INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
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CONSULTATIVE COMMITTEE

I.252.2

(11/1988)

SERIES I: INTEGRATED SERVICES DIGITAL NETWORK

Service capabilities – Supplementary services in ISDN

CALL FORWARDING BUSY

Reedition of CCITT Recommendation I.252.2 published in the Blue Book, Fascicle III.7 (1988)

NOTES

1   CCITT Recommendation I.252.2 was published in Fascicle III.7 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 I.252.2

CALL FORWARDING BUSY

2.1   *Definition*

Call Forwarding Busy (CFB) permits a "served user" (see § 2.2.2) to have the network send to another number all incoming calls for the served user's ISDN number (or just those associated with a specified basic service) which meet busy at the served user's ISDN number. The served user's originating service is unaffected.

Note – In normal situations, the CFB service is provided on a per access basis. (In these situations, there is a one-to-one relationship between ISDN number and access.) However, the network may recognize multiple numbers on a single interface; in addition, it may not undertstand a complete ISDN number (e.g. DDI). In these cases, the CFB service is offered on the basis of the part of the ISDN number which the network can recognize.
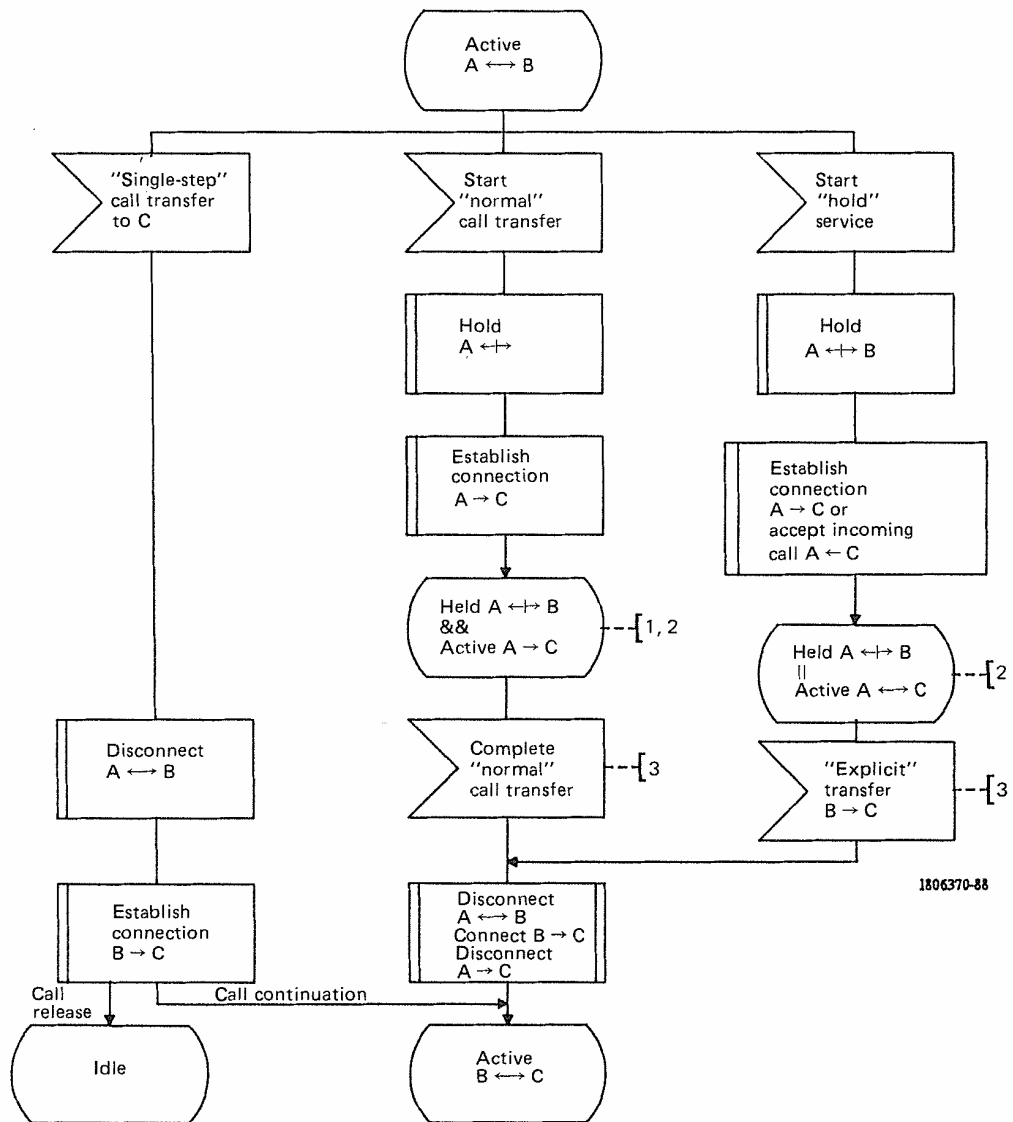
2.2   *Description*

2.2.1   *General description*

For a given ISDN number, this service (including options) may be subscribed to for each basic service to which the user(s) of the number subscribes, or collectively for all the basic services to which the user(s) subscribes. Since subscription is on an ISDN number basis, the same Call Forwarding subscriptions will apply to all terminals using this number.

Note – In this service description, it is assumed that a single ISDN number is not shared across multiple interfaces. A single ISDN number may, however, be shared by multiple terminals on the same interface. Procedures permitting an ISDN number to be shared across multiple interfaces are for further study. For multiple access installations, it may be possible for the user to specify, on activation, if the service is applicable to a specific access or all accesses associated with that installation.

The served user can request a different forwarded-to number for each basic service subscription parameter value to which he has subscribed.

An indication that the CFB service is activated on a number may, as an option, be given to the user who has forwarding activated, each time an outgoing call is made. This may take the form of a special indication in the proceed response.
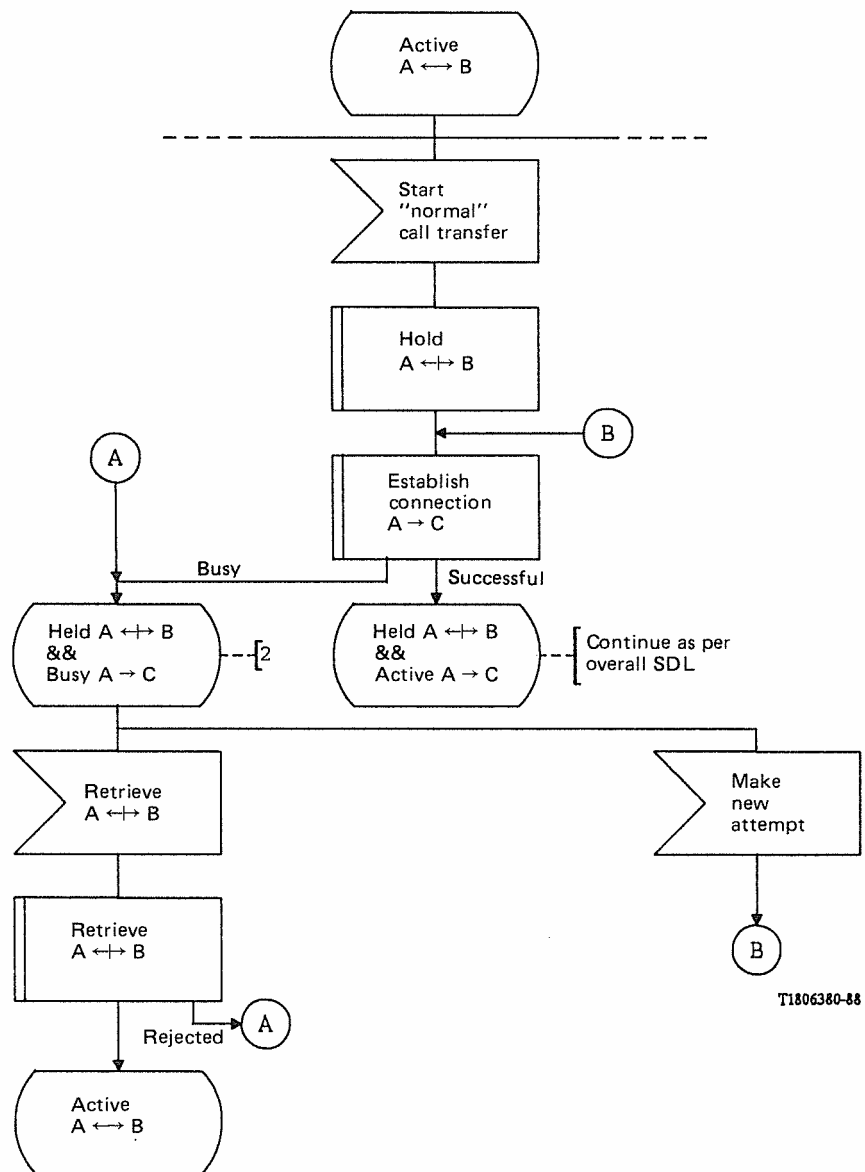
FIGURE 2/I.252

Call Transfer Service Overall SDL

Note 1 — For other "paths" to and from this state, please see the Three-Party Service and Call Waiting service descriptions.

Note 2 — "&&" means service provider is aware of the relationship between the calls. "||" means the service provider is not aware of the relationship. "↔" means the call is on hold.

Note 3 — In some networks, User A can invoke this step before the A → C connection is completely established (e.g., during alerting).
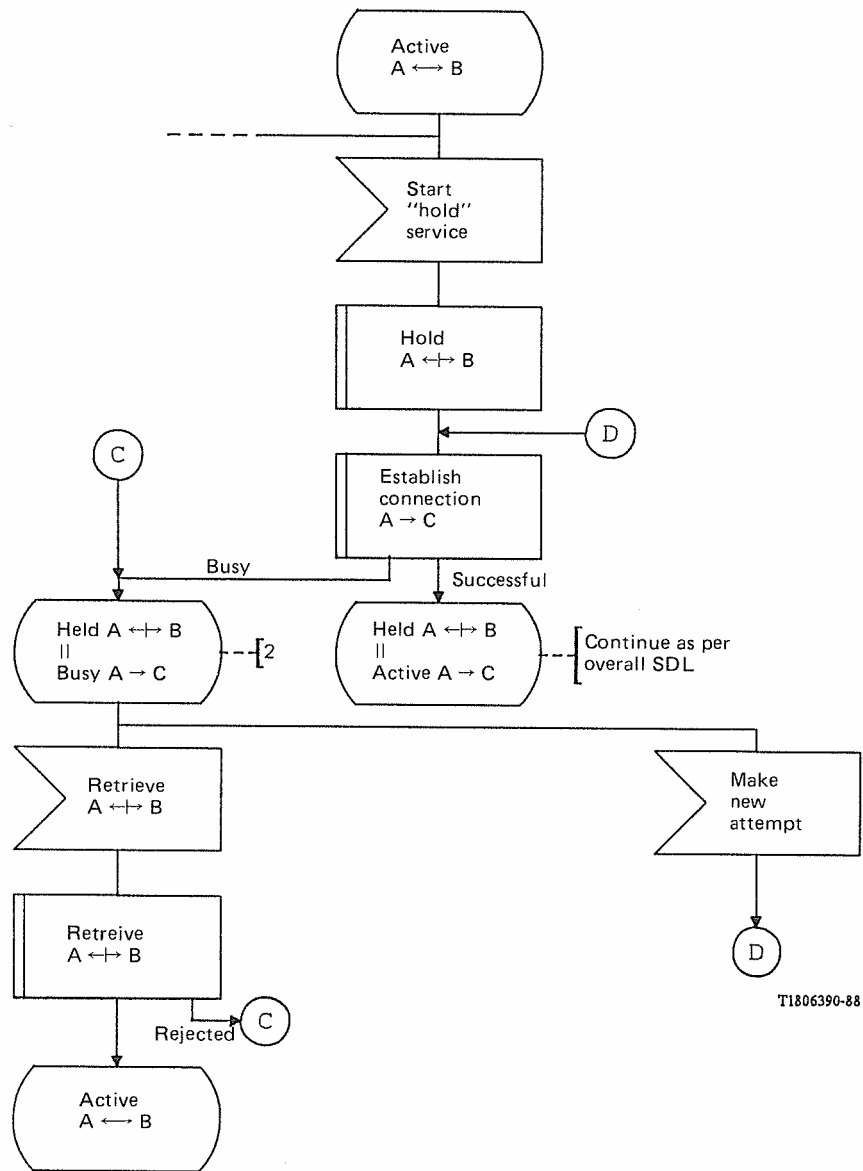
Note 4 — Notifications are provided as described in the text.

Note — For Note 2, see Figure 2/I.252.

FIGURE 3/I.252

Handling of busy condition in Normal Call Transfer

Note — For Note 2, see Figure 2/I.252.

FIGURE 4/I.252

**Handling of busy condition when establishing connections A → C
prior to invoking Explicit Call Transfer**

2.2.2   *Specific terminology*

A served user is a user of a particular ISDN number who is requesting that calls to his number be forwarded. This user may also be referred to as the forwarding user or the called user.

A forwarded-to user is a user to whom the call shall be forwarded.

2.2.3   *Qualifications on the applicability to telecommunications services*

No restrictions identified.

2.3   *Procedures*

2.3.1   *Provision/withdrawal*

CFB shall be provided after pre-arrangement with the service provider.

The service can be offered with three subscription options. Options apply separately to each basic service subscribed to on each ISDN number. For each subscription option, only one value can be selected. Subscription options are summarized below:

| Subscription options	Value
Served user receives notification that call has been forwarded	– No – Yes, with call offering information (see § 2.3.2.2)
Calling user receives notification that his call has been forwarded	– No – Yes, with or without forwarded-to user number
Served user receives notification that CFB is currently activated	– No – Yes

2.3.2 *Normal procedures*

2.3.2.1 *Activation/deactivation/registration*

Same as for Call Forwarding Unconditional (CFU), see § 4.

2.3.2.2 *Invocation and operation*

The following illustration clarifies the CFB procedures. Assume that A calls B1, who forwards the call to B2, . . ., Bm, . . ., Bx. The final receiver of the call is C.
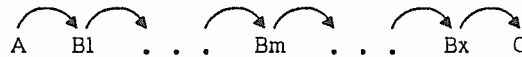
2.3.2.2.1 *Served user Bm's perspective*

If CFB is active and the served user is Network Determined User Busy (NDUB) or User Determined User Busy (UDUB), then an incoming call to the served user will be forwarded. In case of NDUB, the call is not offered to the served user.

In the case of UDUB, the call will have been offered to the served user. Normal call set-up information will already have been provided to the served user. When the forwarding attempt is started, the served user will receive notification that a call has been forwarded. No further notification is given.

When an incoming call is forwarded without being offered to the served user (i.e. NDUB condition), the served user, as a subscription option, may receive notification of the call forwarding (but will not be able to answer the incoming call). This notification is given as soon as the forwarding attempt is started.

This notification includes the following information (on the call that has been forwarded):

1) indication that a call has been forwarded;

2) telecommunications service information (e.g. bearer capability, higher layer compatibility);

3) user-to-user information;

4) Bm's number;

5) calling party number A (if CLIP applicable).

If multiple forwardings have occurred and the served user is authorized to receive additional information, he may also receive:

6) originally called number B1;

7) cause for original forwarding;

8) last forwarding number B (m – 1);

9) cause for last forwarding.

2.3.2.2.2 *Forwarded-to user C's perspective:*

The forwarded-to user C will receive an indication that the call has been forwarded.

As an option he may also receive:

1) originally called number B1;

2) cause for original forwarding;

3) last forwarding number Bx;

4) cause for last forwarding.

(Depending on the use of other supplementary services, the forwarded-to user C may also receive information such as the calling party A number and user-to-user signalling. See the descriptions of interactions with other supplementary services.)

2.3.2.2.3 *Calling user A's perpective*:

As a subscription option, the served user Bm can request that the calling user receive a notification that the call has been forwarded and, as an additional subscription option, that notification can include the forwarded- to number B(m+1). Transfer of the forwarded-to user number will not take place if number restrictions at the forwarded-to user exist.

2.3.3 *Exceptional procedures*

2.3.3.1 *Activation/deactivation/registration*

Same as CFU (see § 4).

2.3.3.2 *Invocation and operation*

Call forwarding applies only to subscribed basic services. Calls to an ISDN number requesting a basic service which is not subscribed to, will never be forwarded.

Within an ISDN, or tandem ISDNs, the total number of all forwardings for each call should be limited. The maximum number of such connections should be limited to a value between 3 and 5 for each call. This is to prevent infinite looping.

If the limit is reached and an attempt is made to forward the call an additional time, then the forwarded call shall be treated as follows:

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the forwarded leg of the call. Specifically, if CFB has been invoked, and CNFR has not occurred, then the call would be cleared back towards the calling user, and the calling user would be sent a cause to indicate that the call has been forwarded but not completed (i.e. because of network congestion, invalid number, facility not available, etc.). If the forwarded call cannot be completed and if CFNR has occurred, then the call should only be cleared back as far as the CFNR exchange and the calling user will, in the case of a telephony call, continue to receive inband ringing tone.

2.3.4 *Alternative procedures*

2.3.4.1 *Activation/deactivation/registration*

None identified.

2.3.4.2 *Invocation and operation*

None identified.

2.4 *Network capabilities for charging*

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information.

It shall be possible to charge the subscriber accurately for the service.

2.5 *Interworking requirements*

Same as CFU (see § 4).

2.6   *Interaction with other supplementary services*

The ways in which Call Forwarding Busy interacts with other supplementary services are in general identical to the ways in which Call Forwarding Unconditional interacts with other supplementary services. Thus, if the interactions are described to be "same as CFU", the CFU text should be taken verbatim, except that the expression "Call Forwarding Unconditional" should be replaced by "Call Forwarding Busy".

2.6.1   *Call Waiting*

Calling user: same as CFU (see § 4).

Called user: No interaction. That is, if the user is not NDUB, Call Waiting will take place. If the user is NDUB, Call Forwarding Busy will take place.

Forwarded-to user: A forwarded call can invoke Call Waiting.

2.6.2   *Call Transfer*

Same as CFU (see § 4).

2.6.3   *Connected Line Identification Presentation*

Same as CFU (see § 4).

2.6.4   *Connected Line Identification Restriction*

Same as CFU.

2.6.5   *Calling Line Identification Presentation*

Same as CFU (see § 4).

2.6.6   *Connected Line Identification Restriction*

Same as CFU (see § 4).

2.6.7   *Closed User Group*

Same as CFU (see § 4).

2.6.8   *Conference Calling*

Same as CFU (see § 4).

2.6.9   *Direct-Dialling-In*

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.10   *Call Diversion (i.e. Call Forwarding) services*

2.6.10.1   *Call Forwarding Busy*

Not applicable.

2.6.10.2   *Call Forwarding No Reply*

The invocation of CFB takes precedence over CFNR.

2.6.10.3   *Call Forwarding Unconditional*

The invocation of CFU takes precedence over CFB.

2.6.11   *Line Hunting*

In general, Line Hunting takes precedence over CFB. Thus, CFB only occurs if all members of the hunt group are busy.

2.6.12   *Three-Party Service*

Refer to Recommendation I.254, § 2.6.10, interaction with CFB.

2.6.13   *User-to-User Signalling*

Same as CFU (§ 4), except that service 2 of UUS cannot be guaranteed prior to completion of the Call Forwarding Busy in case of a user-determined-busy.

2.6.14   *Multiple Subscriber Number*

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.15   *Call Hold*

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.16   *Advice of Charge*

Refer to Recommendation I.256, §§ 2.1.6.10, 2.2.6.10, 2.3.6.10, interaction with CFB.

2.7   *Dynamic description*

The dynamic description given in Figure 5/I.252 contains the descriptions of the three Call Forwarding services (CFU, CFB, and CFNR).
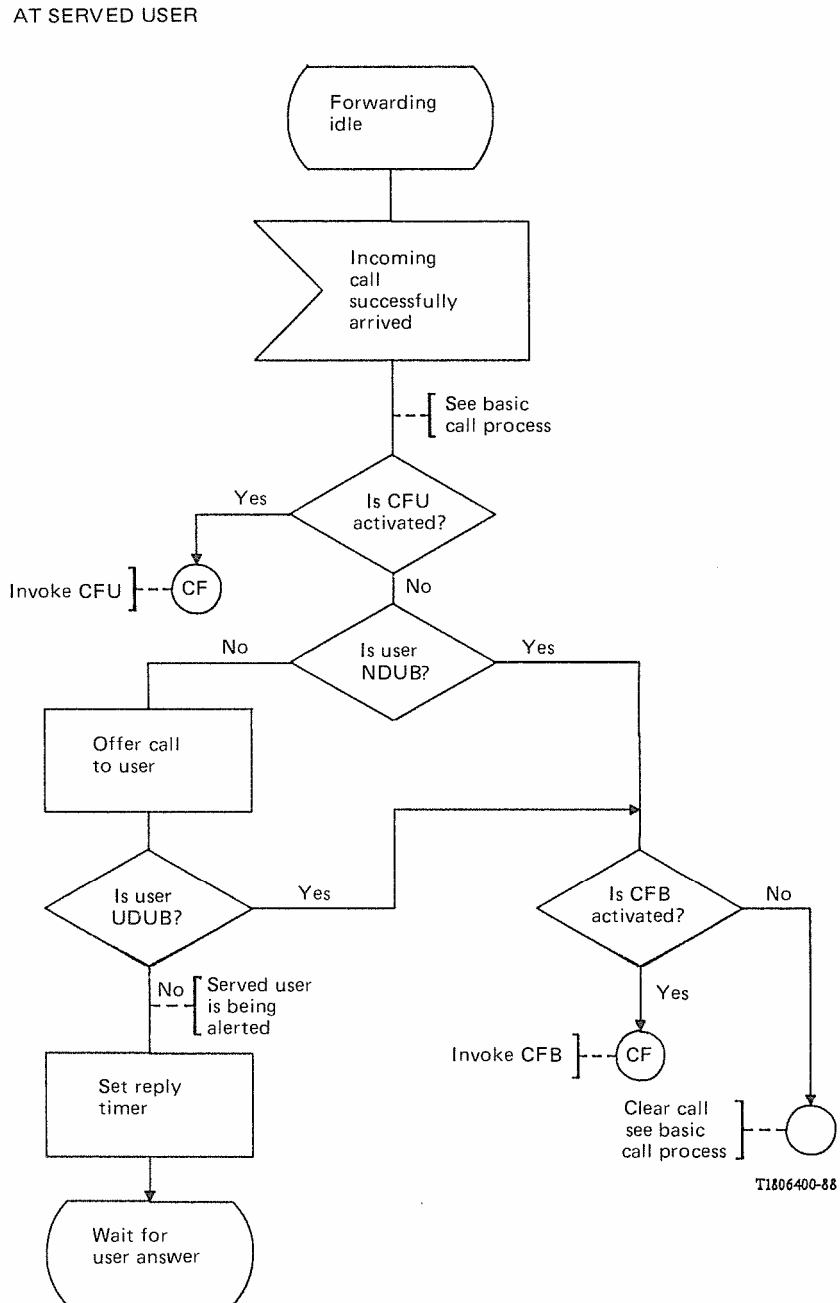
AT SERVED USER

FIGURE 5/I.252 (sheet 1 of 5)

Call forwarding busy

FIGURE 5/I.252 (sheet 2 of 5)
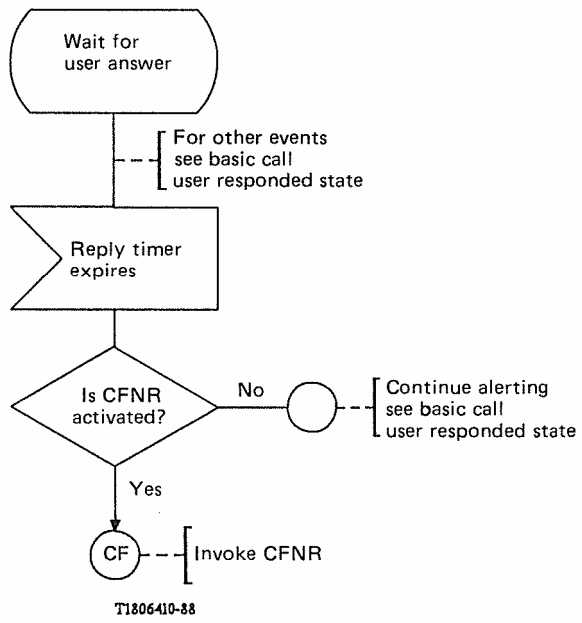
Call forwarding busy

FIGURE 5/I.252 (sheet 3 of 5)

Call forwarding busy

AT SERVED USER
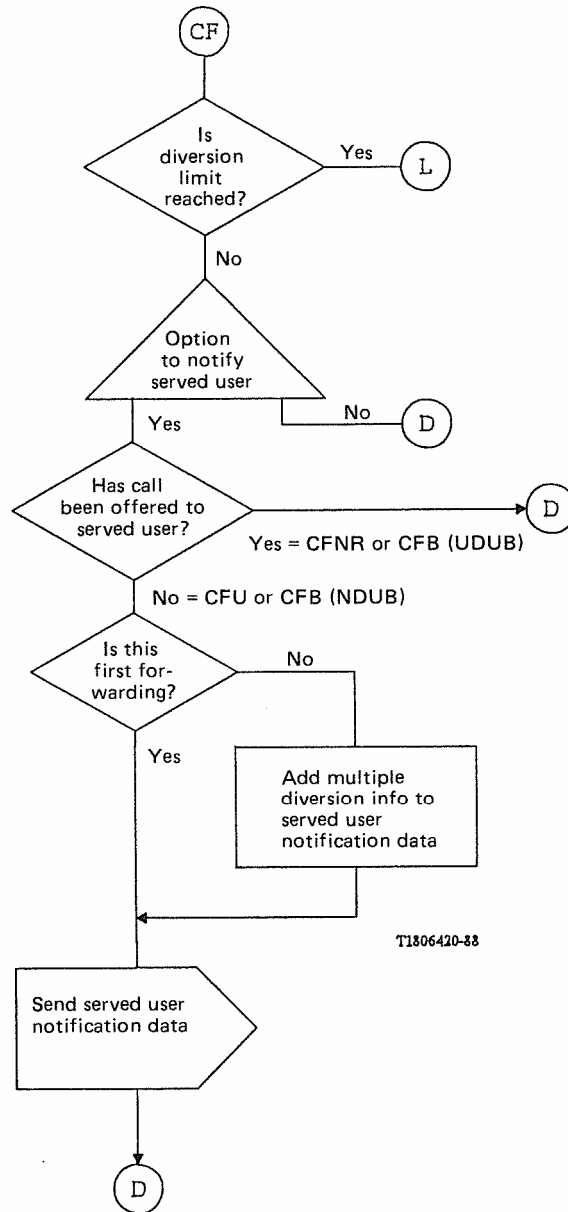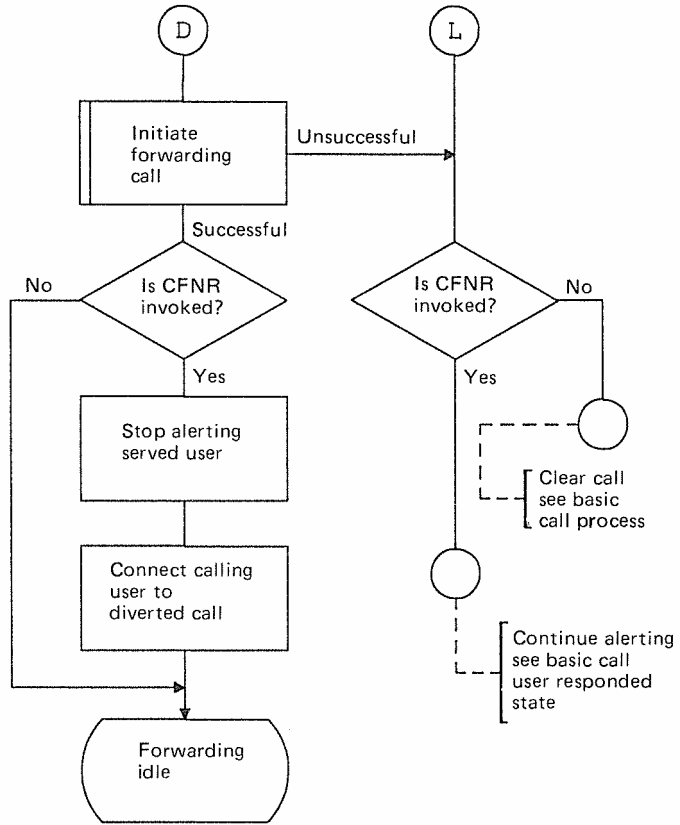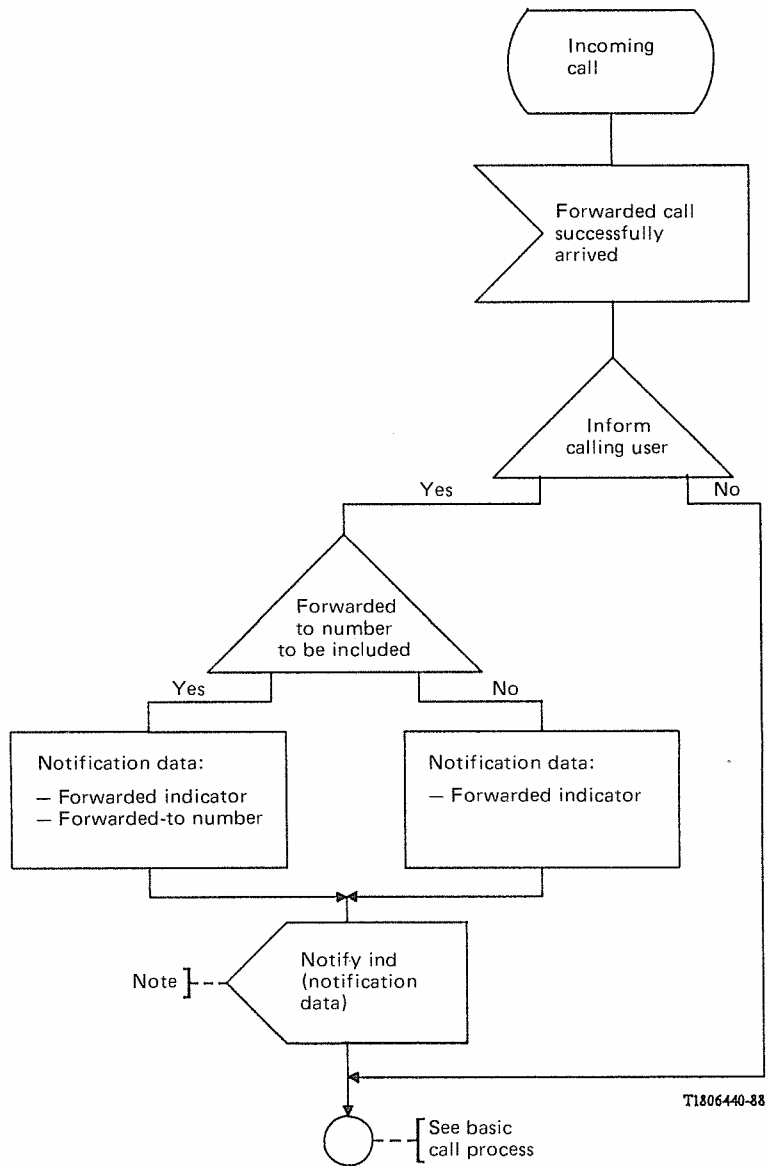

FIGURE 5/I.252 (sheet 4 of 5)

Call forwarding busy

Note − A notification is only sent to the calling user if the served user subscribes to the supplementary service call forwarding with address notification option. Transfer of the forwarded-to user number will not take place, if number restrictions exist at the forwarded-to user.

FIGURE 5/I.252 (sheet 5 of 5)

Call forwarding busy

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