



INTERNATIONAL TELECOMMUNICATION UNION

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THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

Q.82.2

(11/1988)

SERIES Q: SWITCHING AND SIGNALLING

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

**CALL OFFERING SUPPLEMENTARY
SERVICES – CALL FORWARDING SERVICES**

Reedition of CCITT Recommendation Q.82.2 published in
the Blue Book, Fascicle VI.1 (1988)

NOTES

- 1 CCITT Recommendation Q.82.2 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.82.2

CALL OFFERING SUPPLEMENTARY SERVICES

2 Call forwarding services

2.1 Introduction

2.1.1 General

This Recommendation includes stage 2 descriptions for the three versions of call forwarding services given below, when implemented using the “forward switching” network routing algorithm described in Recommendation Q.80.

The following descriptions are for further study:

- re-routing case as described in Recommendation Q.80;
- the optional notification to be sent to the calling user A when the value of the subscription option “calling user receives notification that his call has been forwarded” is “yes, with forwarded-to-user number”;
- the optional notification to be sent to the served user Bm when the value of the subscription option “served user receives notification that his call has been forwarded” is “yes, with call offering information”.

Further details and definitions of the stage 1 description, i.e., the service description as seen from the user, can be found in Recommendation I.252.

2.1.2 Definitions

call forwarding unconditional (CFU)

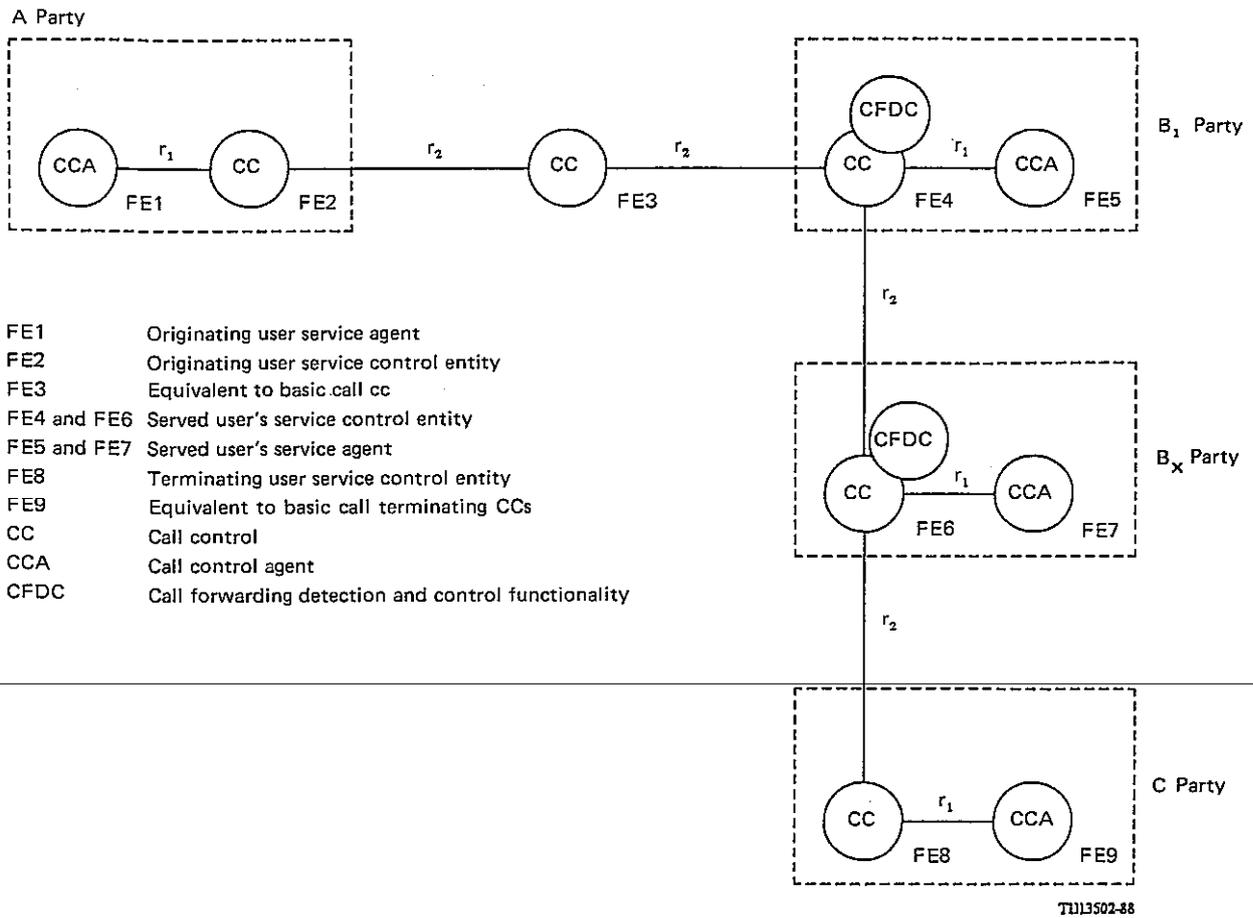
Call forwarding unconditional (CFU) permits a user to have the network send all incoming calls, or just those associated with a specific basic service, addressed to the served user's ISDN number to another number. The served user's originating service is unaffected. If this service is activated, calls are forwarded no matter what the condition of the termination. Other call forwarding services provide call forwarding based on condition, e.g. call forwarding busy (CFB) and call forwarding no reply (CFNR).

call forwarding busy (CFB)

Call forwarding busy (CFB) permits a served user to have the network send all incoming calls, or just those associated with a specific basic service, which meet busy and are addressed to the served user's ISDN number to another number. The served user's originating service is unaffected.

call forwarding no reply (CFNR)

Call forwarding no reply (CFNR) permits a served user to have the network send all incoming calls, or just those associated with a specific basic service, which meet no reply and are addressed to the served user's ISDN number to another number. The served user's originating service is unaffected.



Note — This scenario assumes that A party calls B₁ party, who forwards the call to B₂ party, ..., B_m party, ..., B_x party. The final receiver of the call is C party.

FIGURE 2-1/Q.82
Functional entity model

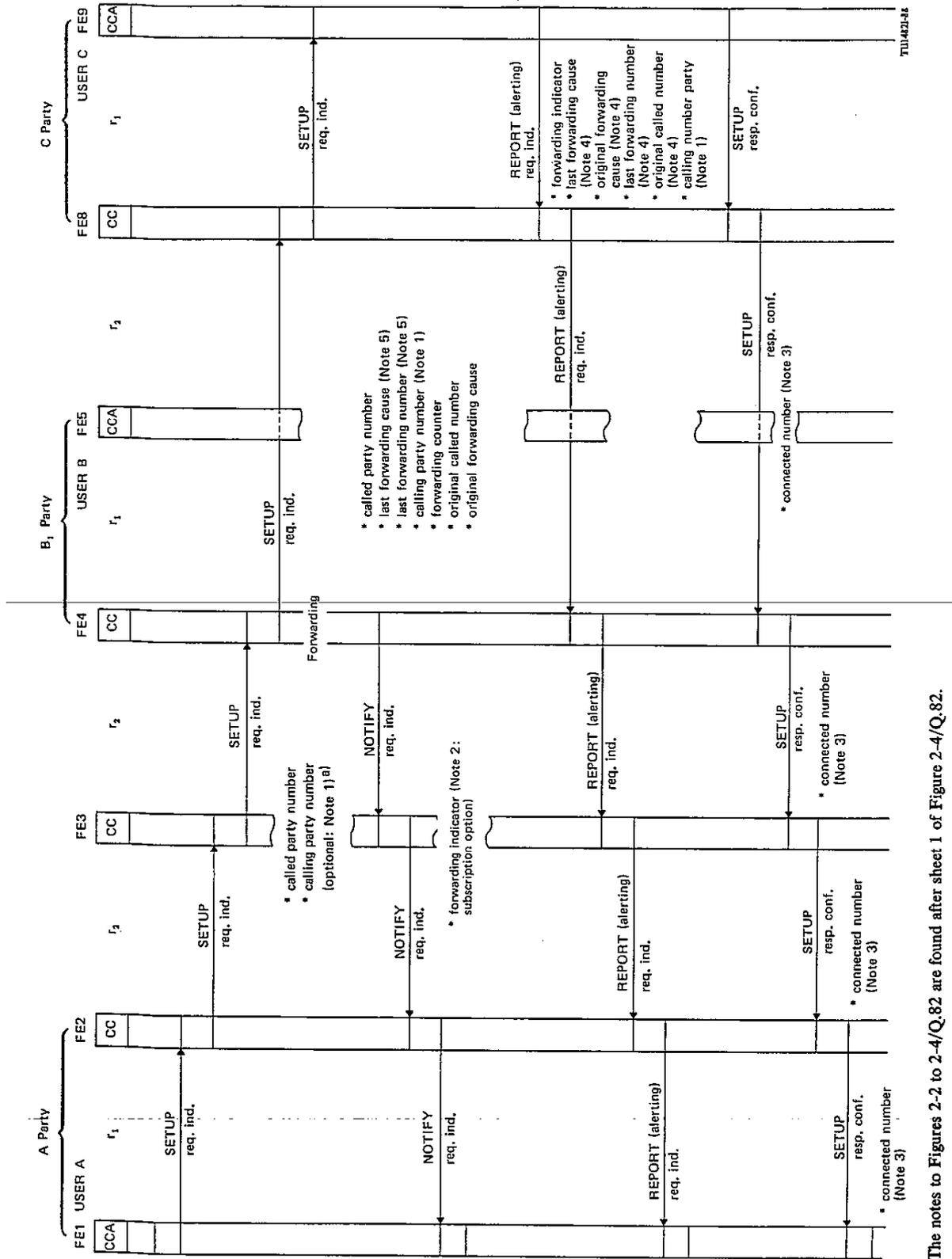
2.2.1 Information flow diagrams

Call forwarding unconditional and for “network determined user busy”: Figure 2-2/Q.82.

Call forwarding for “user determined user busy”: Figure 2-3/Q.82.

Call forwarding on no reply: Figure 2-4/Q.82.

Call forwarding disconnect procedure (including advice of charge): Figure 2-5/Q.82.

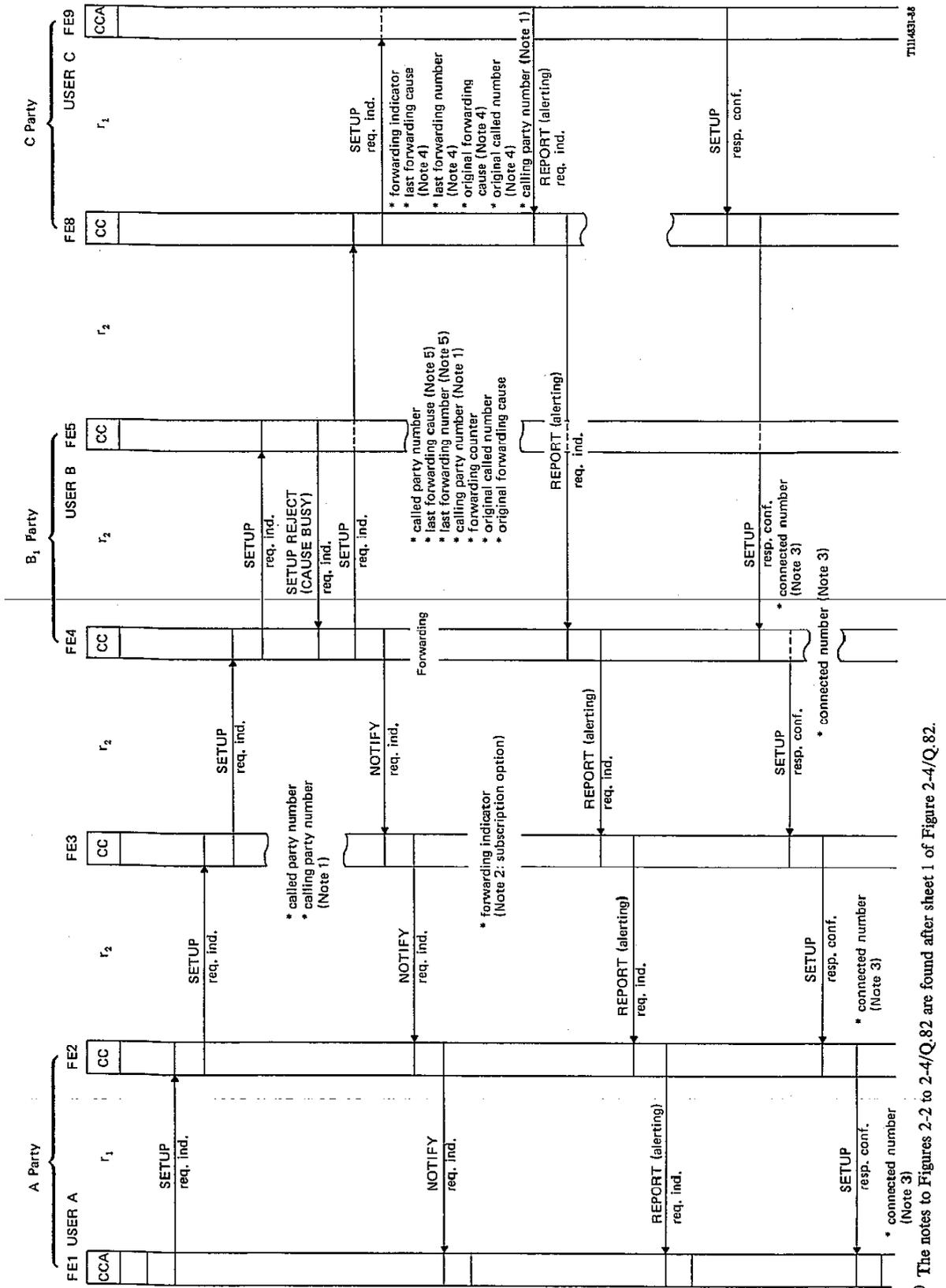


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The notes to Figures 2-2 to 2-4/Q.82 are found after sheet 1 of Figure 2-4/Q.82.

FIGURE 2-2/Q.82

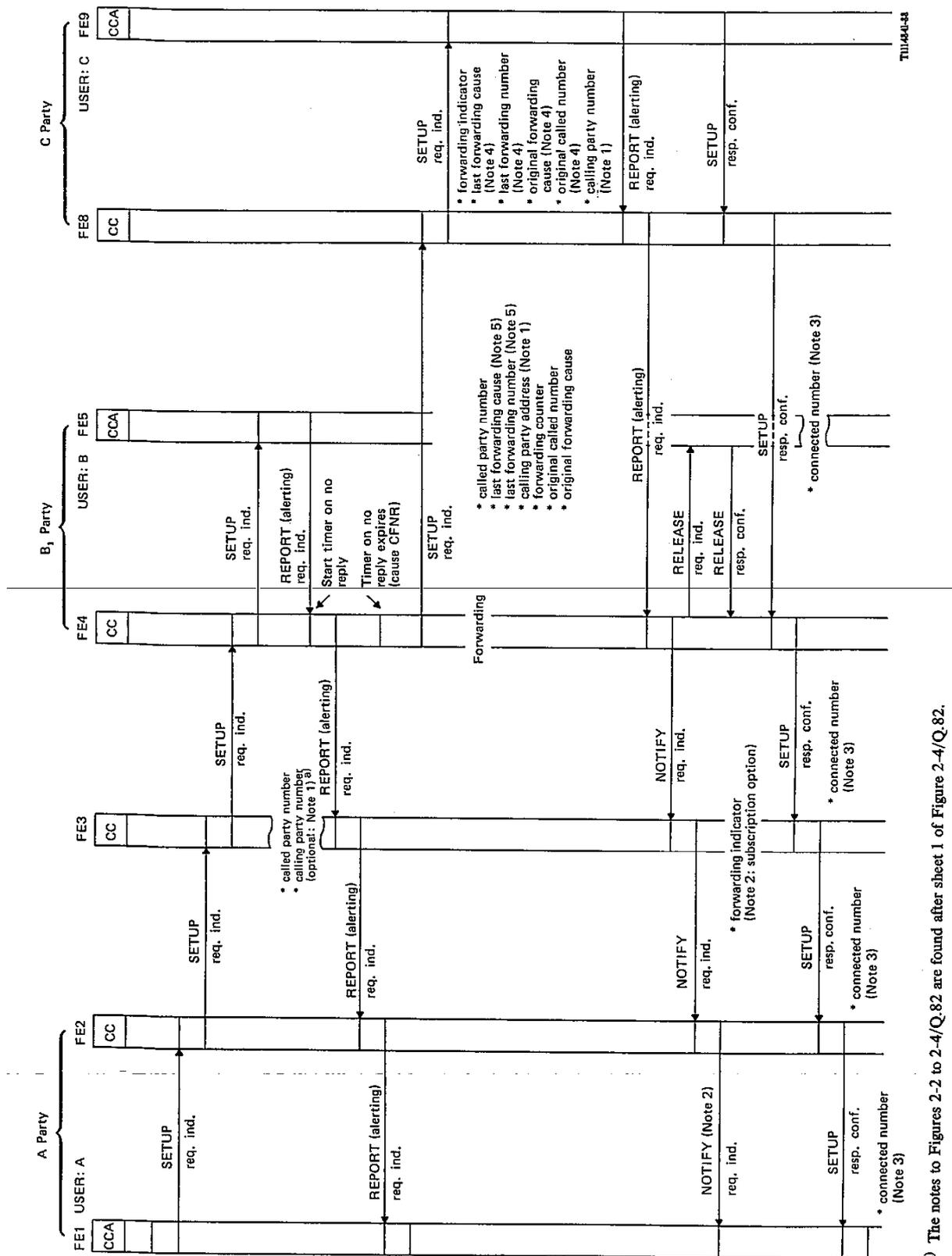
Call forwarding unconditional and for "network determined user busy" using forward switches



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a) The notes to Figures 2-2 to 2-4/Q.82 are found after sheet 1 of Figure 2-4/Q.82.

FIGURE 2-3/Q.82
Call forwarding for "user determined busy", using forward switching



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a) The notes to Figures 2-2 to 2-4/Q.82 are found after sheet 1 of Figure 2-4/Q.82.

FIGURE 2-4/Q.82 (Sheet 1 of 4)

Call forwarding on no reply, using forward switching. Normal case

Notes related to Figures 2-2 to 2-4/Q.82

Note 1 – The calling party number and the last forwarding number should be included if required by the “calling line identification presentation” supplementary service.

Note 2 – The notification should be sent only if the B-party subscribes to the “calling user receives notification that his call has been forwarded” subscription option.

Note 3 – The connected number is included if required by the “connected line Identification presentation/restriction” supplementary service.

Note 4 – The forwarded-to-user will receive this information depending on his notification option, the availability of this information from the network and possible presentation restrictions.

Note 5 – This parameter may be omitted between FE4 and FE6 in order to limit the number of parameters to be passed in the network (see Table 2-6/Q.82, Note 1).

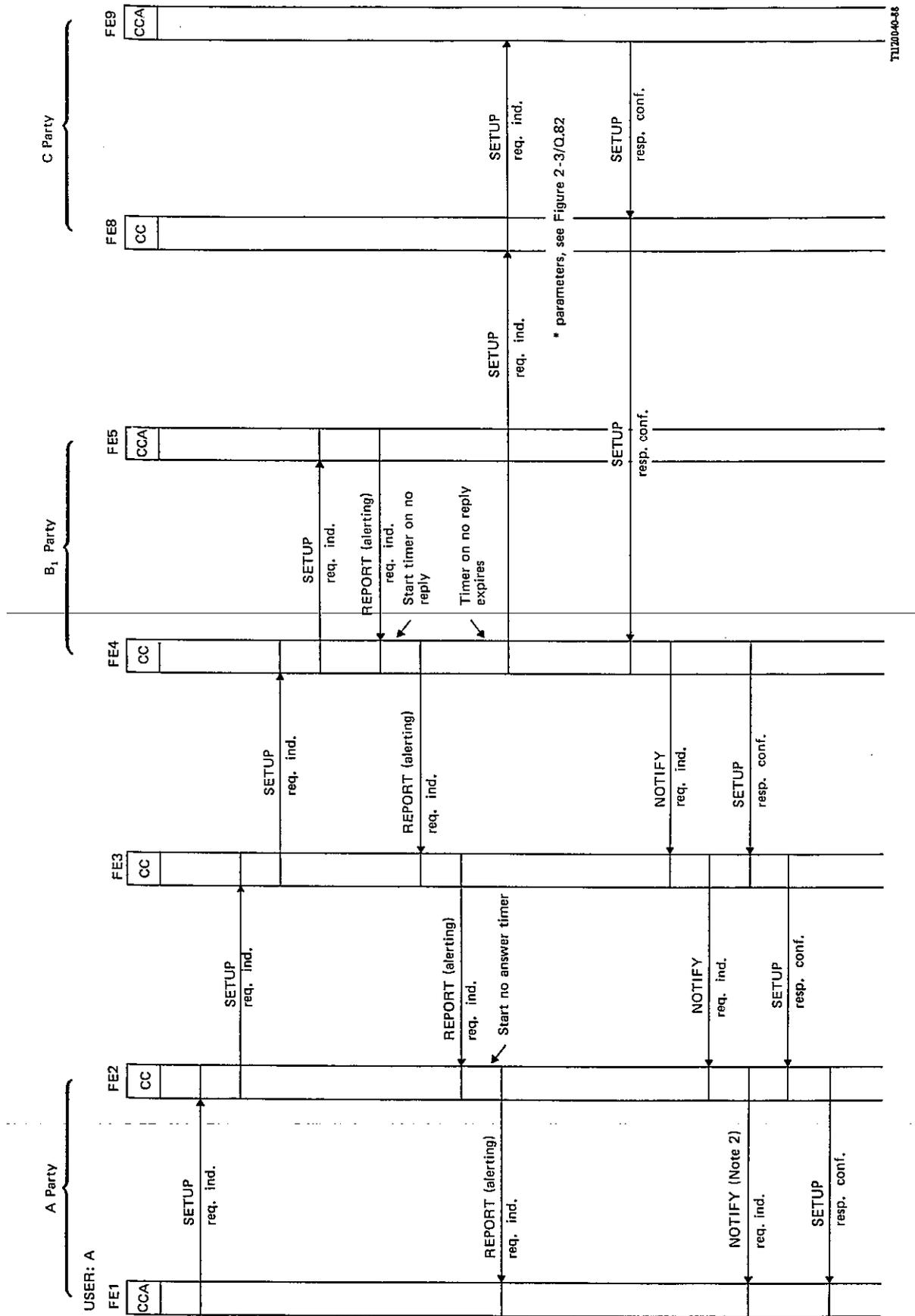


FIGURE 2-4/Q.82 (Sheet 2 of 4)
 Call forwarding on no reply – C party has automatic answering

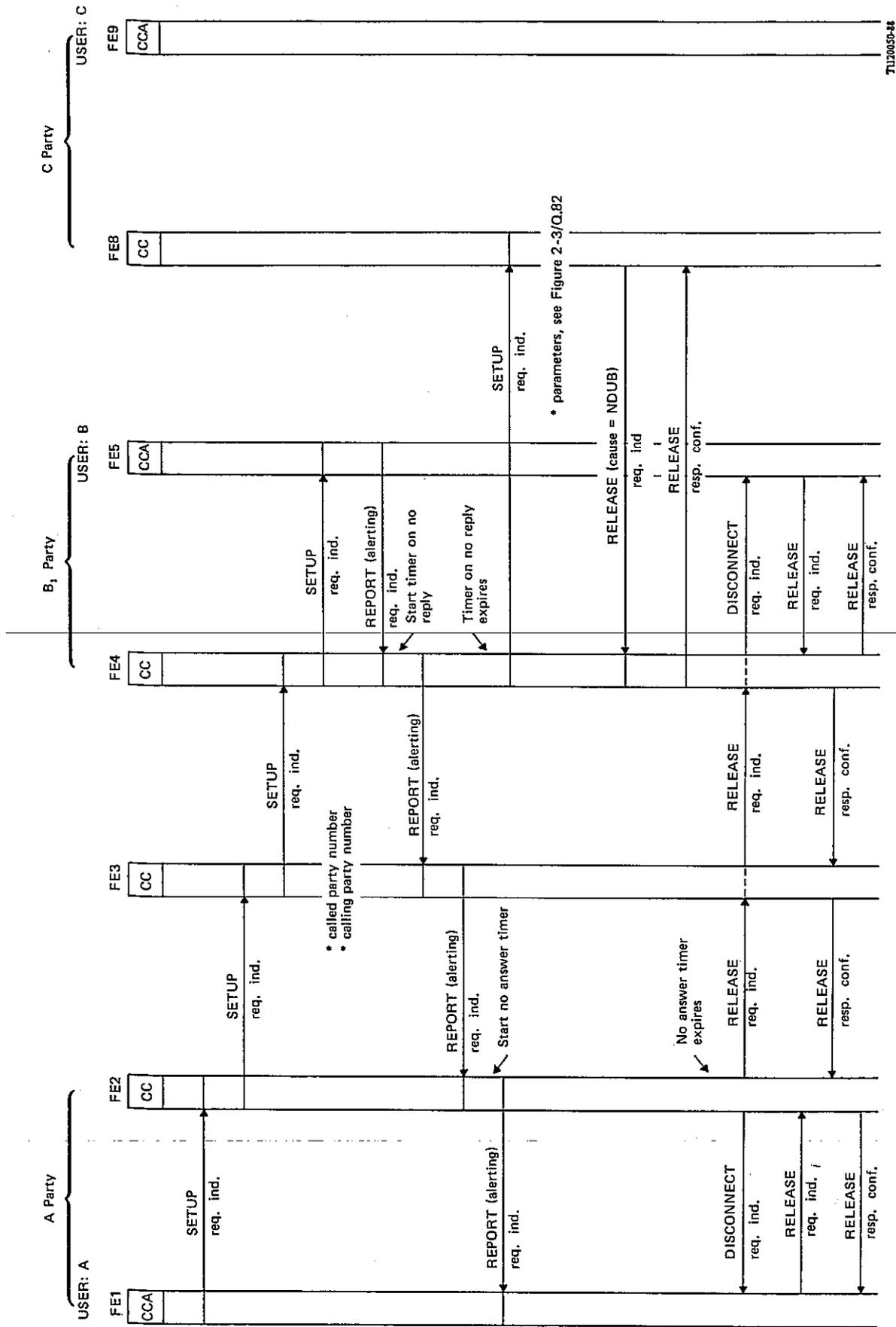
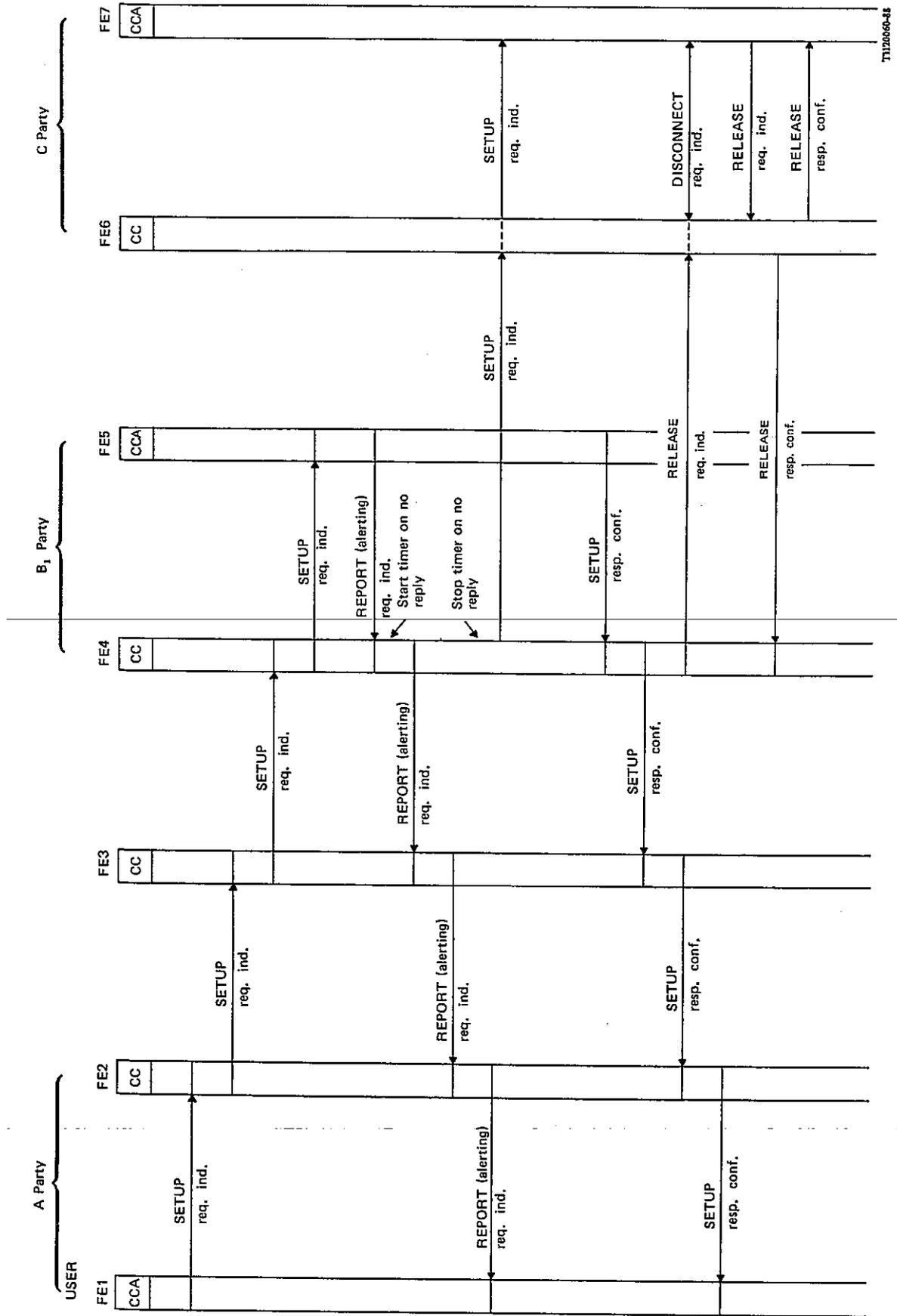
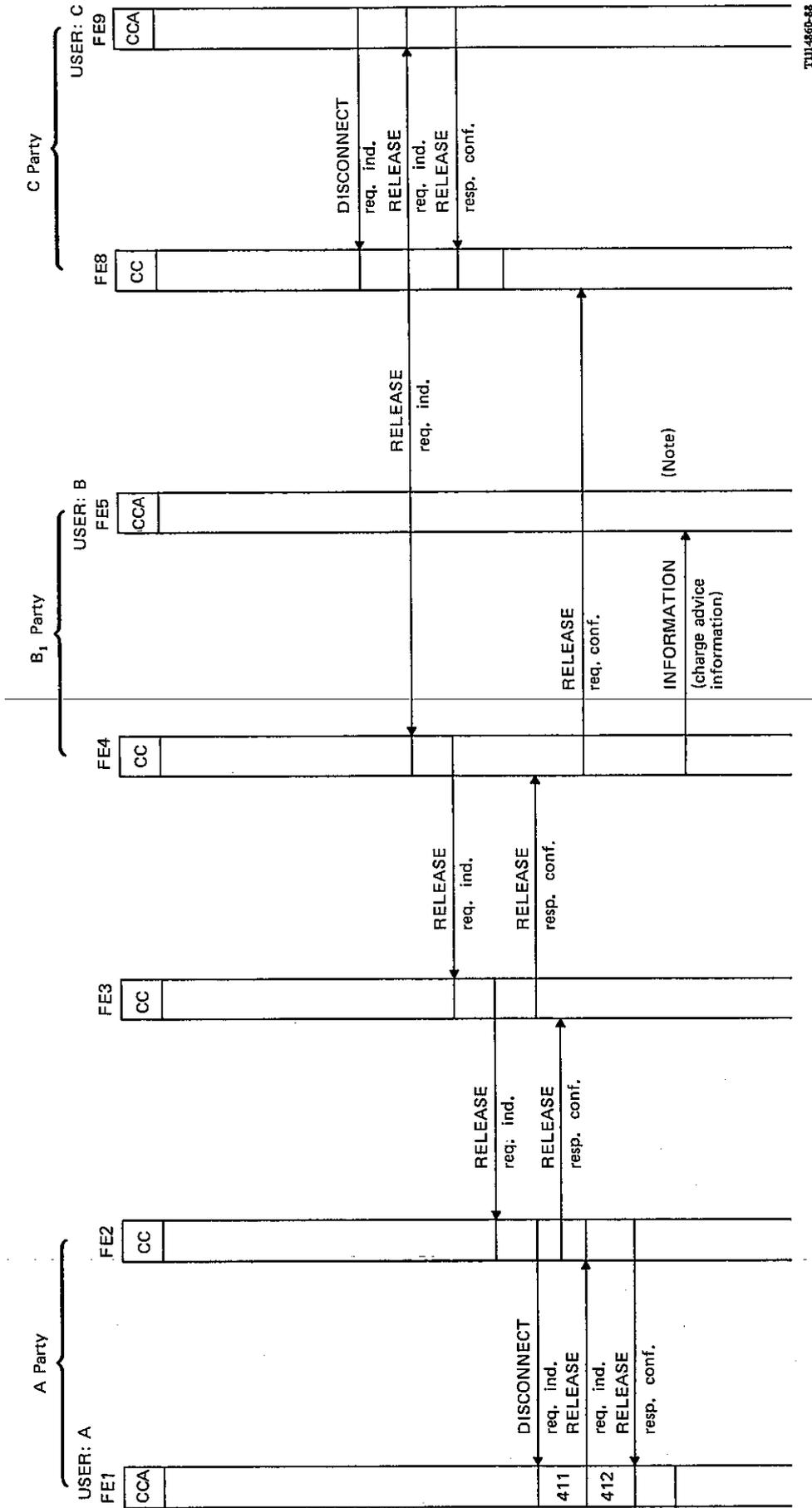


FIGURE 2-4/Q.82 (Sheet 3 of 4)
 Call forwarding on no reply, using forward switching C party network determined user busy



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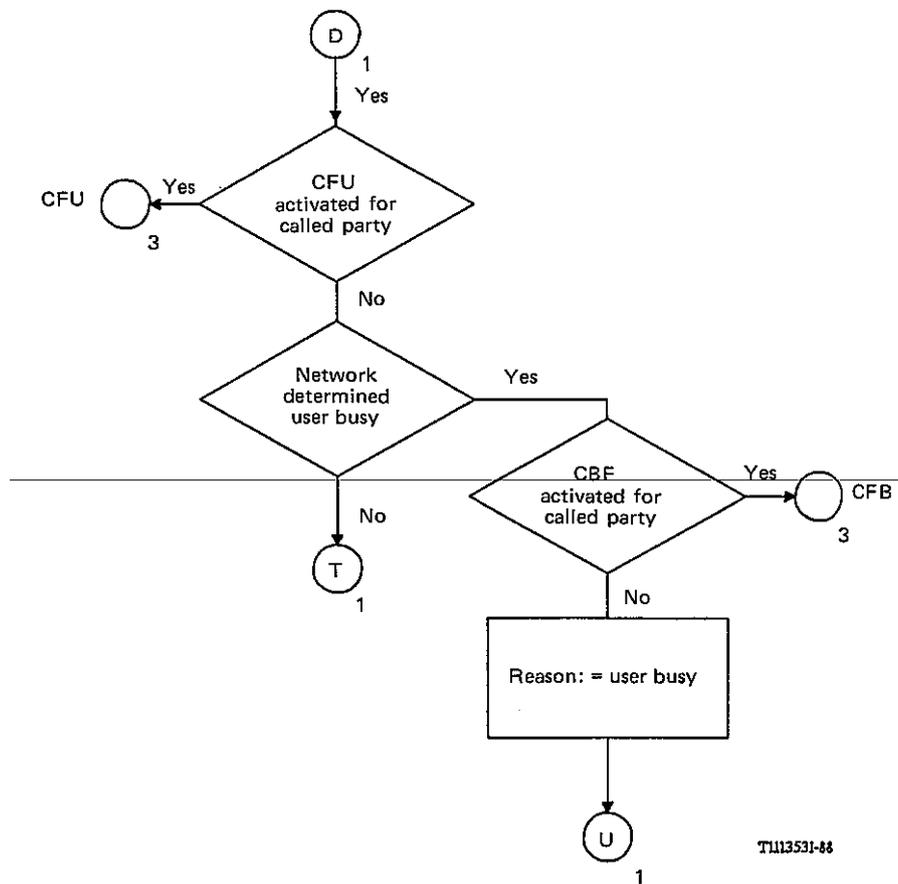
FIGURE 2-4/Q.82 (Sheet 4 of 4)
Call forwarding on no reply – B party answers before C party



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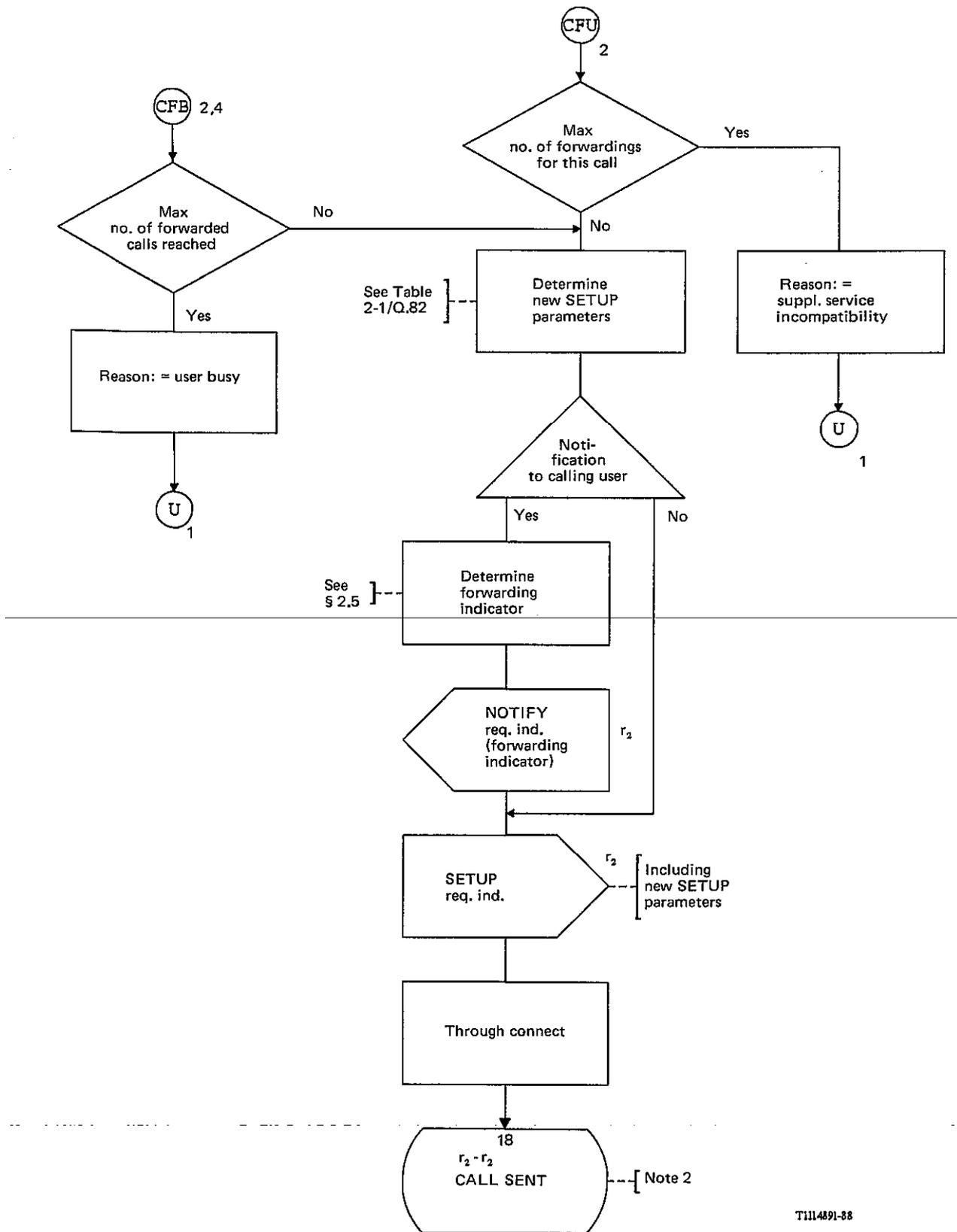
Note — Included if Advice of Charge supplementary service is activated.

FIGURE 2-5/Q.82
Call forwarding disconnect procedure
(including Advice of Charge)



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FIGURE 2-6/Q.82 (Sheet 2 of 8)
FE4/FE6/FES call forwarding



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Note 2 — Further call handling as for basic call, but some additional functions (e.g. for charging) may be required.

FIGURE 2-6/Q.83 (Sheet 3 of 8)
FE4/FE6/FES call forwarding

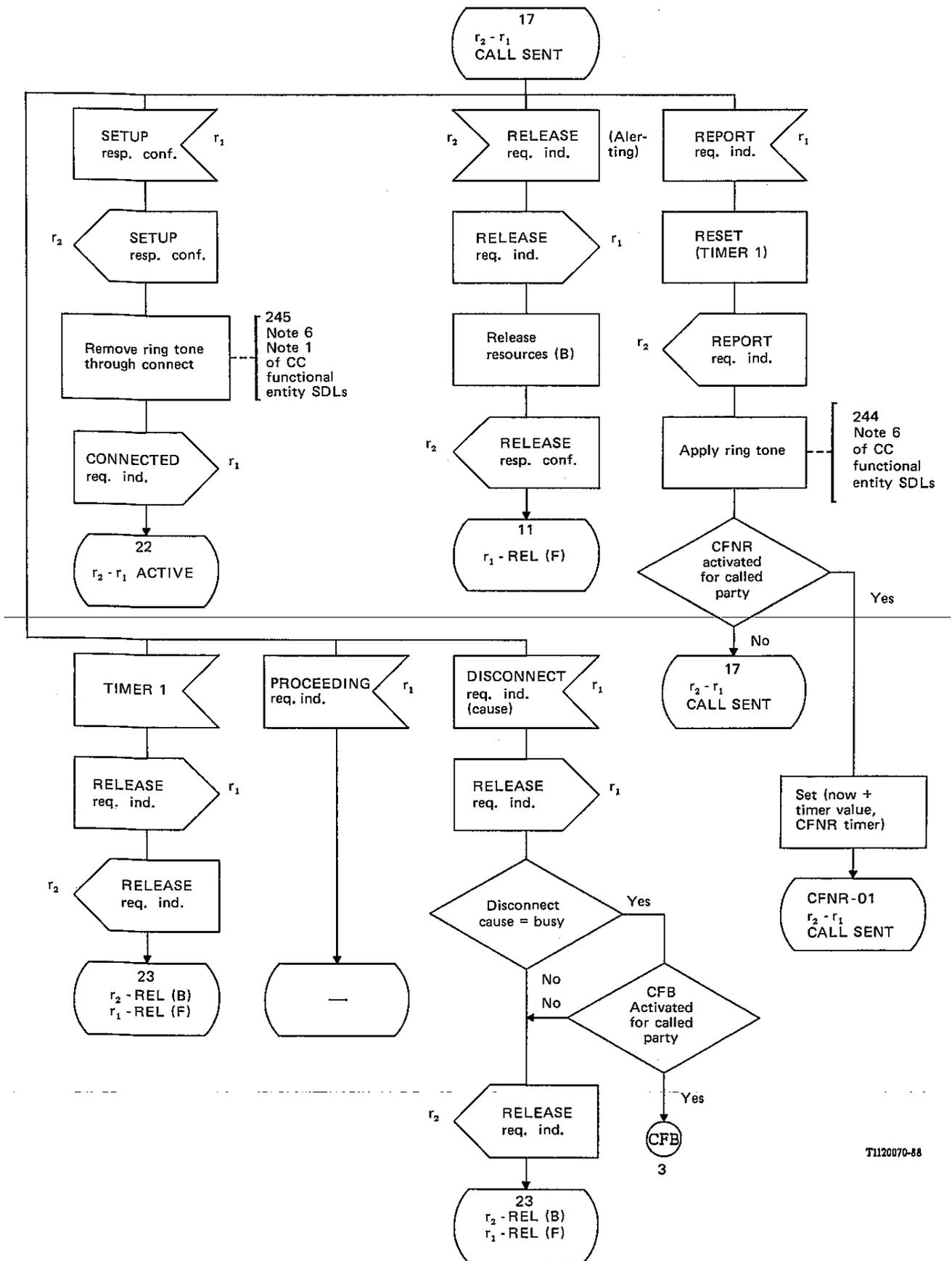


FIGURE 2-6/Q.82 (Sheet 4 of 8)
FE4/FE6/FES call forwarding

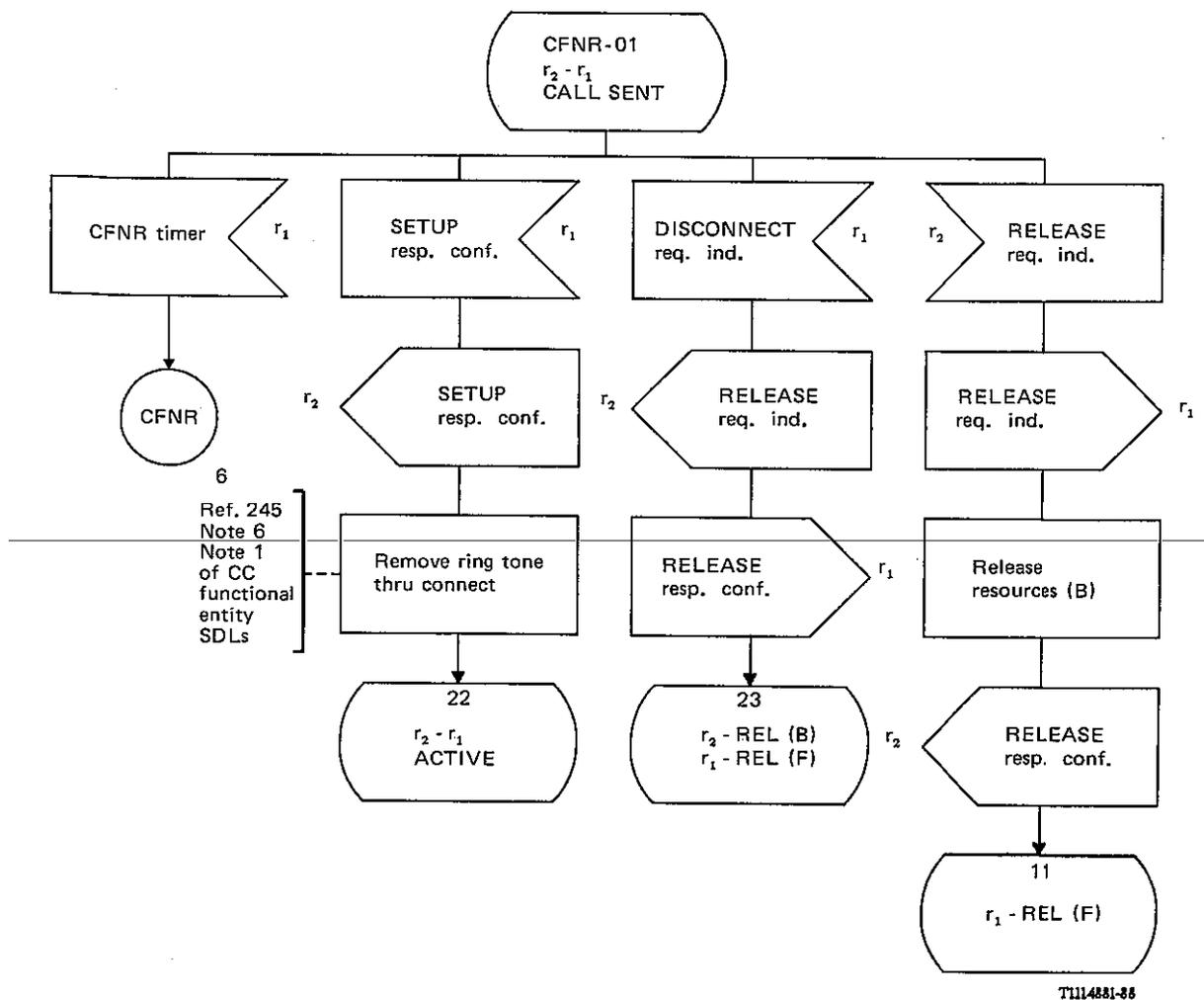


FIGURE 2-6/Q.82 (Sheet 5 of 8)
FE4/FE6/FES call forwarding

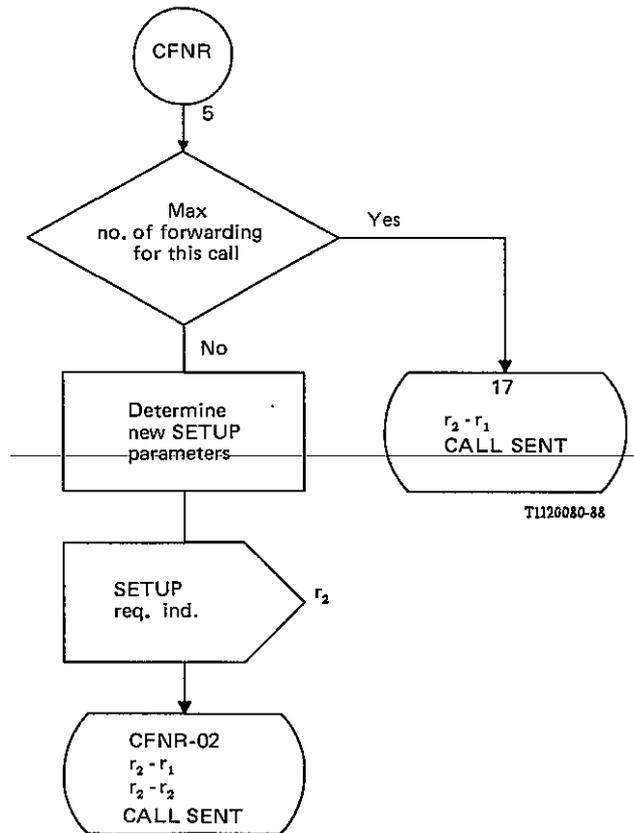
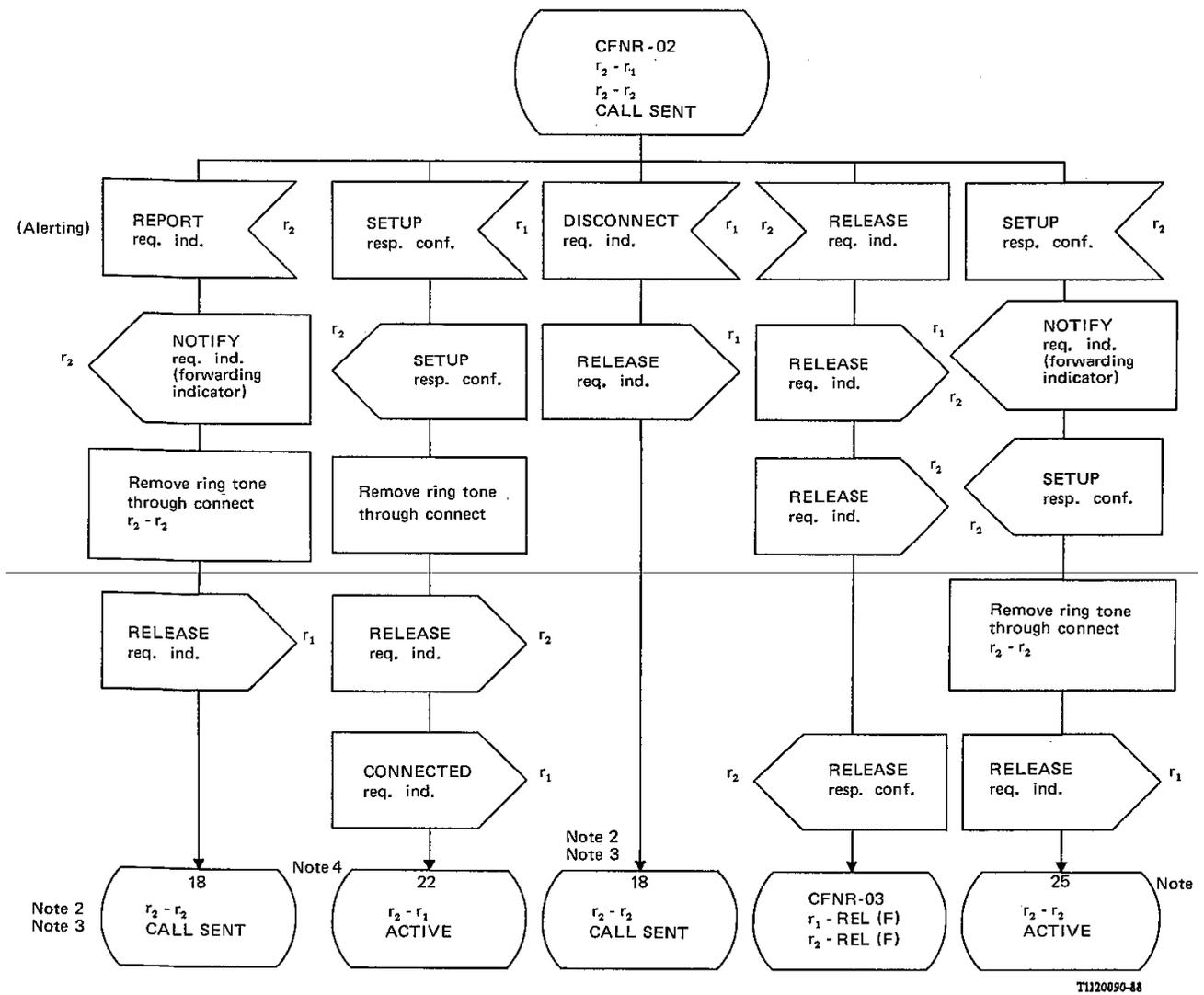
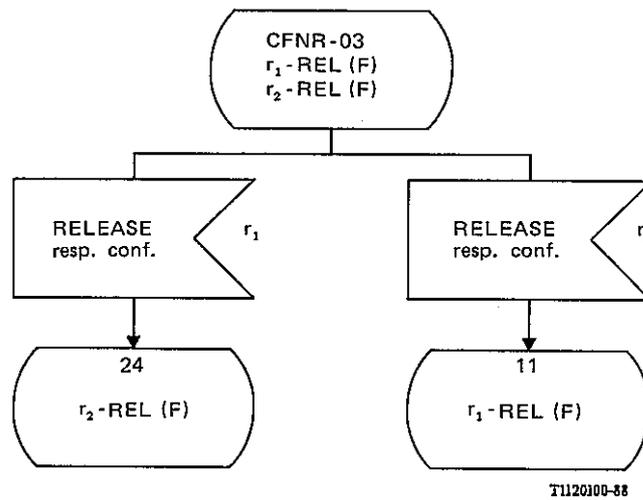


FIGURE 2-6/Q.82 (Sheet 6 of 8)
FE4/FE6/FES call forwarding



Note 2 – See Sheet 3 of 8.
 Notes 3, 4 – See Sheet 8 of 8.

FIGURE 2-6/Q.82 (Sheet 7 of 8)
FE4/FE6/FES call forwarding



Note 3 – Resources associated with the r₁ relationship are released on receipt of RELEASE resp. conf. from r₁.
Note 4 – Resources associated with the r₂ relationship are released on receipt of RELEASE resp. conf. from r₂.

FIGURE 2-6/Q.82 (Sheet 8 of 8)
FE4/FE6/FES call forwarding

2.2.3 *SDL diagrams for other FEs*

These are not explicitly shown since they are equal to basic services (CC or CCA) SDLs with small additions which can be easily derived from the information flow diagrams.

2.2.4 *Definition of individual information flows*

Refer to information indicated in the Notes related to Figures 2-2 to 2-5/Q.82 and § 2.2.5.

2.2.5 *Multiple diversion address handling*

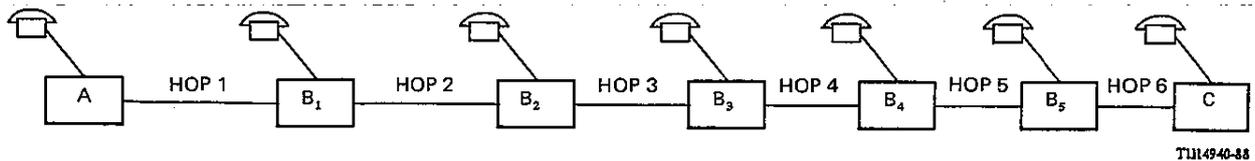


FIGURE 2-7/Q.82

TABLE 2-1/Q.82
Information carried in the SETUP req. ind

Parameter	HOP 1	HOP 2	HOP 3	HOP 4	HOP 5	HOP 6
Calling party number	A	A	A	A	A	A
Calling party number	B ₁	B ₂	B ₃	B ₄	B ₅	C
Last forwarding number		B ₁ Note 1	B ₂	B ₃	B ₄	B ₅
Original call number		B ₁	B ₁	B ₁	B ₁	B ₁
Forwarding counter		1	2	3	4	5
Last forwarding cause		V(B ₁) Notes 1, 2	V(B ₂) Note 2	V(B ₃) Note 2	V(B ₄) Note 2	V(B ₅) Note 2
Original forwarding cause		V(B ₁) Note 2	V(B ₁) Note 2	V(B ₁) Note 2	V(B ₁) Note 2	V(B ₁) Note 2

Note 1 – May be omitted to limit the number of parameters being passed in the network.

Note 2 – V(B₁) indicates the reason for diversion from party B₁ with a value (V) equal to: unknown/not available, user busy, no reply or unconditional when diversion occurs.

TABLE 2-2/Q.82
Information in the backward direction

Parameter	HOP 1	HOP 2	HOP 3	HOP 4	HOP 5	HOP 6
Notification from		B ₁	B ₂	B ₃	B ₄	B ₅
Forwarded-to-number from		For further study				

2.2.6 *Functional entity actions*

- 1) Functional entity actions for FE1
 - Receive indications relating to the service from FE2.
- 2) Functional entity actions for FE2
 - Receive indications relating to the service from FE4 and forward them to FE1.
- 3) Functional entity actions for FE3
 - No functional entity actions uniquely relating to this service are identified for FE3.
- 4) Functional entity actions for FE4/FE6
 - Store call information and user's service allocation and state.
 - Run periodic timers specific to the service.
 - Stimulate forward basic call setups to nominated numbers when service is active.
 - Increment service call counts and forward to next FE4/6.
 - Stimulate release procedures at service call count limit.
 - Receive and implement user's service requests from FE5/7.
 - Determine information to be notified backwards to other users.
- 5) Functional entity actions for FE5/FE7
 - Receive indications relating to the service from FE4/6.
 - Receive and forward user's service requests to FE4/5.
- 6) Functional entity actions for FE8
 - Receive and increment forward call counter.
(*Note* - This is an attribute of FE4/6.)
 - Send forwarding indicators relating to the service of FE9 (this would be an attribute to FE6).
- 7) Functional entity actions for FE9
 - Receive indications relating to the service from FE8.

2.3 *Possible allocation of functional entities to physical locations*

	A PARTY		FE3	B ₁ PARTY		B _x PARTY		C PARTY	
	FE1	FE2		FE4	FE5	FE6	FE7	FE8	FE9
Scenario 1	TE	LE	TR	LE	TE	LE	TE	LE	TE

Other scenarios are for further study.

2.4 *Interactions with other supplementary services*

The interaction with supplementary services, such as calling line identification, connect-test line identification and advice of charge have been considered; interactions with other supplementary services are for further study.

2.5 *Terminology and abbreviations*

Abbreviations used:

CFU	Call forwarding unconditional
CFB	Call forwarding on busy
CFNR	Call forwarding on no reply
CD	Call deflection
CC	Call control
CCA	Call control agent
FE	Functional entity
TE	Terminal equipment
LE	Local exchange
TR	Transit exchange
NDUB	Network determined user busy
UDUB	User determined user busy

Terminology:

Original called number:

The number the originating party dials.

Connected line number:

The number of the final destination.

Forwarding number:

The number of the served user, i.e. the subscriber who initiates the forwarding service and from where the call has been forwarded.

Forwarded-to-number:

The number to which a call has been forwarded.

Forwarding indicator:

Indicator showing that call has been forwarded and indicating whether or not this information should be given to calling party.

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