

Recommendation T/SF 31-07 (Copenhagen 1987)

OPERATIONAL REQUIREMENTS OF ISDN SUPPLEMENTARY SERVICES

1. GENERAL ASPECTS

- 1.1. That Operational Requirements of the Supplementary Services with Service Prose Definition and Description (Stage 1) should be made available.
- 1.2. That the description method described in Annex 0 should be used in describing operational requirements.

2. OPERATIONAL REQUIREMENTS

The Operational Requirements for the following Supplementary Services are contained in the annexes to this appendix:

- Annex 1: Advice of Charge
- Annex 2: Call Waiting
- Annex 3: Called Line Identification Presentation
- Annex 4: Calling Line Identification Presentation (CLIP)
- Annex 5: Calling Line Identification Restriction (CLIR)
- Annex 6: Closed User Group (CUG)
- Annex 7: Completion of Calls to Busy Subscriber (CCBS)
- Annex 8: Conference Calling, Add-On
- Annex 9: Direct Dialling In (DDI)
(Diversion Services:)
- Annex 10: — Call Forwarding Unconditional
- Annex 11: — Call Forwarding Busy
- Annex 12: — Call Forwarding No Reply
- Annex 13: Sub-Addressing
- Annex 14: Terminal Portability Supplementary Service
- Annex 15: Terminal Selection
- Annex 16: Three Party Service
- Annex 17: User to User Signalling

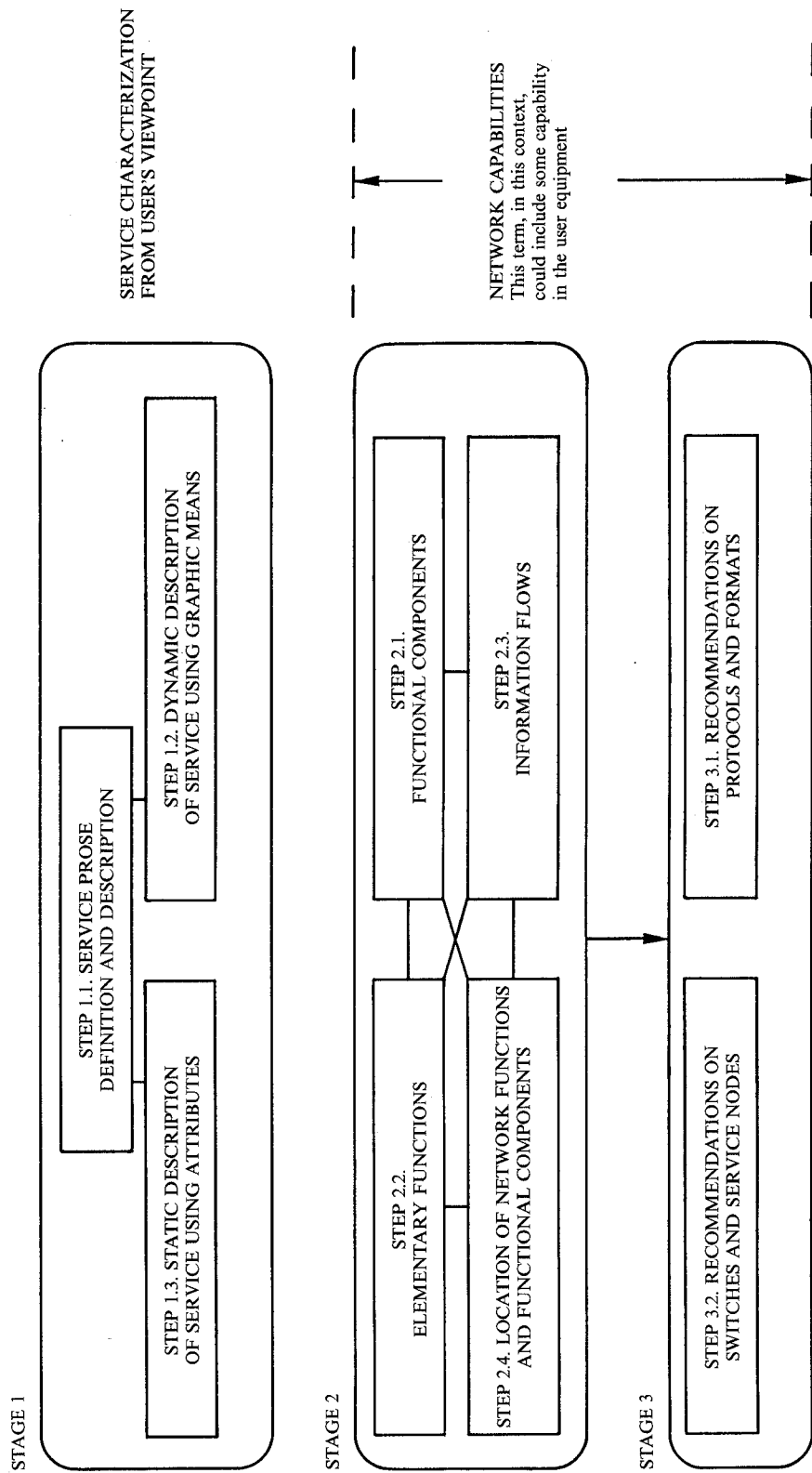


Figure 1 (T/SF 31-07). Graphical representation of the overall method for development of ISDN Recommendations.



Annex 1

ADVICE OF CHARGE

1. DEFINITION

This supplementary service provides charging information to an ISDN user for all chargeable calls.

2. DESCRIPTION

2.1.

Advice of charge supplementary service allows the served user being charged for a call to be advised of charging information applicable to that call.

Charging information may be available for the user at three stages of the call:

1. charging information at the beginning of the call,
2. charging information during an established call, to indicate the progression of charges applied, and/or to be applied to that call,
3. charging information at the end of the call, to indicate the overall charges applied to that call.

The charging information will consist of the accumulated charging units.

If extra charges in terms of additional units are applied, this information should be included in the charging information.

2.2. **Applicability**

This supplementary service is applicable to all basic telecommunication services.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. **Provision**

Provision of the service is on a subscription basis or may be generally available.

A limited version of the service may be offered which only gives the overall call charging information at the end of the call. This version of the service is only provided on a subscription basis.

3.2. **Withdrawal**

At the request of the subscriber or for administrative reasons.

3.3. **Registration**

Not applicable.

3.4. **Erasure**

Not applicable.

3.5. **Activation**

3.6. **Deactivation**

When provided on a subscription basis, the service is activated/deactivated by the network (Administration) for the subscription period and it is applied to every call for which the user is charged.

If generally available, the service is activated on a call by call basis when the user invokes the service.

3.7. **Invocation**

The service is invoked:

- either automatically by the network for each chargeable call, when the service is provided on a subscription basis;
- or by the user on a call by call basis, if the service is generally available.

3.8. **Normal operation with successful outcome**

When the service has been invoked, information on accumulated charging units is sent to the user by the network without any specific user request:

- at the beginning of the call,
- periodically during the call,
- at the end of the call (when charging is completed).

This information should be updated for each additional unit up to a maximum rate of approximately one update per second.

3.9. **Quality of Service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging requirements**

On a subscription basis or on a usage basis if the service is generally available.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

Under certain conditions (e.g. equipment failure, reverse charging) charging information may not be available. In this situation the customer could be given an indication that the service is not operating.

4.2. **Registration**

Not applicable.

4.3. **Erasure**

Not applicable.

4.4. **Activation**

Not applicable.

4.5. **Deactivation**

Not applicable.

4.6. **Invocation**

Not applicable.

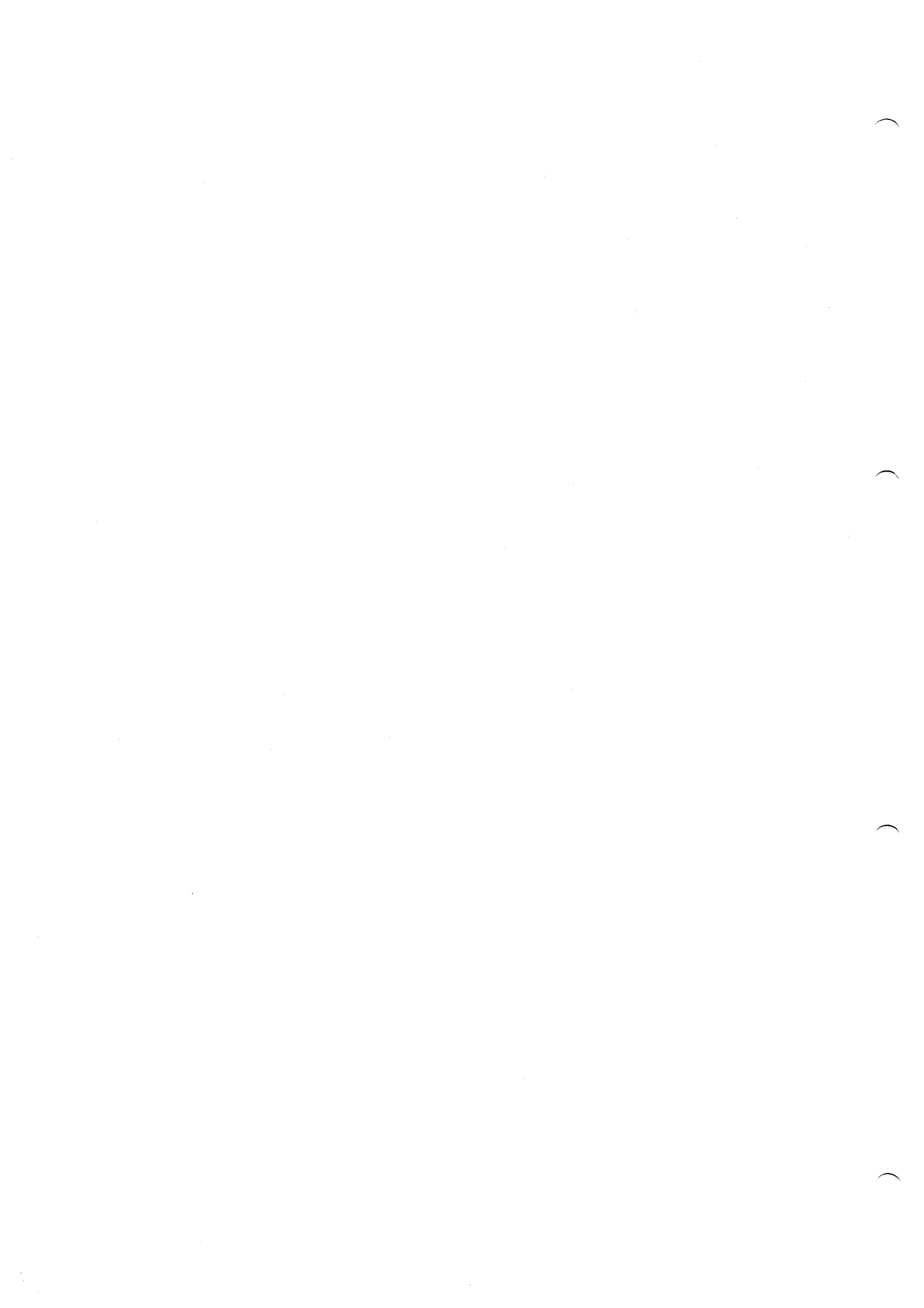
4.7. **Testing**

Not applicable.

- 4.8. **Interrogation**
Not applicable.
- 4.9. **Charging requirements**
Not applicable.
5. **ALTERNATE PROCEDURES**
No alternate procedures are identified.
6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**
- 6.1. **Call Waiting**
No interaction.
- 6.2. **Calling Line Identification Presentation**
No interaction.
- 6.3. **Calling Line Identification Restriction**
No interaction.
- 6.4. **Direct Dialling In**
No interaction.
- 6.5. **Closed User Group**
No interaction.
- 6.6. **Terminal selection**
No interaction.
- 6.7. **User to User Signalling**
No interaction.
- 6.8. **Sub-addressing**
No interaction.
- 6.9. **Terminal portability**
When the call is in the suspended state no charging information is sent to the user; on resumption of the call the sending of charging information will start again (with the updated value of the number of charging units since the beginning of the call).
- 6.10. **Three party service**
Hold for enquiry: if more than one call is in progress at the same user terminal, the charging information should be sent separately for each individual call independently of the call state (active or held).
In this case, the maximum rate for providing charging information should not be exceeded.
Three party speech: for further study.
- 6.11. **Called Line Identification**
No interaction.

- 6.12. **Malicious call identification**
For further study (in principle there is no interaction).
- 6.13. **Conference call**
For further study.
- 6.14. **Freephone**
For further study.
- 6.15. **Call Forwarding Unconditional**
When a call is forwarded and the original called user is charged for the forwarded part of the call and has advice of charge activated, charging information are not sent to this called user.
- 6.16. **Call Forwarding Busy**
See Call Forwarding Unconditional.
- 6.17. **Call Forwarding No Reply**
See Call Forwarding Unconditional.
- 6.18. **Call Deflection**
See Call Forwarding Unconditional.
- 6.19. **Completion of Calls to Busy Subscriber**
For further study.
- 7. **INTERWORKING CONSIDERATIONS**
For further study.
- 8. **OVERALL SDL**
For further study.
- 9. **ATTRIBUTES**
 - 9.1. **Means of Subscription/Provision**
N (Network controlled).
 - 9.2. **Supplementary Service Specific Parameters**
Maximum rate for updating of charging information.
 - 9.3. **Service Activation/Deactivation**
S (Specified period): when service is provided on a subscription basis.
CC (Call by Call): when service is generally available.
 - 9.4. **Means of Specified Period Activation/Deactivation**
N (Network controlled).

- 9.5. **Means of Parameters Registration, Interrogation and Modification**
N (Network controlled).
- 9.6. **Means of Service Invocation**
N (Network invocation): when service is provided on a subscription basis.
L (User invocation, local): when service is generally available.
- 9.7. **Applicability to Telecommunication Services**
All (all Telecommunication services).
- 9.8. **Charging**
S (Subscription based) or U (Usage based).



Annex 2

CALL WAITING

1. DEFINITION

The possibility for a customer to be notified of an incoming call whilst his termination is in the busy state. Subsequently the customer can either answer the incoming call, reject or ignore the call.

2. DESCRIPTION

2.1. Description

2.1.1. This service operates when the controlling customer B's termination is in the busy state which is defined as the condition when both B Channels are engaged.

2.1.2. Also, it is recognised that a small call connect system or active bus may be present at the customer's premises (as an NT2) and that an internal call may be in progress when the call waiting indication is applied. It is felt that it is the responsibility of the intelligence of the customer's equipment to determine what action should take place in these circumstances.

2.1.3. When a third party (calling customer C) attempts to connect to that termination the controlling customer B is given an appropriate indication of the waiting call.

Note. If it can be identified that the incoming call is Telephony and that one of existing calls is Telephony then the presentation of this indication may take the form of an in-channel indication.

2.1.4. In order to simplify the service management in the first phase, both for the network and for the subscriber, the maximum number of waiting calls at one time per subscriber line can be one. This means that no further calls are forwarded to the subscriber during the call waiting state.

2.2. Applicability to Telecommunication Services

This service is applicable to the following Services:

- (a) Telephony Teleservice,
- (b) 64 kbit/s 8 kHz structured 3.1 kHz Audio Bearer Service,
- (c) 64 kbit/s 8 kHz structured Speech Bearer Service, or
- (d) applicable to other services where there is a human attendant. This is not seen as an immediate requirement, but provision should be made in the signalling protocols to accommodate such a requirement.

2.3. Terminology

Call Waiting State

The call waiting state, as seen by the network, can be defined as the time between t1 and t2, where:

t1 = a call waiting indication is sent to the controlling subscriber;

t2 = the waiting call is cleared (either the calling party has cleared or a time out has expired in the network);
or the waiting call is connected.

Line States

In the light of handling the waiting calls in the same way as ordinary calls, signalling messages and tones are sent towards the calling party according to the following controlling customer's line state, as perceived by the network:

- free, when at least one B Channel is free or when both B Channels are busy but the subscriber is able to connect a waiting call, i.e. at least one busy terminal reacts to a call waiting indication;
- busy, when both B Channels are busy and the subscriber is not able to connect a waiting call, i.e. either the busy terminals are not compatible with the waiting call or the line is already in the call waiting state.

3. **NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME**

3.1. **Provision**

This service may be provided by prior arrangement with the Administration or be available on a general basis.

3.2. **Withdrawal**

Withdrawal will be at the request of the customer or for administrative reasons.

Note. Activation, Deactivation, Interrogation can be provided locally, i.e. by the terminals. In addition, these facilities may be provided by the network, in which case paragraphs 3.5., 3.6., 3.11. apply. Where control capabilities are provided in the network the Administration shall have the same control capabilities as the controlling customer, for instance to register and/or activate the supplementary service on the customer's behalf.

3.3. **Registration**

No information needs to be registered with the network for this supplementary service.

3.4. **Erasure**

Not applicable to this supplementary service.

3.5. **Activation**

Activation of this supplementary service will be by the user using an appropriate control procedure. The controlling user shall be informed by the network of the success or otherwise of his action. Information exchanged:

Service Activation request and acknowledgment. (1)

Normal outgoing call procedures apply when this service is activated.

3.6. **Deactivation**

The service will be deactivated by the user using an appropriate control procedure. The controlling user shall be informed by the network of the success or otherwise of his action. Information exchanged:

Service Deactivation request and acknowledgment. (1)

3.7. **Invocation**

This service is invoked by the network on arrival of an incoming call if the controlling customer B's termination is in the busy state.

3.8. **Normal Operation with successful outcome**

3.8.1. On arrival of an incoming call whilst the controlling customer B's termination is in the busy state, an appropriate indication will be given to all appropriate compatible terminals on that termination.

3.8.2. When this service is in the active state and the termination of the controlling customer B is busy, the arrival of a subsequent incoming call to customer B shall be indicated to B by an appropriate indication. The calling customer C shall also receive an appropriate indication. As a basic feature, the calling customer C receives the information (signalling messages and tones) as for an ordinary call. Additional features (specific information to the user) can be provided on a national basis. The network shall then await a response from controlling customer B within a specific time period ranging from 30 seconds to 3 minutes in steps of not more than 30 seconds.

The call waiting service is then suspended for further incoming calls.

The calling customer C shall be kept informed of the state of his call attempt to the controlling customer B.

3.8.3. If a compatible terminal accepts the waiting call, by the use of one of the allowed control procedures, within a specified period (see 3.8.2.) the network shall respond with the corresponding action from the following:

i) Release the existing call and answer the waiting call.

ii) Put the existing call on hold and answer the waiting call.

- 3.8.4. If the controlling customer B responds with an appropriate control procedure within the time period detailed in paragraph 3.8.2. to indicate that he accepts the waiting call and wishes to place the existing call with party A on hold, the network shall remove any indication to the controlling customer B if provided. The existing call between customers B and A shall be placed on hold with customer A receiving a suitable indication, and the waiting call from customer C set up to customer B.
- 3.8.5. If the controlling customer B responds with an appropriate control procedure within the time period detailed in paragraph 3.8.2. to indicate that he accepts the waiting call and wishes to release the existing call with party A, the network shall remove the indication to the controlling customer B if provided and any indication to calling customer C. The existing call between customers B and A shall be released and the waiting call from customer C set up to customer B.
- 3.8.6. If the controlling customer B responds within the time period detailed in paragraph 3.8.2. by clearing the existing call with party A the network shall consider the waiting call from customer C to customer B as a new call and offer it in a normal manner.

3.9. **Quality of Service**

For further study.

3.10. **Testing**

For further study.

3.11. **Interrogation**

The controlling customer may interrogate the network by the use of an appropriate control procedure. The network shall respond with an appropriate indication telling the customer whether the service is activated or deactivated. Information exchanged:

Service Interrogation request and acknowledgment. (1)

3.12. **Charging requirements**

3.12.1. It may be possible to charge for each activation of this supplementary service. (1)

3.12.2. It may be possible to charge for each invocation of this supplementary service. (1)

(1) Where the control capabilities are provided in the network.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional Operation or unsuccessful outcome**

4.1.1. If the waiting call is ignored then after the specified period (see paragraph 3.8.2.) any indication to the controlling customer B will be removed and normal release procedures applied to the waiting call.

4.1.2. If no response is received from controlling customer B within the time period detailed in paragraph 3.8.2. then the network shall remove the indication to controlling customer B if provided and the indication to calling customer C. Calling customer C shall then receive a further indication to inform him that his call cannot be connected.

Call waiting is then made available for a subsequent incoming call.

4.2. **Registration**

Not applicable.

4.3. **Erasure**

Not applicable.

4.4. **Activation**
None identified.

4.5. **Deactivation**
None identified.

4.6. **Invocation**
Not applicable.

4.7. **Testing**
Not applicable.

4.8. **Interrogation**
For futher study.

4.9. **Charging requirements**
For further study.

5. **ALTERNATE PROCEDURES**
None identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. Call waiting shall be deactivated when Service Interception (SVI) is provided at the controlling customer B's termination or when Incoming Calls Barred is activated.
Call waiting will not automatically be re-activated when these incompatible services are removed or deactivated.

6.2. If an attempt is made to activate Call Waiting when the following services are active, the network shall refuse the attempt and inform the controlling customer B of the incompatibility.

- i) Incoming Call Barring.
- ii) Immediate Diversion.
- iii) Diversion on Busy.
- iv) Service Interception.

Note. The call waiting service shall be suspended from the B Channel of a termination under the following circumstances:

- i) The B channel is involved in a three party call where the three party bridge is in the same exchange as the customer.
- ii) The B channel is already involved in a call waiting situation, i.e. is either the channel which has call waiting active (B), the other party in the original call (A) or the party who is awaiting connection (C).
- iii) The B channel is engaged in a multiparty facility and the multiparty bridge is in the same exchange. These facilities are Operator Override, Telephone Service Observation, Service Interception and Monitor.
- iv) Basic diversion or Diversion on engaged are active at the termination. Call waiting will, however, continue to be available on the bypass number.
- v) The B channel is receiving an Alarm Call or an Advice of Duration and Charge call.
- vi) The B channel is activating or programming a supplementary service.

Call waiting is automatically re-applied when these circumstances no longer prevail.

7. **INTERWORKING CONSIDERATIONS**
None identified.

8. **DYNAMIC DESCRIPTION OF THE SERVICE**

See SDL contained in Figure 1 (T/SF 31-07).

9. **ATTRIBUTES**

The following attribute values apply to Call waiting:

Means of Subscription/Provision

Supplementary Service Specific Parameters

Service Activation/Deactivation

Means of Specified Period

Activation/Deactivation

Means of Parameter/Registration, Interrogation and Modification

Means of Service Invocation

Applicability to Telecommunications Services

Charging

Compatibility

Network Controlled or
generally available

Not applicable

Specific Periods

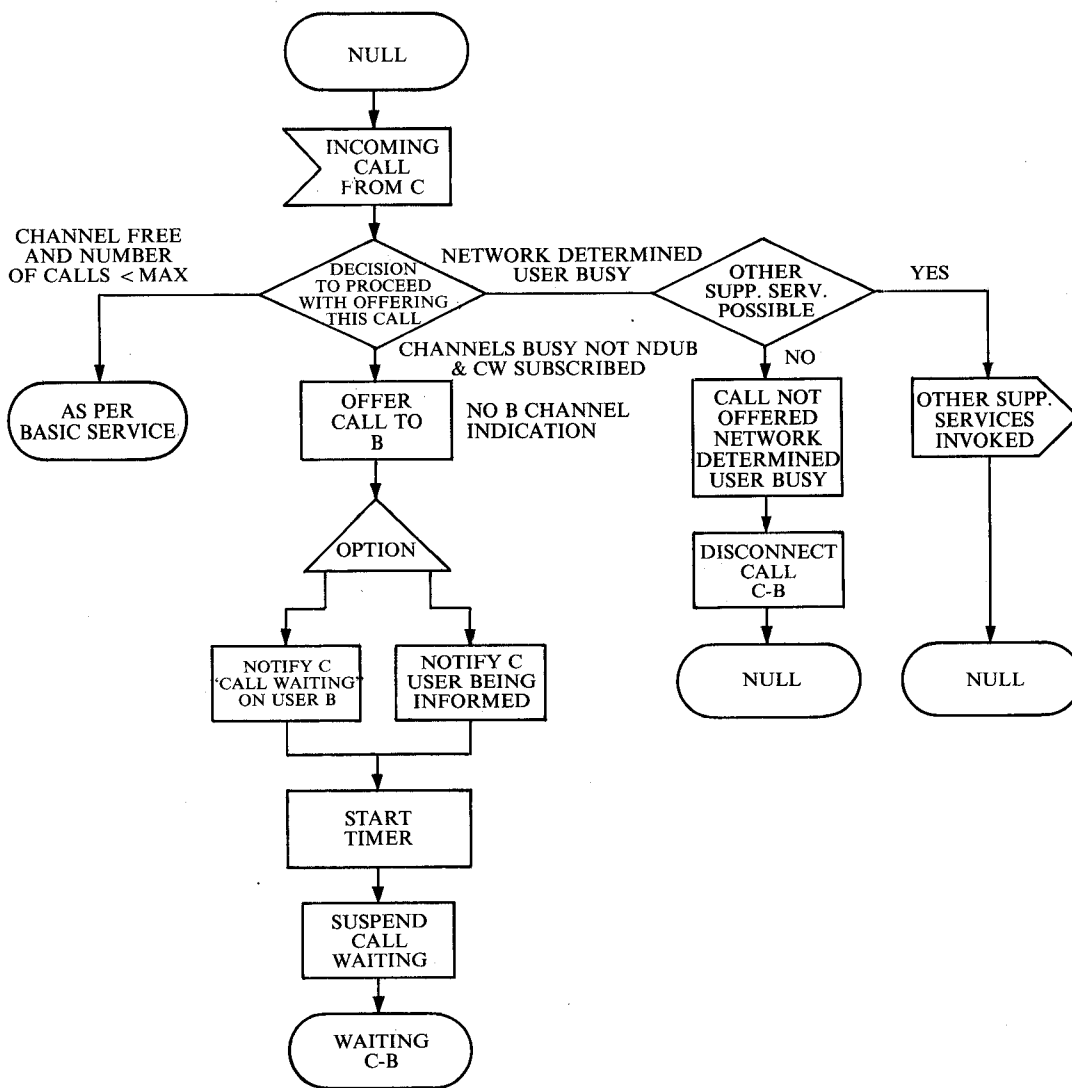
Network Controlled or

Locally Controlled

Not applicable

Network Invocation

SP, VBD, TEL



Overall SDL of Call Waiting (page 1).

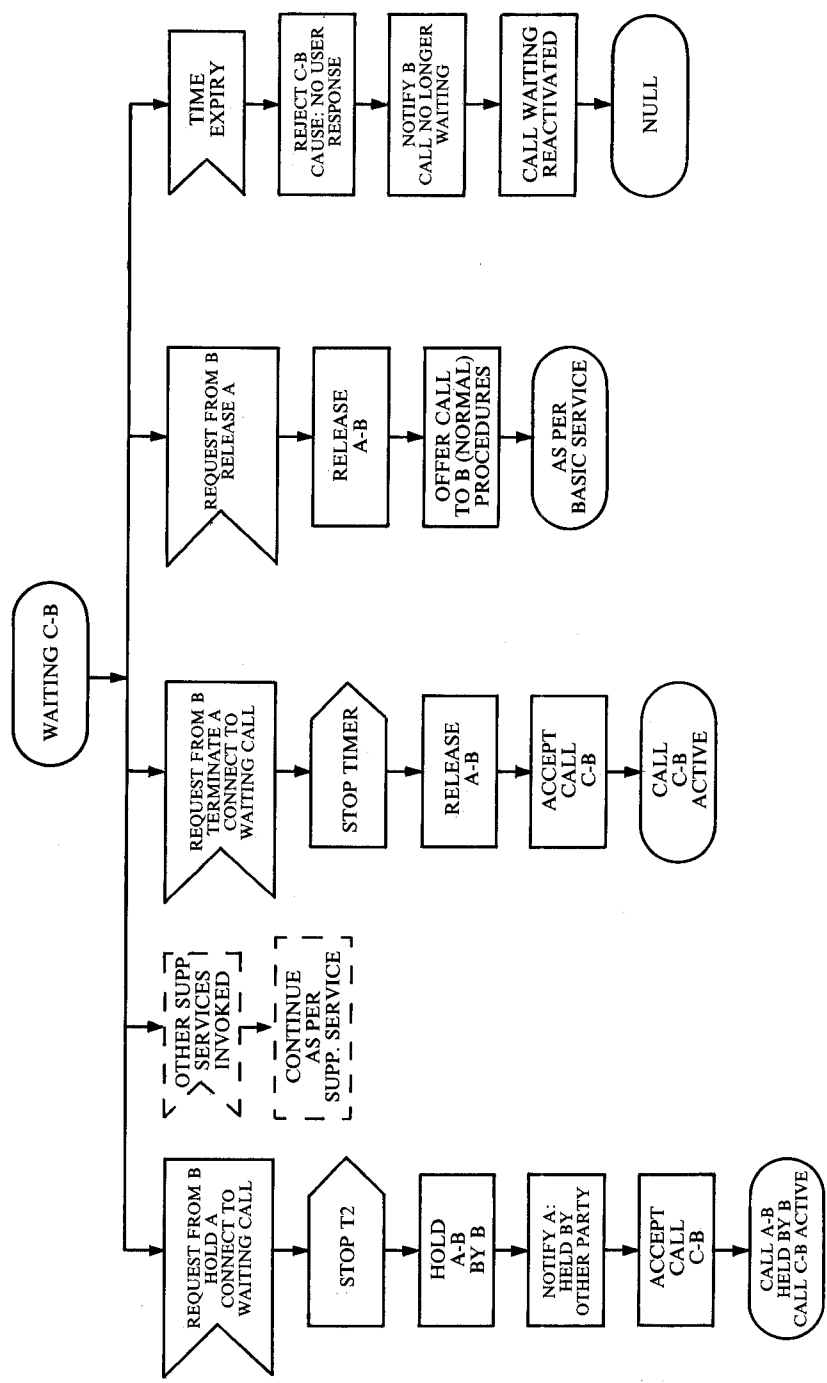


Figure 2.1. (T/SF 31-01) (page 2 of 2). Overall SDL diagram of Call Waiting.

Annex 3

CONNECTED LINE IDENTIFICATION PRESENTATION

1. DEFINITION

The supplementary service Connected Line Identification provides the ability to indicate the ISDN number of the connected line with possible additional address information to the calling party during the call establishment phase.

2. DESCRIPTION

- 2.1. This supplementary service is not meant to be a dialling check for the calling subscriber's termination but an indication to the calling subscriber that the network has selected the wanted access. In a full ISDN environment, the connected line identity must include all the address information necessary to unambiguously identify the destination line; this information is generated by the network.

Moreover, the information on the connected line identity may include additional address information generated by the destination user and transparently transported by the network. The network is not responsible for the content of this additional information.

The network delivers the connected line identity to the calling party when technically feasible regardless of the terminal capability to handle the information.

2.2. Applicability

The Connected Line Identification is provided for the outgoing calls from a subscriber's termination independent of the telecommunication service related to a particular call.

2.3. Terminology

The controlling subscriber is the calling subscriber.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

The Connected Line Identification is provided by the Administration on a subscription basis.

3.2. Withdrawal

This service can be withdrawn at the subscriber's request or for administrative reasons.

3.3. Registration

Not applicable.

3.4. Erasure

Not applicable.

3.5. Activation

The connected line identification, when subscribed to by an ISDN user, is applied for an agreed contractual period to all the outgoing calls at the subscribed premises.

3.6. Deactivation

Not applicable.

3.7. **Invocation**

The service will be invoked automatically by the network.

3.8. **Normal operation with successful outcome**

The ISDN number of the connected party and possible the additional address information is transmitted from the connected user's local exchange to the calling user.

The Connected Line Identification is formed of a number of information units:

— for national calls:

— the subscriber's national number (in the case of DDI, the extension number which is generated by the destination user will be transparently transported by the network. The network is not responsible for this number);

— optionally, additional address information (e.g. Subaddress);

— only for international calls:

additionally the country code and other possible indicators. The additional address information can be the Subaddress.

The provided information elements which are guaranteed by the network have to be made clearly identifiable.

In the call set-up phase the calling customer receives the information as soon as possible, even before the start of charging. In particular, the subscriber's national number (including DDI) and the country code for international calls can be received before the answer of the connected party, while the additional address information can be received at the answer of the destination subscriber.

The destination customer can optionally insert his identity into the response messages to an incoming call indication. The subscriber's national number (including DDI) can be provided both before and in conjunction with the answer, while the additional address information (e.g. "connected subaddress") is included into the connection message.

Outgoing calls from a user having subscribed to the connected line identification are processed by the originating local exchange as requiring the connected line identification. The destination local exchange offers the call to the destination customer who can respond as illustrated further down. The destination local exchange sends back an appropriate message containing the identification of the destination customer (national number plus DDI if provided by the customer, not guaranteed by the network) together with the information whether the presentation is restricted or allowed.

If the customer's answer contains more information than those already sent back (connected DDI, connected subaddress), the destination local exchange provides for sending the complete connected line identity to the originating local exchange.

The originating local exchange delivers the connected line identity to the calling subscriber as described above.

3.9. **Quality of Service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging requirements**

The charges may consist of a rental fee and/or a charge on a per call basis.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

The ISDN number cannot be transmitted in such cases where:

- the connected customer has an agreement with the Administration that his identification must not be delivered to a third party (Secret Numbers);
- in some interworking situations the connection is not completely supported by common channel signalling;
- the destination network of an international call does not provide the Connected Line Identification.

In these cases appropriate information will be given to the calling ISDN user.

If the transmission is not possible or presentation is not allowed, a suitable indication should be given to the connected party.

4.2. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **DDI/Terminal Selection**

The extension number/terminal selection information will be transparently transported by the network, i.e. the network is not responsible for this information.

6.2. **Call Forwarding (Diversion)**

If the connected party has invoked a Call forwarding service, the calling party would be informed that the supplementary service Connected Line Identification cannot be made available. Further study is required.

7. **INTERWORKING CONSIDERATIONS**

The service will be provided whenever an appropriate signalling network is available.

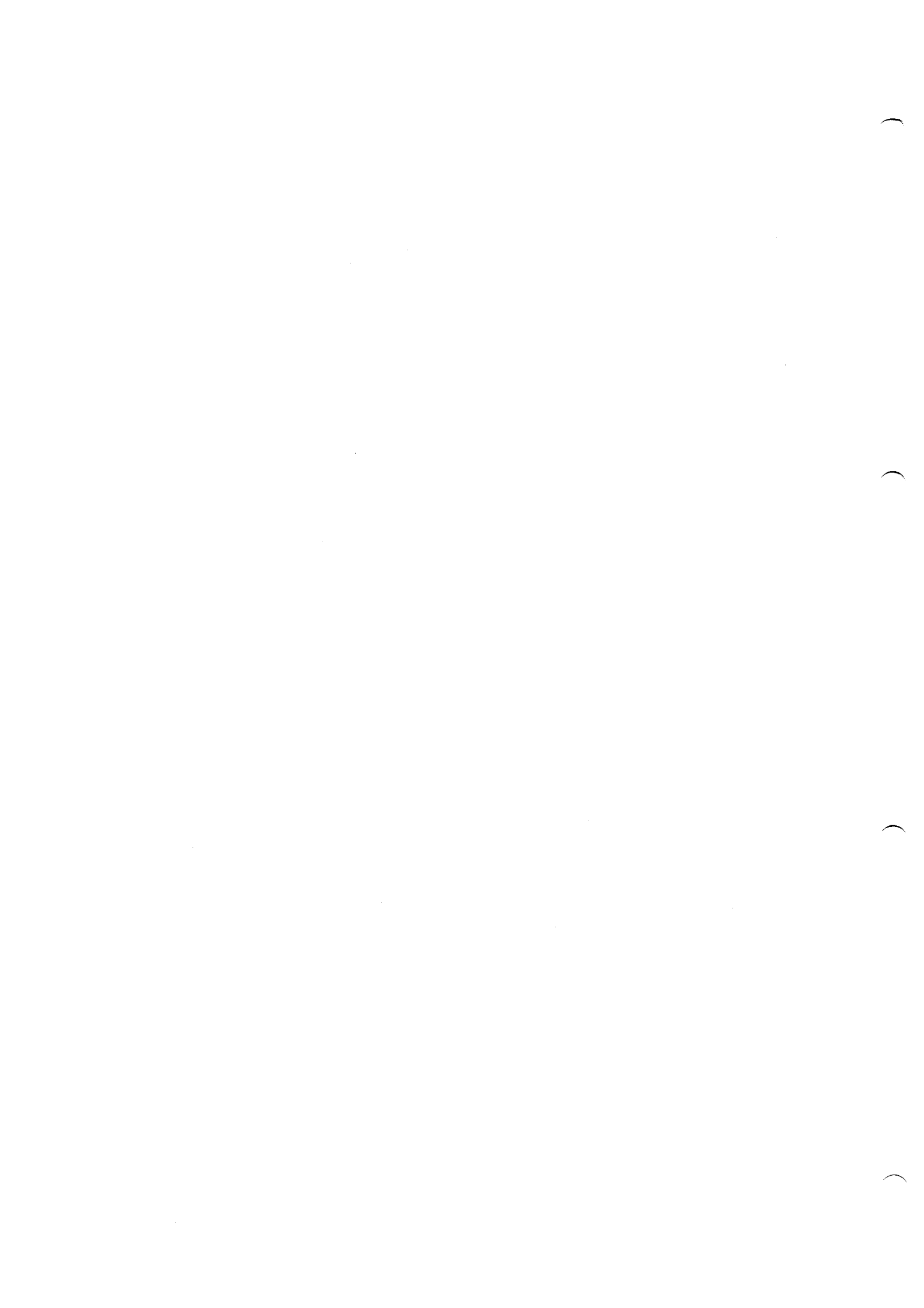
8. **OVERALL SDL**

To be completed.

9. **ATTRIBUTES**

Means of subscription/provision
Supplementary service specific parameters
Service activation/deactivation
Means of specified period activation/deactivation
Means of parameter registration, interrogation and modification
Means of service invocation
Applicability to telecommunication services

N
I
S
N
N
N
all



Annex 4

CALLING LINE IDENTIFICATION PRESENTATION (CLIP)

1. DEFINITION

This supplementary service provides for the ability to indicate the ISDN number of the calling line with possible additional address information to the called party.

Note. The additional information may be a subaddress. Other items are for further study.

2. DESCRIPTION

- 2.1. The CLI, when subscribed to by an ISDN user, is applied for an agreed contractual period to all the incoming calls at the subscriber premises.

In a full ISDN environment, the calling line identity must include all the address information necessary to unambiguously identify the calling line; this information is generated by the network.

Moreover, the information on the calling line identity may include additional address information generated by the calling user and transparently transported by the network. The network is not responsible for the content of this additional address information.

At call set-up time the network delivers the calling line identity to the called party, when technically feasible and when complying with privacy, regardless of the terminal capability to handle the information.

2.2. Applicability

This supplementary service is applicable to all telecommunication services.

2.3. Terminology

Not applicable.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

This service will be provided after prearrangement with the Administration.

3.2. Withdrawal

This service will be withdrawn at the customer's request or for administrative reasons.

3.3. Registration

Not applicable.

3.4. Erasure

Not applicable.

3.5. Activation

This service will be activated by the Administration.

3.6. Deactivation

This service will be deactivated by the Administration.

3.7. Invocation

This service will be automatically invoked by the network in the call set-up phase.

3.8. **Normal operation with successful outcome**

The calling line identity is made up of a number of information units:

- the subscriber's national (ISDN-)number;
- the country code and possible other indications only for international calls;
- optionally, subaddress information, if explicitly provided by the calling user.

The additional information can be:

Sub-address, DDI, Terminal Selection.

Calling Customer Side

A calling customer can optionally insert his calling line identity at call request in accordance to the information units indicated in section 3.8.

Note. For the identification of an extension of a ISPX it will be necessary to insert at least the extension number.

Called Customer Side

A called CLI subscriber receives the call with the information indicated in section 3.8.

When the CLI cannot be delivered to the called subscriber the appropriate information (indicators) is provided.

No activation/deactivation procedure is necessary.

3.9. **Quality of Service**

Further study required.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging requirements**

It shall be possible to charge for this service on a subscription basis.

As a national option CLIP may not be charged separately (the charges then being included in the charges for the ISDN access).

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

The following exceptions may be encountered by customers who subscribe to this service:

- the calling customer has an agreement with the Administration that his identity must not be delivered to a third party (see Calling Line Identification Restriction supplementary service);
- in some interworking situations when the connection is not completely supported by common channel signalling;
- an international call where the originating network does not provide the CLI.

In these cases some information or the reason why the CLI is not available is given to the called ISDN user.

4.2. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Diversion Services**

When a call has been diverted and the new called subscriber (C) has been provided with CLI, then the calling party's number to be given to C should be the original calling party's number (A). As an option it should be possible to provide to C also the number of the diverting party (B).

6.2. **Calling Line Identification Restriction**

The calling line identification will not be presented if the calling user has an arrangement to inhibit the presentation of his number to the called party (calling user subscribes to the supplementary service "Calling Line Identification Restriction").

7. **INTERWORKING CONSIDERATIONS**

According to national network specific rules calling line identification may not be applicable, if at least one of the two parties is not an ISDN subscriber.

8. **OVERALL SDL**

To be completed.

9. **ATTRIBUTES AND VALUES OF ATTRIBUTES**

Means of subscription/provision	N
Supplementary service specific parameters	I, U
Service activation/deactivation	S
Means of specified period activation/deactivation	N
Means of parameter registration, interrogation and modification	N
Means of service invocation	N
Applicability to telecommunication services	all
Charging	S or F



Annex 5

CALLING LINE IDENTIFICATION RESTRICTION (CLIR)

1. DEFINITION

Calling line identification restriction is a supplementary service offered to the calling party to restrict presentation of the calling party's ISDN-number, possible with additional address information, to the called party.

Note. The additional address information may be a subaddress. Other items are for further study.

2. DESCRIPTION

2.1. Description

2.2. Applicability

This supplementary service is applicable to all telecommunication services.

2.3. Terminology

Not applicable.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

This service will be provided after prearrangement with the Administration.

3.2. Withdrawal

This service will be withdrawn at the customer's request or for administrative reasons.

3.3. Registration

Not applicable.

3.4. Erasure

Not applicable.

3.5. Activation

The service can be activated for a permanent period and/or on a per call basis.

3.6. Deactivation

This service will be deactivated by the Administration.

3.7. Invocation

This service will be automatically invoked by the network in the call set-up phase.

3.8. Normal operation with successful outcome

When CLI-restriction is applicable the originating network provides the destination network with a notification that the calling party's ISDN-number, possible with additional address information, is not allowed to be presented to the called party.

If the called user subscribes to CLI-presentation and the calling party has CLI-restriction applied, the called party shall receive an indication that the number is not available.

3.9. **Quality of Service**

Further study required.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging requirements**

It shall be possible to charge for this service on a subscription basis.

As a national option CLIR may not be charged separately (the charges then being included in the charges for the ISDN access).

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

Override category within an ISDN

Certain countries may define categories of subscribers that have the ability to override the presentation restriction and have the calling party's ISDN-number, possible with additional address information, presented (e.g. the police). The ability to have such override category is a national option.

Override category between ISDNs

When a call originates in one ISDN and destines in another ISDN and CLI-restriction is applied, the rules and regulations of the destination network (the host network) should apply. For example, if override category is not applicable in the originating network but in the destination network, a call with CLI-restriction applied can still be overridden in the destination network, whenever CLI-information is available for this network.

4.2. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Calling Line Identification Presentation**

Calling Line Identification Restriction will take precedence over CLI-presentation.

The only occasion when a user subscribing to CLI-presentation can take precedence over CLI-restriction is when the user has an override category. This is a national option.

6.2. **Call Waiting**

When CLI-restriction is applicable and activated, no number will be presented to a called user subscribing to call waiting.

6.3. **Call Completion to Busy Subscriber**

When CLI-restriction is applicable and activated, no number is presented at the original called interface following acceptance of a CCBS-recall.

6.4. **Diversion Services**

When CLI-restriction is applicable and activated, the calling party's ISDN-number will not be presented to the "forward-to" user unless this user has an override category. The latter is a national option.

6.5. **Credit Card Calling**

No interaction.

6.6. **Closed User Group**

It is an option to allow invocation of CLI-restriction in connection with a CUG call.

6.7. **City Wide Centrex**

For further study.

6.8. **Conference Call**

No interaction.

6.9. **Three Party Service**

No interaction.

6.10. **Call Transfer**

For further study.

6.11. **Direct Dialling In**

No interaction.

6.12. **Line Hunting**

No interaction.

6.13. **User-to-User Information**

For further study.

6.14. **Inband Tones and Announcements**

When CLI-restriction is applicable and activated any announcements to the called party of the calling party's ISDN-number is suppressed.

7. **INTERWORKING CONSIDERATIONS**

On calls to or via non-ISDNs, it cannot be assured that a CLI-restriction indication can be carried to the destination network. As a national option the originating network shall have the possibility to restrict that any information identifying the calling party is forwarded to the destination network when CLI-restriction is applicable. If a destination network receives a calling party's ISDN-number without any indication of presentation allowed or restricted, the destination network (the host network) will act according to its rules and regulations.

8. **OVERALL SDL**

To be completed.

9. **ATTRIBUTES AND VALUES OF ATTRIBUTES**

Means of subscription/provision	N
Supplementary service specific parameters	None
Service activation/deactivation	N, CC
Means of specified period activation/deactivation	N
Means of parameter registration, interrogation and modification	Not applicable
Means of service invocation	N, L
Applicability to telecommunication services	all
Charging	S or F

Annex 6

CLOSED USER GROUP

1. DEFINITION

The possibility for a group of users, connected to the ISDN, to intercommunicate only amongst themselves and, if required, one or more users may be provided with incoming/outgoing access to users outside this group.

2. DESCRIPTION

2.1. Description

2.1.1. This supplementary service provides various access arrangements to meet the needs of different 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 according to the requirements of each application. For example, the CUG facilities may be used to provide security of access to databases or to restrict outgoing Telephony access.

2.1.2. As far as the Basic Access is concerned a user may be a member of up to 100 Closed User Groups (CUGs) at the same time. The Primary Rate Access is for further study.

Note. The capability is for further study.

2.2. Applicability to Telecommunication Services

For further study.

2.3. Terminology

2.3.1. The basic CUG facility of forming groups with restricted access may be extended with the following allowed access arrangements for CUG members. This information will be held by the ISDN.

2.3.2. Outgoing Access

The CUG user can have an arrangement which allows outgoing access to all other non-CUG users and to those CUG users with Incoming Access. In addition users may explicitly request Outgoing Access. Thus the CUG basic facility of forming groups with restricted access may be extended to allow access to the "open" network and to customers of other CUGs having Incoming Access.

The Outgoing Access applies to the user and not to individual CUGs.

2.3.3. Incoming Access

The CUG user can have an arrangement which allows incoming access from all other non-CUG users and those CUG users who have explicitly requested Outgoing Access. Thus the CUG basic facility of forming groups with restricted access may be extended to allow access from the "open" network and from customers of other CUGs having outgoing access. Incoming access applies to the User and not to individual CUGs.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

3.1.1. Provision of the CUG facility requires an arrangement between the Administration and the user, and the approval of the management of the particular CUG. The user may apply for provision of any of the CUG facilities defined below:

i) CUG only Facilities

The user may make calls to, and receive calls from, members of those CUGs of which he is a member except where either incoming or outgoing call barring also applies in which case calls are restricted. Redirection of calls within the CUG is possible. No other calls will be allowed.

ii) CUG with Outgoing Access (CUG/OA)

All calls are allowed within the membership of the user's CUG except where either incoming or outgoing call barring also applies. In addition, this user can make calls to all other non-CUG users, and to those other CUG users who allow incoming access. This user has complete access to the network for outgoing calls but incoming calls are restricted to members of his CUG(s).

iii) CUG with Incoming Access (CUG/IA)

All calls are allowed within the membership of the user's CUG except where either incoming or outgoing call barring also applies. In addition, this user may receive calls from any non-CUG user and also from other CUG users who have outgoing access. This user has complete access from the network for incoming calls but outgoing calls will be restricted to members of his CUG(s).

iv) CUG with both Incoming and Outgoing Access

All calls are allowed within the membership of this user's CUGs except where either incoming or outgoing call barring also applies. In addition to this, this user may make calls to, and receive calls from, users who have no CUG facilities as well as members of other CUGs whose access arrangements permit it. This primarily allows a user to gain access to CUGs without placing any other restriction on his calls.

3.1.2. *Preferential CUG*

The network shall provide a Preferential CUG user facility whereby one of the user's CUGs (or only one if a single CUG applies) is used as a Preferential CUG. If a user without outgoing access sets up a call with no CUG facility request, the network assumes that the preferential CUG is required. If a user having outgoing access capability sets up a call with no CUG facility request, the network forwards the call as a CUG within the preferential CUG with the "OA allowed" information. The choice of preferential CUG will only be alterable by Administrative action.

3.1.3. *Outgoing calls barred within the CUG (OCB)*

This facility means that a subscriber is prohibited from calling other subscribers belonging to that CUG but may receive calls from them. This facility is given per subscriber and CUG.

3.1.4. *Incoming calls barred within the CUG (ICB)*

This facility means that a subscriber is prohibited from receiving calls from other subscribers belonging to that CUG. This facility is given per subscriber and CUG.

3.2. **Withdrawal**

Withdrawal of the CUG facility will be by the action of the Administration, at the request of the user or CUG management, or for Administrative reasons.

3.3. **Registration**

Registration of CUG membership is by action of the Administration following a request from the user and with the approval of the CUG management.

3.4. **Erasure**

Not applicable to this supplementary service.

3.5. **Activation**

Not applicable to this supplementary service.

3.6. **Deactivation**

Not applicable to this supplementary service.

3.7. **Invocation**

The CUG supplementary service is invoked by the network following a message requesting CUG facilities from the user. In order that a user may request a particular CUG, a CUG Index is included in any message requesting CUG facilities. The CUG Indices, which will be in the range 0 to 99, are allocated by prior arrangement with the Administration. Where preferential CUG applies no CUG Index is included in the call request.

3.8. **Normal Operation with successful outcome**

3.8.1. At the time of call set-up the user specifies a CUG Index to indicate that service to a particular CUG is required. This is achieved by the user including a CUG facility request and the relevant CUG Index in his call set-up message sequence.

On successful validation of a CUG request the network shall attempt to route the call to the required destination. Assuming that an ISDN route is available, the network shall execute its CUG checks in relation to the called user profile.

3.8.2. If the user sets up a call with no CUG facility request and has preferential CUG working, the network assumes that the preferential CUG is required. Outgoing Access allows CUG customers to make outgoing non-CUG calls. It also allows customers to make a specific Outgoing Access request in conjunction with a request for CUG calls. (Further study is needed.)

Normal call set-up procedures will apply to all CUG calls except that the network shall carry out internal checks to ascertain that the particular call is allowed between the parties concerned. Interlock codes are used within the network to perform the internal checks for each CUG.

Note. The CUG indices are not necessarily the same at each end of the call.

3.8.3. An incoming call from another CUG member will be indicated to the called CUG user with a CUG facility indication and the appropriate CUG Index.

3.8.4. An incoming call to a non-CUG user, assuming that the calling CUG user has specifically requested Outgoing Access, will contain no CUG related information in the call offering message.

3.8.5. An incoming call from a non-CUG user, assuming that the called CUG user has Incoming Access allowed, will contain no CUG related information in the call offering message.

3.8.6. An incoming call to a CUG/IA user from a CUG/OA user will normally contain no CUG related information in the call offering message (Ordinary call). However, in some cases the call offering message could contain either the CUG/OA or the CUG information depending on the calling user profile and on the call information at the originating side.

3.9. **Quality of Service**

For further study.

3.10. **Testing**

Not applicable to this supplementary service.

3.11. **Interrogation**

Not applicable to this supplementary service.

3.12. **Charging Requirements**

3.12.1. It shall be possible to charge a rental and initial connection charge for this service.

3.12.2. It shall be possible to charge normal call tariffs, or as an administration option to apply a different tariff scheme. This option is intended to allow the possibility of being able to apply such a scheme to CUG calls, for instance, which are frequent calls between a small number of destinations. (Further study is required.)

3.12.3. It shall be possible to charge for each addition or other amendment to the list of terminations within a CUG.

3.12.4. The implications of international call charges are for further study.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

4.1.1. On receipt of a CUG facility request the network shall check its validity in conjunction with the access capabilities contained in the user profile. If a non-valid request is received then the network shall reject the call and return an appropriate indication to the calling user.

4.1.2. Should the call fail due to the internal network CUG checks a clearing message shall be sent to the calling customer informing him that access is barred.

4.2. **Registration**
Not applicable.

4.3. **Erasure**
Not applicable.

4.4. **Activation**
None identified.

4.5. **Deactivation**
None identified.

4.6. **Invocation**
Not applicable.

4.7. **Testing**
Not applicable.

4.8. **Interrogation**
For further study.

4.9. **Charging Requirements**
For further study.

5. **ALTERNATE PROCEDURES**
None identified.

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**
For further study.

7. **INTERWORKING CONSIDERATIONS**
None identified.

8. **DYNAMIC DESCRIPTION OF SERVICE**
To be supplied.

9. **ATTRIBUTES**
The following attribute values apply to Closed User Group
Means of Subscription/Provision
Supplementary Service Specific Parameters
Service Activation/Deactivation
Means of Specified Period Activation/Deactivation
Means of Parameter Registration, Interrogation and Modification
Means of Service Invocation
Applicability to Telecommunications Services
Charging
Compatibility

Network Controlled
CUG Index
Specific Periods
Network Controlled
Network Controlled
Network Invocation
For further study

Further study

Annex 7

COMPLETION OF CALLS TO BUSY SUBSCRIBER

1. DEFINITION

Completion of Calls to Busy Subscriber (CCBS) allows a calling User A, encountering a busy destination B, to be notified when the busy destination B becomes not busy and to have the service provider reinitiate the call to the specified destination B if User A desires.

2. DESCRIPTION

2.1. Description

2.2. Applicability

This supplementary service is applicable to all telecommunication services.

2.3. Terminology

User A is defined as the specific device that:

- a) originated the call and requested the feature;
- b) is uniquely addressable for notification/recall.

Destination B: Is defined as whatever entity that was addressed in the original call set-up, i.e. this could be a specific device, or all devices identified by an entity (e.g. Hunt Group).

Destination B request queue Service Timer:

This timer specifies the amount of time that the network will wait before servicing a subsequent request in the queue to allow sufficient time for User A to respond to the recall plus time delay for messaging. The value of this timer is expected to be roughly equal to the CCBS Recall Timer plus 4 seconds for network messaging.

Retention Timer:

This timer specifies the amount of time the network retains the call information for the original call encountering busy. The duration of this timer is for further study.

CCBS Service Duration Timer:

This timer specifies the maximum length of time the service will be active within the network. The value of this period is a network option, typically 15-45 minutes.

CCBS Recall Timer:

This timer specifies the maximum length of time the network will wait for a User A response to a CCBS Recall. The value of this timer is expected to be between 0 and 15 seconds.

Destination B idle Guard Timer:

This timer specifies the amount of time the network will delay after Destination B has become not busy before initiating a CCBS Recall or Notification: B idle to User A. The value of this timer is expected to be in the order of 0 to 15 seconds.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

CCBS is provided by the Administration on a subscription basis.

3.2. Withdrawal

CCBS can be withdrawn at the subscriber's request or for administrative reasons.

3.3. Registration

Not applicable.

3.4. **Erasure**

Not applicable.

3.5. **Activation**

CCBS will be activated by the user on a per call basis.

3.6. **Deactivation**

Not applicable.

3.7. **Invocation**

This service will be automatically invoked by the network after User B has become not busy.

3.8. **Normal operation with successful outcome**

When User A encounters a busy destination, User A can invoke the supplementary service. If User A is allowed to use this service, the network will get the identification of the destination to be scanned/monitored from the information in the initial call request. This information is retained by the network for a defined period (Retention Timer) during which the User A may request CCBS on Party B. If User A requests CCBS on Party B, within this period, the service provider will acknowledge User's A request. This acknowledgement shall be one of the following types and may also inform the requesting user of the reason for denial when the service cannot be provided.

1. Confirmation CCBS request accepted and the service provider will inform User A when Party B is not busy.
2. Short Term Denial Temporary supplementary service incompatibility (see note) or system facility busy or out-of-service. A later attempt by the served user to invoke the same service may succeed.
3. Long Term Denial Request rejected and later attempt to invoke the same service will also be rejected.
4. Called Party Not Busy Called Party now not busy and the network will place the call if User A desires.

Note. A Temporary Supplementary Service incompatibility could exist if destination B has invoked a supplementary service which prohibits the invocation of CCBS against that destination.

User A can have a limited number of CCBS request outstanding. This limit (expected to be under 15) is for further study. All CCBS requests which exceed this limit will be rejected (i.e. Short Term Denial). After having placed a CCBS request, User A shall be able to receive and originate other calls.

Cancellation Procedures

User A can send any of the following three cancellation requests:

- 1) Cancel all outstanding CCBS requests.
- 2) Cancel the last CCBS request.
- 3) Cancel a specific CCBS request. This request must specify enough information to correlate with the initial invocation (e.g. specify a transaction identity or specify the terminating destination, originating destination and bearer capability).

When the CCBS request is accepted the CCBS Service Duration Timer which specifies the duration of the scanning/monitoring is started. The value of this period is a Service Provider option, typically 15-45 minutes. The service provider can optionally notify Destination B that he/she is being scanned for not busy state. When Destination B becomes not busy, for an optional period of time between 0 and 15 seconds (CCBS Recall Timer), the service provider will provide CCBS Recall in the following way:

The network will indicate CCBS Recall to User A informing him that Destination B is now free and will start the CCBS Recall Timer. In addition the service provider will reserve a path across the network, from the node serving User A to the node of Destination B, without completing call set-up. If User A initiates acceptance of the CCBS recall, the network will complete the call set-up to Destination B for User A using information retained within the network from the previous call.

If User A responds with rejection of the CCBS recall, the requested CCBS service will be cancelled.

If User A does not accept or reject the CCBS recall before the CCBS Recall Timer expires, the CCBS service will be cancelled.

Note. If User A is busy, some networks may after informing User A defer the CCBS Recall until User A becomes not busy. In such cases the reserved path is cancelled and the control of the service is transferred to exchange A.

When Party B becomes not busy, the network may reserve for a limited time the resources necessary to complete the CCBS call.

This reservation prevents incoming calls from being offered to B for a Short Time period (maximum of 20 seconds) after B has become not busy. If no outgoing call is made within 5-10 seconds then an indication is returned to User A informing him that B is now not busy. If during the remainder of this period Party B attempts an outgoing call, he will be informed that the network is attempting to set up a CCBS call. Party B may still proceed with his outgoing call or release the call to await the CCBS call.

If destination B is again busy when the call resulting from CCBS is set up, then User A has the option of invoking CCBS again.

Up to "N" CCBS requests can be queued against destination B. These requests should be handled on a first in, first out basis. When destination B becomes not busy, B's CCBS request queue will be serviced upon expiry of the destination B idle timer. After a CCBS request against destination B has been serviced (i.e. dequeued), the network will again wait a period of time (destination B request Q service timer) before again servicing destination B's request queue. The purpose of this delay is to allow User A sufficient time to respond. This time period should be roughly equal to the CCBS recall timer plus 4 seconds for network messaging.

When servicing the queue the following procedure applies: When User A is notified that B is not busy, User A's entry is removed from B's queue. After the Destination B request queue Service timer expires, the next number in B's queue will be serviced if B is still not busy. User A's entry will also be removed from the queue if:

- a) a call set-up is attempted between User A and Destination B, or
- b) User A's exchange requests cancellation of the entry, or
- c) the CCBS Duration Timer expires.

As a general principle, both Parties A and B should be kept advised of call situations at all relevant times.

3.9. **Quality of service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

User A should be able to interrogate the network, by the use of a control procedure, to ascertain the status of this service. In response to this interrogation the network will provide the user with the following information:

(A) In response to a general interrogation User A should be given a list of the numbers against which CCBS requests are outstanding.

(B) In response to a specific request concerning one particular number, User A should be informed whether or not that number has a CCBS request outstanding against it.

3.12. **Charging requirements**

CCBS may be charged with a rental fee and/or a per call basis.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

This service is automatically cancelled and User A is notified if:

Destination B is still busy after the CCBS timer expires.

User A does not accept the CCBS recall before the recall timer expires. (Proposed value of recall timer 20 seconds.)

Destination B invokes a service that conflicts with the existing CCBS invocation after CCBS has been queued.

4.2. to

4.5. Not applicable.

4.6. **Invocation**

This service may not be invoked, and the indications shown will be given if:

Busy/Not Busy status cannot be determined (Long Term Denial). CCBS is not allowed from User A's access (Short of Long Term Denial).

CCBS is not allowed to Destination B i.e. because of current services active or subscription parameters specified (Short of Long Term Denial).

Network resources are unavailable (Short Term Denial).

Destination B is not accessible via the appropriate signalling system (Long Term Denial).

The maximum number of CCBS requests permitted against Destination B has been reached (Short Term Denial).

User A requests CCBS on Destination B after the period in 2.1.1. has ended (Short Term Denial).

User A has reached the maximum number of CCBS requests permitted (Short Term Denial).

4.7. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Call Forwarding Unconditional (CFU)**

(a) CFU activated by B before A requests CCBS:

If the call to Destination B is forwarded to C by Call Forwarding Unconditional and C is busy, then a CCBS request if made by User A will be rejected. User A will be informed that the CCBS request has been rejected with Short Term Denial as the reason. If User A invoked CCBS and subsequently invoked Call Forwarding Unconditional, CCBS recall will be given to User A at his original location.

(b) CFU activated by B after A requests CCBS:

If Destination B invoked CFU after A requests CCBS then the CCBS request will be cancelled.

If User B activated CCBS and either already has activated, or subsequently activated, CFU then the CCBS recall will not be forwarded and will be given to User B at his original location.

Call Forwarding Busy (CFB):

It is assumed, in this case, that User A calls User B and that User B is busy and has CFB activated to C.

(a) When CFB is activated by B prior to A's request for CCBS on B.

If B has activated CFB and is busy and the forwarded-to User C is also busy then any subsequent CCBS request by A will be applied to the originally called User B.

- (b) When CFB is activated by B after A's request for CCBS on B.
If B has activated CFB after A's request for CCBS on B the CCBS recall will still be applied to the originally called User B.
- (c) When CCBS is activated by User B.
If User B activates CCBS and either has invoked or subsequently invokes CFB, then the CCBS recall will be given to B at his original location.

Call Forwarding No Reply (CFNR):

- (a) When CFNR is activated by B prior to A requesting CCBS on B.
If A calls B and the call is forwarded on no reply to C and C is then busy, any request by A for CCBS will be rejected with User A being given a Short Term Denial.
- (b) When CFNR is activated by B after A requests CCBS on B.
If User B activated CFNR after User A has requested CCBS on B, then the CCBS recall will be connected to the forwarded-to party C if it meets No Reply conditions at B.
- (c) When CCBS is activated by User B.
If User B invokes CCBS and either has invoked or subsequently invokes CFNR, the CCBS recall will be given to User B at his original location.

6.2. **Call Transfer**

No interaction identified.

6.3. **Conference Calling**

CCBS can be activated for any leg of a conference call. Conference calling can be invoked while a CCBS request is pending.

6.4. **User-to-User Signalling**

- (a) Calling User meets busy: No User-to-User Information (UUI) is stored by the network. The UUI can be included by the calling user in the CCBS recall.
- (b) Called User Situation: User-to-User signalling can apply as normal in association with the CCBS call that results from User B becoming not busy (it is assumed that the network does not store the original User-to-User signalling).

6.5. **Call Waiting**

No interactions identified at the called Destination B as these services are complementary.

6.6. **Outgoing Calls Barred**

Calling Party activates Outgoing Calls Barred prior to requesting CCBS: No interaction since CCBS is not permitted with Outgoing Calls Barred.

Calling Party activates CCBS prior to requesting Outgoing Calls Barred: For further study.

6.7. **Incoming Calls Barred (ICB)**

- (a) ICB activated at Called Party side: A busy condition is never returned in these circumstances, therefore no interaction can occur.
- (b) If Calling Party A invokes CCBS and subsequently activates Incoming Calls Barred: CCBS recall will be given to Party A.

6.8. **Line Hunting**

CCBS may be activated against a number in a Line Hunting Group. (For further study.)

6.9. **ISDN networking services**

For further study.

6.10. **Closed User Group**

No interaction.

6.11. **Calling Line Identification**

User to indicate to called party who is monitoring him/her and indicate to calling party who is recalling.
For further study.

7. **INTERWORKING CONSIDERATIONS**

When a CCBS service exists in two different networks which can determine busy/not busy status, the user will not perceive any difference in procedure.

When one of the two networks is not able to determine busy/not busy status, the CCBS request will be rejected.

8. **OVERALL SDL**

To be completed.

9. **ATTRIBUTES**

Means of subscription/provision	N
Supplementary service specific parameters	I, MSS
Service activation/deactivation	CC
Means of specified period activation/deactivation	N
Means of parameter registration, interrogation and modification	L
Means of service invocation	L
Applicability to telecommunication services	all

Annex 8

CONFERENCE CALLING, ADD-ON

1. DEFINITION

This supplementary service provides a user with the ability to have a multi-connection call, i.e. a simultaneous communication between more than two parties.

2. DESCRIPTION

2.1. Description

2.2. Applicability

This service is applicable for Telephony only.

2.3. Terminology

In the chapters that follow,

- User A is the served user, which also is the controller of the conference call.
- Other users are called conferees (parties).

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

The supplementary service is provided by prior arrangements with the service provider. The subscription parameters include the maximum number of conferees allowed in a conference call.

3.2. Withdrawal

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

3.3. Registration

Not applicable.

3.4. Erasure

Not applicable.

3.5. Activation

Not applicable.

3.6. Deactivation

Not applicable.

3.7. Invocation

In the idle state the served user can invoke a conference call with up to 10 conferees.

3.8. Normal operation with successful outcome

3.8.1. *Beginning the Conference Call from the idle state*

The served user must request the Conference Call service and the maximum number of conferees must be indicated in the request. A successful request will result in a conference bridge being reserved in the network for the number of parties that were indicated in the Conference Call request.

The connection to the conference bridge, after activation, may be put on hold, so that the first and subsequent conferees may be connected to the bridge.

This procedure is then repeated until all parties have been added to the conference call.

3.8.2. *Managing the Conference*

In principle all participants of the conference call should be informed by the network about the state of their calls whenever necessary.

In the active state of the conference, the served user has the following options:

- i) Put the conference on hold, i.e. put his own connection to the conference bridge on hold. The served user may make an enquiry call from this state. In this state the remaining parties in the conference can have communication with each other.
- ii) Create a private communication with one of the parties. This results in that party being split from the conference, the connection between the served user and the conference being placed on hold, and the conversation between the served user and the designated party being active. The remaining parties may have communication with each other in this state.
- iii) Terminate the entire conference.
- iv) Explicitly disconnect one or more of the parties on a one at a time basis.
- v) Negotiating of transfer of conference call control to another conferee. This user must subscribe to Conference Call. The now served user will also be charged for the remainder of the conference or until a new transfer of conference control occur. The controlling user cannot retire before transferring the conference call control to another conferee (*Note 1*).
- vi) Add another conferee, according to the described procedure, if the number of active parties do not exceed the maximum number of conferees specifically indicated in the conference call request.
- vii) Isolate a conferee. The conference controller can request that a specified party be prevented from communicating with the conference without being removed from it.
- viii) Reattach a conferee previously isolated or splitted.

Note 1. This facility is not required for the initial service introduction but may be a possible long term enhancement.

In the active stage any of the conferees can either:

- i) Put his connection to the conference bridge on hold. In this state the conferee may make an enquiry call.
- ii) Disconnect his connection to the conference bridge.

Notes.

1. If the served user clears by "hanging up", this is interpreted as a request for termination of the entire call.
2. If the conference is on hold and the served user clears by "hanging up", this is interpreted after a short time-out (typically 5 seconds) as a request for termination of the entire call. However, during the short time-out the served user is informed that the conference is still on hold, thus enabling the served user to retrieve the conference.
3. If the served user has a private communication with one of the parties and this party disconnects (hangs up), the party is disconnected and the conference call is automatically retrieved to the served user.

3.9. **Quality of service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

The served user should be able to interrogate the network during the active state of the conference for the status and identity of the conferees.

3.12. **Charging requirements**

For the provision of the service a rental fee and/or a per call charge may apply. Above this the served user is charged for all calls connected to the conference bridge regardless whether they are active or in the held state.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. to

4.5. Not applicable.

4.6. **Invocation**

If a user tries to invoke Conference Calling and the service provider cannot comply with that request, the service provider will deny the request and explain the reason for denial. Possible reasons for noncompliance are:

- Service not subscribed
- Resources cannot be allocated
- Subscriber (or intended conferee) restrictions not met

If the service provider cannot satisfy the request to add a further conferee (e.g. if the conference call has been cleared or if the maximum number of conferees allowed has already been reached) the served user will receive indication that the request is denied, with the reason for failure.

4.7. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURE**

Beginning the Conference Call from an active call:

The served user, who has an existing active call with a user requests the conference call service, indicating the maximum number of conferees and that the active call shall be a part of the conference call. No further alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Call Waiting**

The served user should be able to receive an indication of a waiting call whilst he is engaged in a conference call. The served user may put his connection to the conference on hold and subsequently answer the waiting call. The served user is not, however, allowed to add this call to the conference.

Any conferee should be able to receive an indication of a waiting call whilst he is engaged in a conference call. The conferee may put his connection to the conference on hold and subsequently answer the waiting call.

6.2. **Calling Line Indication**

No interaction.

6.3. **Direct Dialling In**

No interaction.

6.4. **Closed User Group**

All conferees must belong to the same CUG. When adding a new conferee, the CUG restrictions must be checked before the new conferee is allowed to enter the conference.

6.5. **User-To-User Signalling**

Conference Controller: UUI can be sent by the Conference Controller to any of the conferees. UUI can be received by the Conference Controller from any of the conferees.

Note. This assumes that each conferee can be uniquely identified.

The same limitations on the amount of UUI which can be transferred between two users apply to communications between the conference controller and any particular conferee.

Conferees: UUI can be sent to and received from the Conference Controller. Permitting UUI to be sent between conferees in association with the conference is not allowed.

6.6. **Sub-Addressing**

No interaction.

6.7. **Terminal Portability**

No interaction.

6.8. **Three-Party Service**

These two services may not be invoked at the same time by either the conference controller or any conferees.

6.9. **Called Line Identification**

No interaction.

6.10. **Diversion Services**

If the served user attempts to establish a conference call to a user that has Call Forwarding activated, and the appropriate forwarding conditions are met, the forwarded-to user will be alerted and can be added to the conference.

A call that has been forwarded to the Conference Controller cannot be added to the conference.

Conferee: No interaction.

6.11. **Call Completion to Busy Subscriber**

If the served user attempts to establish a call to a party and receives busy treatment, the served user may invoke CCBS to that customer, provided the served user has also subscribed to CCBS. When the served user is informed that the called party is idle, he/she may place the conference on hold, complete the CCBS call, and add that call to the conference.

When the served user has a conference call active, CCBS may be applied to his/her line. For determination of busy, the conference call appears the same as a two-party call.

6.12. **Terminal Selection**

No interaction.

7. **INTERWORKING CONSIDERATIONS**

The served user has to be an ISDN-subscriber. The conferees may belong to any PSTN.

8. **OVERALL SDL DIAGRAM**

To be completed.

9. **ATTRIBUTES**

Means of subscription/provision	N
Supplementary service specific parameters	I, MSS
Service activation/deactivation	CC
Means of specified period activation/deactivation	N
Means of parameter, registration, interrogation and modification	L
Means of service invocation	L
Applicability to telecommunication services	SP, AVD, TEL

Annex 9

DIRECT DIALING IN (DDI)

1. DEFINITION

This service enables a user to call directly to another user on an ISDN-Private Branch Exchange (ISPBX)/Centrex or other complex subscriber's installations, without attendant intervention.

This supplementary service is based on the use of the ISDN number and does not include sub-addressing.

2. DESCRIPTION

- 2.1. DDI can be realised when the last digits in the directory number of an ISPBX or other complex subscriber's installations correspond to the number of the destination. These last digits (fixed or variable length) are sent en-bloc or by overlap sending from the exchange to the ISPBX or to other complex subscriber's installations, which finally and automatically establishes a call to the destination without assistance of an operator.

The number lengths of DDI PABX are not necessarily known by their serving local exchanges nor by any other entity of the public network.

Note. The caller might not find the DDI-number in the public directory.

DDI number forms part of the international numbering plans, i.e. CCITT Recommendations E.163 for telephony network and E.164 for ISDN.

Both CCITT Recommendations provide the flexibility to the Administrations to use national numbering plans of fixed or variable number lengths. This flexibility also applies to DDI numbers, i.e. even within a given DDI PABX, numbers of different lengths may appear.

- 2.2. **Applicability to Telecommunication services**

This service is applicable to all telecommunication services.

3. NORMAL PROCEDURE WITH SUCCESSFUL OUTCOME

- 3.1. **Provision**

This service shall be provided after prearrangement with the Administration.

The Administration shall allocate a proper directory number set corresponding to the overall need of the ISPBX.

- 3.2. **Withdrawal**

The service shall be withdrawn on subscriber's request or for administrative reasons.

- 3.3. **Registration**

Not applicable.

- 3.4. **Erasure**

Not applicable.

- 3.5. **Activation**

The service will be activated by the Administration.

- 3.6. **Deactivation**

The service will be deactivated by the Administration.

3.7. **Invocation**

The service will be automatically invoked by the network.

3.8. **Normal operation with successful outcome**

A call to a number in the DDI numbering set shall be routed to the appropriate destination at the ISPBX. Call initiation procedures are the same as for the basic service. The calling and called users perceive the same completion procedures as for the basic service, without attendant intervention. Upon answer the calling user is connected to the called user designated by the ISDN number.

3.9. **Quality of service**

Further study required.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging requirements**

The charges may consist of an admission fee and of a rental charge based on:

- i) An element proportional to the number of exchange lines with DDI.
- ii) An element proportional to the number of destinations corresponding to the installed capacity of the ISPBX, even if not all of these destinations can be reached by DDI.

Call charges are a national matter.

4. **EXCEPTIONAL PROCEDURE OR UNSUCCESSFUL OUTCOME**

Incoming DDI calls to busy or absent destination users may be diverted to the ISPBX operator, if appropriate.

If a call is made by sending incomplete address information, the call will be released by time supervision within the public exchange. A corresponding time supervision within the ISPBX may be convenient.

Failures in the ISPBX causing inability to receive incoming calls should be signalled from the ISPBX to the public network by suitable means. The public exchange should return to callers the same indication as given on a call to a faulty subscriber's line.

4.2. to

4.9. Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

The following supplementary services are compatible with direct dialling in (*Note*):

- User-to-User Signalling
- Diversion Services
- Closed User Group
- City-Wide Centrex
- Call Waiting
- Completion of Calls to Busy Subscribers

- Calling Line Identification Presentation
- Calling Line Identification Restriction
- Line Hunting
- Three-Party Service
- Call Transfer
- Terminal Portability
- Conference Service
- Credit Card Calling
- Sub-Addressing

Note. In conjunction with DDI some of these supplementary services require actions to be taken by the ISPBX (or the other complex subscriber's installation).

7. **INTERWORKING CONSIDERATIONS**

No restrictions have been identified specific to DDI.

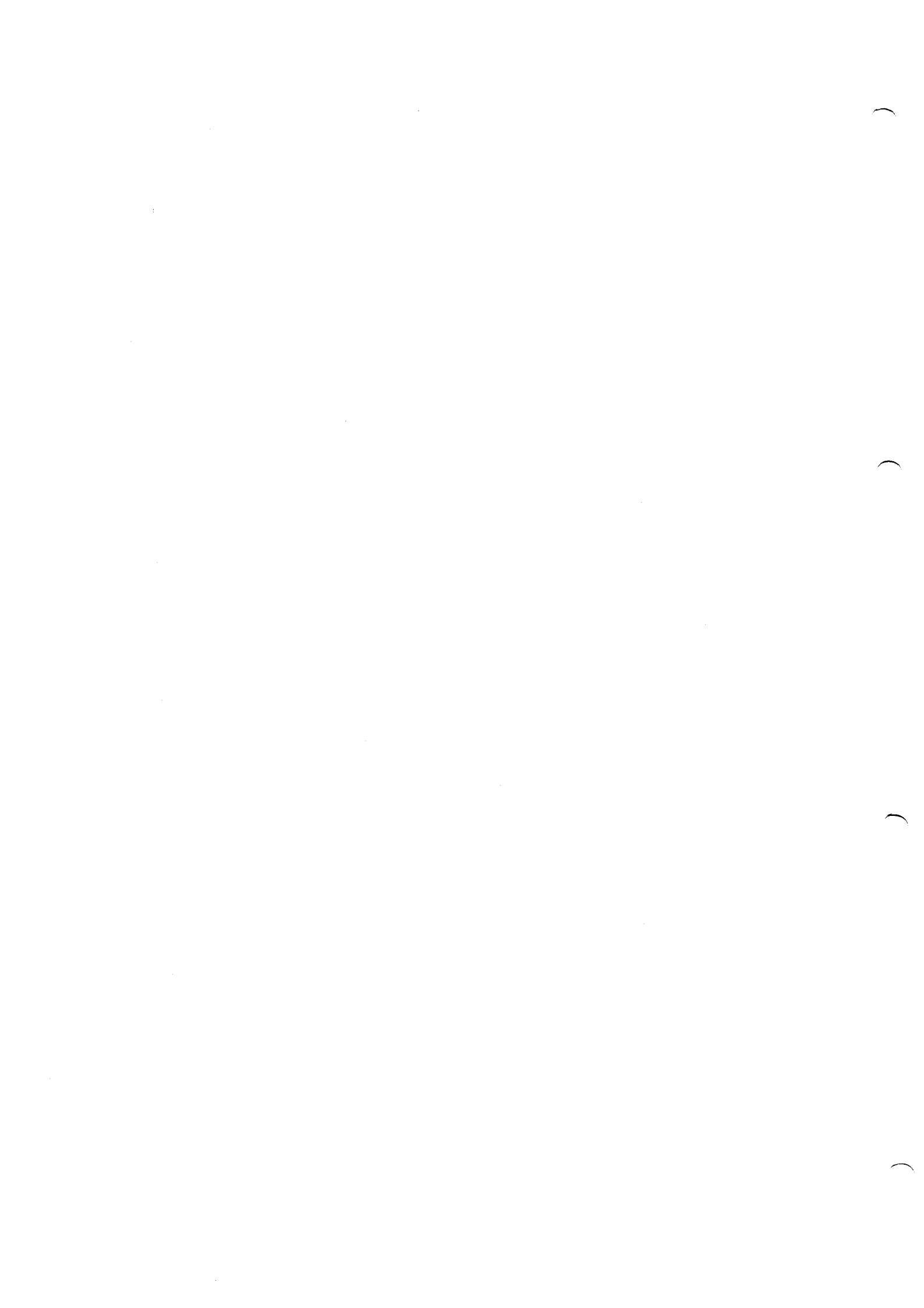
8. **DYNAMIC DESCRIPTION**

The dynamic description is as for a basic call control procedure.

9. **ATTRIBUTES**

- Means of subscription/provision
- Supplementary service specific parameters
- Service activation/deactivation
- Means of specified period activation/deactivation
- Means of parameter registration, interrogation and modification
- Means of service invocation
- Applicability to telecommunication services
- Charging

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Annex 10

CALL FORWARDING UNCONDITIONAL

1. DEFINITION

This service permits a served user to have the network send all incoming calls, or just those associated with a specified 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 for Call Forwarding based on condition (e.g. Call Forwarding Busy (CFB) and Call Forwarding No Reply (CFNR)).

In normal situations, the CFU 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 recognise multiple numbers on single interface; in addition, it may not understand a complete ISDN number (e.g. DDI). In these cases the CFU service is offered on the basis of the part of the ISDN number which the network can recognise.

2. DESCRIPTION

- 2.1. 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 (subscribe), or collectively for all the basic services to which the user(s) subscribes (subscribe). Since subscription is on an ISDN number basis, the same Call Forwarding subscriptions will apply to all terminals using this number.

An indication that the forwarding service is active on a number will be given to the forwarding customer each time an outgoing call is made.

Note 1. 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 could be possible for the user to specify, on activation, if the service is applicable to specific access or all accesses, associated with that installation.

Note 2. The use of ISDN address and/or other methods of terminal identification rather than ISDN number is for further study.

2.2. Applicability to Telecommunication Services

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

Call forwarding unconditional subscription is dependent on the parameter basic service. Possible values of this parameter are as follows:

Per ISDN number

Subscription Parameter	Value
Basic Service	— All Basic Services
	— One or more basic services

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

A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

2.3. Terminology

The following term is used in this definition:

A served user is a user of a particular ISDN number who is requesting that calls to his number be forwarded.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

The service can be offered with several 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 summarised below:

Subscription Options	Value
Allowable of Forwarded-to User Numbers	— All — Others FFS
Calls which may be forwarded	— All — Others FFS
Calling User Receives Notification their call has been forwarded	— No (<i>Note 2</i>) — Yes, with or without forwarded-to User Number
Schedule (<i>Note 1</i>)	— Time of Day — Day of Week — Specific Day

Note 1. The viability of this subscription option is FFS.

Note 2. The desirability of this option needs to be evaluated considering that users are always informed when calls are forwarded from ISDN to non-ISDN.

Note 3. The served user receives no notification that a call has been forwarded.

3.5. Activation

If the served user subscribes to Call Forwarding Unconditional (CFU), the served user will use an activation procedure.

To activate CFU, the served user must apply:

1. the forwarded-to number;
2. information as to whether all calls or all calls of a specified basic service should be forwarded;
3. the ISDN number for which CFU should apply (*Note 1*).

Note 1. Only required if there are multiple ISDN numbers allocated to the served user's interface.

When the served user activates CFU, the service provider will return notification of acceptance or rejection of the request. This notification will include the number of the forwarded-to user to whom the call forwarding is active. If a single number can be used by more than one terminal, activation of CFU will be possible from any terminal which is predesignated as having activation permission. Procedures for distinguishing between terminals which do not have activation permission are for further study.

Permitting a user to place a call to the forwarded-to user automatically upon activation of Call Forwarding (Courtesy Calling) is for further study.

3.6. Deactivation

CFU can be deactivated in either of two ways. The user can specifically deactivate the CFU activation. The user can activate CFU for the specified basic service to another number, thus causing the previous invocation of CFU to be overridden.

Remote activation/deactivation of CFU is for further study.

3.7. Invocation

When CFU is active, an incoming call to the served user will cause CFU to be invoked.

3.8. **Normal Operation with Successful Outcome**

When invoked all incoming calls will be forwarded without being offered to the served user.

The forwarded-to user will receive an indication that the call has been forwarded with the cause. The cause will be the appropriate forwarding condition. The forwarding-to user may, from the last forwarding user, receive identification of the served user's number.

If multiple forwarding is allowed, the forwarded-to user may receive the calling user's number, the original served user's number, and the last forwarding user's number.

When multiple forwarding occurs the reason for forwarding given to the forwarded-to user should relate to the last forwarding user in the chain.

As a subscription option, the served user can request that the calling user receive a notification that the call has been forwarded as an additional subscription option that notification can include the forwarded-to number. Restrictions on transfer of the forwarded-to user number to the calling user are for further study.

3.9. to

3.11. Not applicable

3.12. **Charging**

The forwarding user will be charged for the forwarded leg of the call.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.4. **Activation**

Call Forwarding Unconditional for all basic services and Call Forwarding of a particular basic service cannot be simultaneously activated.

If the system cannot accept an activation request, the served user should receive a notification that Call Forwarding activation was unsuccessful. Examples of possible causes are:

- i) service not subscribed
- ii) forwarded-to invalid ISDN number
- iii) use of an operator access prefix
- iv) insufficient information
- v) forwarded-to number is a special service code (e.g. police)
- vi) forwarded-to number is served user's number
- vii) others for further study

However, the network is not required to validate information related to the forwarded-to user.

4.5. **Deactivation**

If the network cannot accept a user's request for deactivation, cause will be returned to the user, such as: — incorrect origination ISDN number used

The CFU deactivation request must specify the basic service and the originator's ISDN number. If the user does not specify completely which CFU request is to be deactivated, the network will reject the deactivation request with appropriate cause.

If the network deactivates CFU without the served user having requested deactivation (e.g. when an exceptional condition occurs), the served user will receive notification along with the cause.

4.6. **Invocation**

Within an ISDN or tandem ISDNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 3 and 5. This is to prevent infinite looping.

If the limit of successive forwards of a call is reached and an attempt is made to forward the call an additional time, the ISDN calling party will receive call clearing with appropriate cause.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the call. Specifically, if CFU has been invoked, then the call would be cleared back to the originating exchange, 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.).

5. **ALTERNATE PROCEDURES**

None identified.

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Conference Calling**

Calling User: If a calling user attempts to establish a conference call to a user with call forwarding active, and the appropriate forwarding conditions are met, the forwarded-to user will be alerted and can be added to the conference.

Called User: No interaction.

Forwarded-to User: A Forwarded-to User can establish a conference using an existing forwarded call as one of the conference connections.

A call which has been forwarded can be added to a conference by the forwarded-to user.

6.2. **Completion of Calls to Busy Subscribers (CCBS)**

CCBS recalls are directed only to the activating station, regardless of whether Call Forwarding is active at that station.

Assume A calls B who has CFU activated (or activates CFU) to C.

CFU activated by B prior to A requesting CCBS on B:

If a call to B is forwarded to C by CFU and C is busy, then a CCBS request by A will be rejected. A will be informed that the CCBS request has been rejected with Short Term Denial as the reason.

CFU activated by B after A requesting CCBS on B:

If B activates CFU after A has requested CCBS on B, then the CCBS feature will remain active and the resulting call will be forwarded.

CCBS activated by B to other destination D:

If B activates CCBS to other destination D and either already has activated or subsequently activates CFU, CCBS recall will not be forwarded and will be given to User B at his original location.

6.3. **User-to-User Signalling**

Since Call Forwarding does not affect the served user's ability to make outgoing calls, a user with call forwarding activated can send and receive UUI in association with the setup of a new call.

Calls incoming to a User with Call Forwarding Unconditional Activated:

During Forwarding: Any UUI which accompanies the setup of the call will be forwarded along with the forwarded call if both the calling and forwarding (i.e. called) parties have subscribed to Service 1.

After Forwarding: If requested by the calling party and subscribed to by the forwarding (i.e. called) party, then the individual UTU service will be extended to be available for use between the calling party and the forwarded-to party. If the forwarding party has not subscribed to a particular UTU service the calling party will be informed that they can no longer employ that service on this call.

It should be possible for the forwarding party to inhibit UTU on the forwarded leg.

The procedures to be followed if transfer of charge is allowed are for further study.

6.4. **Call Waiting**

Calling User: No interaction.

Called User: If a called user has activated CFU, then the execution of that forwarding condition takes precedence over Call Waiting. CFU can be activated while a call is waiting without changing the state of the waiting call.

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

6.5. **Direct Dialling In**

No interaction.

6.6. **Closed User Group**

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. If the call is forwarded multiple times, CUG restrictions have to be met between the calling user and every intermediate forwarding user.

Calling User/Forwarded-to User: When a call is forwarded a new check of the CUG restrictions is made at the forwarded-to destination. The CUG information sent to the forwarded-to destination is the same CUG information that was sent from the originating network.

Forwarding (i.e. Called) User: Call forwarding can only be activated if CUG restrictions between the Called User and the Forwarded-to User are met.

6.7. **Calling Line Identification Presentation**

Forwarded-to User: Forwarded-to Users having subscribed to Calling Line Identification may receive the Calling User's Number. If subscribed to by the Called User, the Forwarded-to User may receive the Called User's Number when a call has been forwarded.

Forwarded-to Users, which have subscribed to CLI presentation, may receive the calling user's number if the calling user has not subscribed/invoked CLI restriction. In addition, Forwarded-to Users subscribing to CLI presentation may also receive the original called user's number and the last forwarding user's number. If either the calling user, original or final forwarding users has subscribed/invoked CLI restriction, then the customer's number will not be presented to the forwarded-to user (e.g. if A calls B1 who forwards A to B2 who forwards A to B3 who forwards A to C, then C will receive A, B1 and B3's number, unless A, B1 or B3 have restricted delivery).

6.8. **Calling Line Identification Restriction**

Calling User: When the Calling Line Identification Restriction is applicable and activated, the Calling Line Identification will not be presented to the Forwarded-to User unless both the forwarding and forwarded-to users have an override category. In addition, if the forwarding user has an override category, the calling party's number will be provided in the call offering information. The latter is a national option.

6.9. **Subaddress**

The subaddress associated with the original called party should not be forwarded if the call is forwarded. Call Forwarding activation may include a subaddress to be associated with the forwarded-to number.

6.10. **CFB**

CFU takes precedence over CFB.

6.11. **CFNR**

CFU takes precedence over CFNR.

6.12. **Call Deflection**

CFU takes precedence over Call Deflection.

7. **INTERWORKING CONSIDERATIONS**

If the forwarded-to number is not an ISDN number, then an interworking situation is said to exist.

If a forwarded call meets an interworking situation, then an interworking indication should be sent to the calling party.

When interworking with non-ISDN networks tones and announcements will be required.

The number of times a call has been forwarded once it has exited the Common Channel Signalling network may not be limited.

Exceptions are for further study.

8. **DYNAMIC DESCRIPTION**

For further study.

9. **ATTRIBUTES**

Means of Subscription Provision: N (by network), L (from base location), R (from remote location).

Supplementary Service Specific Parameters: I (ISDN number), TI (time information), U (user identification).

Service Activation/Deactivation: S (specified period).

Note. Activation/Deactivation by the user through the network may require special signalling arrangements.

Means of Specified Period Activation/Deactivation: N (by network), L (from base location), R (from remote location).

Means of Parameter Registration, Interaction and Modification: N (by network), L (from base location), R (from remote location) (*Note 1*).

Means of Service Invocation: N (by network).

Applicability to Telecommunication Services:

Basic Bearer Services

Basic Teleservices – No Constraints Yet Identified

(Note that call forwarding may be applied independently of any telecommunication service, or in relation with one or a list of telecommunication services.)

Charging: For further study.

Compatibility: For further study.

Note 1. Procedures to allow for Remote Call Forwarding are for further study.

Annex 11

CALL FORWARDING BUSY

1. DEFINITION

This service 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.

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 recognise multiple numbers on single interface; in addition, it may not understand 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 recognise.

2. DESCRIPTION

- 2.1. 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 (subscribe), or collectively for all the basic services to which the user(s) subscribes (subscribe). Since subscription is on an ISDN number basis, the same Call Forwarding subscriptions will apply to all terminals using this number.

Note 1. 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 could be possible for the user to specify, on activation, if the service is applicable to specific access or all accesses, associated with that installation.

Note 2. The use of ISDN address and/or other methods of terminal identification rather than ISDN number is for further study.

2.2. Applicability to Telecommunication Services

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

Call Forwarding Busy subscription is dependent on the parameter basic service. Possible values of this parameter are as follows:

Per ISDN number

Subscription Parameter	Value
Basic Service	— All Basic Services
	— One or more basic services

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

A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

2.3. Terminology

The following term is used in this definition:

A served user is a user of a particular ISDN number who is requesting that calls to his number be forwarded.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

The service can be offered with several 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 summarised below:

Subscription Options	Value
Allowable of Forwarded-to User Numbers	— All — Others FFS
Calls which may be forwarded	— All — Others FFS
Calling User Receives Notification their call has been forwarded	— No (<i>Note 2</i>) — Yes, with or without forwarded-to User Number
Schedule (<i>Note 1</i>)	— Time of Day — Day of Week — Specific Day

Note 1. The viability of this subscription option is FFS.

Note 2. The desirability of this option needs to be evaluated considering that users are always informed when calls are forwarded from ISDN to non-ISDN.

The served user receives no notification that a call has been forwarded.

3.5. Activation

If the served user subscribes to Call Forwarding Busy (CFB), the served user will use an activation procedure.

To activate CFB, the served user must supply:

1. the forwarded-to number;
2. information as to whether all calls or all calls of a specified basic service should be forwarded;
3. the ISDN number for which CFB should apply (*Note 1*).

Note 1. Only required if there are multiple ISDN numbers allocated to the served user's interface.

When the served user activates CFB, the service provider will return notification of acceptance or rejection of the request. This notification will include the number of the forwarded-to user to whom the call forwarding is active. If a single number can be used by more than one terminal, activation of CFB will be possible from any terminal which is predesignated as having activation permission. Procedures for distinguishing between terminals which do not have activation permission are for further study.

Permitting a user to place a call to the forwarded-to user automatically upon activation of Call Forwarding (Courtesy Calling) is for further study.

An indication that the forwarding service is active on a number, option will be given to the forwarding customer each time an outgoing call is made.

3.6. Deactivation

CFB can be deactivated in either of two ways. The user can specifically deactivate the CFB activation. The user can activate CFB for the specified basic service to another number, thus causing the previous invocation of CFB to be overridden.

Remote activation/deactivation of CFB is for further study.

3.7. Invocation

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 cause CFB to be invoked.

3.8. **Normal Operation with Successful Outcome**

When CFB is invoked the incoming call will be forwarded. In case of NDUB, the call is not offered to the served user.

The forwarded-to user will receive an indication that the call has been forwarded with the cause. The cause will be the appropriate forwarding condition. The forwarded-to user may, from the last forwarding user, receive identification of the served user's number.

When multiple forwarding occurs the reason for forwarding given to the forwarded-to user should relate to the last forwarding user in the chain.

If multiple forwarding is allowed, the forwarded-to user may receive the calling user's number, the original served user's number, and the last forwarding user's number.

The calling user may receive a notification that the call has been forwarded that notification may include the original called user number and the final forwarded-to number. Restrictions on transfer of the forwarded-to user number to the calling user are for further study.

3.9. to

3.11. Not applicable.

3.12. **Charging**

The forwarding user will be charged for the forwarded leg of the call.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. to

4.3. Not applicable.

4.4. **Activation**

Call Forwarding Busy for all basic services and Call Forwarding of a particular basic service cannot be simultaneously activated.

If the system cannot accept an activation request, the served user should receive a notification that Call Forwarding activation was unsuccessful. Examples of possible causes are:

- i) service not subscribed
- ii) forwarded-to invalid ISDN number
- iii) use of an operator access prefix
- iv) insufficient information
- v) forwarded-to number is a special service code (e.g. police)
- vi) forwarded-to number is served user's number
- vii) others for further study

However, the network is not required to validate information related to the forwarded-to user.

4.5. **Deactivation**

If the network cannot accept a user's request for deactivation, cause will be returned to the user, such as: — incorrect origination ISDN number used

The CFB deactivation request must specify the basic service and the originator's ISDN number. If the user does not specify completely which CFB request is to be deactivated, the network will reject the deactivation request with appropriate cause.

If the network deactivates CFB without the served user having requested deactivation (e.g. when an exceptional condition occurs), the served user will receive notification along with the cause.

4.6. **Invocation**

Within an ISDN or tandem ISDNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 3 and 5. This is to prevent infinite looping.

If the limit of successive forwards of a call is reached and an attempt is made to forward the call an additional time, the ISDN calling party will receive call clearing with appropriate cause.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the call. Specifically, if CFB has been invoked, then the call would be cleared back to the originating exchange, 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.).

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Conference Calling**

Same as CFU.

6.2. **Completion of Calls to Busy Subscribers (CCBS)**

Assume A calls B, B is busy and has call Forwarding Busy activated to C.

CFB activated by B prior to A requesting CCBS on B:

If B has activated CFB and is busy, and the forwarded-to user C is also busy, the user A may request CCBS. In this case, the CCBS request will be applied to the originally called user B.

CFB activated by B after A requesting CCBS on B:

The CCBS request remains active to the originally called user B.

CCBS activated by B:

If B activates CCBS and either has invoked, or subsequently invokes CFB, CCBS recall will be given to B at his original location.

6.3. **User-to-User Signalling**

Since Call Forwarding Busy does not affect the forwarding user's ability to make outgoing calls, a user with Call Forwarding Busy activated can send/receive UUI in association with the setup (and the clearing) of an outgoing call.

Calls incoming to a user with Call Forwarding Busy activated:

During Forwarding:

In the case of NDUB (Network Determined User Busy) condition, see Call Forwarding Unconditional; in the case of UDUB (User Determined User Busy) condition, any UUI which accompanies the setup of the call (Service 1) is delivered to the forwarding user with the normal call offering procedure and is not forwarded along with the forwarded call.

After Forwarding:

Same as for CFU.

6.4. **Call Waiting**

Calling User: Same as CFU.

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.

6.5. **Direct Dialling In**

No interaction.

6.6. **Closed User Group**

Same as CFU.

6.7. **Calling Line Identification Presentation**

Same as CFU.

6.8. **Calling Line Identification Restriction**

Same as CFU.

6.9. **Subaddress**

For further study.

6.10. **CFU**
CFU takes precedence over CFB.

6.11. **CFNR**
CFB takes precedence over CFNR.

6.12. **Call Deflection**
For further study.

7. **INTERWORKING CONSIDERATIONS**

If the forwarded-to number is not an ISDN number, then an interworking situation is said to exist.

If a forwarded call meets an interworking situation, then an interworking indication should be sent to the calling party.

When interworking with non-ISDN networks tones and announcements will be required.

The number of times a call has been forwarded once it has exited the Common Channel Signalling network may not be limited.

Exceptions are for further study.

8. **DYNAMIC DESCRIPTION**

For further study.

9. **ATTRIBUTES**

Means of Subscription Provision: N (by network), L (from base location), R (from remote location).

Supplementary Service Specific Parameters: I (ISDN number), TI (time information), U (user identification).

Service Activation/Deactivation: S (specified period).

Note. Activation/Deactivation by the user through the network may require special signalling arrangements.

Means of Specified Period Activation/Deactivation: N (by network), L (from base location), R (from remote location).

Means of Parameter Registration, Interaction and Modification: N (by network), L (from base location), R (from remote location) (*Note 1*).

Means of Service Invocation: N (by network).

Applicability to Telecommunication Services:

Basic Bearer Services

Basic Teleservices – No Constraints Yet Identified

(Note that call forwarding may be applied independently of any telecommunication service, or in relation with one or a list of telecommunication services.)

Charging: For further study.

Compatibility: For further study.

Note 1. Procedures to allow for Remote Call Forwarding are for further study.

Annex 12

CALL FORWARDING NO REPLY

1. DEFINITION

This service permits a served user to have the network send all incoming calls, or just those associated with a specified 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.

In normal situations, the CFNR 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 recognise multiple numbers on single interface; in addition, it may not understand a complete ISDN number (e.g. DDI). In the cases the CFNR service is offered on the basis of the part of the ISDN number which the network can recognise.

2. DESCRIPTION

- 2.1. 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 (subscribe), or collectively for all the basic services to which the user(s) subscribes (subscribe). Since subscription is on an ISDN number basis, the same Call Forwarding subscriptions will apply to all terminals using this number.

Note 1. 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 could 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.

Note 2. The use of ISDN address and/or other methods of terminal identification rather than ISDN number is for further study.

2.2. Applicability to Telecommunication Services

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

Call forwarding No Reply subscription is dependent on the parameter basic service. Possible values of this parameter are as follows:

Per ISDN Number

Subscription Parameter	Value
Basic Service	— All Basic Services — One or more basic services

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

A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

2.3. Terminology

The following term is used in this definition.

A served user is a user of a particular ISDN number who is requesting that calls to his number be forwarded.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

Two conditions of Call Forwarding No Reply (CFNR) are possible as follows:

- 1) the call is offered and no indication of a compatible terminal is received, or
- 2) the call is offered and an indication of a compatible terminal is received.

Only case two is considered herein. Case one is for further study.

The service can be offered with several 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 summarised below:

Subscription Options	Value
Allowable Forwarded-to User Number	— All (<i>Note 1</i>) — Others FFS
Calls which may be forwarded	— All — Others FFS
Calling User Receives Notification their call has been forwarded	— No (<i>Note 3</i>) — Yes, with or without forwarded-to User Number
Schedule (<i>Note 2</i>)	— Time of Day — Day of Week — Specific Day

Note 1. Permitting a user to subscribe to the value «All» in association with CFNR could result in a calling user hearing ringing and then busy.

Note 2. The viability of this subscription option is FFS.

Note 3. The desirability of this option needs to be evaluated considering that users are always informed when calls are forwarded from ISDN to non-ISDN.

The served user receives no notification that a call has been forwarded.

3.2. to

3.4. Not applicable.

3.5. **Activation**

If the served user subscribes to Call Forwarding No Reply (CFNR), the served user will use an activation procedure.

To activate CFNR, the served user must supply:

1. the forwarded-to number;
2. information as to whether all calls or all calls of a specified basic service should be forwarded;
3. the ISDN number for which CFNR should apply (*Note 1*).

Note 1. Only required if there are multiple ISDN numbers allocated to the served user's interface.

When the served user activates CFNR, the service provider will return notification of acceptance or rejection of the request. This notification will include the number of the forwarded-to user to whom the call forwarding is active. If a single number can be used by more than one terminal, activation of CFNR will be possible from any terminal which is predesignated as having activation permission. Procedures for distinguishing between terminals which do not have activation permission are for further study.

Permitting a user to place a call to the forwarded-to user automatically upon activation of Call Forwarding (Courtesy Calling) is for further study.

An indication that the forwarding service is active on a number will be given to the forwarding customer each time an outgoing call is made.

3.6. **Deactivation**

CFNR can be deactivated in either of two ways. The user can specifically deactivate the CFNR activation. The user can activate CFNR for the specified basic service to another number, thus causing the previous invocation of CFNR to be overridden.

Remote activation/deactivation of CFNR is for further study.

3.7. **Invocation**

If a served user has subscribed to Call Forwarding No Reply (CFNR), incoming calls will be offered to the user. If the served user does not reply within a time t interval, Call Forwarding No Reply will be invoked. Where t is between 5 and 30 seconds.

3.8. **Normal Operation with Successful Outcome**

When invoked the incoming call will be forwarded. The served user will be informed that the call has been forwarded.

The forwarded-to user will receive an indication that the call has been forwarded with the cause. The cause will be the appropriate forwarding condition. The forwarded-to user may, from the last forwarding user, receive identification of the served user's number.

If multiple forwarding is allowed, the forwarded-to user may receive the calling user's number, the original served user's number, and the last forwarding user's number.

The calling user may receive a notification that the call has been forwarded and that notification may include the original called user's number and the final forwarded-to number. Restrictions on transfer of the forwarded-to user's number to the calling user are for further study.

3.12. **Charging**

The forwarding user will be charged for the forwarded leg of the call.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. to

4.3. Not applicable.

4.4. **Activation**

Call Forwarding No Reply for all basic services and Call Forwarding of a particular basic service cannot be simultaneously activated.

If the system cannot accept an activation request, the served user should receive a notification that Call Forwarding activation was unsuccessful. Examples of possible causes are:

- i) service not subscribed
- ii) forwarded-to invalid ISDN number
- iii) use of an operator access prefix
- iv) insufficient information
- v) forwarded-to number is a special service code (e.g. police)
- vi) forwarded-to number is served user's number
- vii) others for further study

However, the network is not required to validate information related to the forwarded-to user.

4.5. **Deactivation**

If the network cannot accept a user's request for deactivation, cause will be returned to the user, such as:
— incorrect origination ISDN number used

The CFNR deactivation request must specify the basic service and the originator's ISDN number. If the user does not specify completely which CFNR request is to be deactivated, the network will reject the deactivation request with appropriate cause.

If the network deactivates CFNR without the served user having requested deactivation (e.g. when an exceptional condition occurs), the served user will receive notification along with the cause.

4.6. **Invocation**

Within an ISDN or tandem ISDNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 3 and 5. This is to prevent infinite looping.

If the limit of successive forwards of a call is reached and an attempt is made to forward the call an additional time, the calling party will receive call clearing with appropriate cause.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the call. Specifically, if CFNR has been invoked, and in-band ringing tone is applied at the forwarding exchange, then only the second leg of the call would be cleared and the calling party would continue to receive in-band ringing tone.

5. **ALTERNATE PROCEDURES**

None identified.

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Conference Calling**

Calling User: If a calling user attempts to establish a conference call to a user with call forwarding active, and the appropriate forwarding conditions are met, the forwarded-to user will be alerted and can be added to the conference.

Called User: No interaction.

Forwarded-to User: A Forwarded-to User can establish a conference using an existing forwarded call as one of the conference connections.

A call which has been forwarded can be added to a conference by the forwarded-to user.

6.2. **Completion of Calls to Busy Subscribers (CCBS)**

Assume A calls B, B does not reply and has Call Forwarding No Reply activated to C.

CFNR activated by B prior to A requesting CCBS on B:

If a call to B is forwarded on no reply to C and C is busy, then a CCBS request will be rejected. User A will be informed that a CCBS request has been rejected with Short Term Denial as the reason.

CFNR activated by B after A request CCBS on B:

If B activates CFNR after A has requested CCBS on B, then the CCBS callback call will be connected to the forwarded-to party C when meeting no reply at B.

CCBS activated at B:

If B activates CCBS and either has activated, or subsequently activates CFNR, CCBS recall will be given to B at his original location.

6.3. **User-to-User Signalling**

Since Call Forwarding No Reply does not affect the forwarding user's ability to make outgoing calls, a user with Call Forwarding No Reply activated can send/receive UUI in association with the setup (and the clearing) of an outgoing call.

Calls incoming to a user with Call Forwarding No Reply activated:

During Forwarding

Any UUI which accompanies the call setup of the call (Service 1) is delivered to the forwarding user with the normal call offering procedure and is not forwarded along with the forwarded call.

After Forwarding

Same as for Call Forwarding Unconditional.

6.4. **Call Waiting**

For further study.

6.5. **Direct Dialling In**

No interaction.

6.6. **Closed User Group**

Same as CFU.

6.7. **Calling Line Identification Presentation**

Same as CFU.

6.8. **Calling Line Identification Restriction**

Same as CFU.

6.9. **CFU**

CFU takes precedence over CFNR.

6.10. **CFB**

CFB takes precedence over CFNR.

6.11. **Call Deflection**

Call Deflection takes precedence over CFNR.

6.12. **Subaddress**

Same as CFU.

7. **INTERWORKING CONSIDERATIONS**

If the forwarded-to number is not an ISDN number, then an interworking situation is said to exist.

If a forwarded call meets an interworking situation, then an interworking indication should be sent to the calling party.

When interworking with non-ISDN networks tones and announcements will be required.

The number of times a call has been forwarded once it has exited the Common Channel Signalling network may not be limited.

Exceptions are for further study.

8. **DYNAMIC DESCRIPTION**

For further study.

9. **ATTRIBUTES**

Means of Subscription Provision: N (by network), L (from base location), R (from remote location).

Supplementary Service Specific Parameters: I (ISDN number), TI (time information), U (user identification).

Service Activation/Deactivation: S (specified period).

Note. Activation/Deactivation by the user through the network may require special signalling arrangements.

Means of Specified Period Activation/Deactivation: N (by network), L (from base location), R (from remote location).

Means of Parameter Registration, Interaction and Modification: N (by network), L (from base location), R (from remote location) (*Note 1*).

Means of Service Invocation: N (by network).

Applicability to Telecommunication Services

Basic Bearer Services

Basic Teleservices — No Constraints Yet Identified

(Note that call forwarding may be applied independently of any telecommunication service, or in relation with one or a list of telecommunication service(s).)

Charging: For further study.

Compatibility: For further study.

Note 1. Procedures to allow for Remote Call Forwarding are for further study.



Annex 13

SUB-ADDRESSING

1. DEFINITION

This supplementary service allows the served user to expand his addressing capacity beyond the one given by the ISDN number. A sub-address, if presented by a calling user, is delivered unaffected to the called (served) user. Only the served user defines the significance of the sub-address.

So the called user can give some supplementary possibilities to his calling users if he has previously initiated them into this fact. The most common applications will be:

1. to select or to prefer a specific terminal at the called customer's termination, as well as
2. to invoke a specific process in a terminal at the called customer's termination.

Note. This second use of sub-addressing is considered as having lower priority of implementation and will not be dealt with in the initial base. However, interworking compatibility between terminals should be supported in any case.

2. DESCRIPTION

2.1. Size of sub-address

A sub-address of up to 4 characters/octetets should be used for the first implementation. However there is a long term requirement to have a sub-address of 40 digits/20 octets for OSI compatibility.

2.2. Applicability

Sub-addressing is applicable to all Telecommunication services, for communications between ISDN subscribers.

2.3. Terminology

MALSAN (Maximum Authorized Length of Sub-address Accepted by Network): is the maximum number of sub-address octets that the network is able to accept and transmit.

Note 1. As described above, 4 characters are the value of MALSAN for the first implementation. This could be changed to a greater value at a later date and then be dependent on the requested telecommunication service.

Note 2. In practice, the originating exchange may apply one value in accordance with its own possibilities and a second value, which is more restrictive, may appear at another point in the network. This would e.g. occur in some cases of international communications. For any fixed communication, the real value of MALSAN parameter will be the shortest length accepted by all crossed exchanges.

MALSACS (Maximum Authorized Length of Sub-address for Any fixed Called Subscriber): is the maximum number of characters that will be sent to a called subscriber's installation according to his own prearrangement with the Administration.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

— Calling subscriber

For calling subscriber provision is without any arrangement with the Administration. However, a prior arrangement might be introduced for exceeding initial value (4 characters) of the MALSAN parameter.

— Called subscriber

For called subscriber provision may be general without any arrangement or by prior arrangement with the Administration; and in the second case this will define the MALSACS parameter.

Note. An Administration may apply a standard value of MALSACS to all subscribers.

3.2. **Withdrawal**

Withdrawal is done by the Administration at the subscriber's request or for administrative reasons.

3.3. **Registration**

Not applicable to the user-network interface and provided by an appropriate user-terminal procedure (because sub-address is stored within the terminal).

3.4. **Erasure**

Not applicable to the user-network interface and provided by an appropriate user-terminal procedure (because sub-address is stored within the terminal).

3.5. **Activation**

Not applicable.

3.6. **Deactivation**

Not applicable.

3.7. **Invocation**

The service is invoked by the calling user in the call setup phase.

3.8. **Normal operation with successful outcome**

Calling user side

- During the call setup phase the calling user inserts the sub-address information which is then transported transparently by the network from the originating exchange to the destination exchange.
- During the call setup procedure the calling terminal can also insert its own sub-address to complement the calling number identification generated by the network (see supplementary service "Calling Line Identification Presentation").

Called user side

- The sub-address that complements the called user's ISDN number is transferred transparently through the network and sent from the destination exchange to the called user installation.
This sub-address information is used by the called user's terminal in association with the requested service indications to check their ability to accept the incoming call. In the case where sub-address is not included by the calling user, the destination exchange always provides a normal call offering to the called user termination (except where other supplementary services apply).
- The called user's terminal which is finally selected for the incoming call can also insert its own sub-address in the response to complement the called number identification that may be generated by the network (see supplementary service "Called Line Identification").

3.9. **Quality of service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable to the user-network interface and provided by an appropriate user-terminal procedure (because sub-address is stored within the terminal).

3.12. **Charging requirements**

In case of usage based charging:

- Outgoing calls: when dialling a sub-address no more than 4 characters (initial value of MALSAN) will ever be charged to the calling subscriber. However, if a longer sub-address will be accepted at a later date, some of them could be charged to the calling subscriber according to each Administration's own policy in this matter. Then implications for international call charges would be subject to further study.
- Incoming calls: each Administration may charge the called subscriber according to its own charging policy each time the network presents a call with no empty sub-addressing information to his installation, particularly when the called subscriber does not respond.

To avoid misuse of information transfer, call attempts could be chargeable.

Further study is required.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

If provision of sub-addressing requires a prearrangement with the Administration and if the called user has not subscribed to the supplementary service, the network will not send a called user's sub-address with the incoming call message.

If provision of sub-addressing requires a prearrangement with the Administration and if the calling user has not subscribed to the supplementary service, the network will discard the calling user's sub-address received within the call setup message.

Sub-address has no significance for Called party

When sub-address information is used directly by terminals inside the called user's installation, any value without operational significance is unknown and the incoming call can be rejected.

But when the called user's installation is more intelligent (e.g. PABX) pertinent actions may be engaged to reach a successful result for the incoming call (e.g. forwarding to another terminal...).

Sub-address is too long

Every sub-address exceeding the MALSAN value will be cut down accordingly.

If the sub-address length exceeds the MALSACS value prearranged with the called subscriber, none of the sub-address information will be sent to the called subscriber's installation as if this was erased by the network. No particular indication will be returned to the calling user.

4.2. **Registration**

Not applicable.

4.3. **Erasure**

Not applicable.

4.4. **Activation**

Not applicable.

4.5. **Deactivation**

Not applicable.

4.6. **Invocation**

Not applicable.

4.7. **Testing**

Not applicable.

4.8. **Interrogation**

Not applicable.

4.9. **Charging requirements**

Not applicable.

5. **ALTERNATE PROCEDURES**

No alternate procedures are identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Call Waiting**

Sub-addressing can be used in conjunction with Call Waiting. The sub-address is included in the call offering message.

6.2. **Calling Line Identification Presentation**

An ISDN user can subscribe to both sub-addressing and CLIP and both services can be used for an incoming call without interaction.

If the calling user subscribes to sub-addressing and the called user subscribes to CLIP, both the calling party sub-address, if provided by the calling user, and the calling party number are presented to the called user. Sub-address information inserted by calling terminal to complement calling user identification is not checked by the network which is not responsible for the content of this information.

6.3. **Calling Line Identification Restriction**

If CLIR applies, the calling party sub-address, if provided by the calling user, is not delivered to the called party.

6.4. **Direct Dialling In**

No interaction.

6.5. **Closed User Group**

No interaction.

6.6. **Terminal selection**

No interaction. Sub-address can complement Terminal selection. The appropriate use of their combination is a user responsibility.

6.7. **User-to-user signalling**

No interaction.

6.8. **Terminal portability**

No interaction.

6.9. **Three party service**

No interaction.

6.10. **Advice of charges**

No interaction.

6.11. **Called line identification**

If the called user subscribes to sub-addressing and the calling user subscribes to Called Line Identification, both the called party sub-address, if provided by the called user, and the called party number are presented to the calling user.

Sub-address information inserted by called terminal to complement called user identification is not checked by the network which is not responsible for the content of this information.

6.12. **Malicious Call Identification**

For further study.

6.13. **Conference call**

No interaction.

6.14. **Freephone**

For further study.

6.15. **Call forwarding unconditional**

The sub-address associated to the original called party should not be forwarded if the call is forwarded. Call forwarding activation may include a sub-address to be associated with the forwarded-to number.

6.16. **Call forwarding busy**

The sub-address associated to the original called party may be delivered to this called party (if a Network Determined User Busy condition does not occur) and should not be forwarded if the call is forwarded. Call forwarding activation may include a sub-address to be associated with the forwarded-to number.

6.17. **Call forwarding no reply**

The sub-address associated to the original called party is delivered to this called party and should not be forwarded if the call is forwarded. Call forwarding activation may include a sub-address to be associated with the forwarded-to number.

6.18. **Call deflection**

The sub-address associated to the original called party is delivered to this called party and should not be forwarded if the call is forwarded. A sub-address can be part of the forwarded-to address (if registered in the called user installation in association with the forwarded-to number).

6.19. **Completion of Calls to Busy Subscriber**

The sub-address of the calling terminal, if provided in the initial call setup, could be used to select this originating terminal when notifying/recalling the calling user. Further study is required.

7. **INTERWORKING CONSIDERATIONS**

According to national network specific rules, sub-addressing may not be applicable if at least one of the two parties is not an ISDN subscriber.

8. **OVERALL SDL**

The dynamic description is as for basic call control procedures.

9. **ATTRIBUTES**

9.1. **Means of Subscription/Provision**

N (Network controlled).

9.2. **Supplementary Service Specific Parameters**

MALSAN (Maximum Authorized Length of Sub-address Accepted by Network): 4 characters for the first implementation.

MALSACS (Maximum Authorized Length of Sub-address for Any fixed Called Subscriber): 4 characters for the first implementation.

9.3. **Service Activation/Deactivation**

S (Specified period): the service is activated for the subscription period and is available on a call-by-call basis.

9.4. **Means of Specified Period Activation/Deactivation**

N (Network controlled).

9.5. **Means of Parameters Registration, Interrogation and Modification**

U (User controlled, within the user installation) for sub-address; there is no user-network procedure.

N (Network controlled) for MALSAN and MALSACS.

9.6. **Means of Service Invocation**

L (User invocation, local).

Sub-address completing the called number: the calling user dials sub-address information as a complement of the called number.

Sub-address completing identification: the terminal sending its own identification automatically inserts the sub-address information which is stored in it.

9.7. **Applicability to Telecommunication Services**

All (all Telecommunication services).

9.8. **Charging**

S (Subscription based) or, as a national option, either

F (Free of charge) or U (Usage based).

Annex 14

TERMINAL PORTABILITY SUPPLEMENTARY SERVICE

1. DEFINITION

This supplementary service allows a user to move a terminal from a socket to another within one given access installation during the established state of a call.

The portability of a terminal during the idle state is part of the basic access capabilities and does not require any user procedure.

The portability of a terminal in the call establishment and in the call clearing phases is not possible. The portability of a terminal during alerting (in called subscriber termination) is for further study.

2. DESCRIPTION

- 2.1. The service is intended for application to the basic interface structure; its possible use for primary access is for further study.

A terminal in the active state can be moved from a socket to another provided that an appropriate signalling procedure is performed. Such procedure is based on the suspension of the call, before the terminal is unplugged, and the resumption of the call, after the terminal is plugged again. This procedure is applicable both to calling and called side.

Moreover, this supplementary service allows a user:

- to replace a terminal by another compatible terminal at the same socket during the call established phase
- to move from one terminal to another compatible terminal within a basic access installation during the call established phase
- to suspend an established call and to resume it subsequently at the same terminal and the same socket

2.2. Applicability to Telecommunication Services

The Terminal Portability applies to interactive telecommunication services requiring the attendance of a human being, such as telephony, videotelephony, videotex, audiovideotex, and so on.

The relative terminals should provide at the man/machine interface the capabilities for:

- suspension of the call
- resumption of the call
- indication of the phase of the call (i.e. established phase and suspended phase) as long as the terminal remains plugged in

The Terminal Portability does not apply to non-interactive services such as facsimile, teletex, mixed-mode, computer communication, and so on. The relative terminals should not provide for the above-mentioned capabilities.

It is a user responsibility to resume the call by a terminal which is compatible both with the remote terminal and with the type of connection previously established.

3. NORMAL PROCEDURE WITH SUCCESSFUL OUTCOME

3.1. Provision

This service may be provided by prior arrangement with the Administration or be available on a general basis.

3.2. Withdrawal

Withdrawal will be at the request of the customer or for administrative reasons.

3.3. Registration

- 3.4. **Erasure**
- 3.5. **Activation**
- 3.6. **Deactivation**
- 3.7. **Invocation**

3.8. **Normal operation with successful outcome**

This section refers to the portability of a terminal in the call established phase.

A user wishing to move a terminal has to suspend the call by sending proper message with optionally a call identity limited to two characters. The network, when receiving this message, performs the following actions:

- stores the call identity value if specified (if no call identify is specified the network allocates a null value)
- reserves the B channel involved in the connection until the call is resumed or an appropriate timeout expires. This timeout should be selectable by the Administration from 2 to 15 minutes. However, from a service point of view, 3 minutes would appear to be acceptable, especially as the suspended call is still being charged
- holds the connection
- sends an acknowledgement to the controlling user

The terminal, upon receiving the acknowledgement message, informs the user that he can physically disconnect it.

After plugging in the terminal again, the user can resume, within the appropriate timeout, the call by sending a message (if no call identity was specified, it is not mandatory to specify the call identity in the resumption message). On reception of the resumption message the actions are taken by the network:

- re-establishment of the call
- sending an acknowledgement message to the user

- 3.9. **Quality of service**
- 3.10. **Testing**
- 3.11. **Interrogation**
- 3.12. **Charging requirement**

It would be possible to charge for this service on a subscription basis.

As a national option Terminal Portability may not be charged separately (the charges then being included in the charges for the ISDN access).

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

The network, if not able to satisfy either the suspension or the resumption of a call, may reject the requests sending an appropriate indication.

If the controlling user does not resume within the specified timeout, the call will be released by the network. A subsequent resume request will be rejected by the network with an appropriate indication.

If the remote user releases the call during the held state, a subsequent resume request by the controlling user will be rejected by the network with an appropriate information.

- 4.2. **Registration**
- 4.3. **Erasure**
- 4.5. **Activation**

- 4.6. **Deactivation**
- 4.7. **Invocation**
- 4.8. **Testing**
- 4.9. **Interrogation**
- 4.10. **Charging requirements**

5. **ALTERNATE PROCEDURES**

No alternate procedures have been identified.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

The following supplementary services are compatible with Terminal Portability:

- Diversion Services
- Closed User Group
- City-Wide Centrex
- Completion of Call to Busy Subscribers
- Calling Line Identification Presentation
- Calling Line Identification Restriction
- Line Hunting
- Three Party Call
- Call Transfer
- Conference Services
- Credit Card Calling
- Sub-addressing

The following supplementary services cannot be supported during the call suspended state of Terminal Portability Supplementary service:

- User-to-User Signalling
- Call Waiting

7. **INTERWORKING CONSIDERATIONS**

Not applicable as the Terminal Portability supplementary service has only local significance.

8. **OVERALL SDL**

See overall SDL-Diagrams (Figures 14.1 and 14.2 (T/SF 31-07)).

9. **ATTRIBUTES**

9.1. **Means of Subscription/Provision**

N (Network Controlled).

9.2. **Supplementary Service Specific Parameters**

TI (Timer for supervision of suspend-resume period)

CI (Call Identity)

MNSC (Maximum Number of Suspended Calls) provisional default value: identical to the number of communication channels available at the interface, i.e. two for the basic access.

9.3. **Service Activation/Deactivation**

S (Specified Period).

- 9.4. **Means of Specified Period Activation/Deactivation**
N (Network controlled).
- 9.5. **Means of Parameter Registration, Interrogation and Modification**
N (Network controlled) for TI and MNSC (see 9.2.).
L (User Controlled, local) for CI (see 9.2.).
- 9.6. **Means of Service Invocation**
L (User Invocation, local)
- 9.7. **Applicability to Telecommunication Services**
TEL (Telephony)
VDX (Videotex)
ADX (Audiovideographic)
AGC (Audiographic)
TLC (Teleconference)
VTL (Videotelephony)
- 9.8. **Charging**
S (Subscription based), or
F (Free or charge).
For further study.

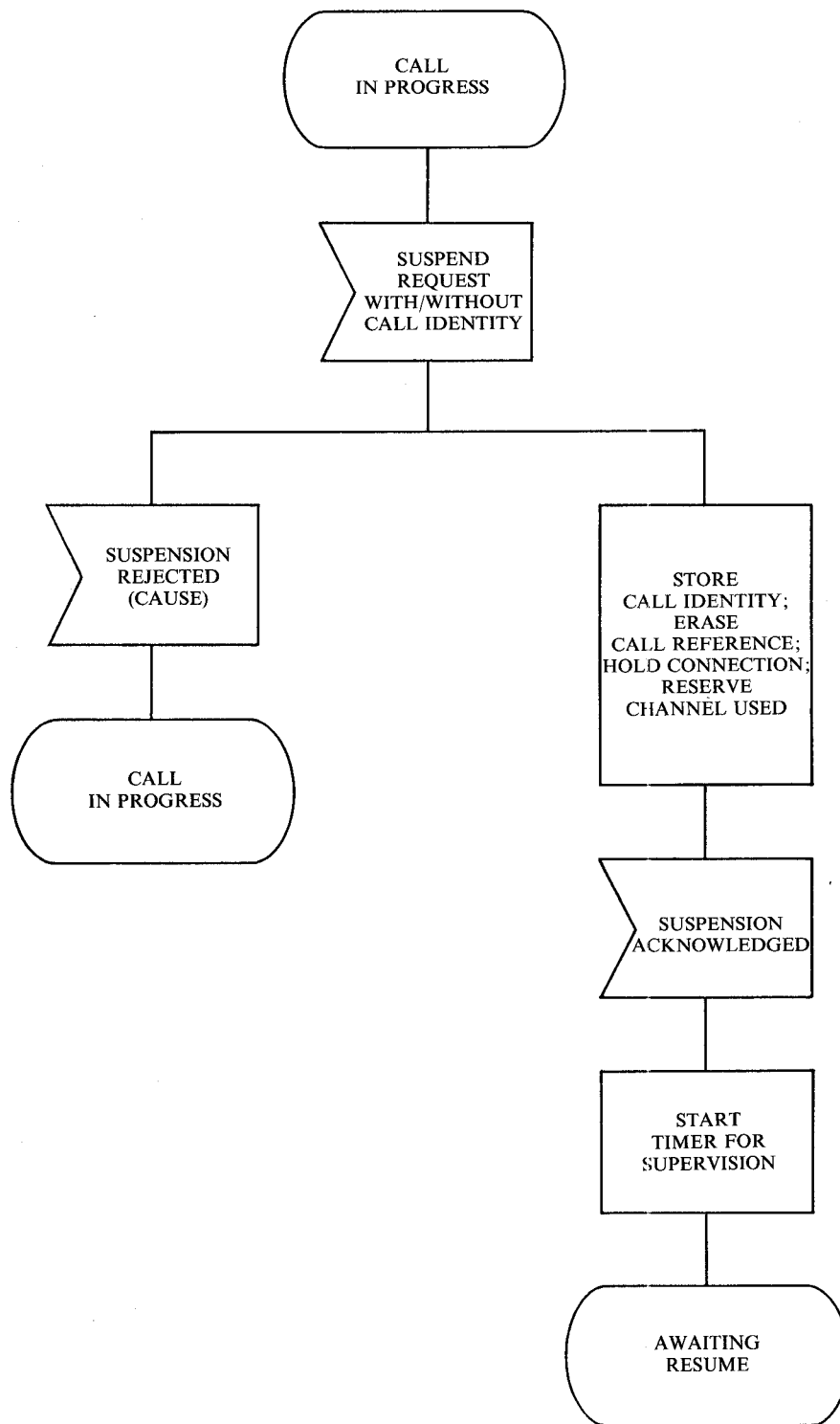


Figure 14.1 (T/SF 31-07). Overall SDL-Diagram of Terminal Portability (Location: Serving Local Exchange).

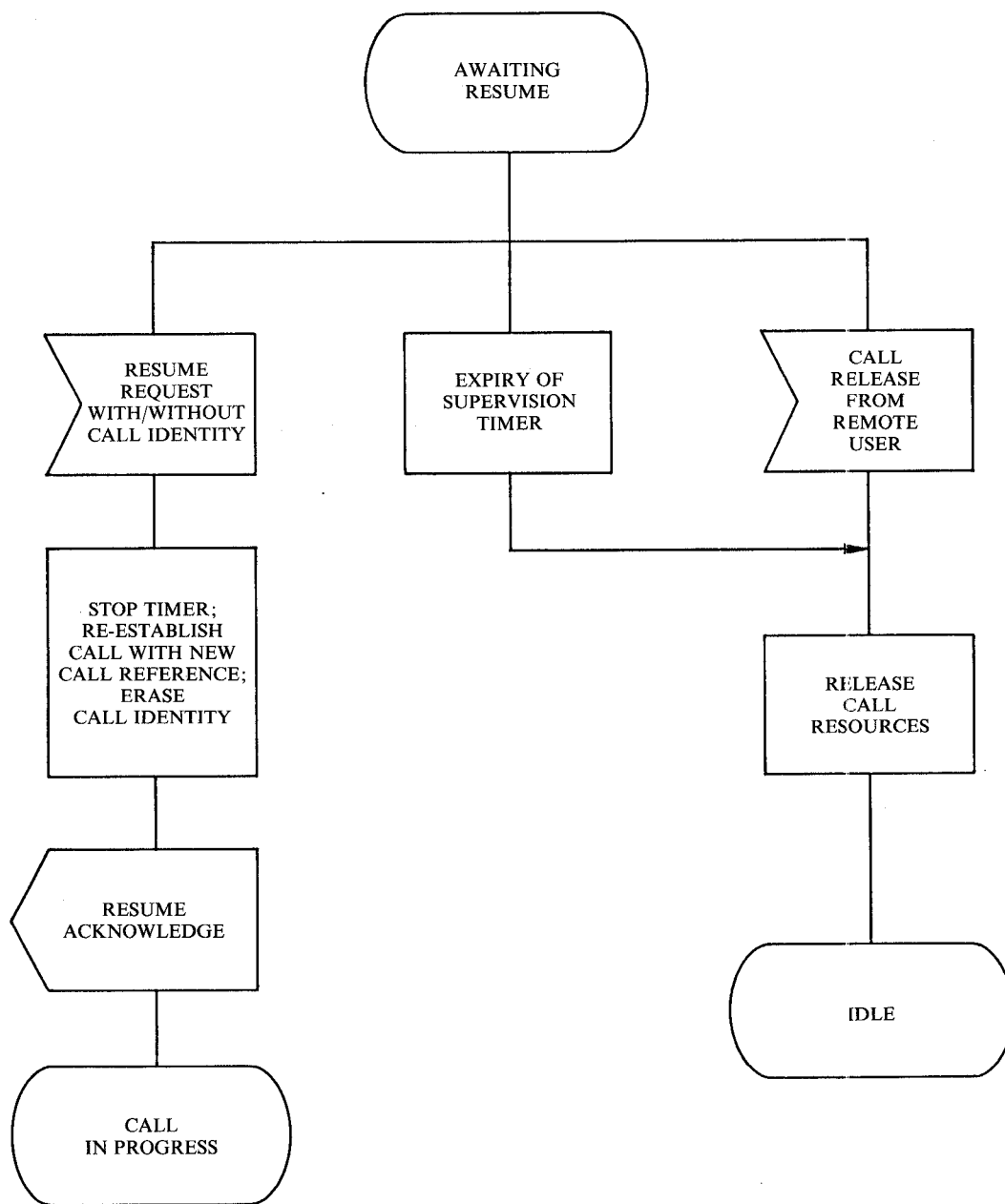


Figure 14.2 (T/SF 31-07). Overall SDL-Diagram of Terminal Portability (Location: Serving Local Exchange).

Annex 15

TERMINAL SELECTION

1. DEFINITION

Calls can be dialled via the public network directly to terminals connected to the basic access.

2. DESCRIPTION

- 2.1. It should be noted that the following issues have been considered in defining this service:
- that some Administrations may not have knowledge or control over what is connected to the basic access e.g. an NT2 or passive bus;
 - that Administrations have differing numbering methods;
 - that common international terminal specifications are desired.

The addressing of terminals on a basic access may be achieved by applying a set of directory numbers to the single basic access.

In general, any set of numbers may be sent from the exchange to the subscribers equipment. However it is recognized that administrative practices and certain equipment designs may lead to the adoption of restricted numbering sequences e.g. by relating the last digit(s) of a fixed length directory number to the terminals to be connected. The actual method of relating the dialled number to a particular terminal is a matter of national implementation but may, for example, be done by central intelligence or by distributed intelligence within the terminals.

Sub-addressing may be used as an alternative or in conjunction with the above in a pure ISDN communication.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

- 3.1.1. The service shall be provided after prearrangement with the Administration.
- 3.1.2. The Administration shall allocate a proper directory number set corresponding to the overall need of the basic access. The digit(s) significant for terminal selection is/are an integral part of the numbering scheme.

3.2. Withdrawal

The service shall be withdrawn after prearrangement with the Administration.

3.3. Registration

Not applicable to this service.

3.4. Erasure

Not applicable to this service.

3.5. to

3.7. Not applicable.

3.8. Normal Procedures with successful outcome

- 3.8.1. A call to a number in the terminal selection numbering set shall be routed to the basic access.
- 3.8.2. The complete directory number will be transferred without modification across the called user-network interface. All called terminals of a service which identify the directory number equal to their own terminal identification will respond to the incoming call.

3.12. Charging Requirements

- 3.12.1. Supplementary Service provision may be part of the general subscription accounting.
- 3.12.2. Charges may include a subscription fee and a rental charge proportional to the quantity of numbers assigned to the multinumber subscriber. Call charges are a national matter.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional Operation or Unsuccessful Outcome**

If a call is made by sending incomplete address information the connection will be released by time supervision within the public exchange.

5. **ALTERNATE PROCEDURE**

None identified.

6. **INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES**

Interaction with the following services should be studied:

- Line hunting
- Calling line identification
- Three party service
- Call waiting
- Conference call
- Closed User Group
- Completion of Calls to Busy Subscriber
- Diversion

7. **INTERWORKING CONSIDERATIONS**

None identified.

8. **DYNAMIC DESCRIPTION OF THE SERVICE**

To be supplied.

9. **ATTRIBUTES**

The following attribute values apply to Terminal Selection

Means of Subscription/Provision	Network Controlled
Supplementary Service Specific Parameters	ISDN Number block
Service Activation/Deactivation	Specific Periods
Means of Specified Period	
Activation/Deactivation	Network Controlled
Means of Parameter Registration, Interrogation and Modification	Network Controlled
Means of Service Invocation	Network Invocation
Applicability to Telecommunication Services	UNR, SP, VBD, ASD, AVD, TEL, TTX
Charging	
Compatibility	

Annex 16

THREE-PARTY SERVICE

1. DEFINITION

The Three-Party Service enables a user to establish a three party conversation. A user who is active on a call is able 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, or join the two calls together into a three-way conversation.

2. DESCRIPTION

2.1. Description

2.1.1. The served user, User A, who has an existing active call with User B, asks the service provider to begin the Three-Party Service.

Note. 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).

2.1.2. Once the call to the third party reaches the active state (or, for some operations, has simply started alerting) the served user can:

- i) Alternate from one call to the other as required.
- ii) Disconnect the active party.
- iii) Disconnect the held party.
- iv) Disconnect the entire call.
- v) Request the service provider to begin a Three-Way Conversation.

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

- i) Terminates the conference.
- ii) Explicitly disconnects one of the parties.
- iii) Place his/her connection to the conference on hold.
- iv) Create a private communication with one of the parties.

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

2.2. Applicability to Telecommunication Services

This service is applicable to all services which carry speech traffic.

2.3. Terminology

In this description:

- User A is the served user—the one who subscribes to, and is using, the service.
- User B is the other party in the original call (A ↔ B)
- User C is the “third party”—the other party in the “enquiry call” (A ↔)

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

Provision of this facility requires an arrangement between the Administration and the user.

3.2. Withdrawal

Withdrawal of this facility will be at the request of the user or for Administration reasons.

3.3. Registration

Not applicable

3.4. **Erasure**

Not applicable

3.5. **Activation**

Not applicable

3.6. **Deactivation**

Not applicable

3.7. **Invocation**

This service will be invoked by the served user by use of a control procedure.

3.8. **Normal operation with successful outcome**

3.8.1. *Beginning Three-Party Service*

The served user, User A, who has an existing active call 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).

Conceivably, a similar "Held and Active" state 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.

3.8.2. *Managing Two Associated Calls (One Held, One Active)*

Served User

Once the call to the third party reaches the active state (or, for some operations, has simply started alerting) 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/her terminal. Compare the two methods of alternating between calls given in the SDL diagram under "Alternate" vs. "Return to A ↔ B(C)".

- ii) Disconnect the active party (e.g. User C), whereupon the service provider would notify the served user that the other party (e.g. User B) is still held and waits for one of the following events:
 - Request from the served user that the held party be retrieved.
 - Request from held party to disconnect.

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

- 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.

- iv) Disconnect the entire call.

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

- v) Request the service provider to begin a Three-Way Conversation (see Managing an Active Three-Way Conversation below).

Active Party

If the active party disconnects, the service provider will clear the connection with the served user and retrieve 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.

3.8.3. *Managing an Active Three-Way Conference*

Served User

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

i) Terminates the conference.

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

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

iii) Explicitly disconnects one of the parties, which would result in a simple active call between the served user and the remaining party.

iv) Places his/her connection to the conference on hold, or

v) Creates a private communication with one of the parties. This results in that party being split from the conference, the connection between the served user and the conference being placed on hold, and the connection between the served user and the designated party being active.

Remote party (B or C)

Either of the remote parties (Users B or C) can ask the service provider to:

i) Release it from the conference, which results in a simple active call between the served user and the remaining party.

ii) Place its connection to the conference on hold.

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

3.9. **Quality of Service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging Requirements**

For further study.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

In order to avoid chaining of three party connections which could be difficult for users to manage, the non served users on a three-party call shall be prevented from initiating a three-party service request.

Note. During the first phase it may only be possible to control this when all three users are on the same exchange. Ultimately the network shall have the capability to control this action wherever the three users are connected.

4.2. **Registration**

Not applicable.

4.3. **Erasure**

Not applicable.

4.4. **Activation**

Not applicable.

4.5. **Deactivation**
Not applicable.

4.6. **Invocation**
None identified.

4.7. **Testing**
Not applicable.

4.8. **Interrogation**
Not applicable.

4.9. **Charging Requirements**
For further study.

5. **ALTERNATE PROCEDURES**
None Identified, except for the point made regarding variations due to different terminal capabilities.

6. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

6.1. **Call Completion to Busy Subscriber**
If the served user attempts to establish a call to a party and receives busy treatment, the served user may invoke CCBS to that customer, provided the served user has also subscribed to CCBS. When the served user is informed that the called party is idle, he/she may place the active call on hold, complete the CCBS call, and continue with the Three-Party Service.

6.2. **Diversion Services (Call Forwarding all forms)**
If the served user attempts to establish a Three-Party call to a user that has Call Forwarding activated, and the appropriate forwarding conditions are met, the forwarded-to user will be alerted and added to Three-Party call.

6.3. **Calling User Identification**
For further study.

6.4. **CLID Presentation Restrictions**
For further study.

6.5. **Closed User Group**
For further study.

6.6. **Conference Call**
For further study.

6.7. **Credit Card Calling**
For further study.

6.8. **Direct Dialling in**
No interactions identified.

6.9. **Line Hunting**

For further study.

6.10. **User-to-User Signalling**

The served user will be able to send User-to-User information (UUI service 3) to both parties on a three-way conference call individually and in some networks, as an option, broadcast messages to both parties.

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

UUI can be received by the served user from either party. A party may send and receive UUI from the served user. UUI cannot be sent between Party B and Party C in association with three-way conference call [although any two parties, if subscribed, could send non-call associated UUI to each other]. A conferee's ability to send broadcast messages to all parties (under control of the served user) is for further study.

7. **INTERWORKING CONSIDERATIONS**

For further study.

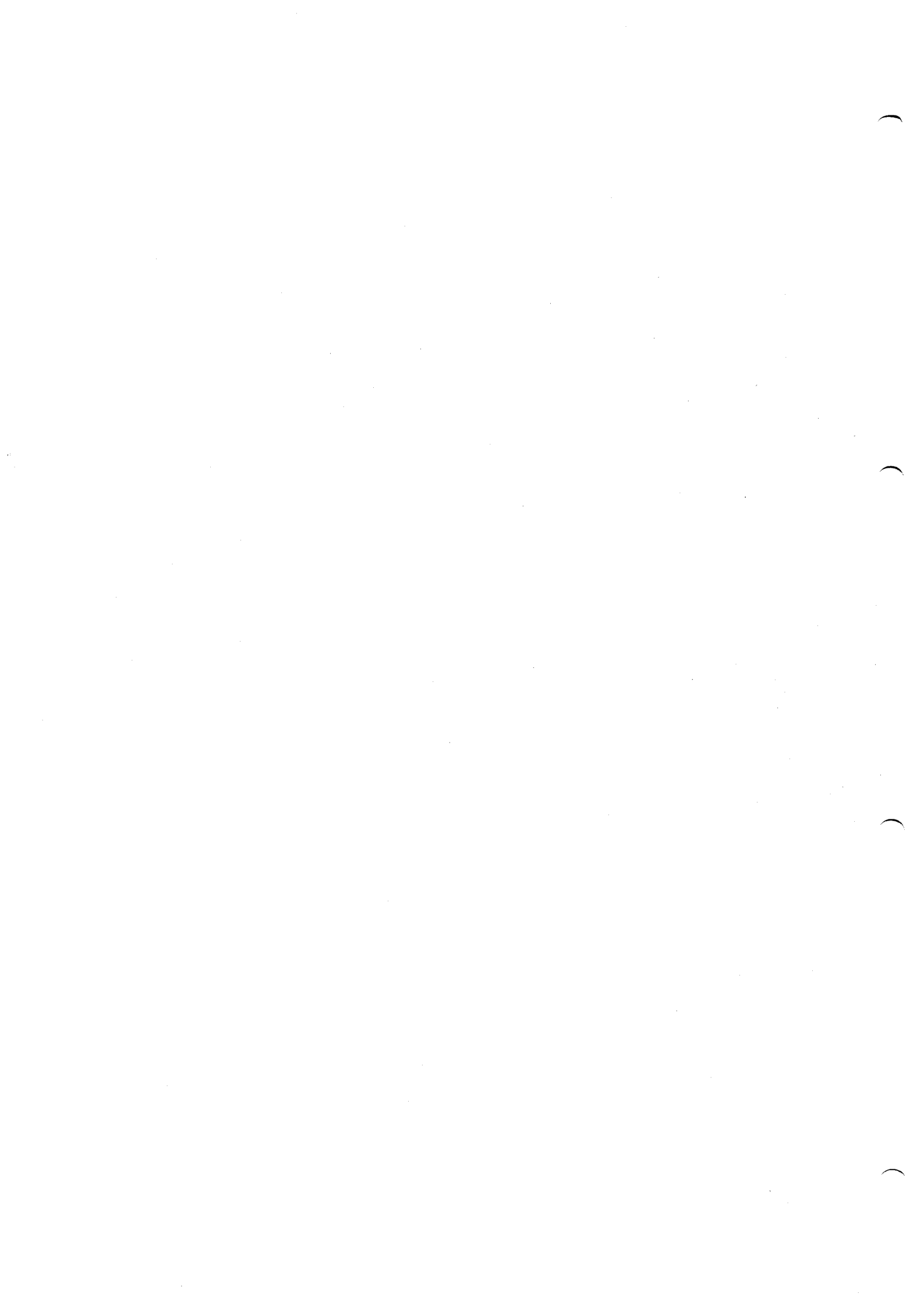
8. **DYNAMIC DESCRIPTION OF SERVICE**

Overall SDL to be supplied.

9. **ATTRIBUTES**

The following attribute values apply

Means of Subscription/Provision	Network Controlled
Supplementary Service Specific Parameters	ISDN Number block
Service Activation/Deactivation	Specific Periods
Means of Specified Period Activation/Deactivation	Network Controlled
Means of Parameter Registration, Interrogation and Modification	Not applicable
Means of Service Invocation	User Invocation Local
Applicability to Telecommunication Services	UNR, SP, VBD, ASD, AVD, TEL, TTX
Charging	Further Study
Compatibility	Further Study



Annex 17

USER-TO-USER SIGNALLING

1. DEFINITION

The user-to-user signalling (UUS) supplementary services allow an ISDN user to send/receive a limited amount of information to/from another ISDN user over the signalling channel in association with a call to the other ISDN user.

Note. These procedures are applicable to user-to-user information (UUI) transfer in association with a circuit-switched telecommunication service only. Procedures to permit UUI transfer in association with other types of calls (e.g. packet bearer services) need to be investigated.

2. DESCRIPTION

- 2.1. User-to-user signalling (UUS) allows the user to send/receive a limited amount of user generated information to/from another user-network interface. This information is passed transparently (i.e. without modification of contents) through the network. Normally, the network will not interpret or act upon this information.

The user can transfer UUI in different phases of the call depending on the service(s) to which the user subscribes. These are:

Service 1: The transfer of UUI during the setup and clearing phases of a call, with UUI embedded within call control messages. This service allows the transmission of 32 octets to be transmitted per message.

Service 2: The transfer of UUI during the setup phase of a call, transferred independently of call control messages. From the sender's point of view UUI is sent prior to the active phase of the call (i.e. prior to the reception of the connect message at the outgoing exchange). Observe that this same UUI may be received by the terminating exchange during the active phase of the call. This services allows 128 octets to be transmitted per message.

Service 3: During the active phase of a call, transferred independently of call control messages. This service allows 128 octets to be transmitted per message.

Note. Limitations are also placed on the amount of information a user is allowed to transfer in a given time period (e.g. limitations can be placed on the number of messages transmitted, or the throughput can be limited).

In a point-to-multipoint arrangement the following UUI transfer is allowed:

- in the forward direction: UUI can be sent only if it is contained in either the initial setup or the first clearing message;
- in the backward direction: UUI will only be accepted from a terminal which is selected. If the call never reaches the active phase, UUI will be accepted provided that only one message is sent to the calling party.

2.2. Applicability to Telecommunication Services

This supplementary service is applicable to all telecommunication services supported by circuit-switched capabilities (for communication between ISDN subscribers).

2.3. Terminology

- 2.3.1. Point-to-point does not necessarily mean a physical point-to-point configuration: some networks may have knowledge of the physical configuration, others may detect a point-to-point situation on the basis of interface characteristics (e.g. primary user-network interface), still others may obtain this information through signalling on a per call basis.
- 2.3.2. A selected terminal is the terminal behind the called interface that the service provider considers or elects as the terminal to be in the active phase of a call.

3. NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

3.1. Provision

The supplementary service is provided by prior arrangement with the Administration. The subscription to Service 1 enables the user to send UUI. Subscription to Services 2 and/or 3 enables the user to invoke the relevant service(s) and to send UUI. Subscription is not necessary for the reception of UUI.

Services 1, 2 and 3 must be subscribed to by the calling user to whom billing will apply. It is a service provider option whether these component services are offered to the user as separate supplementary services or in any particular combination.

ISDN users do not have to subscribe to UUS to be able to receive UUI sent by another ISDN user.

3.2. Withdrawal

At the request of the subscriber or for administrative reasons.

3.3. Registration

Not applicable.

3.4. Erasure

Not applicable.

3.5. Activation

User-to-user signalling must be requested by the calling user at the beginning of a call if UUI transfer is desired in either direction at any time during the call (i.e., if any of the Services 1, 2 or 3 are expected to be used). The network will then accept UUI according to the subscription.

On a per call basis, the calling user should be able to specify the desired UUS service(s) according to the service options offered by the service provider.

3.6. Deactivation

Not applicable.

3.7. Invocation

In Service 1 both subscribers may insert UUI in call control messages. Services 2 and 3 have to be invoked by the calling user by an indication at the beginning of the call establishment phase. If Services 2 and/or 3 have not been invoked by the calling user then Service 2 and 3 UUI cannot be sent by the called user. The called party has to be notified of the service invocation by the calling party.

3.8. Normal operation with successful outcome

3.8.1. Service 1

3.8.1.1. User-to-User signalling during call establishment phase

From Calling User to Called User

The calling user can insert up to 32 octets of UUI inside the call request of an outgoing call. This user information will, if the calling user has subscribed to the service and if the call is to be offered to the called party, be included by the network in the incoming call indication delivered to the called user. If the calling subscriber has not subscribed to the service the information will be discarded but the call will be continued. If the call is not, for some reason, offered then the information may be discarded without specific notification and normal call indications will apply. It is not necessary for the called subscriber to be registered for or to subscribe to the service to receive UUI.

Examples of the use of this service are:

- personal identification (name)
- access code to data base
- password for terminal telecontrol
- signalling between ISPBX for end-to-end facilities control

From Called User to Calling User

- (a) The called user's installation can insert UUI inside the answer message sent to the network. This user information will, if the called user has subscribed to the service, be included by the network in the call connected message delivered to the calling user. Otherwise the information is discarded and the call is continued according to the normal procedures.

Examples of the use of this service are:

- "welcome" message
- signalling between ISPBX for end-to-end facilities control

- (b) If the network has the knowledge that at the called side there is a point-to-point configuration the network can accept and forward to the calling party the UUI inserted by the called party in the alerting message, i.e. before answer. If the network does not have knowledge of the configuration, the only UUI transported to the calling user will be that included in the call answer.

In some configurations more than one compatible terminal may insert UUI in their call answer of the incoming call. In any case, the UUI transmitted by the network is the one in the message from the terminal which receives an acknowledgement that the call has been connected (user-to-user signalling sent by the other terminals is lost). If the call enters the answered phase, such information is delivered by the network to the calling party when he is informed of connection of the call.

In all other cases UUI will be ignored.

- (c) The sending of UUI by the called user is not dependent on the reception of UUI from the calling party.
- (d) User-to-User signalling on no answer to an incoming call:
The possibility of inserting UUI inside a negative response to an incoming call is for further study (especially the charging aspects). Such a facility could be used to provide a "mini answering service".
- (e) User-to-User signalling when the called user is busy must be treated with Call Waiting.

3.8.1.2. User-to-User signalling during call clearing phase

- (a) The calling and/or called user can insert UUI in the first message used to initiate the call clearing phase. The UUI contained in this message is transferred to the remote user in the first clearing message. This transfer will only be performed if the UUI is received at the exchange of the remote user before clearing is initiated to that user. Otherwise the information is discarded and the call is cleared according to the normal procedures, without a specific notification to the other party.
- (b) The possibility for the calling user to insert UUI in the clearing message during the alerting phase is for further study (especially the charging aspects). This UUI may be used to provide a "mini recording service" to the called user.

3.8.2. *Service 2*

Confirmation of the UUS Service 2 request is preceded by an end-to-end check by the network for service availability.

3.8.2.1. From calling user to called user

During the call establishment phase of the call, but after the setup has been initiated and before the call enters the active phase, the calling user may transfer a limited amount of UUI to the other user on the call (provisionally 2 messages). UUI cannot be sent by the calling user after the call has been answered.

The UUI should be delivered in such a way so as to enable all terminals to receive the UUI.

It is not necessary for the called subscriber to subscribe to the service to receive UUI.

Examples of the use of this service are:

- personal identification (name)
- access code to data base
- password for terminal telecontrol
- signalling between ISPBX for end-to-end facilities control

3.8.2.2. From called user to calling user

The called user may send UUI in dedicated messages (provisionally up to 2 messages) between the call information and answer.

If the network has the knowledge that at the called side there is a point-to-point configuration the network can accept and forward to the calling party the UUI inserted by the called party. The situation where the network does not have knowledge of the configuration is for further study.

The sending of UUI by the called user is not dependent on the reception of UUI from the calling party.

Examples of the use of this service are:

- “welcome” message
- signalling between ISPBX for end-to-end facilities control

3.8.3. *Service 3*

If confirmation of the UUS service request has been received from the network, during the active phase of a call an ISDN user may transfer a limited amount of user generated UUS information to the other user on the call. Confirmation of the UUS Service 3 request is preceded by an end-to-end check by the network for service availability.

3.9. **Quality of Service**

For further study.

3.10. **Testing**

Not applicable.

3.11. **Interrogation**

Not applicable.

3.12. **Charging Requirements**

UUS may be charged as follows:

- subscription (individually to Services 1, 2 and 3 or bundled, as a service provider option);
- the amount (volume) of UUI transferred. In this case the calling party is charged for all UUI in either direction;
- in case of reverse charging the called party will assume the charges for the basic service and also for UUS (if any).

Additional charges (e.g. for distance) are for further study.

4. **EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME**

4.1. **Exceptional operation or unsuccessful outcome**

If a non-subscribing user attempts to send UUI the UUI will be discarded and normal call handling will apply.

The user may not be able to interpret incoming UUI. In such situations, the user should discard this information without disrupting normal call handling. No specific signalling is provided by the network to accommodate this situation.

Under circumstances of network congestion or failure, the network may discard UUI. Users desiring to have confirmed UUI delivery must employ their own end-to-end protocols (i.e. acknowledgements of receipt by another UUS message).

The network does not ensure that the UUI it delivers to the remote user can be handled by the remote user's installation. Furthermore, the network does not provide any guarantees on the delivery of UUI although it would normally offer a high degree of probability of delivery.

A user wishing to send UUI will be informed by the network as part of normal call establishment if there is not sufficient signalling connectivity to allow the transfer of UUI. Confirmation of delivery is not provided by the network. The network does not expect any confirmation of UUI acceptance from the destination. Where UUI cannot be forwarded by the network, the sending user will be given a suitable indication. The question of default procedures when the calling user has not specified UUI are for further study.

If the network cannot accept a request for UUI transfer, notification with cause will be returned to the served user. Possible reasons for rejection are:

1. Service not subscribed to
2. Excessive UUI length
3. Called user is not an ISDN user
4. Protocol error
5. Necessary interoffice signalling connectivity does not exist between sending and receiving users
6. User constraints prohibit invocation of service between calling and called users (e.g. CUG, Incoming Call Barring)
7. Network congestion

Note. If UUI contained in a setup message cannot be transferred for reasons 3 or 6, notification will not be provided until after the network has received a response to the setup message, since the network does not know beforehand whether UUI can be transferred or not.

4.2. **Registration**

Not applicable.

4.3. **Erasure**

Not applicable.

4.4. **Activation**

None identified.

4.5. **Deactivation**

Not applicable.

4.6. **Invocation**

UUI sent near or at the end of a call may not reach its destination, e.g. if the called party initiates disconnection procedures prior to the arrival of the UUI. At all other times, however, the network offers high probability that messages will be delivered correctly.

4.7. **Testing**

Not applicable.

4.8. **Interrogation**

Not applicable.

4.9. **Charging Requirements**

None identified.

5. **ALTERNATE PROCEDURES**

None identified.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. Call Waiting

Calling User: Any UUI included in the call setup message will be delivered with the call waiting indication. UUI can be sent by the Calling User to the Called User during the call alerting period.

Called User: If a Call Waiting user also subscribes to UUI, they can include UUI with the rejection of the call. UUI can be sent by the Called User to the Calling User during the call alerting period.

Note. See section 2.1. for restrictions on point-to-multipoint arrangements.

6.2. Call Forwarding Unconditional

Calls Originated by a User with Call Forwarding Unconditional Activated: Since Call Forwarding Unconditional does not affect the forwarding user's ability to make outgoing calls, a user with CFU activated can send and receive UUI in association with an outgoing call or at the setup of a new call.

Calls incoming to a User with CFU Activated:

During Forwarding:

Any UUI which accompanies the setup of the call will be forwarded along with the forwarded call if both the calling and forwarding (i.e. called) parties have subscribed to Service 1.

After Forwarding:

If the calling party has inserted UUI in the call setup for Service 1 and/or requested UUS Service(s) 2 and/or 3 in their initial call setup, and if the forwarding (i.e. called) party has subscribed to the same service(s), then the services will automatically be extended to be available for use between the calling party and the forwarded-to party. If the forwarding party does not subscribe to the same service (set of services), the calling party will be informed that they can no longer employ the service(s) on this call.

It should be possible for the forwarding party to inhibit UUS on the forwarded leg.

Note. The procedures to be followed if transfer of charge is allowed are for further study.

6.3. Call Forwarding Busy

Calls Originated by a User with Call Forwarding Busy Activated: Since Call Forwarding Busy does not affect the forwarding user's ability to make outgoing calls, a user with Call Forwarding Busy activated can send UUI in association with an outgoing call or at the setup of a new call.

Calls Incoming to a User with Call Forwarding Bsbuy Activated:

During Forwarding:

In the case of Network Determined User Busy (NDUB) condition, see Call Forwarding Unconditional; in the case of User Determined User Busy (UDUB) condition, any UUI which accompanies the setup of the call (Service 1) is delivered to the forwarding user with the normal call offering procedure and is not forwarded along with the forwarded call.

After Forwarding: Same as for CFU.

6.4. Call Forwarding No Reply

Calls Originated by a User with CFNR Activated: Since CFNR does not affect the forwarding user's ability to make outgoing calls, a user with CFNR activated can send UUI in association with an ongoing call or at the setup of a new call.

Calls Incoming to a User with CFNR Activated:

During Forwarding:

Any UUI which accompanies the setup of the call (Service 1) is delivered to the forwarding user with the normal call offering procedure and is not forwarded along with the forwarded call. Service 2 UUI is not guaranteed to be transferred to the transferred-to user until after call forwarding is complete. Before forwarding takes place, Service 2 UUI is transferred to the original user. After forwarding takes place, Service 2 UUI is transferred to the forwarded-to user.

After Forwarding: Same as for CFU.

6.5. **Call Deflection**

Calls Originated by a User with CD Activated: Since CD does not affect the forwarding user's ability to make outgoing calls, a user with CD activated can send UUI in association with an ongoing call or at the setup of a new call.

Calls Incoming to a User with Call Deflection Activated:

During Forwarding

Any UUI which accompanies the setup of the call (Service 1) is delivered to the forwarding user with the normal call offering procedure; if Call Deflection is invoked by the called user, this UUI is not forwarded along with the forwarded call.

After Forwarding:

Service 1 between the calling and forwarded-to users is only possible in the call establishment phase in the reverse direction (and in the call clearing phase) and if the called (forwarding) user has subscribed to the same service.

Services 2 and 3 are for further study.

6.6. **Conference Calling**

Conference Controller: UUI can be sent by the Conference Controller to any of the conferees individually, and optionally as broadcast to all conferees. UUI can be received by the Conference Controller from any of the conferees.

Note. This assumes that each conferee can be uniquely identified.

The same limitations on the amount of UUI which can be transferred between two users apply to communications between the conference controller and any particular conferee.

Conferees: UUI can be sent to and received from the Conference Controller. Permitting UUI to be sent between conferees in association with the conference is not allowed. A conferees ability to send messages to all parties is for further study.

6.7. **Calling Line Identification**

No interaction identified.

6.8. **CUG**

No interaction for Service 1. Services 2 and 3 are for further study.

6.9. **Direct Dialling In**

No interaction identified.

6.10. **Completion of Calls to Busy Subscribers**

Calling User: The network will not store UUI sent in the initial Setup Message that got through to busy. A user may provide UUI in the setup message on the CCBS recall acceptance.

Called User: If a Called User is unaware that he/she is being monitored for Network Determined User Busy/Not Busy, then UUI transfer to the Calling Party will not apply.

A Called User could be aware that he/she is being monitored for User Determined Busy/Not Busy. Interactions in this case are for further study. UUI is not forwarded to a user who is in a "Network Determined User Busy" condition. If the "Network Determined User Busy" condition is not true, UUI will be forwarded to the called party (i.e. UUI is forwarded even when the user is experiencing a "channels busy" or "User Busy" condition).

6.11. **Calling Line Identification Restriction**

No interaction.

6.12. **Terminal Selection**

No interaction.

6.13. **Sub-Addressing**

No interaction.

6.14. **Terminal Portability**

Not compatible.

6.15. **Three-Party Service**

User-to-User signalling (Service 1) can be used when establishing or clearing any of the individual calls between the served user of the Three-Party Service and the other parties.

6.16. **Advice of Charge**

No interaction.

6.17. **Called Line Identification**

No interaction.

6.18. **Malicious Call Identification**

For further study.

6.19. **Freephone**

For further study.

7. **INTERWORKING CONSIDERATIONS**

UUS can be delivered only when both users are ISDN subscribers or when a non ISDN network provides a means of conveying the UUI.

Interworking methods are for further study.

8. **DYNAMIC DESCRIPTION OF SERVICE**

Overall SDL to be supplied.

9. **ATTRIBUTES**

The following attribute values apply

Means of Subscription/Provision	Network Controlled
Supplementary Service Specific Parameters	ISDN Number block
Service Activation/Deactivation	Call by Call
Means of Specified Period Activation/Deactivation	Network Controlled, Call by Call
Means of Parameter Registration, Interrogation and Modification	Network Controlled
Means of Service Invocation	Network Invocation, User Invocation Local
Applicability to Telecommunication Services	UNR, SP, VBD, ASD, AVD, TEL, TTX
Charging	Further study
Compatibility	Further study

Annex 18

SUPPLEMENTARY SERVICE DIGITAL CONNECTIVITY FOR TELESERVICES

CEPT

considering

- that both conventional analog networks and digital IDN/ISDN networks will exist simultaneously for a long period of time,
- that a great demand is envisaged for Teleservices using 64 kbit/s connections in the early phase of IDN and ISDN introduction,
- that public networks will provide a competitive and cost-effective means of providing Teleservices operating on 64 kbit/s,

recommends

- that a supplementary service Digital Connectivity for Teleservices should be standardized on the bases of user and operational requirements as presented in this document.

A SERVICE PROSE DEFINITION AND DESCRIPTION

1. DEFINITION

The digital connectivity is a user facility that enables user to establish a fully digital path at 64 kbit/s user-to-user(s).

2. DESCRIPTION

Supplementary service Digital Connectivity is an optional facility assigned to the user and provided on a call request basis (version a) or by specific subscriber category (version b).

A natural condition is that both A- and B-subscribers have a digital subscriber line.

3. OPERATIONAL REQUIREMENTS

3.1. General requirements

3.1.1. Provision

The Administration provides the service on a subscription base. This applies for the both two cases of the service, i.e. the service applies for all calls or the service is activated on a call-based request.

3.1.2. Withdrawal

The Administration will withdraw the service at the request of the subscriber or for administrative reasons.

3.1.3. Invocation

When the service is provided for all calls it will automatically be invoked by the network at the call set up. For on a call based request it will be invoked at the activation of the service by the user using a service code as described in paragraph 4.

3.1.4. Normal operation with successful outcome

At a call set up when the network identifies a digital connectivity request, an attempt on the possibility to route the call on a digital path is made by the network:

If the attempt is successful, the call is routed on 64 kbit/s routes.

3.1.5. *Exceptional operation or unsuccessful outcome*

At a call setup when the network identifies a digital connectivity request, an attempt on the possibility to route the call on a digital path is made by the network:

If the attempt is unsuccessful, the call is rejected and the subscriber will receive an appropriate indication:

- an appropriate announcement and/or a visual indication, e.g. "digital path not provided" in case where a routing that allows a complete digital path doesn't exist, or
- a congestion tone in case where a digital path exists but it is not possible to complete the call due to congestion or failure.

3.1.6. *Quality of service*

Quality of service requirements are the same as set for the Teleservice(s) provided to the concerned subscriber lines. Important quality of service character at the early provision of the service is the number of unsuccessful calls due to lack of digital path, and certain measures should be set to be a threshold of the marketing of the service. This is for further study.

3.2. **Controlling subscriber requirements**

3.2.1. *Activation/deactivation*

In version a), activation occurs together with invocation; the service is automatically deactivated after each call.

In version b), the supplementary service is activated on provision by the Administration, using the operation and maintenance interface and the service remains continuously activated until withdrawal.

3.2.2. *Invocation*

In version a), the service is invoked by means of control procedure which includes a call request.

In version b), the service is automatically invoked on each call set up.

3.2.3. *Testing*

The subscriber may test the service by using it.

3.2.4. *Interrogation*

Interrogation of the registered information may be provided.

3.3. **Service operation requirements**

Advanced signalling systems such as CCITT SS No. 7 makes it possible to select a 64 kbit/s path and to inform the concerned subscribers accordingly.

However, some digital 64 kbit/s connections may use conventional signalling systems with limitations in this respect. Therefore, a handshaking operation is necessary between the originating subscriber's and destinating subscriber's connection in order to verify an end-to-end 64 kbit/s connectivity.

3.4. **Interaction with other supplementary services**

The service relates to call set-up phase. Compatibility with supplementary services such as abbreviated dialling where a subscriber control procedure for use of the service is necessary at the call set-up phase should be resolved for the on a call-based request case of the service. The following is recommended for a simultaneous use of abbreviated dialling and digital connectivity call set-up:

LH DT★ 32★★ AN ... for prefix method

LH DT★ 32★ AN # ... for suffix method

when procedures harmonized for the 12-button terminal are used.

3.5. **Interworking considerations**

When the service is invoked and a call has been set-up, call waiting and operator intrusion or any other form of supervisory tones and announcements applied after answer are not allowed either to the A-subscriber or to the B-subscriber if these interrupt the 64 kbit/s channel. This applies to teleservices other than telephony. Problems of interworking between networks require further study.

3.6. **Administration requirements**

The service is provided by the Administration on a subscription base. At provision the specific subscriber category and the type of service required is registered into the network by the Administration.
The Administration erases the service at the withdrawal of the service.

3.7. **Charging requirements**

A charge for the registration of the service together with a rental charge for, and provision period of, the service should apply. It shall be possible to charge as for normal call, or at a higher rate. An additional charge for the use of the service at each call may apply.
Interrogation may be charged if provided.

4. **CONTROL POSSIBILITIES**

4.1. **General**

Service code 32 is allocated for the on a call-based request case of the service.

4.2. **Registration/Erasure**

Not applicable.

4.3. **Activation/Deactivation**

There are no separate control procedures for activation/deactivation (see paragraph 3.2.1.).

4.4. **Invocation**

For version a) the recommended control procedure for the standard 12-button terminal.

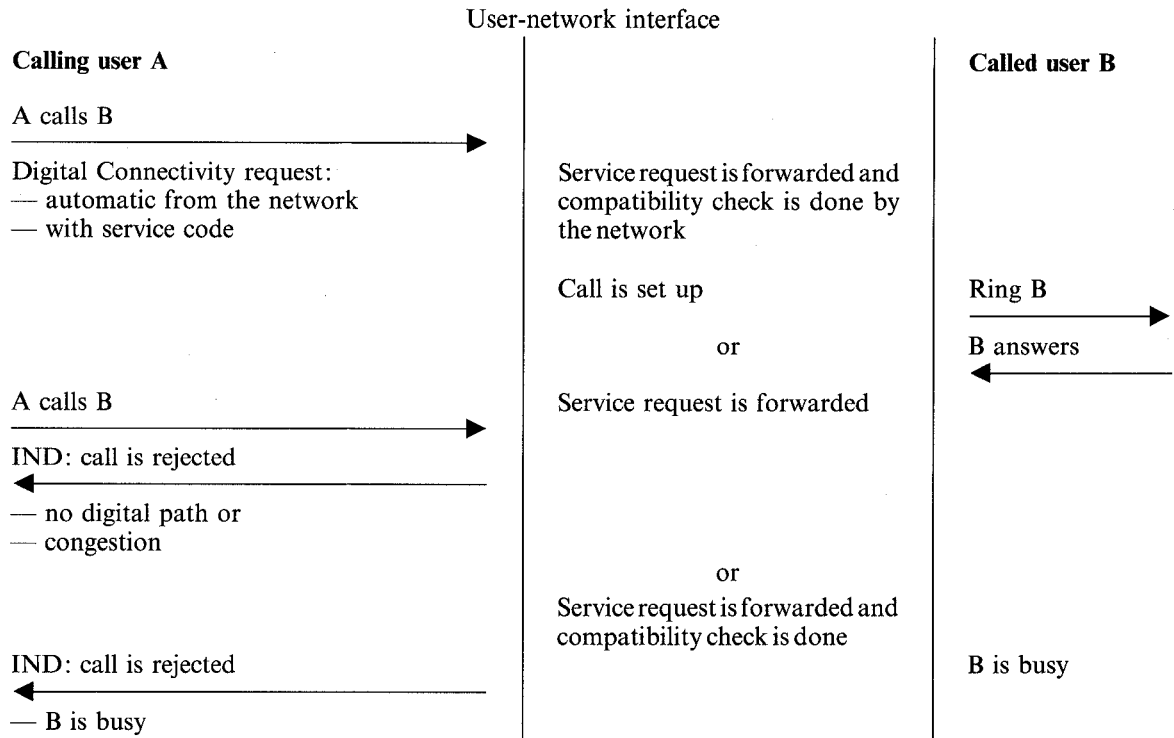
LH DT ★ 32 (★) TN (#)

For version b) there is no specific invocation procedure (see paragraph 3.2.2.). The service is automatically invoked on each normal call set-up procedure.

4.5. **Interrogation**

Not applicable.

A' DYNAMIC DESCRIPTION



B' TABLE OF ATTRIBUTES AND THEIR POSSIBLE VALUES

Attribute name	Possible values
1. Means of subscription/provision (MS)	N
2. Supplementary service specific parameters (SSP)	I
3. Service activation/deactivation (SA/D)	CC, S
4. Means of specified period activation/deactivation (MSA)	N
5. Means of parameter registration, interrogation and modification (PRM)	N, L
6. Means of service invocation (MSI)	N, L
7. Applicability to telecommunication services (AT)	UNR, SP, VBD, ASD, AVD, TEL, TTX, TTF Videophone
8. Charging	For further study
9. Compatibility	For further study

Legends:

ASD	64 kbit/s unrestricted, alternate speech, data
AVD	64 kbit/s alternate speech, 3.1 kHz
CC	Call-by-call
I	ISDN address
L	User controlled, local
MSS	Maximum service size
N	Network controlled
R	User controlled, remote
S	Specified periods
SP	64 kbit/s speech
TEL	Telephony
TI	Time related information
TTX	Teletex
U	User identification
UNR	64 kbit/s unrestricted
VBD	64 kbit/s voiceband data, 3.1 kHz audio
TTF	Telefax