ITU INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

I.254.2
(11/1988)

SERIES I: INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

Service capabilities – Supplementary services in ISDN

MULTIPARTY SUPPLEMENTARY SERVICES: THREE PARTY SERVICE

Reedition of CCITT Recommendation I.254.2 published in the Blue Book, Fascicle III.7 (1988)

NOTES

1   CCITT Recommendation I.254.2 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.254.2

MULTIPARTY SUPPLEMENTARY SERVICES: THREE PARTY SERVICE

(Melbourne, 1988)

2　　　I.254.2　–　**Three Party Service**

2.1　　*Definition*

The Three-Party Service enables a user who is active on a call to hold that call, make an additional call to a third party, switch from one call to the other as required (privacy being provided between the two calls), and/or release one call and return to the other. Optionally, the served user could subscribe to an ability to join the two calls together into a three-way conversation. (Relationships between this service and the Call Transfer supplementary service are indicated throughout the text and Figure 4/I.254).

2.2　　*Description*

2.2.1　　*General description*

Three-Party Service provides a user with flexibility in handling up to two (initially-) independent calls. Different forms of the service exist which allow the user to control these calls. The various forms of Three-Party Service are given in Table 1/I.254.

In principle, all participants in a Three-Party Service call should be informed about the state of their calls whenever necessary.

TABLE 1/X.254

Form of service	– Hold existing call – Make call to 3rd party – Alternate between parties	Form common path between all three parties
Minimal service	Yes	No
Full three-party service	Yes	Yes

2.2.2　　*Specific terminology*

Call ID: the served user's reference to a call of which he is a party. Examples:

1)　the call to user B (or user C) prior to its being used to form a three-way conversation;

2)　the three-way conversation, once it is formed.

Served user: during the invocation and active phases, the service is under the control of the "served user", i.e. the one for whom the service was subscribed. This user is also referred to as "user A".

User B: The other party in the original call (A ↔ B).

User C: The "third party" - the other party in the second (e.g. enquiry) call (A → C).

(For the original call, the served user may have been either the calling or called party (i.e. it may have been either an incoming or outgoing call)).

2.2.3　　*Qualifications on the applicability to telecommunication services*

This supplementary service is considered meaningful when applied to the Telephony teleservice and the speech and 3.1 kHz audio bearer services. Furthermore, it may also be meaningful when applied to other services.

2.3　　*Procedures*

2.3.1　　*Provision/withdrawal*

The Three-Party supplementary service is subscribed to by prior arrangements with the service provider. Subscription can be made for the Minimal Service or the Full Three-Party Service.

Withdrawal of the service is made by the service provider upon request by the subscriber or for service provider reasons.

2.3.2 *Normal procedures*

2.3.2.1 *Activation/deactivation/registration*

None identified.

2.3.2.2 *Invocation and operation*

2.3.2.2.1 *Beginning Three-Party Service* (see Figure 4/I.254, Sheet 1)

The served user, user A, who has an existing active call with user B, asks the service provider to begin the Three-Party Service. The service provider puts the existing call on hold. User A then proceeds to establish the second call (to user C).

Note – The same actions take place when the served user asks the service provider to start the "normal" Call Transfer service (see Call Transfer service description). Conceivably, a similar "Held && Active" service state (see Figure 2/I.252) could be attained as a result of accepting an incoming call in such a way that the service provider knew to associate that incoming call with the existing call and, hence, put the existing call on hold (see Call Waiting service description for one such possibility).

2.3.2.2.2 *Managing two associated calls – one held one active* (see Figure 4/I.254, Sheets 1 and 2)

Served user:

Once the call to the third party reaches the alerting state, the served user can:

i)   alternate from one call to the other as required (possibly several times), privacy being provided between the two calls;

   Note – The exact interactions between the served user and the service provider depend somewhat on the information and control capabilities available to the user from his terminal. Compare the two methods of alternating between calls given in Figure 4/I.254 under "Alternate" vs. "Return to B(C)".

ii) Disconnect the active party (e.g. user C), whereupon the service provider would notify (see Note) the served user that the other party (e.g. user B) is still held and wait for one of the following events:

   –   a request from the served user that the held party be retrieved;

   –   a request from held party to disconnect.

   If neither event occurs within a brief time interval, the service provider will disconnect the held party.

   Note – This would be a "high priority notify", i.e. one capable of gaining the served user's attention if he were away from the terminal. Ringing is an example of this.

iii) Disconnect the held party (e.g. user B)

   Note – Disconnecting a held party without previously retrieving it is considered undesirable for a "human-to-human" call but may be useful in other cases;

or, if subscribed for:

iv) request the service provider to begin a three-way conversation (see managing an active three-way conversation below).

   Note – In some networks, the served user can invoke this step only after the call to the third party reaches the active state.

Active party

If the active party disconnects, the service provider would notify the served user that the other party (e.g. user B) is still held and wait for one of the following events:

   –   a request from the served user that the held party be retrieved;

   –   a request from the held party to disconnect.

If neither event occurs within a brief time interval, the service provider will disconnect the held party.

Held party

If the held party disconnects, the service provider will clear that connection, resulting in a simple active call between the served user and the currently-active user.

2.3.2.2.3 *Managing an active three-way conversation* (See Figure 4/I.254, Sheet 3)

Note – The extent to which the service provider re-uses the existing resources (e.g. a bridge) to form the resulting, simple call is a service provider option.

Served user

During an active three-way conversation, the served user can request that the service provider:

i) end the three-way conversation;

Note – Signalling procedures for disconnecting a multi-connection call are not yet defined.

ii) disconnect himself from the three-way conversation. Since the served user is also the controller (and normally the one that is charged for the call), this shall result in the entire three-way call being cleared.

Note – An anticipated future extension to this service and the Call Transfer service is the ability to negotiate charging and control responsibilities, thus permitting the call to continue after the served user has disconnected (See Figure 4/I.254: call transfer from Active Three-Way Conversation state).

iii) explicitly disconnect one of the other parties which would result in a simple active call between the served user and the remaining other party;

iv) place his connection into the conversation on hold (and, typically, later retrieve it).

Note – While the served user is held, the other parties (B and C) may continue to communicate.

v) split off one of the parties in order to have a private communication with that party. This results in that party being split off from the conversation, the connection between the served user and the other party on the three-way call being placed on hold, and the connection between the served user and the designated party being active.

Other party (B or C)

Either of the other parties (users B or C) can ask the service provider to:

i) release it from the three-way conversation which results in a simple active call between the served user and the remaining party;

ii) place its connection to the three-way conversation on hold (and, typically, later retrieve it);

Note – While the served user is held, the other parties (i.e. served user and remaining party) may continue to communicate.

2.3.3 *Exceptional procedures*

2.3.3.1 *Activation/deactivation/registration*

None identified.

2.3.3.2 *Invocation and operation*

None identified.

2.3.4 *Alternative procedures*

2.3.4.1 *Activation/deactivation/registration*

None identified.

2.3.4.2 *Invocation and operation*

None identified, except for the point made above regarding variations due to different terminal capabilities.

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*

None identified.

2.6   *Interaction with other supplementary services*

2.6.1   *Call Waiting*

Assume that users A, B and C have subscribed to the Call Waiting service, then:

–   if a call waiting indication was presented to user A and/or user B either before or during the Three-party-Service invocation, then the call waiting indication would still be present after the Three-Party Service is active. While the Three-Party Service is active, the party with the waiting call may put his active call on hold to accept the waiting call;

–   a call waiting indication may be presented to any party involved in a Three-Party Service call, and that party:

1) may be active in a two-party call (A-B or A-C),

2) may be on hold (B during A-C, C during A-B),

3) may be active in a three-way conversation, or

4) may have his connection to the three-way conversation on hold;

–   it may be desirable to include a capability of accepting an incoming call as part of Three-Party Service. Currently a user could alternate between the first call and the second (waiting or answered) call by combining hold and retrieve requests. A user could also join the second (waiting or active) call to the first call by invoking a three- (or more) party conference call.

2.6.2   *Call Transfer*

Call Transfer can be invoked in either the Held A $\leftrightarrow$ B(C) && Active A $\rightarrow$ C(B) state (see Figure 2/I.252 for Call Transfer service) or the Active Three-Way Conversation state (see Figure 5/I.254, call transfer from Active Three-Way Conversation state).

2.6.3   *Connected Line Identification Presentation*

No impact supplementary service affects the operation of the other supplementary service.

2.6.4   *Connected Line Identification Presentation*

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

2.6.5   *Calling Line Identification Presentation*

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

2.6.6   *Calling Line Identification Restriction*

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

2.6.7   *Closed User Group*

Assume that a user A, who has subscribed to the Three-Party Service, has an established call with user B and wishes to create a three-party call by including a user C (either a minimum Three-Party Service or a three-way conversation).

When user A invokes the Three-Party Service and places a call to user C, the service provider shall check that all CUG conditions are met between users A and C but is *not* required to check CUG conditions between users B and C at this point since user A may wish to only have a minimal Three-Party Service call.

If any of the parties to be involved in the three-party call are also a CUG member, then CUG conditions must be met by all of the parties before a three-way conversation can be formed.

2.6.8   *Conference Calling*

A served user who has invoked Three-Party Service to create a three-way conversation may convert the three-way conversation to a conference call by invoking the Conference Calling Service and identifying the Party IDs of the currently existing other two parties as part of the conference invocation. This requires that the served user of the Three-Party Service has also subscribed to the Conference Calling service. For other interactions, see § 1.6.12.

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 (Call Forwarding) services*

If the served user attempts to establish the second call to a user C who has Call Forwarding activated, and the appropriate forwarding conditions are met, the forwarding-to user will be alerted and treated in all other respects as if the call had been placed to him.

2.6.11   *Line Hunting*

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

2.6.12   *Three-Party Service*

The served user (A) may treat a Three-Party Service call that has reached the Three-Way Conversation service state as an "existing call" upon which the minimal Three-Party Service may be invoked. That is, if the served user A is in a three-way conversation with parties B and C and invokes (minimal) Three-Party Service on it, the service provider will place the served user's connection to the conversation on hold (with channel reservation) and allow the served user to establish a call to another party (D). Once the call to user D reaches the alerting state, any of the procedures in § 2.3.2.2.2 may be used to manage the call to party D and the "three-way conversation" call.

2.6.13   *User-to-User Signalling*

While adding the third party (user C) to the three-party service, the served user (user A) can send and receive UUI (services 1, 2 and 3) from the new party until the new party is added to a three-way conversation.

The served user will be able to send and receive UUI (service 3) to both remote parties (users B and C) on a three-way conversation individually and in some networks optionally broadcast UUI (service 3) messages to both parties (see Note). UUI (service 3) cannot be sent between remote parties (users B and C) in association with the three-way conversation.

Note – This assumes that each party can be uniquely identified.

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*

A served user who has all of his parties on hold would not be able to invoke the Three-Party Service, since he is not active on any given call.

A served user A engaged in an active call to a user B shall be able to invoke the Three-Party Service (if subscribed to) to a user C already on hold to served user A. This will allow served user A to create a three-way conversation with user B and previously held user C.

Any party involved in a Three-Party Service call (either minimum service or a three-way conversation) will be able to put the Three-Party Service call on hold. Once a party puts a Three-Party Service call on hold, that party may retrieve any other call it has previously held.

For any party involved in a three-party call which has also subscribed to the hold service without channel reservation, that party may place the Three-Party Service on hold and

1)   initiate a new call;

2)   receive a call (e.g. to process a Call Waiting request); or

3)   complete a call to a new free party that previously was busy and for which the Completion of Calls to Busy Subscribers (CCBS) had been invoked (see Note).

Note – The Completion of Calls to Busy Subscribers supplementary service needs further study.

The Call Hold service allows a user to switch (by hold and retrieve) between "parties" where a party may be a single user, a three-way conversation, or a conference call. Thus, a party in a three-way conversation may switch between the three-way conversation and another "party" hold, the "party" being a single user, another three-party call or a conference call.

2.6.16   *Advice of Charge*

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

2.7   *Dynamic description*

The dynamic description of this service is shown in Figure 4/I.254.
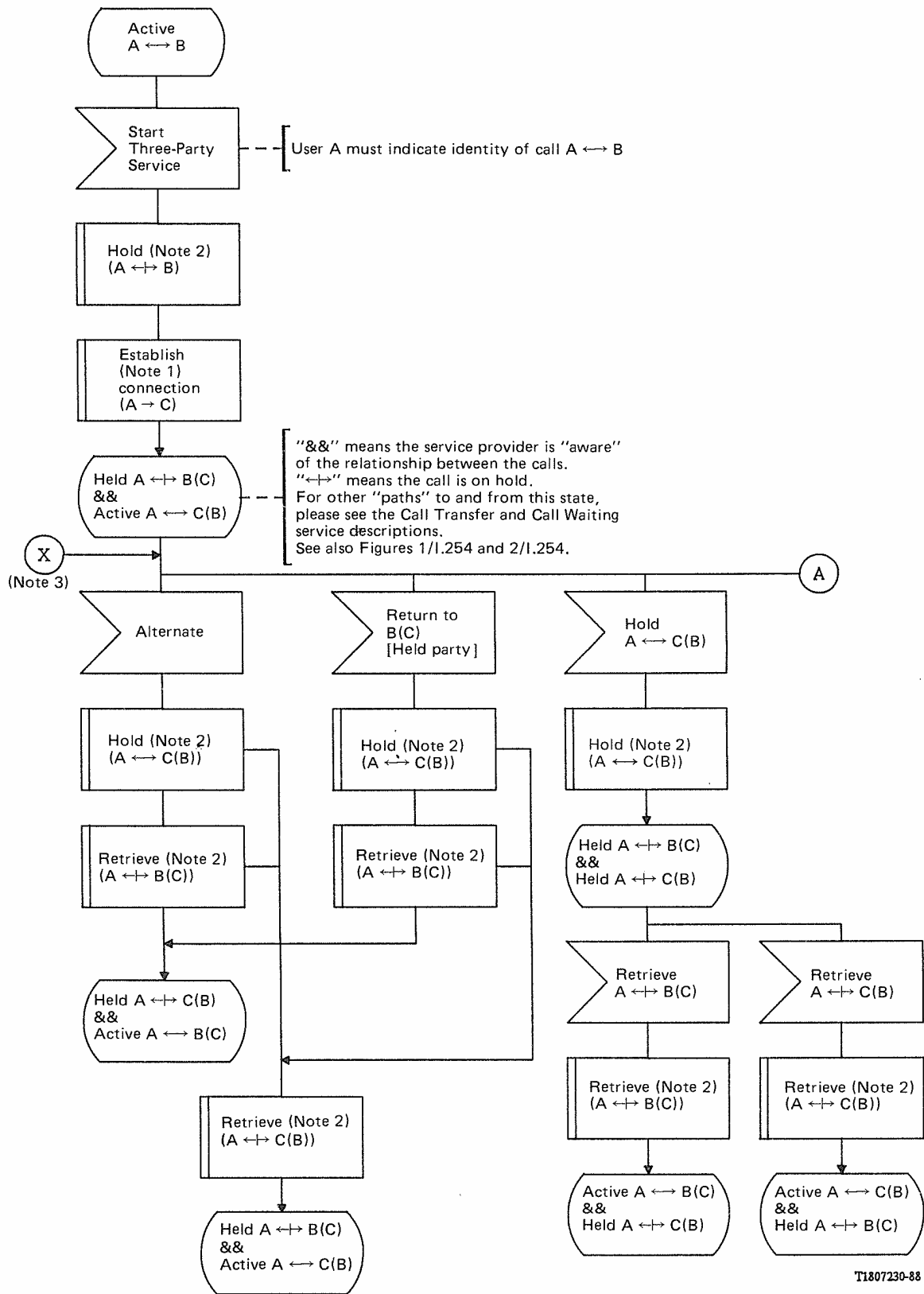
Note 1 — The information sent to the involved parties is described in the Basic Call service description.
Note 2 — The information sent to the involved parties is described in the Call Hold service description.
Note 3 — From Figure 6/I.254.
Note 4 — Handling of busy condition in Three-Party Service is given in Figure 7/I.254.

FIGURE 4/I.254 (sheet 1 of 3)

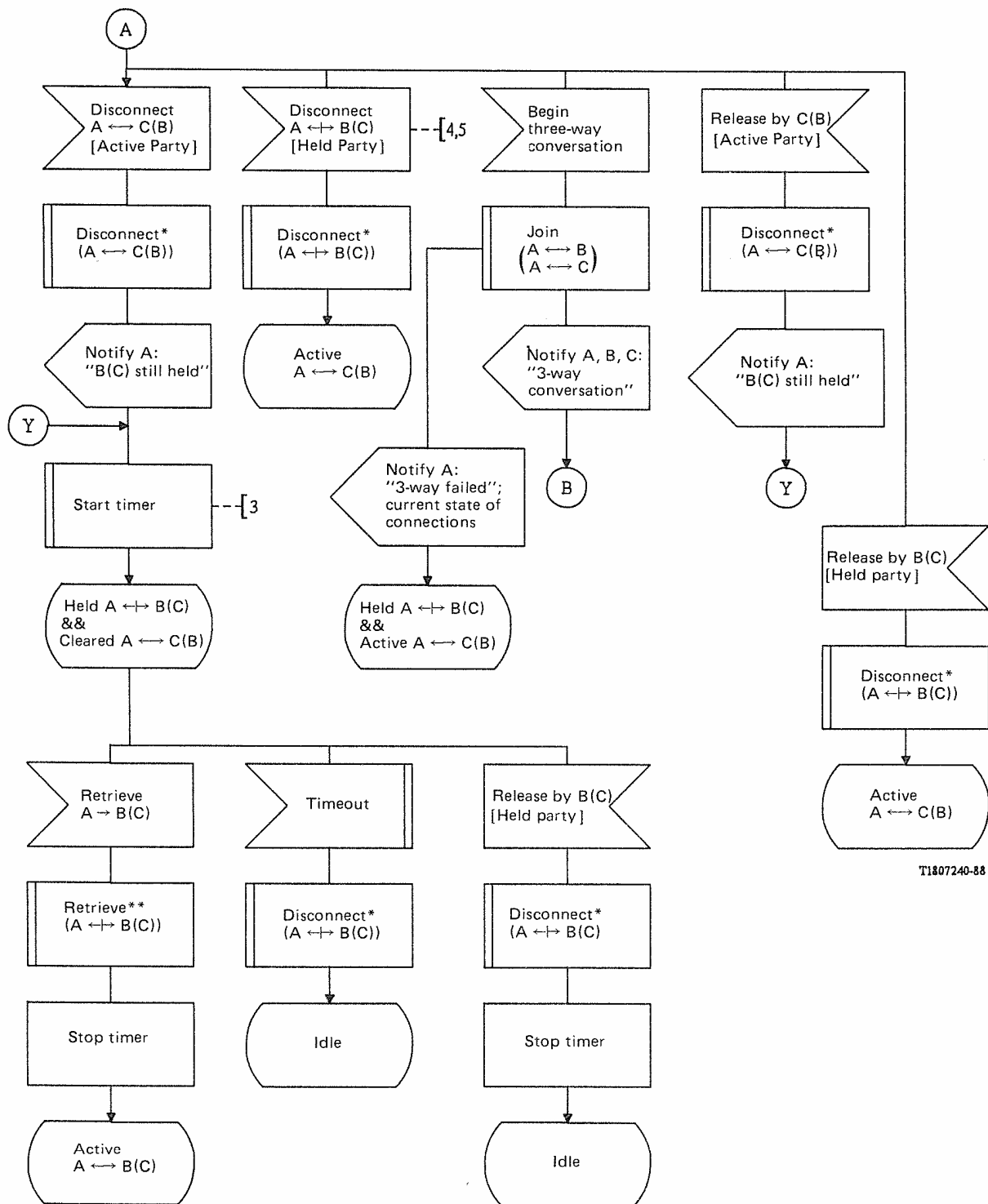**Three-Party Service overall SDL**

A

| Disconnect A ⟷ C(B) [Active Party] | Disconnect A ⟼ B(C) [Held Party] | Begin three-way conversation | Release by C(B) [Active Party] |

--[4,5]

| Disconnect* (A ⟷ C(B)) | Disconnect* (A ⟼ B(C)) | Join (A ⟷ B, A ⟷ C) | Disconnect* (A ⟷ C(B)) |

Notify A: "B(C) still held"

Active A ⟷ C(B)

Notify A, B, C: "3-way conversation"

Notify A: "B(C) still held"

Y

B

Y

Start timer

--[3

Notify A: "3-way failed"; current state of connections

Release by B(C) [Held party]

Held A ⟼ B(C) && Cleared A ⟷ C(B)

Held A ⟼ B(C) && Active A ⟷ C(B)

Disconnect* (A ⟼ B(C))

| Retrieve A ⟶ B(C) | Timeout | Release by B(C) [Held party] |

Active A ⟷ C(B)

| Retrieve** (A ⟼ B(C)) | Disconnect* (A ⟼ B(C)) | Disconnect* (A ⟼ B(C)) |

| Stop timer | Idle | Stop timer |

Active A ⟷ B(C)

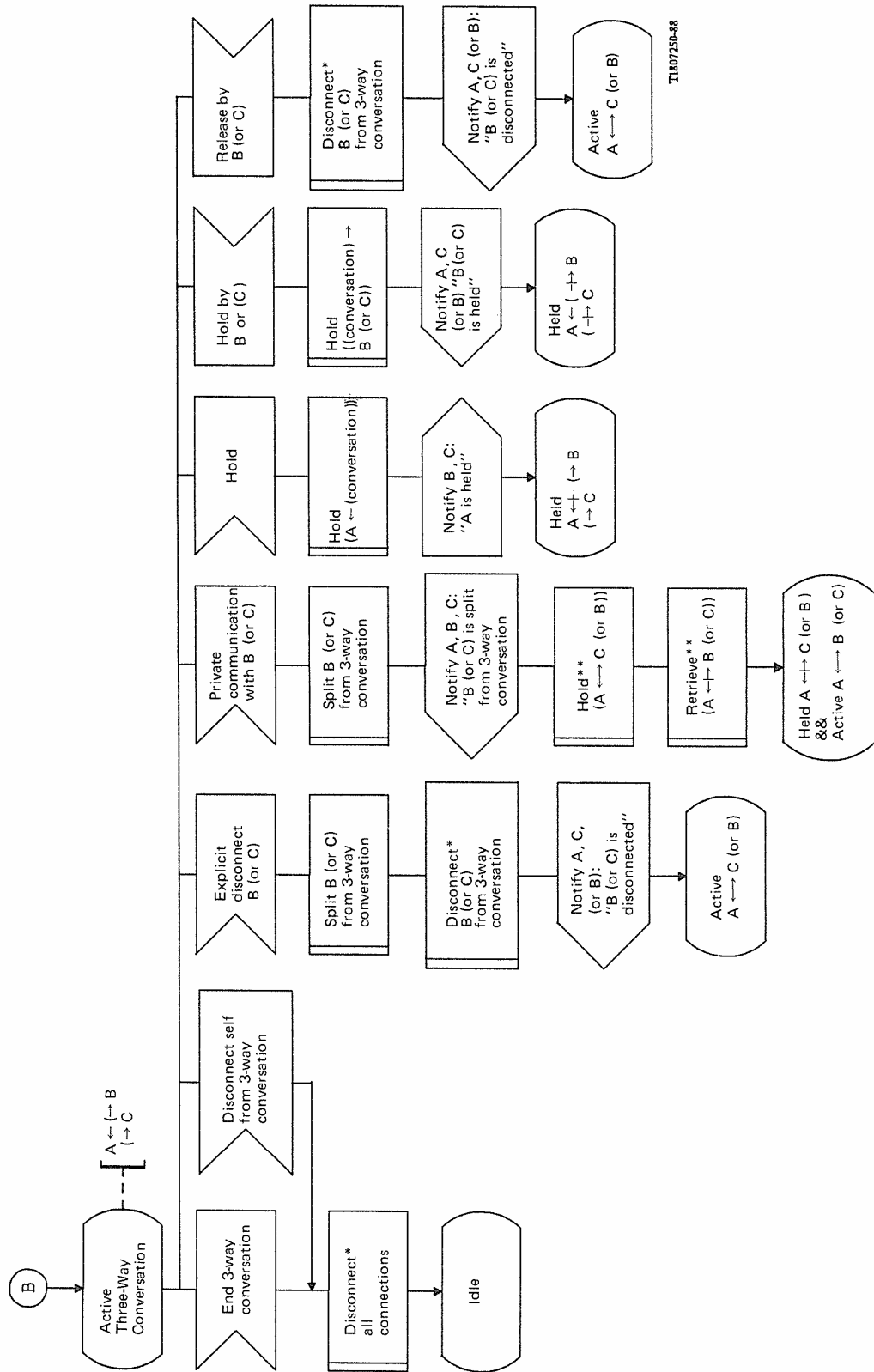Idle

T1807240-88

* See Note 1 on sheet 1.
** See Note 2 on sheet 1.

Note 3 — Timer values in the range of 5-10 seconds seem reasonable.

Note 4 — Discourteous for "human-to-human" call; may be useful otherwise.
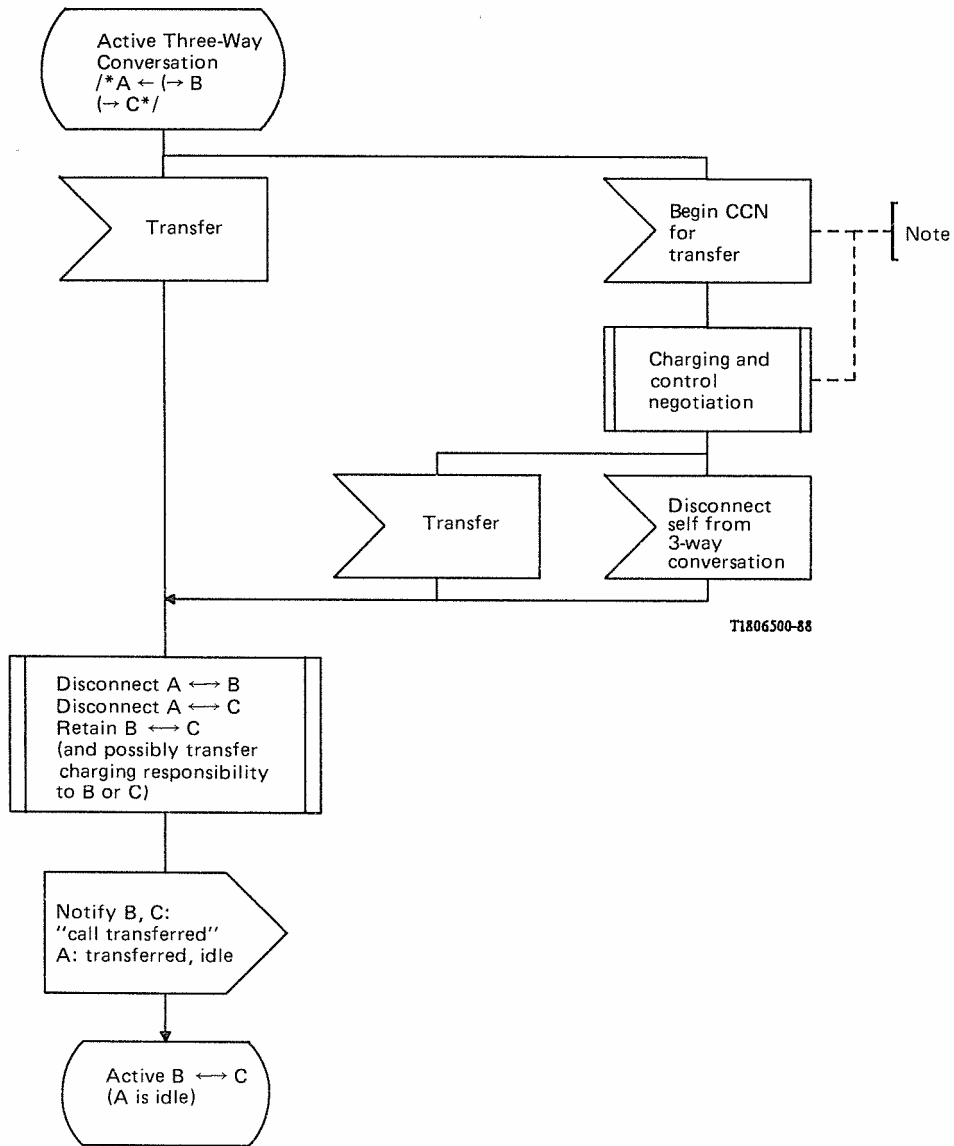
Note 5 — Signalling procedures do not yet exist for disconnecting a held party.

FIGURE 4/I.254 (sheet 2 of 3)

Three-Party Service overall SDL

FIGURE 4/I.254 (sheet 3 of 3)

Three-Party Service overall SDL

*   See Note 1 on sheet 1.
** See Note 2 on sheet 1.

TI807250-88

Active Three-Way Conversation

A ← (→ B
(→ C

End 3-way conversation

Disconnect* all connections

Idle

Disconnect self from 3-way conversation

Explicit disconnect B (or C)

Split B (or C) from 3-way conversation

Disconnect* B (or C) from 3-way conversation

Notify A, C, (or B): "B (or C) is disconnected"

Active A ⟷ C (or B)

Private communication with B (or C)

Split B (or C) from 3-way conversation

Notify A, B, C: "B (or C) is split from 3-way conversation

Hold** (A ⟷ C (or B))

Retrieve** (A ⟷ B (or C))

Held A ⟷ C (or B) && Active A ⟷ B (or C)

Hold

Hold (A ← (conversation))

Notify B , C: "A is held"

Held A ← (→ B (→ C

Hold by B or (C)

Hold ((conversation) → B (or C))

Notify A, C (or B) "B (or C) is held"

Held A ← (→ B (→ C

Release by B (or C)

Disconnect* B (or C) from 3-way conversation

Notify A, C (or B): "B (or C) is disconnected"

Active A ⟷ C (or B)

B

Note — These procedures require further study.

FIGURE 5/I.254

Call transfer from Active Three-Way Conversation state

Call Waiting-[4

Active A ⟷ B
‖
Waiting A ← C   --[1

(Request from A)
Hold A ⟷ B
Connect A ← C

(Procedures as
defined in
call waiting
service description)

Two unrelated calls

Held A ←|→ B
‖
Active A ⟷ C   --[1

Held A ←|→ B
//
Active A ← C   --[2

Start
Three-Party
Service   --[3

Start
Three-Party
Service   --[3

Held A ←|→ B
&&
Active A ⟷ C

X   (Continue as per Three-Party Service
     service description, Figure 4/I.254, sheet 1)

T1806510-88
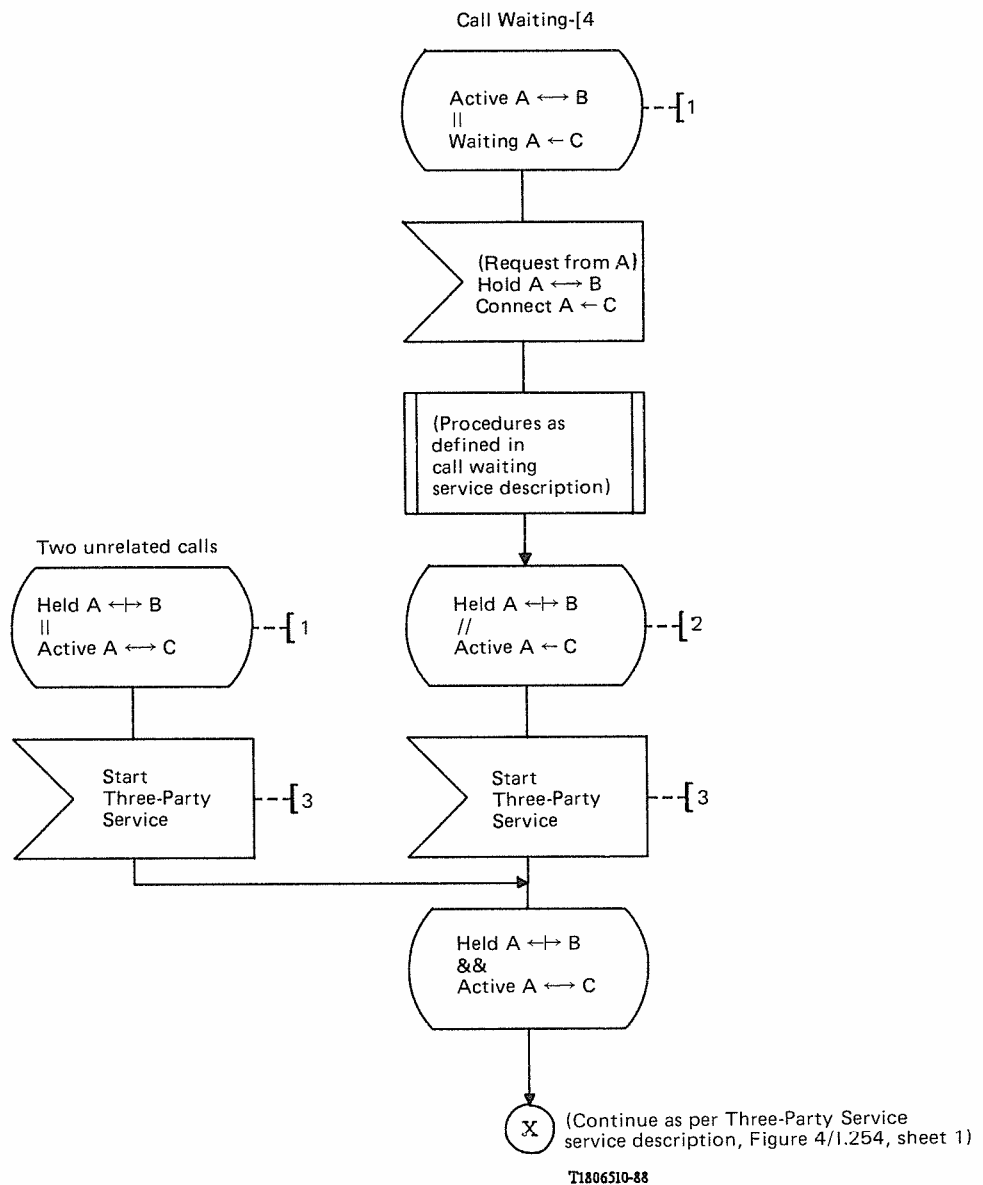
Note 1 — "//" means service provider is not aware of the relationship between the two calls.

Note 2 — "//" means service provider may be aware of a relationship between the two calls, but is not as "strong" a relationship as the "&&" relationship needed for Three-Party Service.

Note 3 — User A must indicate identities of A ←|→ B and A ← C.

Note 4 — Nomenclature used here is different from that used in Call Waiting service description, but is functionally equivalent.

FIGURE 6/I.254

**Invoking Three-Party Service using a waiting call
or using two unrelated calls**
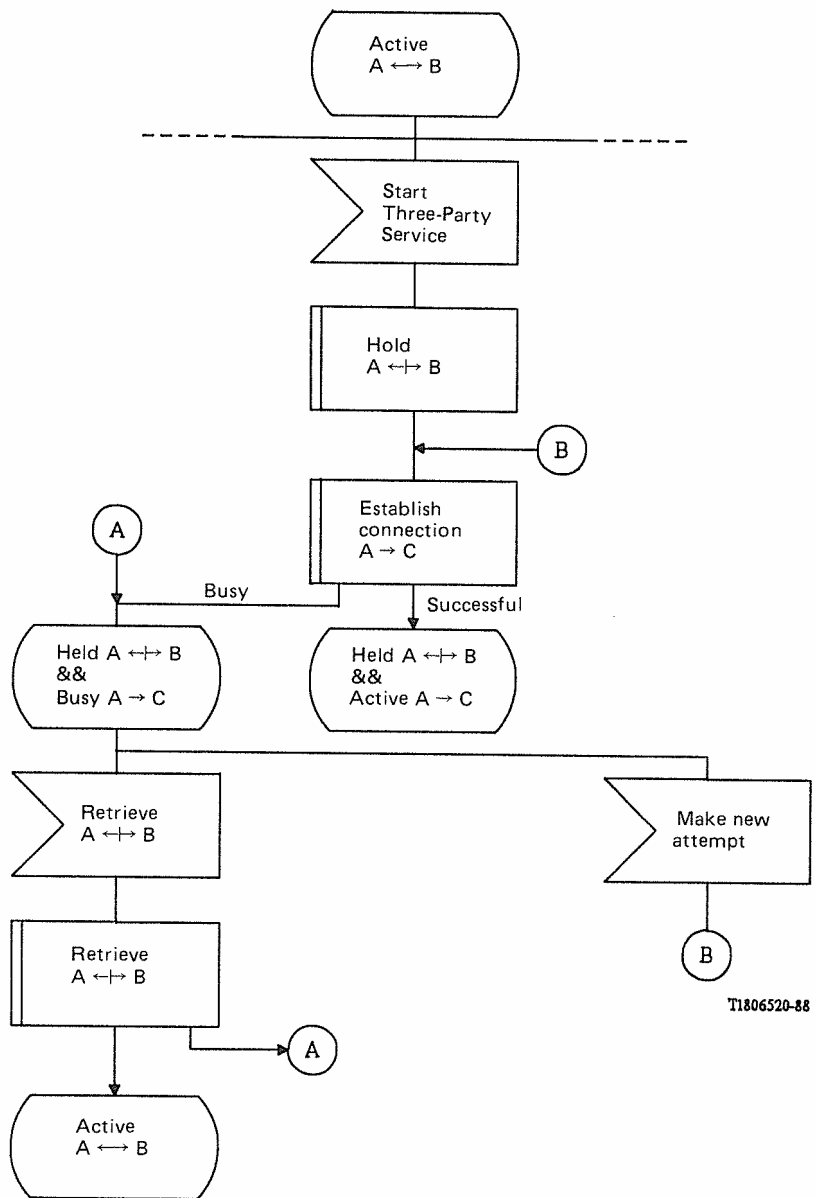
FIGURE 7/I.254

Handling of busy condition in Three-Party Service

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	**Integrated services digital network**
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems