


FIGURE 1-10/Q.85 (Sheet 5 of 5)
CC functional entity (r_1-r_i) i = 1, 2
(based on Recommendation Q.71)

1.6 *Network physical allocation scenarios*

TABLE 1-3/Q.85
Network physical allocation scenario A

	FE1	FE2	FE3	FE4	FE5	FE6
A.1	TE/NT2	LE1	LE1	LE2	LE2	TE/NT2
A.2	TE/NT2	LE1	DB1	LE2	DB1	TE/NT2
A.3	TE/NT2	LE1	DB1	LE2	DB2	TE/NT2
A.4	TE	NT2A	NT2A	NT2A	NT2B	TE

The *network scenario A.1* represents the decentralized approach of the CUG service implementation.

The *network scenario A.2* describes the fully centralized approach with a unique data base (DB1).

The *network scenario A.3* describes a centralized approach with two data bases (DB1 and DB2).

In *the network scenario A.4*, the CUG service is handled in the NT2s and then the network is transparent for this service.

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