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OPERATIONAL REQUIREMENTS OF ISDN SUPPLEMENTARY SERVICES

Recommendation proposed by Working Group T/GT 7 "Services and Facilities" (SF)
Amendments proposed by Project Team Service Descriptions for the ISDN (SDI)

Text of the Recommendation adopted by Commercial Action Committee (CAC)

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INTRODUCTION

This Recommendation contains the description of the supplementary services from a user's point of view.

The descriptions are not intended for the users, but for use within the network operators.

The European Conference of Post and Telecommunications Administrations

considers

1. that there is a need for a description of the users' requirements as to the elaboration of the supplementary services,

2. that the present solutions do not always meet the optimum requirements.

recommends

1. that the operational requirements of the supplementary services with service prose definition and description should be made available,

2. that the description method described in Annex 0 should be used in the description of operational requirements,

3. that the descriptions in this Recommendation should be used by the network operators,

4. that according to national selection, supplementary services are provided in accordance with the descriptions in this Recommendation,

5. that national user manuals should be worked out on the basis of the text in this Recommendation,

6. that supplementary services which due to the absence of technical possibilities cannot meet all the user requirements immediately should, by way of introduction, be provided in a reduced version, but should be improved as soon as possible to meet all the user requirements.

1. GENERAL ITEMS CONCERNING DESCRIPTIONS OF SUPPLEMENTARY SERVICES

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Annex 16:	PRI	Priority
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Annex 18:	SUB	Sub-Addressing
Annex 19:	TP	Terminal Portability
Annex 20:	3PTY	Three-Party Service
Annex 21:	UUS	User-to-User Signalling

Annex 0.1

FORMAT FOR THE OPERATIONAL REQUIREMENTS FOR SUPPLEMENTARY SERVICES

The following list contains possible items in the operational requirements for a supplementary service. The list is mainly intended as a check-list in order to include all the relevant items in the same order. It is not the intention that all the items should be completed. The following standard phrases can be used to indicate that the result of the studies does not give rise to further remarks on the subject in question:

- Not applicable
- None identified
- No impact.

The descriptions should be used as basic material for the technical realisation of the services and for the elaboration of user guides.

1. DEFINITION

A brief description of the service in order to distinguish it from others.

2. DESCRIPTION

2.1. General Description

Prose description of the service as conceived by the user, i.e. not a technical description. However, technical terms are permitted where the use of these improves the understanding.

Where it is suitable, a family tree is used to show the connection between various options.

2.2. Denomination of Users

In this paragraph is briefly stated whether the service is used:

- at the establishment of a call,
- during a call, or
- at the end of a call,

- by the calling user,
- by the called party, or
- by other parties to the call.

2.3. **Specific Terminology**

In this paragraph is described any specific terminology and, if necessary, the use of general terminology.

2.4. **Applicability to Telecommunication Services**

In this paragraph are stated the telecommunication services to which the service is considered applicable.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

In this paragraph is stated whether the service is expected to be generally available, whether a subscription is a prerequisite for the service or whether specific conditions, e.g. legal matters, prevail.

3.1.2. *Registration and Erasure*

In this paragraph is stated how possible user specific data are registered/erased (by the network operator or the user).

3.1.3. *Activation and Deactivation*

In this paragraph is stated how the service is brought in or out of such a state that it can be invoked automatically.

3.1.4. *Invocation and Operation*

In this paragraph is described how the service is invoked:

- automatically by entering a state,
- manually by the user's action, or
- by time control.

3.1.5. *Interrogation*

In this paragraph is described how the user can control the current state of the service.

3.2. **Alternative Method for Users to Access the Service**

If there are any alternative methods for the user's access to the service, these are stated in this paragraph under the same subtitles as for normal access.

3.2.1. *Provision and Withdrawal*

3.2.2. *Registration and Erasure*

3.2.3. *Activation and Deactivation*

3.2.4. *Invocation and Operation*

3.2.5. *Interrogation*

3.3. **Stimulus Mode Procedures**

In this paragraph is stated the stimulus mode procedures to be used by the user to access the services by using a standard 12 button keyboard.

The user procedures are described in T/CAC S 10.7, Annex 0.2.

The following subparagraphs may be relevant.

3.3.1. *Registration*

3.3.1.1. Registration without Activation

3.3.1.2. Registration with Activation

3.3.2. *Erasure*

3.3.3. *Activation*

3.3.4. *Deactivation*

3.3.5. *Invocation*

3.3.6. *Interrogation*

3.3.6.1. Status Check

3.3.6.1. Data Check

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

In this paragraph is stated what the user should experience in case of unsuccessful outcome.

5. INTERWORKING AND INTERCOMMUNICATION

In this paragraph is stated the conditions in the case of interworking and intercommunication with other networks, including private networks.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

In this paragraph is stated what should happen in case of simultaneous use of two or more supplementary services and the influence on the functions, e.g. which service takes precedence, if two services are in use at the same time.

Individual services are written in bold and followed by the service abbreviation. Groups of services are written in bold italic. The service group abbreviations are not indicated.

Groups of services are referred to by a two-digit reference number.

Individual services not included in a service group are referred to by a two-digit reference number. Services included in a service group are referred to by a three-digit reference number.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

In this paragraph are stated the customer categories to whom the service is most useful.

7.2. Charging

In this paragraph are stated any specific charging matters.

7.3. Quality of Service

In this paragraph are stated any measurable parameters which can express satisfaction of the users' expectations to the service.

Annex 0.2

USER OPERATION OF SUPPLEMENTARY SERVICES

1. INTRODUCTION

This annex describes how the users are enabled to operate the supplementary services when these services have been provided by the network operator.

The provision of a supplementary service is carried out by the network operator and may be:

1. General: The service is made available to all customers without prior arrangements being made with the network operator.

2. Pre-arranged: The service is made available to an individual subscriber only after the necessary arrangements have been made with the network operator.

The description is based on the stable states the supplementary services may reach after they have been provided by the network operator.

2. STABLE STATES

After the provision of a supplementary service it may assume three different stable states depending on the service type:

1. Provided
2. Registered
3. Active

2.1. Provided

Provided is the first stable state occurring when the network operator has provided a supplementary service.

The provided state is terminated through the withdrawal of the supplementary service by the network operator.

At withdrawal the supplementary service shall be deactivated automatically and registered data shall be erased.

2.2. Registered

Upon provision, the first event changing a service state is the registration of the service. Registration is programming of the network for execution of the supplementary service in accordance with the requirements of the current user. This means that user specific data for the individual supplementary service is registered in the network.

Registration is the first possible user operation.

Registration may be omitted if the supplementary service type does not imply the use of user specific data. [1])

The user's possibility of registering a supplementary service may also be omitted if the user specific data are entered permanently by the network operator at the time of provision.

A few supplementary services feature automatic registration on activation of the supplementary service. This registration is then carried out on the basis of the current state at the user's network termination. [2])

The registered data is deleted through erasure.

Erasure of the supplementary service shall result in automatic deactivation.

2.3. Active

In the active state where supplementary service shall be invoked automatically:

1. on the occurrence of a defined state and/or event determined by the supplementary service type and/or through the registration, or

2. at the time determined at the registration of the supplementary service.

The service may be user activated.

Separate activation may be omitted if the service type implies automatic activation at the time of provision and/or registration.

Activation may also be omitted if the supplementary service in question does not imply automatic invocation. [3])

Depending on the supplementary service type, activation may take place either from the provided or the registered state.

Termination of the active state takes place through deactivation.

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[1]) Call Waiting (CW) is a supplementary service which does not imply registration.

[2]) Completion of Calls to Busy Subscriber (CCBS) is a supplementary service where registration takes place automatically.

[3]) Abbreviated Dialling is a supplementary service which does not imply automatic invocation.

3. USER OPERATION OF SUPPLEMENTARY SERVICES

User operation of supplementary services may be divided into three groups:

1. Preparation of supplementary services,
2. Manual invocation of supplementary services, and
3. Interrogation of supplementary services.

3.1. Preparation of Supplementary Services

Preparation of a supplementary service means that the service is brought into a required stable state.

The above section already indicates a need for the first four user procedures in the following description. Add to this the possibility of overwriting an earlier registration without prior erasure.

3.1.1. *Registration*

Data programming makes a specific supplementary service function in accordance with the requirements of the current user.

3.1.2. *Erasure*

The deleting of data stored against a particular user termination and supplementary service.

3.1.3. *Activation*

An action taken to enable a process to run as and when required by the supplementary service concerned.

3.1.4. *Deactivation*

An action taken to terminate the active state of the supplementary service.

3.1.5. *Overwriting*

Attempts to register an already registered and possibly active supplementary service shall result in automatic erasure, a new registration, and possibly activation in accordance with the data entered by the user. Before the overwriting is finally approved, the user shall be warned of the erasure of the old registration through an appropriate indication. The overwriting is not effective until after approval by the user. Overwriting will not be treated separately because apart from the warning it does not differ from registration.

All user procedures may also be carried out by the network operator.

3.2. Manual Invocation

Manual invocation enables the user to invoke a supplementary service. Manual invocation is primarily used for services which are invoked for a specific call. This may be in connection with the initiation of the call, handling of an incoming call, or during the call.

At invocation in connection with a specific call, the procedures are initiated before dialling of the called number.

3.3. Interrogation

Interrogation enables the user to request notification from the network of the present status and registered data for a given supplementary service on its network termination.

The interrogation may be divided into three different categories:

3.3.1. Status Check

Status check enables the subscriber to request notification of the present status of the desired supplementary service. The network returns a standard indication describing the present state of the supplementary service.

3.3.2. Data Check

Data check compares the data input entered by the user during the interrogation procedure with the information stored in the network. The network returns a standard indication.

3.3.3. Data Request

Data request enables the user to request the stored data against a particular supplementary service on its network termination. The system returns an appropriate indication of the stored data.

4. USER PROCEDURES

Two different types of user procedures are anticipated:

1. Functional user procedures
2. Stimulus user procedures

Re 1. Functional procedures require that the terminal is equipped with operating devices for each current supplementary service and accompaning procedures. These may be permanently programmed keys, user programmed keys, or softkeys, the functions of which depend on the current status of the terminal.

Re 2. Stimulus procedures enable the user to operate all supplementary services by means of a standard keyboard and procedures composed of *, # and digits in accordance with a fixed procedure model. If necessary, there should also be an R-button.

The two procedure types provide the user with the same possibilities, but they both have their advantages and disadvantages.

Re 1. Functional user procedures are the most simple ones to use by the user, but they make certain demands on the capabilities of the terminal for each supplementary service.

Re 2. Stimulus user procedures provide maximum flexibility, but make the user operation more complex.

Both procedure types are necessary. The functional procedures will be used from more advanced terminals purchased, upgraded or programmed for operation of the required number of supplementary services. The stimulus procedures are used from simple terminals and for procedures which have not been entered for functional operation from advanced terminals. A combination may be anticipated so that functional procedures are used from an advanced main terminal, whereas stimulus procedures are used from simple terminals connected in parallel at the network termination. Comprehensive procedures, e.g. a complex registration, are expected only to be made from the main terminal by means of a functional procedure.

Details concerning functional procedures are outside the scope of this Annex which only deals with details concerning stimulus procedures. The general considerations, however, apply to both functional and stimulus procedures.

5. COMBINED PROCEDURES

The above implies that shifts between stable states take place according to a fixed procedure, so that registration and a subsequent activation take place in two separate procedures. However, it must be expected that the user's registration will take place concurrently with the first activation of a supplementary service. A procedure simultaneously registering and activating the service is therefore desirable to the user. A need for separate registration for subsequent activation is still relevant and must not be sacrificed for the sake of a combined procedure.

The automatic deactivation of a service at erasure makes corresponding considerations concerning combination of erasure and deactivation unnecessary.

The above considerations show a need for addition of the combined procedure, registration with activation.

6. STIMULUS PROCEDURES

The stimulus user procedures are treated in CEPT Recommendation T/CAC O 2.

The general model for stimulus user procedures is illustrated in the following way:

P SC * SI (* SI) #

where the individual parts are:

P Prefix
The following prefixes are used:
- * Registration and activation
- # Erasure and deactivation
- *# Interrogation

SC Service Code

* Separators

SI Supplementary Information.
(*SI) Further Supplementary Information, if required
Suffix. The # should always be used as the procedure suffix.

6.1. Preparation of Supplementary Services

According to the above sections there is a need for the following procedures:

1. Registration without activation
2. Registration with activation
3. Erasure
4. Activation
5. Deactivation

The latter SI is used to determine whether activation takes place concurrently with registration, and whether erasure or deactivation is carried out. If 0 is used as default, the procedures are further reduced to the following, where the parenthesis around * 0 shows the default function.

3.3.1.1. Registration without Activation

* SC * SI (* SI) * 0 #

3.3.1.2. Registration with Activation

* SC * SI (* SI) (* 1) #

3.3.2. *Erasure*

SC * 1

3.3.3. *Activation*

* SC #

3.3.4. *Deactivation*

SC (* 0)

6.2. Manual Invocation

Manual invocation of a supplementary service in connection with a call takes place by placing the prefix, the SC, and any SI in front of the called party's number (CPN) which will then become a SI. The result may be that the user forgets the suffix. The suffix is therefore left out, however, in such a way that it is ignored, if it is sent. The procedure model will then be:

3.3.5. *Invocation*

* SC (* SI) * CPN (#)

6.3. Interrogation

3.3.6.1. Status Check

No SI shall be entered at status check. The procedure is:

*# SC #

3.3.6.2. Data Check

At data check the data to be checked are entered as supplementary information. The procedure is:

*# SC * SI (*SI) #

3.3.6.3. Data Request

At data request no data shall be entered, but a SI shall separate data request from status check. SI = 1 is used. The procedure is:

*# SC * 1 #

7. RESPONSE FROM THE NETWORK

In the cases where a user procedure does not result in a network event, which is directly perceived by the user, the network shall give a response in the form of an audible signal or a dispaly message. These messages to the user are called indications.

The formulation of such indications is a national matter. With respect to the international traffic they should be combined with internationally understandable tones and symbols. Concerning tones reference is made to CEPT Recommendations T/CAC S 3 (Formerly T/SF 14), T/CAC S 5 (T/SF 17), and T/CAC S 7 (T/SF 23).

Annex 0.3

LIST OF DEFINITIONS FOR USED TERMS

1. ACTIVATION

An action taken by either the network operator or the subscriber to enable a process to run as and when required by the supplementary service concerned.

The time during which the process is activated is defined as the active phase. During activation, the supplementary service will be either "quiescent" or "operative" according to whether or not the system is actually using the supplementary service, e.g. to divert a call, to apply call waiting indication or to establish an alarm call.

2. CONTROL POSSIBILITIES

The possibilities for the network operator to

- activate
- register
- deactivate
- erase
- test
- interrogate

a supplementary service on behalf of the subscriber.

3. CONTROL PROCEDURES

An action taken by the subscriber to enable the network or the terminal to offer a supplementary service or a certain aspect of a supplementary service.

4. DATA CHECK

The interrogation function "Data Check" compares the data input by the subscriber during an interrogation procedure with the information stored in the system. The system returns a standard tone or announcement (e.g. "Check is positive" or "Check is negative") or indications.

LIST OF DEFINITIONS FOR USED TERMS

5. **DATA REQUEST**

The interrogation function "Data Request" enables the subscriber to obtain confirmation of this input data. The system returns an appropriate announcement (e.g. "the time of the alarm call is 0630") or indication.

6. **DEACTIVATION**

An action taken by either the network operator, the subscriber or the system to terminate the process started at the activation.

7. **DISABLE**

An action taken by the user on a per call basis to prevent the action of a supplementary service, e.g. to allow number presentation although Calling Line Identification Restriction (CLIR) is active.

8. **ERASURE**

The deleting by the network operator, the subscriber or the system of information stored against a particular supplementary service by a previous registration.

9. **INDICATION**

An instruction or response to the user issued by the network.

10. **INTERACTION WITH OTHER SUPPLEMENTARY SERVICES**

When more than one supplementary service is active, new logical situations, decisions, priorities, etc. may arise. This section would identify and define the resolution of such situations as they affect user perception of the supplementary service. Special procedures may therefore be required, e.g. to allow, where possible, the simultaneous use of different supplementary services by one subscriber.

11. **INTERROGATION**

The interrogation procedure allows the subscriber, on request, to receive output from the exchange giving information concerning the supplementary service data stored relating to its line.

12. **INTERWORKING CONSIDERATIONS**

Identification of user perceptions when a call exists from ISDN to another CEPT specified network or enters an ISDN from another CEPT specified network.

LIST OF DEFINITIONS FOR USED TERMS

13. INVOCATION

An action, either by the user e.g. by pressing a specific button or by keying the supplementary code, or automatically by the network or terminal as a result of a particular condition, e.g. a diversion supplementary service registered by the called subscriber.

14. NETWORK OPERATOR REQUIREMENTS

Conditions with which a network operator may reserve the right to maintain optimum utilization of a given service by the network operator and/or its customers.

15. NOMINATED SUBSCRIBER REQUIREMENTS

The network responses required by a subscriber who receives a call as the result of an action by a second party in order that he can control and act upon all the calls forwarded to his line or originated from his line.

16. NORMAL OPERATION WITH SUCCESSFUL OUTCOME

Description of the normal operation of the supplementary service, the normal served user actions and the system response. Decision points, screening action, timing, traffic record, routing parameter modification and call progress signals would be some of the aspects defined for the supplementary service if they can be perceived by the user.

17. PROVISION

An action to make a supplementary service available to a subscriber. The provision may be

1) General: where the supplementary service is made available to all subscribers (subject to compatibility restrictions enforced) without prior arrangements being made with the network operator.

2) Pre-arranged: where the supplementary service is made available to an individual subscriber only after the necessary arrangements have been made with the network operator.

18. REGISTER RECALL

The availability for a subscriber to start a control procedure during an established call.

19. REGISTRATION

The programming by the network operator or subscriber of information to enable subsequent operation of a supplementary service. This programming action involves input of specific supplementary information.

For certain supplementary services the registration procedure may cause activation whilst for others the supplementary service may already be in the action phase.

LIST OF DEFINITIONS FOR USED TERMS

20. **SERVICE CODE**

A numerical code designating a supplementary service, e.g. in a stimulus procedure.

21. **SERVICE OPERATION REQUIREMENTS**

A description of the various static and dynamic processes to be undertaken by the system in order to realise the supplementary service concerned.

22. **STATUS CHECK**

The interrogation function "Status Check" enables the subscriber to request confirmation of the present status of the desired supplementary service. The system returns a standard tone announcement (e.g. "the service is activated" or "the service is deactivated") or indication.

23. **SUSPENSION**

An action taken by the network operator or the system which without initiating deactivation of a supplementary service prevents the operation of a supplementary service during the period of incompatibility of two or more supplementary services.

24. **SWITCHING ORDER**

An instruction sent by the user, to the exchange, during a condition different from the normal call setup conditions to perform a function relating to a supplementary service.

Switching Orders, which may or may not be prefixed by register recall, may be sent during a one call state, e.g. to accept a Reverse Charging call, or during a two call state, e.g. to shift to a held call.

25. **SYSTEM RESPONSE**

The reaction of the network or any part of the network to the receipt or recognition of any signal, tone, number series or other instruction to set up or cease a call, to provide, withdraw, activate or deactivate a supplementary service, or to effect an action related to the control of a supplementary service or call. This response may be positive, in compliance with the requirement indicated, or negative, i.e. refusal of the requirement and either condition may be notified to the subscriber(s) concerned by means of a connection, a tone, a verbal announcement or indication.

26. **TESTING**

The test procedure allows the subscriber to check whether or not the supplementary service is operating as he desires.

In some cases the use of the supplementary service is sufficient, for others a method of testing is included in the control procedure.

LIST OF DEFINITIONS FOR USED TERMS

27. **WITHDRAWAL**

An action taken by the network operator to remove an available service from a subscriber's line. The withdrawal may be:

1) General: where the supplementary service is removed from all subscribers provided with the supplementary service.

2) Specific: where the supplementary service is removed on an individual basis from subscribers provided with the supplementary service.

Annex 0.4

LIST OF ABBREVIATIONS

Supplementary Services

AOC	Advice of Charge
AOC-S	Advice of Charge, Charging Information at Call Setup Time
AOC-D	Advice of Charge, Charging Information During the Call
AOC-E	Advice of Charge, Charging Information at the End of the Call
CCBS	Completion of Calls to Busy Subscriber
CCC	Charge Card Calling [1])
CD	Call Deflection
CFB	Call Forwarding Busy
CFB-S	Call Forwarding Busy to a Service Centre
CFNR	Call Forwarding No Reply
CFNR-S	Call Forwarding No Reply to a Service Centre
CFU	Call Forwarding Unconditional
CFU-S	Call Forwarding Unconditional to a Service Centre
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CONF	Conference Call, Add-on
CRED	Credit Card Calling [2])
CUG	Closed User Group
CW	Call Waiting
DDI	Direct Dialling In
ECT	Explicit Call Transfer
FPH	Freephone
HOLD	Call Hold
ICB	Incoming Call Barring [2])
IIFC	Inhibition of Incoming Forwarded Calls [2])
IM	Incall Modification [2])
LH	Line Hunting
MBG	Multilocation Business Group [1])
MCID	Malicious Call Identification
MLPP	Multilevel Precedence and Pre-emption [2])
MMC	Meet-me Conference
MSN	Multiple Subscriber Number
OCB	Outgoing Call Barring
PNP	Private Numbering Plan
PRI	Priority
PRM	Primary Rate [2])
RCSS	Remote Control of Supplementary Services
REV	Reverse Charging [2])
SCF	Selective Call Forwarding [2])

LIST OF ABBREVIATIONS

SCT	Single Step Call Transfer
SUB	Sub-Addressing
TP	Terminal Portability
UAN	Universal Access Number [2])
UUS	User-to-User Signalling
VCC	Virtual Card Calling [1])
3PTY	Three Party Service

Miscellaneous

CPN	Called Party's Number
DTE	Data Terminating Equipment
DTN	Diverted-to Number
GDN	General Directory Number
GOCB	General Outgoing Call Barring
IOCB	International Outgoing Call Barring
ISDN	Integrated Services Digital Network
KW	Keyword
NDUB	Network Determined User Busy
PAD	Packet Assembly/Disassembly
PSN	Private Switched Network
PSTN	Public Switched Telephone Network
SC	Service Code
SI	Supplementary Information
SO	Switching Order
SOCB	Special Outgoing Call Barring
UDUB	User Determined User Busy

Notes:

1. This supplementary service is not included in this Recommendation.

2. This supplementary service is not included in this Recommendation, the definition of the service can be found in Recommendation T/CAC S 10.5, Annex 2.

Annex 1

ADVICE OF CHARGE SERVICES

Advice of Charge Services is a group of supplementary services allowing the user paying for a call to be informed of usage-based charging information.

These supplementary services are not meant to replace the charge metering inside the network which is considered to be the correct one in all cases.

The group includes the following three supplementary services:

1. **Advice of Charge, Charging Information at Call Setup Time (AOC-S)**
2. **Advice of Charge, Charging Information During the Call (AOC-D)**
3. **Advice of Charge, Charging Information at the End of the Call (AOC-E)**

Annex 1.1

ADVICE OF CHARGE, CHARGING INFORMATION AT CALL SETUP TIME (AOC-S)

Operational Requirements

1. DEFINITION

The Advice of Charge, Charging Information at Call Setup Time (AOC-S) supplementary service provides the possibility for a user to receive information about the charging rates at call setup time and about a possible change of charging rates during the call.

2. DESCRIPTION

2.1. General Description

This supplementary service provides the user with the possibility to receive information about the charging rates at call establishment. In addition, the user will be informed if a change in the charging rates takes place during the call.

The service may be active for all calls or it may be invoked on a per call basis. The charging information is provided by the network during call establishment or at the latest at call connection. The information is transferred to the user in a charge advice information element in the call control message.

The charging information may consist of a number of information units such as:

1. Case of Advice of Charge
   - Charging rate information

2. Charged Amount Information
   - Free of charge
   - Charging period

3. Charging Rate Information
   - Price per time unit and size of time units
   - Price per volume unit and size of volume units
   - Price per number of times

   Note: Number of times should be used, e.g. to charge a certain number of supplementary service invocations.

4. Usage Charge Element
   - Registration
   - Call attempt

- Invocation
- Duration
- Volume

2.2. Denomination of Users

This supplementary service is used by the calling party.

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The possibility to receive information about the charging rates is provided on a subscription basis or may be generally available. The service shall be withdrawn at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

The service may be activated and deactivated by the user. When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4. *Invocation and Operation*

3.1.4.1. Automatical

When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4.2. Manual

When not active, the supplementary service may be invoked manually at the call setup.

3.1.5. *Interrogation*

Interrogation of the provision and the activation of the supplementary service shall be possible.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 461 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 461 #

3.3.4. *Deactivation*

461

3.3.5. *Invocation*

* 461 * CPN (#)

Note: CPN = Called Party's Number.

3.3.6. *Interrogation*

*# 461 #

4. **USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME**

If no charging information will be given to a user with AOC-S provided, the user shall be informed accordingly as soon as possible.

5. **INTERWORKING AND INTERCOMMUNICATION**

This service shall be supported across the inter-network interface between ISDNs, including private ISDNs.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Not applicable.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact. [1])

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

When a call is transferred and the transferring user is charged for the transferred part of the call, the charging information shall be sent to the transferring user at the transfer time, if the transferring user has activated or invokes AOC-S.

6.4.2. Single Step Call Transfer (SCT)

When a call is transferred and the transferring user is charged for the transferred part of the call, the charging information shall be sent to the transferring user at the transfer time, if the transferring user has activated or invokes AOC-S.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.8.2. **Meet-Me Conference (MMC)**

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.2. Call Forwarding Busy (CFB)

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.3. Call Forwarding No Reply (CFNR)

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.4. Call Deflection (CD)

Calling user: No impact.

Deflecting user: Advice of the charge on the deflected leg of the call shall be given.

6.10.5. Call Forwarding Unconditional to a Service Centre (CFU-S)

At registration of the service the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the AOC-S supplementary service.

6.10.6. Call Forwarding Busy to a Service Centre (CFB-S)

At registration of the service the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the AOC-S supplementary service.

6.10.7. Call Forwarding No Reply to a Service Centre (CFNR-S)

At registration of the service the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the AOC-S supplementary service.

6.11. Freephone (FPH)

Calling user: No impact.

Called user: No charging information shall be given.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No information concerning charges for UUS shall be given.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All groups of customers.

7.2. CHARGING

The AOC-S supplementary service may be charged on a subscription basis and/or on a per call basis.

7.3. Quality of Service

The charging information given may not differ more than a certain percentage from the charge debited the user. The accuracy between the charging and the information given in the AOC-S supplementary service is a network operator option.

Annex 1.2

ADVICE OF CHARGE, CHARGING INFORMATION DURING THE CALL (AOC-D)

Operational Requirements

1. DEFINITION

The Advice of Charge, Charging Information During the Call (AOC-D) supplementary service provides the possibility for a user to receive charging information for a call during the active phase of the call. The service may be invoked manually at any time during a call.

2. DESCRIPTION

2.1. General Description

This supplementary service provides the user with information that may be either incremental or cumulative. The information shall be sent automatically or on request. If a terminal offers the possibility of AOC information during a call, then cumulative information is the minimum requirement which should be covered by all terminals. The other features are optional and should be reserved for more enhanced terminals.

The charging information may consist of a number of information units such as:

1. Case of Advice of Charge
   - Incremental charging during a call, or
   - Cumulative charging during a call

2. Charged Amount Information
   - Free of charge
   - Number of charged units
   - Charging period

3. Charging Rate Information
   - Price per time unit and size of time units
   - Price per volume unit and size of volume units
   - Price per number of times

   Note: Number of times should be used, e.g. to charge a certain number of supplementary service invocations.

4. Usage Charge Element
   - Registration
   - Call attempt

- Invocation
- Duration
- Volume

2.2. Denomination of Users

This supplementary service is used by the party charged for the call. Normally, the calling party (A).

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Charging information during a call is provided on a subscription basis. Withdrawal at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

The service may be activated and deactivated by the user. When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4. *Invocation and Operation*

3.1.4.1. Automatical

When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4.2. Manual

When not active, the supplementary service may be invoked manually at any time during the call.

3.1.4.3. When the call is released,

- the remaining number of charging units since the last transfer of charging information are sent to the user in one of the call control messages clearing the call (incremental),

or

- the overall charge for the call is sent to the user in one of the call control messages clearing the call (cumulative).

3.1.5. *Interrogation*

Interrogation of the provision and the activation of the supplementary service shall be possible.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The following service codes have been allocated:
- Cumulative information 462,
- Incremental information 463.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 462/463 #

3.3.4. *Deactivation*

462/463

3.3.5. *Invocation*

* 462/463 * CPN (#)

Note: CPN = Called Party's Number.

3.3.6. *Interrogation*

*# 462/463 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If no charging information will be given to a user with AOC-D provided, the user shall be informed accordingly as soon as possible.

5. INTERWORKING AND INTERCOMMUNICATION

This service shall be supported across the inter-network interface between ISDNs, including private ISDNs.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

Not applicable.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No information concerning the transferred part of the call shall be sent to the transferring user.

6.4.2. Single Step Call Transfer (SCT)

No information concerning the transferred part of the call shall be sent to the transferring user.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact.

6.6.2. Outgoing Call Barring (OCB)

No impact.

6.7. Completion of Calls to Busy Subscriber (CCBS)

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information shall be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.8.2. Meet-Me Conference (MMC)

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information shall be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.2. **Call Forwarding Busy (CFB)**

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.3. **Call Forwarding No Reply (CFNR)**

Calling user: No impact.

Forwarding user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.4. **Call Deflection (CD)**

Calling user: No impact.

Deflecting user: No information shall be given. The user may use the supplementary service Advice of Charge, Charging Information at the End of the Call (AOC-E).

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.11. **Freephone (FPH)**

Calling user: No impact.

Called user: No charging information shall be given.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

When the call is in the suspended state no charging information shall be sent to the user; on resumption of the call the sending of charging information shall start again with the updated value.

6.20. **Three-Party Service (3PTY)**

Charges for the different connections within the service: No impact.

Charges for the use of the three-party connection: This charging information shall be sent to the charged user. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.21. User-to-User Signalling (UUS)

No information concerning charges for User-to-User Signalling shall be given.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All groups of customers.

7.2. Charging

The service may be charged on a subscription basis and/or on a per call basis.

7.3. Quality of Service

The charging information given may not differ more than a certain percentage from the charge debited the user. The accuracy between the charging and the information given in the AOC-D supplementary service is a network operator option.

Annex 1.3

ADVICE OF CHARGE, CHARGING INFORMATION AT THE END OF THE CALL (AOC-E)

Operational Requirements

1. DEFINITION

The Advice of Charge, Charging Information at the End of the Call (AOC-E) supplementary service provides the possibility for a user to receive charging information for a call when the call is released.

2. DESCRIPTION

2.1. General Description

This supplementary service provides a user with charging information for a call when the call is released.

The charging information may consist of a number of information units such as:

1. Case of Advice of Charge
   - Charging at the end of a call

2. Charged Amount Information
   - Free of charge
   - Number of charged units

3. Charging Rate Information
   - Price per time unit and size of time units
   - Price per volume unit and size of volume units
   - Price per number of times

Note: Number of times should be used, e.g. to charge a certain number of supplementary service invocations.

4. Usage Charge Element
   - Registration
   - Call attempt
   - Invocation
   - Duration
   - Volume

2.2. **Denomination of Users**

This supplementary service is used by the party charged for the call. Normally, the calling party (A).

2.3. **Specific Terminology**

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

Charging information at the end of a call can be provided on a subscription basis or be generally available. Withdrawal at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

The service may be activated and deactivated by the user. When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4. *Invocation and Operation*

3.1.4.1. Automatical

When active, the supplementary service shall be invoked automatically at all outgoing calls.

3.1.4.2. Manual

When not active, the supplementary service may be invoked manually at the call setup.

3.1.5. *Interrogation*

Interrogation of the provision and the activation of the supplementary service shall be possible.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 464 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 464 #

3.3.4. *Deactivation*

464

3.3.5. *Invocation*

* 464 * CPN (#)

Note: CPN = Called Party's Number

3.3.6. *Interrogation*

*# 464 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If no charging information will be given at the end of the call, the charged user shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

This service should be supported across the inter-network interface between ISDNs, including private ISDNs.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.1.2. **Advice of Charge, Charging Information During the Call (AOC-D)**

No impact.

6.1.3. **Advice of Charge, Charging Information at the End of the Call (AOC-E)**

Not applicable.

6.2. **Call Waiting (CW)**

No impact.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

When a call is transferred and the transferring user is charged for the transferred part of the call, the charging information may be sent to the transferring user when the call is cleared, if the transferring user has activated or invokes AOC-E.

6.4.2. **Single Step Call Transfer (SCT)**

When a call is transferred and the transferring user is charged for the transferred part of the call, the charging information may be sent to the transferring user when the call is cleared, if the transferring user has activated or invokes AOC-E.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. *Call Barring Services*

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.8.2. **Meet-Me Conference (MMC)**

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller. If no charging information can be given, e.g. due to off-line processing of the charging, the user shall be informed accordingly.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

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

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, the charging information may be transferred to the forwarding user when the call is cleared.

6.10.2. **Call Forwarding Busy (CFB)**

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, the charging information may be transferred to the forwarding user when the call is cleared.

6.10.3. **Call Forwarding No Reply (CFNR)**

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, the charging information may be transferred to the forwarding user when the call is cleared.

6.10.4. **Call Deflection (CD)**

When a call is deflected and the deflecting user is charged for the deflected part of the call, the charging information may be transferred to the deflecting user when the call is cleared.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

After the release of a call forwarded to the service centre the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the AOC-E supplementary service.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

After the release of a call forwarded to the service centre the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the AOC-E supplementary service.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

After the release of a call forwarded to the service centre the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the AOC-E supplementary service.

6.11. **Freephone (FPH)**

Calling user: No impact.

Called user: No charging information shall be given.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

If the call is cleared while it is in the suspended state at the calling party's access, then no advice of charge information shall be given to that party.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No information concerning charges for User-to-User Signalling shall be given.

7. COMMERCIAL CONSIDERATIONS

7.1 Customer Segment

All groups of customers, especially those who let out telecommunication stations, e.g. in hotel rooms and leisure time residences.

7.2. Charging

The service may be charged on a subscription basis and/or on a per call basis.

7.3. Quality of Service

The charging information given may not differ more than a certain percentage from the charge debited the user. The accuracy between the charging and the information given in

the AOC-E service is a network operator option.

Annex 2

CALL WAITING (CW)

Operational Requirements

1. DEFINITION

The Call Waiting (CW) supplementary service enables a busy user to be notified of an incoming call in a waiting position. The notification indicates that no interface information channel is available. The user then has the choice of accepting, rejecting or ignoring the waiting call.

2. DESCRIPTION

2.1. General Description

This service operates when both B-channels of the served user's termination are engaged.

Moreover, the customer may have the possibility of receiving an incoming call indication on all its compatible terminals even when only one B-channel is busy.

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 CW 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.

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.

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

The maximum number of calls that can be handled (e.g. active, held, alerting, waiting) for each ISDN number on a given interface is a network operator option.

This service only applies to installations having one basic access. In the case that a customer's installation consists of more than one basic access combined in a line hunting group, CW should not be provided.

2.2. Denomination of Users

The user is a called party busy on an ongoing call. The user may be as well the calling as the called party on the ongoing call.

2.3. Specific Terminology

NDUB: Network Determined User Busy. See definition in Recommendation T/CAC S 10.1, clause 7.

T1: User response time-out: The duration of this time-out is the time the network will wait for a positive response to the offered call. It is part of the basic call and has a value of a few seconds.

T2: No answer time-out: The duration of this time-out is the time the network will wait for an answer from user B to the offered call from user C. The value of this time is between 0.5 and 2 minutes.

User A: The user who is engaged in a call with user B (this call can be in any state).

User B: The user who reacts to the CW at B.

User C: The user who has originated a call to B which causes the CW service to be invoked.

2.4. Applicability to Telecommunication Services

This supplementary service is considered meaningful when applied to the telephony teleservices, the speech, and the 3.1 kHz audio bearer services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CW can be provided on a subscription basis or be generally available to all users without subscription. CW can be withdrawn at the customer's request or for administrative reasons.

As part of each applicable bearer service or teleservice, there is an option specifying the maximum number of information channels which can be used (occupied) on the interface for each ISDN number, all ISDN numbers, or subsets of ISDN numbers. CW for bearer services or teleservices occurs only when an attempt is made to exceed these limits.

As a network operator option, CW can be offered with several subscription options. The options apply separately to each ISDN number and service combination. For each subscription option, only one value can be selected. Subscription options are summarised below:

Subscription Option	Value
Calling user receives notification that the call is in a waiting position	- No - Yes

In addition, the following network operator options can be specified for each ISDN number, all ISDN numbers, or subsets of ISDN numbers on each interface.

Network Operator Options	Value
Maximum number of calls which can be waiting	- One - N, where N is more than one

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

The served user shall be able to activate and deactivate CW with an appropriate procedure. After the completed procedure the network shall inform the user of the result of its action by an appropriate indication.

3.1.4. *Invocation and Operation*

When an incoming call from user C arrives at the access of user B and encounters the channels busy condition and a network determined user busy condition does not exist, then the CW supplementary service will be invoked and the call shall be offered to user B with an indication that the channels busy condition exists.

If a response is received from a terminal at the B access within the normal basic call period that user(s) is (are) being informed about the incoming call, then user C will be given an indication that the called user(s) is (are) being informed of the incoming call. In some networks this indication may also indicate that CW is in operation.

If user B requests to be connected to the waiting call and to place the specified active call with user A into a held state, before the expiry of the no answer time-out T2, then the call between user C and user B is completed in the normal manner with any indications to user C being removed. The previously active call between user A and user B is put into the held state with user A being given an indication that its call has been put into the held state.

Note: From this state other supplementary services, e.g. the Three-Party Service, may be used.

If user B requests to connect to the waiting call and to terminate the specified active call with user A, before the expiry of the no answer time-out T2, then the call between user C and user B is completed in the normal manner with any indications to user C being removed. The previously active call between user A and user B is terminated in the normal manner.

If user B terminates the active call with user A before the expiry of the no answer time-out T2, then this call shall be released in the normal manner. User B is then able to accept the waiting call from user C using normal information channel selection procedures.

If user B holds the active call with user A before the expiry of the no answer time-out T2,

then this call shall be held in the normal manner. User B is then able to accept the waiting call from user C using normal information channel selection procedures.

If user A requests to terminate the active call with user B, before the expiry of the no answer time-out T2, then the above conditions apply.

3.1.5. *Interrogation*

Interrogation of the provision and the activation of the supplementary service shall be possible.

3.2. **Alternative Method for Users to Access the Service**

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

Not applicable.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

3.2.4.1. Incoming Call from User C Ignored by User B

If the no answer time-out T2 expires without any acceptance from user B of the incoming call, then the network shall inform user B that the call is no longer waiting and also inform user C that its call cannot be connected. Normal release applies to the call attempt from user C with an appropriate indication (indicating no response) given to user C.

3.2.4.2. Incoming Call from User C Rejected by User B

A rejection of the waiting call by one of the terminals on the interface of user B will not stop the no answer time-out T2 as another terminal may subsequently accept the waiting call within the remainder of the specified period. Such a rejection shall, however, cancel any indication given to that terminal.

Where rejections of a waiting call have been received from all those terminals that responded with an alerting indication before the expiry of the no answer time-out T2, then the network shall inform user C that its call cannot be connected. Normal release applies to the call attempt from user C with the call being cleared indicating user rejection. User B is notified that the call is no longer waiting.

3.2.4.3. Release by User C within the Waiting Period

If the calling user C informs the network before the expiry of the no answer time-out T2 that he wishes to release its call attempt to user B, then the network shall inform user B of this situation and initiate release of the call attempt from user C.

3.2.4.4. No Positive Response from Terminals at User B's Interface

If no positive response that user(s) is (are) being informed of the waiting call is received from a terminal at user B's interface during the normal call period (user response time-out T1), then the call attempt from user C shall be released by the network with user C being given the reason for the release.

3.2.4.5. No Resources Available

If user B accepts a call and network resources do not exist to complete the call (i.e. no information channels are available), the network shall indicate an error to user B with cause: No B-channels available. The network shall not clear the call, but wait for another user B indication for acceptance, until user C clears the call or the no answer time-out T2 expires.

3.2.5. *Interrogation*

None identified.

3.3. **Stimulus Mode Procedures**

The service code 43 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 43 #

3.3.4. *Deactivation*

43

3.3.5. *Interrogation*

*# 43 #

4. **USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME**

In the case of unsuccessful outcome the incoming call attempt shall be handled as a call meeting busy.

5. INTERWORKING AND INTERCOMMUNICATION

If an ISDN user B receives a call from a non-ISDN calling party, the network shall send the CW indication to user B in the normal way.

An inband indication may be applied to channels occupied with the 3.61. kHz audio bearer service (where the call originated from the PSTN as identified by a progress indicator), only if it is destined to a number designated for in-band notification by the CW user.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

Not applicable.

6.3. Call Hold (HOLD)

When an ISDN user receives a CW indication the ISDN user may use the HOLD supplementary service to hold its active call and answer the waiting call. Use of the hold service does not place a call into a waiting state.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

User B, who has subscribed to both CW and ECT supplementary services, cannot transfer a waiting call from user C until a connection to user C has been established.

6.4.2. Single Step Call Transfer (SCT)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5. *Number Identification Services*

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact. If the user(s) at B is (are) given a CW indication and has (have) the CLIP service active, then the calling party's number shall be presented to the user(s) at B at the same time as the CW indication is given.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact. If the calling party C has the CLIR service active, no number indication shall be given to the user(s) at B when the CW indication is given.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact. When user B uses one of the CW procedures to accept a waiting call, user C shall be informed of the connection. The confirmation that a connection has been established may provide the connected user B's number.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. *Call Barring Services*

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

If a subscriber to CCBS places a call to a user B who has subscribed to CW and user B is given the CW indication, CCBS invocation shall not be allowed.

If user B is unable to receive the CW indication, the calling user shall receive busy indication and shall be able to invoke CCBS to user B.

A CCBS recall may invoke CW, if the user's access is in an appropriate condition.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

A user at B, who is active on any type of a conference call, may receive an indication of a waiting call.

Once a conference has been established:

1. Any party that has activated CW shall be able to receive an indication of an incoming call and their connection to the conference could be put on hold to accept the waiting call.

2. The conference controller could, if desired, add the party from the waiting call by answering the waiting call and using the add party procedure.

6.8.2. **Meet-Me Conference (MMC)**

1. Any party that has activated CW shall be able to receive an indication of an incoming call and their connection to the conference could be put on hold to accept the waiting call.

2. The conference controller could, if desired, add the party from the waiting call by answering the waiting call and using the add party procedure.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

If user B has activated CFU, then CFU shall take precedence over CW. CFU can be activated while a call is waiting without changing the state of the waiting call.

6.10.2. **Call Forwarding Busy (CFB)**

If user B is not NDUB, CW shall take place. If user B is NDUB, CFB shall take place. Therefore, these services are mutually exclusive and there is no interaction.

6.10.3. **Call Forwarding No Reply (CFNR)**

If user B has CFNR activated, then a waiting call shall still be offered as described in this definition. If no answer is received to this call during the CFNR time, then the CFNR service shall be invoked.

6.10.4. **Call Deflection (CD)**

When receiving the CW indication, the served user can invoke CD.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

CFB-S shall have precedence over CW.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

The CW supplementary service should not be provided to a line in a hunt group.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

A waiting call cannot be suspended.

6.20. **Three-Party Service (3PTY)**

A user who is involved in a 3PTY operation or active in a three-way conversation may receive an indication of a waiting call.

6.21. User-to-User Signalling (UUS)

UUS Service 1
User-to-user information included in the call setup message shall be delivered to user B with the CW indication.

UUS Service 2
User-to-user information sent from the calling user to the called user during the alerting phase is allowed to be sent when a point-to-point configuration exists at the called side.

UUS Service 3
There is no interaction with UUS service 3.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All single line customers.

7.2. Charging

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

Annex 3

Call Hold (HOLD)

Operational Requirements

1. DEFINITION

The Call Hold (HOLD) supplementary service allows a user to interrupt communication on an existing call and then subsequently, if desired, re-establish communication.

2. DESCRIPTION

2.1. General Description

When the HOLD is invoked, communication on a B-channel is interrupted and the B-channel is released from use by the existing call. The B-channel shall be reserved for use by the given terminal used to invoke the HOLD supplementary service.

When a user (as indicated by a terminal) puts a call on hold, a B-channel should always be available on that user's interface for the user to:

- retrieve that call from hold
- originate a new call
- retrieve another call
- establish connection to another call.

One B-channel shall be kept available for the user as long as the user has one or more calls on hold with reservation and is not currently connected to any other call. I.e. the network shall not reserve more than one B-channel for a user (as defined by the given terminal used to invoke HOLD supplementary service).

2.2. Denomination of Users

HOLD can be invoked during a current call by the calling as well as by the called party.

2.3. Specific Terminology

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all circuit switched basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

The Call Hold supplementary service may be generally available or subscribed to by prior arrangement with the network operator.

As HOLD can often be used together with other supplementary services (e.g. Call Waiting and Three Party Service) a network operator may choose to make the subscription of HOLD automatically through the subscription of these services.

Withdrawal of the service is made by the network operator upon request by the subscriber or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

3.1.4.1. Hold Request

The served user indicates to the network that the communication on the interface is to be interrupted. A call may be put on hold:

- on the calling user's interface by the calling user at any time after the connection has been established or as a network operator option after the call has been offered to the called user;

- on the called user's interface by the called user at any time after the call has been answered and before call clearing has begun.

The communication on the interface is then interrupted. The network acknowledges this action, and the associated channel is made available for other users, depending on the reservation option. The network shall immediately send a notification to the held party indicating that the call has been put on hold.

When the call is held before the connection has been established, the notification shall be sent only on those terminals that have responded at that time.

If a held call(s) is (are) cleared for any reason, the network will continue to reserve a channel for the specified user(s)/terminal(s) until there are no more held calls with reser-

vation associated with the specified user(s)/terminal(s). If, at any time, a call is in the held state, either party may clear the call.

3.1.4.2. Retrieve Request

When the user that invoked HOLD indicates that the call is to be retrieved, the network will re-establish communication, provided that a B-channel is available, and acknowledge to the served user and optionally to the held party that the call is now active.

The user may optionally indicate a B-channel selection parameter in the retrieve request. The parameter may indicate:

1) any channel acceptable,
2) specified channel is preferred, or
3) specified channel is exclusively required.

If the network can satisfy the request, the call shall be returned to the active phase; if not, the request shall be rejected with the appropriate cause returned to the user.

3.1.4.3. Reservation Processing

The following conditions concerning channel reservation shall apply:

1) When a call is retrieved, any reservation associated with that call shall be cleared, independent of the channel used to retrieve the call;
2) When a call is cleared, any reservation associated with the call shall be cleared;
3) When all reservations for a given terminal are cleared, normal channel allocation procedures shall apply;
4) When any reservation is outstanding for a given user (as identified by a terminal) and that user is not using a channel for an active call, then the network shall consider a channel as unavailable for that user for subsequent incoming calls.

3.1.4.4. Clearing with a Call on Hold

If the served user clears with a call on hold, the served user shall be notified of the call on hold or simply be re-alerted. Then the served user may:

1) retrieve the held call, or
2) disconnect the held call, if the served user ignores the notification or the re-alert, the held call shall be disconnected after the normal period for disconnection of unanswered calls.

3.1.5. *Interrogation*

Interrogation of the provision of the service shall be possible.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. **Stimulus Mode Procedures**

The service code 94 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

HOLD is invoked manually by use of Switching Order (SO) 2:

(R) 2

Later on the following SOs are used:

0 Terminate the held call
1 Terminate and switch (Terminate the active call and switch to the held call).
2 Hold and switch (Hold the active call and switch to the held call or a new call possibility).

3.3.6. *Interrogation*

 # 94 (SI) #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

4.1. Hold Request

If the user tries to hold a call while not subscribed to the service or the network cannot hold the call for some other reason, an indication giving the reason for failure shall be provided to the user.

4.2. Retrieve Request

If the network cannot retrieve a previously held call, the user shall be informed of the reason for failure. (For example, there may not be any channel available or the call may be in the process of being cleared.)

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

The operation of this supplementary service shall not be affected by the nature of the remote end of the connection.

Note: If the distant user is a PSTN user, the notification about the hold request or retrieve request of the call to that user may not be supported. In this interworking case it may also occur that a call is held before the call is offered to the called user.

5.2. Interworking with Private ISDNs

When a remote user is on a different network from the served user (e.g. one user on a private ISDN and the other user on a public ISDN), indications to the remote user shall be sent to the remote user's network for forwarding to the remote user.

6. INTERACTION BETWEEN OTHER SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

If all channels are not free (busy or reserved) and a user has also subscribed to the CW, the network shall be able to offer an incoming call with an indication that no interface information channel is available. The served user may accept that incoming call using a reserved channel. A user may use the HOLD supplementary service to hold an active call in order to be able to subsequently answer the waiting call.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.3. Call Hold (HOLD)

If parties A and B have both subscribed to the HOLD supplementary service then:

1) party A can have party B on hold,
2) party B can have party A on hold, and
3) each party can have the other party on hold.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

ECT shall have no impact on any held calls not involved in the transfer. If either of the transferred users have put their call on hold prior to the transfer, the resulting transferred call shall remain on hold by that user. The transferring user shall in the resulting call be replaced by the other user.

6.4.2. Single Step Call Transfer (SCT)

SCT shall have no impact on any held calls not involved in the transfer. If the transferred user has put the call to transferring user on hold prior to the transfer, the resulting transferred call will remain on hold by that user. The transferring user shall as the hold user in the resulting call be replaced by the transferred-to user.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact.

6.6.2. Outgoing Call Barring (OCB)

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

Any party involved in an active conference may put the conference call on hold and later retrieve the connection to the conference. Any party putting the conference on hold may retrieve any other party previously put on hold.

6.8.2. **Meet-Me Conference (MMC)**

Any party involved in an active conference may put the conference call on hold and later retrieve the connection to the conference. Any party putting the conference on hold may retrieve any other party previously put on hold.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

Not applicable.

6.10.2. **Call Forwarding Busy (CFB)**

Not applicable.

6.10.3. **Call Forwarding No Reply (CFNR)**

Not applicable.

6.10.4. **Call Deflection (CD)**

Not applicable.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

When the network interfaces forming a hunting group are connected to a PBX at the user, terminals connected to this PBX must not be able to invoke HOLD in the public network.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

A terminal cannot suspend an active call when HOLD is in operation on that terminal.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. **COMMERCIAL CONSIDERATIONS**

7.1. **Customer Segment**

HOLD may be of interest to all customers.

7.2. **Charging**

When a call is put on hold the charging shall continue according to the national charging rules.

Annex 4

CALL TRANSFER SERVICES

Call Transfer Services is a group of supplementary services allowing users to transfer an active call to a third party.

The group includes the following two supplementary services:

1. **Explicit Call Transfer (ECT)**

2. **Single Step Call Transfer (SCT)**

Annex 4.1

Explicit Call Transfer (ECT)

Operational Requirements

1. DEFINITION

The Explicit Call Transfer (ECT) supplementary service enables a user who has two calls, each of which can be either an incoming or an outgoing call, to connect the other parties in the two calls.

2. DESCRIPTION

2.1. General Description

In this way, a user can transform two of that user's calls (an active and a held call), each of which can be either an incoming or an outgoing call, into a new call between the other parties in the two calls. One of the two calls shall be answered, the other call can be either alerting or answered, depending on a network option.

2.2. Denomination of Users

Any user taking part in an established call, the calling or the called party.

2.3. Specific Terminology

Served user: The user who subscribes to and invokes the ECT supplementary service. This user can also be referred to as user A.
User B: The other party in one (the answered) call.
User C: The other party in the other call. This user can also be referred to as the third party.

2.4. Applicability to Telecommunication Services

The ECT supplementary service is applicable to all circuit switched basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Methods for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The ECT supplementary service may be provided by prior arrangement with the network operator.

Withdrawal of the ECT by the network operator may be upon request by the subscriber or for network operator reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

The served user (user A) who has two calls (with user B and user C), each of which can be either an incoming or an outgoing call, can invoke the ECT supplementary service with respect to the two calls. One of the calls (referred to as the call between user A and user B) shall be answered.

It is the responsibility of the served user to ensure that the two calls are compatible.

It is not relevant which call (between users A and B or between users A and C) is on hold, when ECT supplementary service is invoked. For example, a user who has an answered call can put that call on hold and then set up a second call. After that, the served user can interchange the held and not held states of the two calls as appropriate.

As a network option, the ECT supplementary service can be invoked either:

a) after alerting has commenced at user C, or after user C has answered; or,
b) only after user C has answered.

In case of option (a), if user C is being alerted at the time of transfer, it shall continue to be alerted, and on answer it shall be connected to user B. If user C fails to answer, then as a network option, the call shall be represented to the served user.

On successful invocation of the ECT supplementary service, the two calls between users A and B and between users A and C, respectively, shall be removed from user A's access and shall be transformed into a call between users B and C.

The network operator shall notify users B and C of the transfer and shall indicate the answered or alerting state of the third party (user C).

In the case where the network supports (a) above, then after the transferred alerting call is answered, user B shall again be notified in order to indicate the answered state.

Depending on interworking conditions, the number of user C shall be indicated to user B,

and the number of user B shall be indicated to user C, subject to any restrictions (see also subclauses 6.5.2 and 6.5.4).

In addition to the number, sub-addresses can also be exchanged. As a result of notification, users can provide their sub-addresses. If this information is supplied by the user, the network shall deliver it to the other user. For an interim period of time, some networks will not support the sending of notification to the remote users.

3.1.5. *Interrogation*

It shall be possible to interrogate the provision of the service.

3.2. Alternative Methods for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 96 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

The active call shall be put on hold by using the HOLD supplementary service, and then, after the establishment of a call to the transferred-to user, the held call shall be transferred by using switching order 4:

(R) 4

3.3.6. *Interrogation*

3.3.4.1. Status Check

*# 96 #

3.3.4.2. Data Check

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The ECT supplementary service request shall be rejected if the user invoking it has not subscribed to the ECT supplementary service.

Also, the ECT supplementary service request shall be rejected, if the network is unsuccessful in connecting users B and C (e.g. if both calls to users B and C are unanswered).

The user shall be notified of the cause of rejection and the two calls between user A and users B and C shall remain in the state they were in before the ECT supplementary service request was received.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

If a transferred user is not within the ISDN, it may not be possible to notify that user of the transfer. Also, the address of a transferred user that is not within the ISDN may be unavailable (e.g. no information or due to restrictions agreed between the network operators).

5.2. Interworking with Private ISDNs

When a remote user is on a different network (e.g. one user on a private ISDN and the other user on a public ISDN), indications to the remote user shall be sent to the remote user's network for forwarding to the remote user.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

When a call is transferred, user A is no longer involved in the call, and so charging information shall not be provided to the transferring user.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

If the transferring user is charged for either or both calls then, as a network option, that user shall be informed of the charge at the end of the resulting transferred call.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

The invocation of ECT supplementary service shall have no impact on any held calls involved in the transfer.

If either of the transferred users (B or C) has put the call to the served user (user A) on hold prior to the transfer, the resulting transferred call shall remain on hold by that user. The served user shall be replaced as the held user in the call by the other user (B or C).

6.4. *Call Transfer Services*

Call Transfer services can be invoked simultaneously by the users on an answered call, but this is not regarded as a normal situation. The network will not expressly prevent this from occurring, but likewise it cannot be guaranteed that the notifications supplied to the users involved will be sensible to those users. There can be more than one notification generated due to multiple call transfers and the arrival of such notifications is dependent on the timing of their invocation by the users involved in the call. Then the network will transfer these notifications when they are generated.

6.4.1. Explicit Call Transfer (ECT)

If both users (A and B) in a normal call have subscribed to the ECT service, they can simultaneously transfer the call. I.e. if users A and B are active in an established call, user A can transfer the call to a user C and user B can transfer the call to a user D. Call progress signals and other notifications shall be delivered to the appropriate party.

6.4.2. Single Step Call Transfer (SCT)

If both users (A and B) in a normal call have subscribed to the call transfer services they shall be able to simultaneously transfer the call. I.e. if user A and user B are active in an established call, user A can invoke the ECT supplementary service in order to transfer the call to a user C, whilst user B can invoke the SCT supplementary service in order to transfer the call to a user D. Call progress signals and other notifications shall be delivered to the appropriate party.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

A calling user's restriction requirements from the original call shall be used in order to restrict the presentation or that user's address to the other user in a transferred call.

6.5.3 **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

A connected user's restriction requirements from the original call shall be used in order to restrict the presentation of that user's address to the other user in a transferred call.

A transferred-to user's restriction requirements shall be used in order to restrict the presentation of that user's address to the other user in a transferred call.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

Closed user group restriction shall be met between users when the first call is set up. Similarly, closed user group restrictions between users shall also be met when setting up the second call. Finally, the two calls must use the same closed user group for the transfer to be completed.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

The conference controller shall be prevented from transferring the conference to another user.

Conferees can invoke the ECT supplementary service in order to transfer their connection to the conference to another user after the connection to that user has been established.

6.8.2. **Meet-Me Conference (MMC)**

Any participant in a meet-me conference can invoke the ECT supplementary service in order to transfer their connection to the conference to another user after the connection to that user has been established.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

Where a network supports the option to transfer an answered call to an alerting user C, the transferred call will be forwarded to another user D, if user C has activated CFNR and user C does not answer before the call forwarding no reply timer expires.

6.10.4. **Call Deflection (CD)**

Where a network supports the option to transfer an answered call to an alerting user C, the transferred call will be deflected to another user D, if user C invokes CD.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

The transferring user cannot invoke MCID on a call after transfer of that call has been invoked.

If user B (or C) successfully invokes MCID after transfer has been completed, then the network shall register, in addition to the call information of the original call, the number of the transferred-to user (user C or B, respectively).

6.14. Multiple Subscriber Number (MSN)

No impact.

6.15. Private Numbering Plan (PNP)

No impact.

6.16. Priority (PRI)

No impact.

6.17. Remote Control of Supplementary Services (RCSS)

Not applicable.

6.18. Sub-addressing (SUB)

No impact.

6.19. Terminal Portability (TP)

No impact.

6.20. Three-Party Service (3PTY)

A user who has invoked 3PTY can not invoke ECT in order to transfer either of the calls. The served user shall cancel 3PTY in order to transfer either of the calls involved in the 3PTY.

6.21. User-to-User Signalling (UUS)

When ECT is invoked, any UUS service that has previously been activated on either leg shall be cancelled by the network. No specific notification will be sent to the users on the resulting call when an activated UUS service is no longer available.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

It shall be possible to charge the ECT supplementary service on a subscription basis or by use.

7.3. Quality of Service

If the ECT supplementary service is invoked and results in a call which involves more than one network, e.g. the call involves different PSTNs or ISDNs of different countries, or even different continents, a decrease in quality of service parameters may arise.

Depending on national implementations, networks may provide some precautions, e.g. limit the number of international border crossings and satellite hops, and therefore, the invocation of the ECT supplementary service may be rejected by some networks in some cases.

Annex 4.2

Single Step Call Transfer (SCT)

Operational Requirements

1. DEFINITION

The Single Step Call Transfer (SCT) supplementary service enables a user to transfer an answered call to a third party without having to set up a new call to the third party first.

2. DESCRIPTION

2.1. General Description

By means of Single Step Call Transfer the served user's answered call can be transformed into a new call between the other party of that call and a third party specified by the user.

2.2. Denomination of Users

Any user taking part in an established call, the calling or the called party.

2.3. Specific Terminology

Served user:	The user who subscribes to and invokes the SCT supplementary service. This user is referred to as user A.
User B:	The other party in the original (answered) call.
User C:	The other party in the resulting call, i.e. the call between user B and user C. This user can also be referred to as the third party.

2.4. Applicability to Telecommunication Services

The SCT supplementary service is applicable to all circuit switched basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Methods for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The SCT supplementary service may be provided by prior arrangement with the network operator.

Withdrawal of the SCT supplementary service by the network operator may be upon request by the subscriber or for network operator reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

The served user (user A) can transfer an established call (with user B) to another user (user C) without first establishing a call to user C.

To invoke the SCT supplementary service, the served user shall indicate to the network the address of user C together with all the service information necessary to set up the resulting call between user B and user C.

It is the responsibility of the served user to ensure that the two calls are compatible.

On successful invocation of the SCT supplementary service, the call between user A and user B shall be removed from user A's access and shall be transformed into a call between user B and user C.

The network shall notify users B and C of the transfer and shall indicate the answered or alerting state of the third party (user C). When user C answers, user B shall again be notified in order to indicate the answered state.

Depending on the network conditions, the number of user C shall be indicated to user B, and the number of user B shall be indicated to user C, subject to any restrictions. For an interim period of time, some networks will not support the sending of notification to the remote users.

In addition to the number, sub-addressing information can also be exchanged. As a result of notification, users can provide their sub-addresses. If this information is supplied by the user, the network shall deliver it to the other user.

The SCT supplementary service can also be used to transfer an answered call between users A and B, to another user, the user C, located in the same passive bus as user B, provided user C has addressing capabilities.

If users B and C are in the same passive bus and user B invokes the SCT supplementary service by sending the address of user C to the network after answering an incoming call

from user A, then the network will set up a call between user A and user C, removing the previous call between users A and B.

3.1.5. *Interrogation*

It shall be possible to interrogate the provision of the service.

3.2. Alternative Methods for Users to Access the Service

Not applicable.

3.3. Stimulus Mode Procedures

The service code 97 has been allocated for the service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

The active call shall be put on hold by using the HOLD supplementary service, and then, the held call shall be transferred to the user C without establishing a new call by using switching order 4 together with the user C address:

(R) 4 * User C address (#)

Being the user address:
- an ISDN number
- an ISDN number and a sub-address
- a sub-address

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 97 #

3.3.6.2. Data Check

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The SCT supplementary service request shall be rejected if the user invoking the SCT service has not subscribed to the SCT supplementary service.

The request shall be rejected if the call to user C does not result in user C alerting or answering.

If user C fails to answer then, as a network option, the call shall be represented to the served user.

The user shall be notified of the cause of rejection and the original call between users A and B shall remain in the state it was in before the SCT supplementary service request was received.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

If a transferred user is not within the ISDN, it may not be possible to notify that user of the transfer. Also, the address of a transferred user that is not within the ISDN may be unavailable (e.g. no information or due to restrictions agreed between the network operators).

5.2. Interworking with Private ISDNs

When a remote user is on a different network (e.g. one user on a private ISDN and the other user on a public ISDN), indications to the remote user shall be sent to the remote user's network for forwarding to the remote user.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Charging Information During the Call (AOC-D)

When a call is transferred, user A is no longer involved in the call, and so charging information shall not be provided to the transferring user.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.1.3. Charging Information at the End of the Call (AOC-E)

If the transferring user is charged for either or both calls then, as a network option, that user shall be informed of the charge at the end of the resulting transferred call.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

The invocation of SCT supplementary service shall have no impact on any held calls involved in the transfer.

If the transferred user has put the call to the served user on hold prior to the transfer, the resulting transferred call shall remain on hold by that user. The served user shall be replaced as the held user in the call by the third party.

6.4. *Call Transfer Services*

Call Transfer services can be invoked simultaneously by the users on an answered call, but this is not regarded as a normal situation. The network will not expressly prevent this from occurring, but likewise it cannot be guaranteed that the notifications supplied to the users involved will be sensible to those users. There can be more than one notification generated due to multiple call transfers and the arrival of such notifications is dependent on the timing of their invocation by the users involved in the call. Then the network will transfer these notifications when they are generated.

6.4.1. Explicit Call Transfer (ECT)

If both users in a normal call have subscribed to the call transfer services, they can simultaneously transfer the call. I.e. if users A and B are active in an established call, user A can invoke the SCT supplementary service in order to transfer the call to a user C, whilst user B can invoke ECT in order to transfer the call to a user D. Call progress signals and other notifications shall be delivered to the appropriate party.

6.4.2. Single Step Call Transfer (SCT)

If both users in a normal call have subscribed to SCT, they can simultaneously transfer the call. I.e. if users A and B are active in an established call, user A can transfer the call to a user C and user B can transfer the call to user D. Call progress signals and other notifications shall be delivered to the appropriate party.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

A calling user's restriction requirements from the original call shall be used in order to restrict the presentation or that user's address to the other user in a transferred call.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

A connected user's restriction requirements from the original call shall be used in order to restrict the presentation of that user's address to the other user in a transferred call.

A transferred-to user's restriction requirements shall be used in order to restrict the presentation of that user's address to the other user in a transferred call.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

Closed user group restriction shall be met between users when the first call is set up. The closed user group for the first call shall be the user for the second call.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

The conference controller shall be prevented from transferring the conference.

Conferees shall be prevented from transferring the conference by use of the SCT supplementary service.

6.8.2. **Meet-Me Conference (MMC)**

A network operator may take appropriate measures to prevent a MMC call from being transferred by means of the SCT supplementary service.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

In general, if the served user attempts to transfer a call to a party that is forwarding calls, the forwarding-to party shall be alerted.

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

If user C has activated CFU the transferred call shall be forwarded to another user D.

6.10.2. **Call Forwarding Busy (CFB)**

If user C is busy on another call when the transferred call is received and has activated CFB, the call shall be forwarded to another user D.

6.10.3. **Call Forwarding No Reply (CFNR)**

If user C, who has activated CFNR does not answer the transferred call, then upon expiration of the call forwarding no reply timer the call shall be forwarded to another user D.

6.10.4. **Call Deflection (CD)**

User C who has subscribed to CD can request that the transferred call is deflected to another user D.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

The transferring user cannot invoke MCID on a call after transfer of that call has been invoked.

If any of the users invokes MCID after transfer has been completed, then the network shall

register, in addition to the call information of the original call, the number of the transferred-to user.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

A user who has invoked 3PTY can not invoke SCT in order to transfer either of the calls. The served user shall cancel 3PTY in order to transfer either of the calls involved in 3PTY.

6.21. **User-to-User Signalling (UUS)**

When SCT supplementary service is invoked, any UUS service that was requested or activated on the first call shall be cancelled by the network.

When the second call is set up by the served user, any request for the UUS service shall be cancelled by the network. However, if a setup request from the transferring user contains user-to-user information, this user-to-user information shall be delivered to the transferred-to user before UUS is cancelled.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

It shall be possible to charge the SCT supplementary service on a subscription basis or by use.

7.3. Quality of Service

If the SCT supplementary service is invoked and results in a call which involves more than one network, e.g. the call involves different PSTNs or ISDNs of different countries, or even different continents, a decrease in quality of service parameters may arise.

Depending on national implementations, networks may provide some precautions, e.g. limit the number of international border crossings and satellite hops, and therefore, the invocation of the SCT supplementary service may be rejected by some networks in some cases.

Annex 5

NUMBER IDENTIFICATION SERVICES

Number Identification Services is a group of supplementary services presenting or restricting identification of the call partner for a current call.

The group includes the following four supplementary services:

1. **Calling Line Identification Presentation (CLIP)**
2. **Calling Line Identification Restriction (CLIR)**
3. **Connected Line Identification Presentation (COLP)**
4. **Connected Line Identification Restriction (COLR)**

Annex 5.1

CALLING LINE IDENTIFICATION PRESENTATION (CLIP)

Operational Requirements

1. DEFINITION

The Calling Line Identification Presentation (CLIP) supplementary service provides the called party with the possibility to receive identification of the calling party.

2. DESCRIPTION

2.1. General Description

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

Note: The additional information may be a sub-address.

CLIP, when subscribed to by an ISDN user, is applied for an agreed contractual period to all the incoming calls at the subscriber terminal.

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:

- in case of a TE directly connected to the ISDN, normally by the ISDN (see subclause 6.14)

- in case of an NT 2 (ISPBX) connected to the ISDN, normally by the NT 2.
  This information shall be marked as user provided which implies that it was not or only partially verified. If, however, the NT 2 does not provide information, the exchange shall enter a default value (e.g. the access number) and shall mark this information as network provided.

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 setup time, the network delivers the calling line identity to the called party, when technically feasible and when complying with privacy, regardless of the terminal's capability to handle the information.

2.2. **Denomination of Users**

This service is offered to called users.

2.3. **Specific Terminology**

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

This service shall be provided after prearrangement with the network operator.
This service shall be withdrawn at the customer's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

This service shall be activated by the network operator at provision.
This service shall be deactivated by the network operator at withdrawal.

3.1.4. *Invocation and Operation*

This supplementary service shall automatically be invoked by the network in the call setup phase. 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, sub-address information, if explicitly provided by the calling user.

The additional information can be:

- Sub-address
- Calling Customer Side
  A calling customer can optionally insert his calling line identity at call request in accordance with the information units indicated above.

Note: Insertion of a full or partial ISDN number shall make sense only when DDI or MSN applies at the calling party's user-network interface (see subclauses 6.9. and 6.14 below).

- Called Customer Side
  A called CLIP subscriber receives the call with the information indicated above.

  When the CLIP cannot be delivered to the called subscriber the appropriate indication is provided.
  No activation/deactivation procedure is necessary.

3.1.5. *Interrogation*

Interrogation of the provision and activation of the supplementary service should be possible.

3.2. **Alternative Method for Users to Access the Service**

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

Not applicable.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

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

- The calling customer has an agreement with the network operator that his identity must not be delivered to a third party (see CLIR supplementary service)

- In some interworking situations where the connection is not completely supported by sufficient signalling

- An international call where the originating network does not provide the CLIP.

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

3.2.5. *Interrogation*

None identified.

3.3. **Stimulus Mode Procedures**

The service code 30 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

*# 30 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

In case the calling party's number is not available, the called party shall be informed accordingly, and if possible the reason shall be given.

5. INTERWORKING AND INTERCOMMUNICATION

According to national rules CLIP may not be applicable, if at least one of the two parties is not an ISDN subscriber.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.2. **Call Waiting (CW)**

No impact.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

Not applicable.

6.5.2. **Calling Line Identification Restriction (CLIR)**

CLIR will take precedence over CLIP.
The only occasion when a user subscribing to CLIP can take precedence over CLIR is when the user has an override category. This is a national option.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

The number of a user who has activated COLR will not be presented in case CLIP is activated by the called party.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. Completion of Calls to Busy Subscriber (CCBS)

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

No impact.

6.8.2. Meet-Me Conference (MMC)

Not applicable. However, the operator, if available, shall be able to receive the numbers of all participants of the conference.

6.9. Direct Dialling In (DDI)

If DDI is applicable to the user-network interface of the calling party, then the ISPBX of this party should normally provide at least the calling party's extension number on outgoing call requests. Depending on the way in which the DDI numbers fit into the public ISDN numbering plan, the network may check the customer provided calling party's ISDN number for validity on the corresponding access. If the check is successful, then the user provided calling party's ISDN number part shall be used by the network to make up the full calling line identification. If the check fails or if no calling number information is provided by the ISPBX, then the network should apply either a default ISDN number by means of which the ISPBX can be identified (e.g. general directory number) or indicate to the served user that the calling line identity is not available.

Note: Since CLIP may be used for making calls back to the calling party at a later point in time, it is the responsibility of the ISPBX customer to secure within the ISPBX that non-voice calls made to the general directory number will find an appropriate destination, where voice calls made to that number will normally give access to an operator.

If DDI is applicable to the user-network interface of the called party, then neither supplementary service affects the operation of the other supplementary service.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

When a call has been forwarded and the forwarded-to user has been provided with CLIP, he should receive the original calling user's number, if this calling user has not subscribed to/invoked CLIR. As an option, the forwarded-to user may also receive the forwarding user's number. In this case, if multiple forwarding occurs, the forwarded-to user may receive the original called user's number and the last forwarding user's number.
In the case one or more of the mentioned parties have CLIR active its number shall be replaced by an indication that the number is not available.

6.10.2. **Call Forwarding Busy (CFB)**

When a call has been forwarded and the forwarded-to user has been provided with CLIP, he should receive the original calling user's number, if this calling user has not subscribed to/invoked CLIR. As an option, the forwarded-to user may also receive the forwarding user's number. In this case, if multiple forwarding occurs, the forwarded-to user may receive the original called user's number and the last forwarding user's number.
In the case one or more of the mentioned parties have CLIR active its number shall be replaced by an indication that the number is not available.

6.10.3. **Call Forwarding No Reply (CFNR)**

When a call has been forwarded and the forwarded-to user has been provided with CLIP, he should receive the original calling user's number, if this calling user has not subscribed to/invoked CLIR. As an option, the forwarded-to user may also receive the forwarding user's number. In this case, if multiple forwarding occurs, the forwarded-to user may receive the original called user's number and the last forwarding user's number.
In the case one or more of the mentioned parties have CLIR active its number shall be replaced by an indication that the number is not available.

6.10.4. **Call Deflection (CD)**

When a call has been deflected and the deflected-to user has been provided with CLIP, he should receive the original calling user's number, if this calling user has not subscribed to/invoked CLIR. As an option, the forwarded-to user may also receive the deflecting user's number. In this case, if multiple deflection occurs, the deflected-to user may receive the original called user's number and the last deflecting user's number.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact. In addition to the calling user's identification, the served user may receive the called freephone number.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

If MSN is applicable to the public network access interface of the calling party, then this party may provide the appropriate calling party MSN digits or full ISDN number on outgoing call requests. The network may check the user provided calling party's number information for validity on the corresponding access. If the check fails or if no calling number information is provided by the user, then the network should apply the default ISDN number of the calling party's access.

If MSN is applicable to the public network access interface of the called party, then neither supplementary service affects the operation of the other supplementary service.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

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).

Annex 5.2

CALLING LINE IDENTIFICATION RESTRICTION (CLIR)

Operational Requirements

1. DEFINITION

The Calling Line Identification Restriction (CLIR) supplementary service enables the calling party to restrict presentation of its number to the called party.

2. DESCRIPTION

2.1. General Description

CLIR is a supplementary service offered to the calling party to restrict presentation of the calling party's ISDN number, possibly with additional address information to the called party.

Note: The additional information may be a sub-address.

2.2. Denomination of Users

This service is offered to the calling party.

2.3. Specific Terminology

Disabling : To prevent invocation of the active service on a per call basis.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CLIR can be provided on a subscription basis or be generally available.

As a network operator option, CLIR can be offered with several subscription options. The

options apply separately to each ISDN number. Subscription options are summarised below:

Subscription Option	Values
CLIR mode	- permanent (active for all calls) - temporary (specified by user)
Default (only for temporary mode)	- presentation restricted - presentation not restricted

It is a network operator option to specify either or both of the above options for all subscribers, for e.g. in an exchange or a network.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

If subscribed to in the permanent mode, COLR is active until withdrawal.

If subscribed to in the temporary mode, the user shall be able to activate and deactivate the service.

3.1.4. *Invocation and Operation*

This service shall automatically be invoked by the network when the service is active or manually on a per call basis in the call setup phase. When the service is active it shall be possible by means of a user procedure to allow presentation of the calling party's number to the called party on a per call basis. This possibility is called: to disable the service.

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

If the called user subscribes to CLIP and the calling party has CLIR applied, the called party shall receive an indication that the number is not available.

3.1.5. *Interrogation*

Interrogation of the provision and activation of the supplementary service shall be possible.

3.2. **Alternative Method for Users to Access the Service**

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

Not applicable.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

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

Override Category between ISDNs
When a call originates in one ISDN and destinates in another ISDN and CLIR is applied, the rules and regulations of the destination network (the host network) shall apply. For example, if the override category is not applicable in the originating network but in the destination network, a call with CLIR applied can still be overridden in the destination network, whenever the calling line identification information is available for this network.

3.2.5. *Interrogation*

None identified.

3.3. **Stimulus Mode Procedures**

The service code 31 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 31 #

3.3.4. *Deactivation*

31

3.3.5. *Invocation*

3.3.5.1. Invocation per Call

* 31 * CPN (#)

Note: CPN = Called Party's Number.

3.3.5.2. Disabling per Call

31 * CPN (#)

3.3.6. *Interrogation*

3.3.6.1. Status Check

* # 31 #

3.3.6.2. Data Check

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The calling party shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

On calls to or via non-ISDNs it cannot be assured that a CLIR 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 CLIR is applicable. If a destination network receives a calling party ISDN number without any indication of presentation allowed or restricted, the destination network (the host network) shall act according to its rules and regulations.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

CLIR shall take precedence over CLIP.
The only occasion when a user subscribing to CLIP can take precedence over CLIR is when the user has an override category. This is a national option.

6.5.2. **Calling Line Identification Restriction (CLIR)**

Not applicable.

6.5.3. **Connected Line Identification Presentation (COLP)**

The number of a user who has activated CLIR shall not be presented in case COLP is activated by the calling user.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact, i.e. when CLIR is applicable and activated by user A, no number is presented

at the original called interface following acceptance of a CCBS recall.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

Not applicable. However, the operator shall be able to receive the number of all participants of the conference. This applies also to restricted numbers, if a bilateral agreement for this purpose exists.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

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

When CLIR is applicable and activated, the calling party's ISDN number shall not be presented to the forwarded-to user unless the forwarded-to user has an override category. This override category is a national option.

6.10.2. **Call Forwarding Busy (CFB)**

When CLIR is applicable and activated, the calling party's ISDN number shall not be presented to the forwarded-to user unless the forwarded-to user has an override category. This override category is a national option.

6.10.3. **Call Forwarding No Reply (CFNR)**

When CLIR is applicable and activated, the calling party's ISDN number shall not be presented to the forwarded-to user unless the forwarded-to user has an override category. This override category is a national option.

6.10.4. **Call Deflection (CD)**

When CLIR is applicable and activated, the calling party's ISDN number shall not be presented to the deflected-to user unless the deflected-to user has an override category. This override category is a national option.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Calling party: If the calling party has CLIR active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user

shall be informed accordingly at the registration of the service.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Calling party: If the calling party has CLIR active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user shall be informed accordingly at the registration of the service.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Calling party: If the calling party has CLIR active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user shall be informed accordingly at the registration of the service.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact, i.e. when MCID is activated, the number of an incoming call is registered in the network regardless of whether the calling user has activated CLIR or not.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

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).

Annex 5.3

CONNECTED LINE IDENTIFICATION PRESENTATION (COLP)

Operational Requirements

1. DEFINITION

The Connected Line Identification Presentation (COLP) supplementary service enables the calling party to receive at the establishment of the call an indication of the ISDN number of the connected line including possible additional address information.

2. DESCRIPTION

2.1. General Description

This supplementary service is not a dialling check but an indication to the calling user about the identity of the connected line. In a full ISDN environment, the connected line identity must include all the address information necessary to unambiguously identify the connected line; this information is generated or checked by the network.

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

At call connect time the network delivers the connected line identity to the calling party when technically feasible and when complying with privacy regardless of the terminal capability to handle the information.

2.2. Denomination of Users

This service is offered to calling users.

2.3. Specific Terminology

The controlling subscriber is the calling subscriber.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

It is to be noted that in the telematic services an exchange of terminal identification occurs

at a higher layer subsequent to a successful call establishment.

For telematic services this supplementary service shall only consist of the access number of the connected party and this shall be provided by the network.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The COLP is provided by the network operator on a subscription basis or is generally available.
This service can be withdrawn at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

When subscribed to by an ISDN user, COLP is applied for an agreed contractual period to all outgoing calls at the subscribed premises.

3.1.4. *Invocation and Operation*

When provided, the service shall automatically be invoked by the network on each outgoing call made by the served user.

In the connected line identity the following parts are to be distinguished:

- connected ISDN number (including DDI or MSN digits),
- connected sub-address, if provided by the connected party (see subclause 6.18).

The connected ISDN number as presented to the served user is either:

- completely provided by the network,
- completely provided by the connected party,
- partially provided by the network and the rest provided by the connected party, e.g. in the case of DDI the access number is provided by the network and the additional digits to make the number complete by the connected party.

Where either the complete connected number or part of the number is initially provided by the connected party, the network shall check its validity. If this check is successful, then this number shall be used by the network. If the check is unsuccessful, then the default ISDN number for the connected access should be used. (For DDI, however, see subclause 6.9).

At call connect time, the network should deliver the connected line identity to the served user, provided that it is available and that no presentation restriction applies.

The network should indicate to the served user whether the shown connected number is network provided or user provided.

The network should indicate to the served user whether the indicated number is a national or an international one.

3.1.5. *Interrogation*

Interrogation of the provision and activation of the supplementary service should be possible.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

Not applicable.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

The connected line identity shall or cannot be made available in the following cases:

- If the connected user subscribes to COLR (see the relevant supplementary service description).
- In the case of interworking with networks or network parts which do not support connected line identification.

In these cases the served user should receive an indication that the connected line identity is not available.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

The service code 76 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

*# 76 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

In case the called party's number is not available, the calling party shall be informed accordingly, and if possible the reason shall be given.

5. INTERWORKING AND INTERCOMMUNICATION

According to national rules COLP may not be applicable, if at least one of the two parties is not an ISDN subscriber.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

The number of a user who has activated CLIR shall not be presented in case COLP is activated by the calling user.

6.5.3. **Connected Line Identification Presentation (COLP)**

Not applicable.

6.5.4. **Connected Line Identification Restriction (COLR)**

COLR shall take precedence over COLP.

The only occasion when a user subscribing to COLP can take precedence over COLR is when the user has an override category. This is a national option.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

Conference controller: No impact.
Conferees: They do not receive COLP information of parties being added to the conference.

6.8.2. Meet-Me Conference (MMC)

No impact.

6.9. Direct Dialling In (DDI)

If DDI is applicable at the called party's public network interface, then the called ISPBX should normally provide at least the extension number part of the connected ISDN number.

The network should check the customer provided ISDN number part for belonging to the range of allowed numbers on the corresponding access. If found acceptable it should be used to make up the full connected line ISDN number.
If found not acceptable or if the connected ISPBX does not specify any part of the connected ISDN number, then either the default ISDN number for the connected access should be used (e.g. the general directory number), or the connected number should be considered as being not available.

Note: Since COLP may be used for making calls to a connected party at a later point in time, it is the responsibility of the ISPBX customer to secure within the ISPBX that non-voice calls made to the general directory number shall find an appropriate destination, where voice calls made to that number shall normally give access to an operator.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

If the calling user has COLP activated, it should receive the connected line identity of the (final) forwarded-to user unless any of the forwarding users subscribes to forwarding without notification and unless COLR is applicable for the (final) forwarded-to user. If any of these restrictions applies, the calling party shall receive an indication that the connected line identity is not available.

6.10.2. Call Forwarding Busy (CFB)

If the calling user has COLP activated, it should receive the connected line identity of the (final) forwarded-to user unless any of the forwarding users subscribes to forwarding without notification and unless COLR is applicable for the (final) forwarded-to user. If any of these restrictions applies, the calling party shall receive an indication that the connected line identity is not available.

6.10.3. Call Forwarding No Reply (CFNR)

If the calling user has COLP activated, it should receive the connected line identity of the (final) forwarded-to user unless any of the forwarding users subscribes to forwarding without notification and unless COLR is applicable for the (final) forwarded-to user. If any of these

restrictions applies, the calling party shall receive an indication that the connected line identity is not available.

6.10.4. **Call Deflection (CD)**

Calling user: If the calling user has activated COLP, it should receive the connected line identity of the forwarded-to user unless the original connected user has subscribed to the privacy option. In this case, the calling party shall be informed that the COLP supplementary service is not available.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

The calling party shall receive the number of the served user, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

The calling party shall receive the number of the served user of the service, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

The calling party shall receive the number of the served user of the service, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.11. **Freephone (FPH)**

Callers to freephone numbers may not be given the connected line identity, but the freephone number. A possible national option shall allow disclosure of the connected line identity.

6.12. **Line Hunting (LH)**

The general directory number is to be given as the connected line. A possible national option shall allow disclosure of the connected line identity.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact, i.e. if the connected user subscribes to sub-addressing and the connected user subscribes to COLP, both the connected party sub-address, if provided by the connected user, and the connected party's numbers are presented to the calling user.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

All customers.

7.2. **Charging**

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

Annex 5.4

CONNECTED LINE IDENTIFICATION RESTRICTION (COLR)

Operational Requirements

1. DEFINITION

The Connected Line Identification Restriction (COLR) supplementary service enables the connected party to restrict presentation of the connected party's ISDN number to the calling party.

2. DESCRIPTION

2.1. General Description

When COLR is applicable and activated, the destination node provides the originating node with a notification that the connected party's ISDN number is not allowed to be presented to the calling party. In this case, no connected party's number is included in the call connected information to the calling party's installation.

Note: When COLR is subscribed to, some network operators may not wish to send the identity of the connected customer to other network operators.

2.2. Denomination of Users

This service is offered to called users.

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

COLR can be provided on a subscription basis or be generally available.

As a network operator option, COLR can be offered with several subscription options. The options apply separately to each ISDN number. Subscription options are summarised below:

Subscription Option	Values
COLR mode	- permanent (active for all calls) - temporary
Default (only for temporary mode)	- presentation restricted - presentation not restricted

It is a network operator option to specify either or both of the above options for all subscribers, e.g. in an exchange or a network.

3.1.2. *Registration Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

If subscribed to in the permanent mode, COLR is active until withdrawal.

If subscribed to in the temporary mode, the user shall be able to activate and deactivate the service.

3.1.4. *Invocation and Operation*

If subscribed to in the permanent mode, COLR is automatically invoked by the network.

If subscribed to in the temporary mode, the invocation depends on the user's activation of the service.

If the COLP is invoked and the connected party has COLR activated, the calling party shall receive an indication that the connected party's number is not available.

3.1.5. *Interrogation*

Interrogation of the provision and activation of the supplementary service shall be possible.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. **Stimulus Mode Procedures**

The service code 77 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 77 #

3.3.4. *Deactivation*

77

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

*# 77 #

3.3.6.1. Status Check

* # 77 #

3.3.6.2. Data Check

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The served user shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

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

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

Assume that a call from a user at C invokes CW at user B, who has subscribed to COLR. The user B shall receive a call waiting indication but shall not have its number returned, when the call waiting indication is given.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

The number of a user who has activated COLR shall not be presented in case CLIP is activated by the called party.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

COLR shall take precedence over COLP.

The only occasion when a user subscribing to COLP can take precedence over COLR is when the user has an override category. This is a national option.

6.5.4. **Connected Line Identification Restriction (COLR)**

Not applicable.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

When the diverted call is finally answered, no connected number shall be presented to the calling party unless this party has an override category. The latter is a national option.

6.10.2. **Call Forwarding Busy (CFB)**

When the diverted call is finally answered, no connected number shall be presented to the calling party unless this party has an override category. The latter is a national option.

6.10.3. **Call Forwarding No Reply (CFNR)**

When the diverted call is finally answered, no connected number shall be presented to the calling party unless this party has an override category. The latter is a national option.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

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

Annex 6

CALL BARRING SERVICES

Call Barring Services is a group of supplementary services limiting the possibilities of making calls to or from a certain installation.

The group includes the following two supplementary services:

1. Closed User Group (CUG)

2. Outgoing Call Barring (OCB)

Annex 6.1

CLOSED USER GROUP (CUG)

Operational Requirements

1. DEFINITION

The Closed User Group (CUG) supplementary service enables users to form groups to and from which access is restricted. Members of a specific CUG can communicate among themselves but not, in general, with users outside the group. Specific CUG members can have additional capabilities that allow them to originate calls outside the group and/or to receive calls from outside the group.

2. DESCRIPTION

2.1. General Description

A CUG is a list of users that may be member(s) of one or several public networks; each ISDN member of a CUG is identified by an ISDN number.

A CUG may be defined independently of any basic service or in relation with one or a list of basic services.

Specific CUG members can have additional restrictions that prevent them from originating calls to other members of the CUG or from receiving calls from other members of the CUG.

The network will treat all accesses in the same way. This means that e.g. a whole ISPBX belongs to one or more CUGs and that the network has no knowledge of whether a restriction applies for a certain extension line.

2.1.1. *Access Arrangements*

A user may be a member of several CUGs. Each network operator may define the maximum number of CUGs which can be allocated to an individual subscriber. When subscribed to at least one CUG, a user may subscribe to one of the following access arrangements:

1) CUG (c)
2) CUG with incoming access (c+i)
3) CUG with outgoing access (c+o)
4) CUG with incoming and outgoing access (c+i+o)

A user may subscribe to one of two additional access restrictions within each particular CUG:

- incoming calls barred within a CUG (icb)
- outgoing calls barred within a CUG (ocb)

All of these cases are illustrated in appendix 1.

1) CUG possibilities only

The user may make calls to and receive calls from members of the CUGs of which the user is a member (see case 1 in appendix 1).

An exception to this is when either incoming calls barred within the CUG or outgoing calls barred within the CUG apply.

Incoming calls barred within the CUG (icb):
This access restriction means that a CUG user is prohibited from receiving calls from users subscribing to the same CUG. This access restriction is given per CUG user and CUG (see case 2 in appendix 1).

Outgoing calls barred within the CUG (ocb):
This access restriction means that a CUG user is prohibited from making calls to users subscribing to the same CUG. This access restriction is given per CUG user and CUG (see case 3 in appendix 1).

Icb and ocb can be considered as relevant in connection with data communication between terminals and a host computer; icb for the terminals and ocb for the host.

The network shall provide a preferential CUG option whereby one of the user's CUGs (or the only one, if a single CUG applies) is used as a preferential CUG. If the user sets up a call with no CUG facility request, the network assumes that the preferential CUG is requested (i.e. preferential CUG is the default).

2) CUG with outgoing access

The user may make and receive calls within the CUG in the same way and with the same exceptions as in (1). In addition, this user can make calls to all other non-CUG users and to those other CUG users who allow incoming access. Incoming calls are only allowed from members of the user's CUG(s). (See cases 4, 5 and 6 in appendix 1).

3) CUG with incoming access

The user may make and receive calls within the CUG in the same way and with the same exceptions as in (1). In addition, this user may receive calls from any non-CUG user and also from other CUG users who have outgoing access. Outgoing calls are only allowed to members of the user's CUG(s). (See cases 7, 8 and 9 in appendix 1).

Case 2 and case 3 combined with incoming and outgoing access, cases 5, 6, 8 and 9 can be possible.

4) CUG with incoming and outgoing access

The outgoing access and incoming access can be offered simultaneously to members of the CUG by the network operator.

There is no relevance existing between icb and ocb simultaneously for calls within the CUG.

2.1.2. *Interaction between the options "Preferential CUG" and "Outgoing Access"*

The network may 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 capability 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 outgoing access allowed information. The choice of preferential CUG will only be alterable by network operator action.

2.2. Denomination of Users

Any user taking part in a call, the calling or the called party.

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The CUG service is provided on a subscription basis. As a network operator option, CUGs can be offered with several subscription options. The subscriber options may apply separately to each ISDN number and basic service or to a particular ISDN number for a set of basic services.

Subscription Option	Values
Closed User Groups	- List of one or more CUGs
Preferential CUG	- None designated (see note) - CUG value
Type of inter-CUG access (in/out of CUG)	- None - Outgoing access - Incoming access - Outgoing and incoming access

Per CUG per Number/Service:

Subscription Option	Values
Inter-CUG restrictions	- None - Incoming (terminating) calls barred - Outgoing (originating) calls barred

Note: The user must always specify a preferential CUG when the type of inter-CUG access option is set to none.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

Normal call setup procedures will apply to all CUG calls. In addition, the network shall carry out internal checks to determine whether or not the particular call is allowed between the two parties concerned.

3.1.4.1. Outgoing (Originating) Calls

At the time of call setup the user specifies a CUG index to indicate that a particular CUG is requested. This is achieved by the user by including a request for CUG service and the relevant CUG index in setting up the call. The CUG indices are allocated by prior arrangements with the network operator. Withdrawal of the CUG service or indices will be an action of the network operator at the request of the user or due to network operator reasons.

When requesting an outgoing access capability the user makes a normal call.

If the user sets up a call without requesting the CUG service and the user has a preferential CUG, the network assumes that the preferential CUG is requested.

The choice of preferential CUG will only be alterable by network operator action.

3.1.4.2. Incoming (Terminating) Calls

An incoming call from another CUG member shall be indicated to the called CUG user with a CUG indication and the appropriate CUG index.

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

An incoming call from a CUG user using outgoing access to a CUG user subscribing to a different CUG but with incoming access shall contain no CUG related information in the call offering message.

3.1.5. *Interrogation*

It shall be possible to interrogate the provision and the subscription values of the service.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 01 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 01 * CI * CPN #

Note: CI = CUG Index.
CPN = Called Party's Number.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 01 #

3.3.6.2. Data Check

*# 01 * CI #

4. **USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME**

Upon receipt of a request for the CUG service the network shall check its validity in conjunction with the access capabilities contained in the user profile. If a non-valid request is received or the checks cannot be performed, then the network shall reject the call and return an appropriate indication to the calling user.

If, due to an interworking situation, signalling in the network is not able to carry the information required to provide the service, the call attempt is terminated and an appropriate cause information is given to the calling user.

5. INTERWORKING AND INTERCOMMUNICATION

A CUG may span over several networks. In this case the responsibility for the management of this CUG is in one of these networks; in addition, there is a need for a CUG identification mechanism that would be accepted by all of the encompassed networks. One such mechanism presently exists for CUGs spanning over data networks having X.121 as the numbering plan (see CCITT Recommendation X.180, administrative arrangements for international CUG). An equivalent mechanism should be defined for CUGs on networks using the E.164 numbering plan or on networks which do not use the same numbering plan.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

The CUG restrictions must be met:

- between the calling/called party and the transferring party,

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

- between the transferring party and the transferred-to party, and
- between the calling/called party and the transferred-to party.

If all and only if the above statements are fulfilled, the transfer of the call is allowed.

6.4.2. **Single Step Call Transfer (SCT)**

The CUG restrictions must be met:

- between the calling/called party and the transferring party,
- between the transferring party and the transferred-to party, and
- between the calling/called party and the transferred-to party.

If all and only if the above statements are fulfilled, the transfer of the call is allowed.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1 **Closed User Group (CUG)**

Not applicable.

6.6.2 **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

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.

6.8.2. Meet-Me Conference (MMC)

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.

6.9. Direct Dialling In (DDI)

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

6.10.2. Call Forwarding Busy (CFB)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

6.10.3. Call Forwarding No Reply (CFNR)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

6.10.4. Call Deflection (CD)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

6.10.5. Call Forwarding Unconditional to a Service Centre (CFU-S)

No impact. It shall be possible for a service centre to be member of a CUG.

6.10.6. Call Forwarding Busy to a Service Centre (CFB-S)

No impact. It shall be possible for a service centre to be member of a CUG.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact. It shall be possible for a service centre to be member of a CUG.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

When a free line of a hunting group has been found, any CUG condition must be met before the connection is established.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

Different CUGs can be assigned to each MSN. The network cannot guarantee that a given CUG matches beyond the access towards the user. As the CUG assignment to the MSN is in the responsibility of the user, this may lead to restricted applicability of a combination of the CUG and MSN supplementary services.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. Three-Party Service (3PTY)

Assume that a user A who has subscribed to 3PTY has an established call with user B and wishes to create a three-party call by including a user C (either a minimum three-party service or a three-way conversation).

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

- If user A and/or user B is member of a CUG, then CUG conditions were already met for the established call between them.

- When user A invokes 3PTY and places a call to user C, the network shall check that all CUG conditions are met between users A and C but is not required to check CUG conditions between users B and C at this point, since user A may wish only to have a minimum 3PTY call.

6.21. User-to-User Signalling (UUS)

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

This supplementary service is primarily intended for business customers and administrative services.

Data communication customers. The service is a tool to support the user's need for data protection.

7.2. Charging

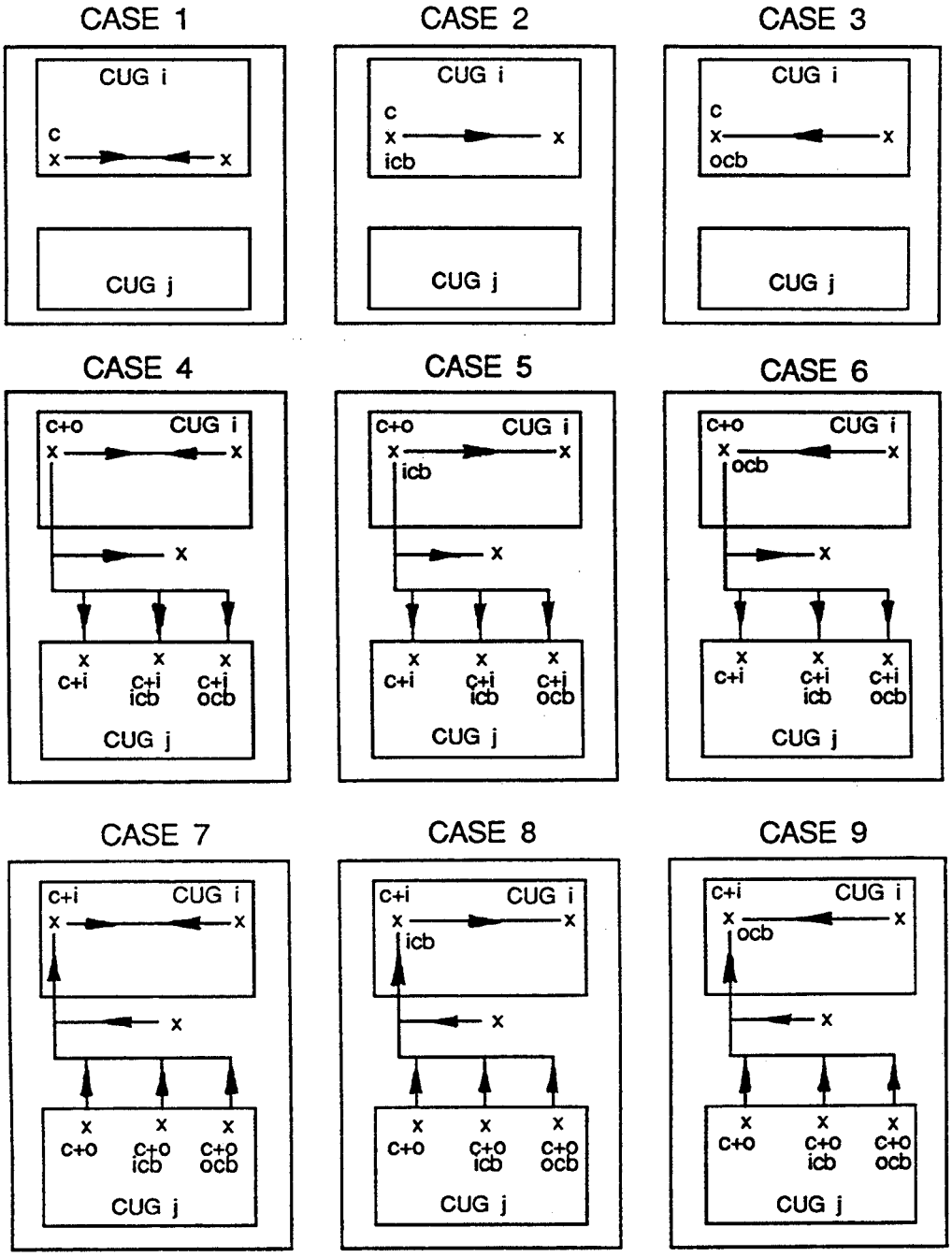
It shall be possible to charge a rental and initial connection charge for this service.

It shall be possible to charge normal call tariffs or, as a network operator option, to apply a different tariff scheme. This option is intended to allow the possibility of applying such a scheme, e.g. to CUG calls, which are frequent calls between a small number of destinations.

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

Appendix 1

Access Arrangements in CUG



c = CUG
c+o = CUG + outgoing access
c+i = CUG + incoming access

icb = incoming calls barred within CUG
ocb = outgoing calls barred within CUG

Annex 6.2

OUTGOING CALL BARRING (OCB)

Operational Requirements

1. DEFINITION

The Outgoing Call Barring (OCB) supplementary service provides the user with the possibility to have certain categories of outgoing calls barred from its termination.

2. DESCRIPTION

2.1. General Description

For a given type of barring, this supplementary service may be subscribed to for each basic service to which the user of the number subscribes or collectively for all basic services to which the user subscribes.

As network operator option, the following types of barring may be provided:

- Fixed barring: the activation/deactivation of the service is carried out by the network operator.
- User-controlled barring: the possibility for the user to activate/deactivate the service.

For each type of barring the service can be activated for specific periods of the day or days of the week (time-controlled barring). In the case of user-controlled barring the period of activation is indicated in the registration procedure.

The service can be offered with at least three subscription versions. Versions apply separately to each basic service subscribed to on each ISDN number.
The subscription versions are:

- General Outgoing Call Barring (GOCB): All originating calls are barred.
- International Outgoing Call Barring (IOCB): All originating international calls are barred.
- Special Outgoing Call Barring (SOCB): All originating calls belonging to a special group of calls (e.g. long distance calls, intercontinental calls) are barred.

Note 1: The definition of long distance calls is a national matter.

Note 2: Different SOCBs can be offered.

The network operator decides which numbers are not barred. Access to special numbers (e.g. Emergency number, Police, Fire Brigade, Freephone, Speaking Clock) may be permitted under all barred conditions.

Restriction on the access to operator services should be involved as required.

2.2. Denomination of Users

This supplementary service is applicable to the calling party.

2.3. Specific Terminology

Fixed barring:	Activation/deactivation of the service carried out by the network operator.
Time-controlled Barring:	The possibility to have the service activated, e.g. for specific periods of the day or days of the week.
User-controlled barring:	The possibility for the user to activate/deactivate the service according to his needs.
GOCB:	General Outgoing Call Barring
IOCB:	International Outgoing Call Barring
SOCB:	Special Outgoing Call Barring.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

This supplementary service is provided after prearrangement with the network operator.

OCB subscription is dependent on the basic service parameter. Values of this parameter are as follows:

Per ISDN number

Subscription Parameter	Value
Basic Service	- All basic services - One or more basic services

The user can request different versions of the service for each basic service subscription

parameter value to which he has subscribed.
The service can be offered with at least three subscription values. The values apply separately to each basic service parameter subscribed to on each ISDN number.

Some of the subscription versions are:

Subscription Versions	Value
General Outgoing Call Barring	- Yes - No
International Outgoing Call Barring	- Yes - No
Special Outgoing Call Barring	- Yes - No

Note: Several SOCBs can be offered.

In the case of user-controlled barring and for each version of the service subscribed to by the user, the network operator allocates a keyword for each basic service or in accordance with the user subscription a single keyword is allocated for all basic services at the subscriber access.
It is possible to obtain several versions of OCB in parallel for each basic service.

This service will be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Registration will be made by the network operator at provision or by the user when selecting the barring.

3.1.3. *Activation and Deactivation*

In the case of fixed barring automatic activation/deactivation is carried out by the network operator.

In the case of user-controlled barring, the user will use the activation procedure.

To activate one version of OCB for one basic service, the user must supply the appropriate keyword that has to be received by the network. When the user has also subscribed to the possibility for time-controlled barring, the time must be indicated in the activation procedure.

When the user activates OCB, the network shall return a notification of acceptance or rejection of the request (see clause 4 for a list of possible causes of rejection).

At the deactivation of a previously activated OCB, the same keyword has to be received by the network.

When the user deactivates OCB, the network shall return notification of acceptance or rejection of the request (see clause 4 for a list of possible causes of rejection).

In the case of the activation of a different version of OCB it is not necessary to deactivate

the version which is currently active. It should be sufficient to insert the appropriate keyword for the desired version only.

3.1.4. *Invocation and Operation*

When OCB is active, outgoing call attempts shall be examined by the network. They shall be processed further in and beyond the local exchange, if they are within the limitations of the OCB version that has been activated.

When a user attempts to set up a call to a destination which is barred by the OCB version that is currently active, the call setup shall not be completed. The network may give a notification of the invocation of OCB to the user.

3.1.5. *Interrogation*

Interrogation shall be possible for any type of barring subscribed to.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* 33 * KW (* SI) #

Note: SI = Data specifying the barring.
KW = Keyword.

3.3.1.2. Registration without Activation

* 33 * KW (* SI) * 0 #

3.3.2. *Erasure*

* 33 * KW * 0 #

3.3.3. *Activation*

* 33 * KW #

3.3.4. *Deactivation*

33 * KW

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 33 #

3.3.6.2. Data Check

*# 33 * SI #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the network cannot accept a deactivation request, a notification with cause shall be returned to the user. Possible causes are:

- Service not subscribed to
- Insufficient information
- Unallocated keyword

  Note: A certain number of deactivation attempts (e.g. 3) with an unallocated keyword should result in a temporary ignoration of further deactivation attempts (e.g. 30 minutes).

- Service already activated

  Note: Treatment of consecutive attempts to deactivate OCB is a network operator option.

- Terminal/user not allowed for service deactivation.

5. INTERWORKING AND INTERCOMMUNICATION

None identified.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Information During the Call (AOC-D)

No impact.

---

[1] When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.1.3. **Advice of Charge, Information at the End of the Call (AOC-E)**

No impact.

6.2. **Call Waiting (CW)**

No impact.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

If OCB is active a call can only be transferred within the OCB restrictions.

6.4.2. **Single Step Call Transfer (SCT)**

If OCB is active a call can only be transferred within the OCB restrictions.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

OCB can introduce additional outgoing call restrictions for a member of a CUG, i.e. if the user is a CUG member and an OCB version has been activated, outgoing calls can only be made, in accordance with the CUG access arrangement limitations and within the restrictions of the OCB version that has been activated.

6.6.2. **Outgoing Call Barring (OCB)**

Not applicable.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

By exception, OCB condition is not checked before adding a new conferee.

6.8.2. **Meet-Me Conference (MMC)**

No impact and particularly calling the nearest conference is allowed by any value of the user's OCB parameters except GOCB.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

When CFU has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the OCB version that has been activated, i.e. in this case there exists no interaction between the two services.
After OCB has been activated, registration of CFU can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.10.2. **Call Forwarding Busy (CFB)**

When CFB has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the OCB version that has been activated, i.e. in this case there exists no interaction between the two services.

After OCB has been activated, registration of CFB can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.10.3. **Call Forwarding No Reply (CFNR)**

When CFNR has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the OCB version that has been activated, i.e. in this case there exists no interaction between the two services.
After OCB has been activated, registration of CFNR can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.10.4. **Call Deflection (CD)**

After OCB has been activated, invocation of CD can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

When a free line of a hunting group has been found, any OCB condition must be met before the connection is established.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

Assume that a user A, who has subscribed to 3PTY, has an established call with a user B and wishes to create a three party call by including a user C. In that case the network shall check that OCB conditions are met by user A.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

This supplementary service is applicable to all groups of subscribers.

7.2. Charging

It should be possible to charge the customer for use of the service.

Annex 7

COMPLETION OF CALLS TO BUSY SUBSCRIBER (CCBS)

Operational Requirements

1. DEFINITION

The Completion of Calls to Busy Subscriber (CCBS) supplementary service allows a calling user A encountering a busy destination B to have the call completed, when the busy destination B becomes idle without having to make a new call attempt.

2. DESCRIPTION

2.1. General Description

When user A encounters a busy destination, user A can activate the supplementary service.

CCBS shall monitor the wanted destination on becoming idle.

When the wanted destination becomes idle and the B party has not re-used the access resources for making an outgoing call within a certain delay, then the network will reserve a communication path between both party A and party B and recall the A party.

When the A party answers the recall, the call will be offered to the B party and the call shall be completed as a normal call.

2.2. Denomination of Users

The service is used at the establishment of a call by the calling user (user A).

2.3. Specific Terminology

Busy:	Definition of the term busy can be found in Recommendation T/CAC S 10.1, paragraph 8.
User A:	Is defined as the specific device that: a) originated the call and requested the supplementary service, b) is uniquely addressable for notification/recall.

Destination B:	Is defined as whatever entity that was addressed in the original call setup, i.e. this could be a specific device or all devices as identified by an entity (e.g. a hunt group).
Retention time:	The retention time specifies the time during which the network retains the call information for the original call encountering busy. The duration of this time should be 10-20 seconds.
CCBS service duration time:	The service duration time specifies the maximum time during which the service will be active within the network. The value of this period is a network option, typically 15-45 minutes.
CCBS recall time:	The recall time specifies the maximum time during which the network will wait for a user A response to a CCBS recall. The value of this time should be 10-20 seconds.
Destination B idle guard time:	The destination B idle guard time specifies the time during which the network after destination B has become idle shall wait before initiating a CCBS recall or notification: B idle to user A. The value of this time is expected to be in the order of 0-15 seconds.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CCBS may be provided to calling parties by the network operator on a subscription basis or may be generally available. Withdrawal may happen on the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

Not applicable.

3.1.2.2. Erasure

This service is automatically erased and user A is notified if:

1) destination B is still busy after the CCBS service duration time expires;

2) user A does not accept the CCBS recall before the recall timer expires;

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

3.1.3. *Activation and Deactivation*

3.1.3.1. Activation

When user A encounters a busy destination, user A can activate the supplementary service. If user A is allowed to use this service, the network will register 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 time) during which the user A may activate CCBS on party B. If user A activates CCBS on party B within this period, the network will acknowledge user A's activation. 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 activated.

1) Confirmation
CCBS activation accepted and user A will be recalled, when user B is idle and a communication path to user B is available.

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 activate the same service may succeed.

3) Long Term Denial
Request rejected and later attempt to activate the same service will also be rejected.

4) Called Party Not Busy
The called party is now idle and the network shall place the call, if desired by user A.

Note: A temporary supplementary service incompatibility could exist, if destination B has activated a supplementary service which prohibits the activation of CCBS against that destination.

User A can have a limited number of CCBS requests outstanding. All CCBS requests exceeding this limit will be rejected (i.e. short term denial). Having placed a CCBS request, user A shall be able to receive and originate other calls.

When the CCBS activation is accepted, the CCBS service duration time which specifies the duration of the scanning/monitoring is started. The value of this period is a network operator option, typically 15-45 minutes.

The network operator can optionally notify destination B that it is being scanned for the idle state.

3.1.3.2. Deactivation

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

1) Deactivate all outstanding CCBS requests.

2) Deactivate the last CCBS request.

3) Deactivate a specific CCBS request. This request must specify enough information to correlate with the initial activation (e.g. specify a transaction identity or specify the terminating destination, originating destination, and bearer capability).

3.1.4. *Invocation and Operation*

When user B becomes idle, the network should apply the destination B idle guard time (see subclause 2.3.) before starting the CCBS recall procedure. This time-out allows the B party to reuse access resources for making an outgoing call. When the destination B idle guard time expires, then the network should reserve resources within the network between the user access interfaces of the parties A and B, provided that both A and B are idle. If a free communication path is found, then user A should be recalled with a notification that the recall concerns his CCBS request, and the CCBS recall timer should be started. If user A accepts the recall within the time-out, then the network should complete the call setup on the B party's interface.

When the B party becomes idle, the network should reserve on the B party's interface the resources which are necessary to complete the CCBS call. This reservation prevents incoming calls to the B party from pre-empting these resources. However, these resources may be used by the B party to make an outgoing call. The resources should be released as soon as it appears that the CCBS recall attempt has failed or has not been accepted by user A.

Normally, only one CCBS request can be stored against destination B. However, as a subscription option, destination B may be provided with the possibility to store up to seven CCBS requests simultaneously in a destination CCBS request queue. This queue should be served on a first in first out basis each time the destination B idle guard timer has expired after destination B has become idle.

User B may inhibit CCBS requests from being stored against his termination. If this occurs while CCBS requests are still in store, these requests should be canceled and the relevant A parties should be informed. No new requests may be stored until the inhibition has been deactivated by user B.

3.1.5. *Interrogation*

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

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

2) 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.

3.2. **Alternative Method for Users to Access the Service**

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

None identified.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

If user B makes an outgoing call during the period when the destination B idle guard time is running, then the resources reserved for the CCBS call may be used for the outgoing call, if no other resources are available. Servicing of the destination B request queue should then be deferred until the B party becomes idle again.

If user B makes an outgoing call after the CCBS recall procedure has been started but before user A has accepted the recall, then user B should be informed at the outgoing call attempt that the network is attempting to set up a CCBS call. User B may still proceed with the outgoing call or release the call to await the CCBS call.

If the A party is found busy when the B destination idle guard time has expired, then the A party should be notified and the CCBS request should be suspended until the A party becomes idle again.

If no free resources can be found within the network for the CCBS call, then the CCBS request should be suspended during a period of three minutes.

Note: This should be repeated until free resources are found or the CCBS service duration time has expired.

Suspended CCBS requests in the destination B queue should be skipped (equally, if the queue consists of one position only) when this queue is serviced, but retain their position in the queue.

When a CCBS request becomes unsuspended and at that time the B party is idle or any other CCBS request from the same queue is being processed, then the destination B queue should be serviced again.

Note: Normally, this will result in processing the just unsuspended CCBS request.

If destination B is busy again when the call resulting from CCBS is set up, then user A may invoke CCBS again; however, this should be considered as a new CCBS request.

If user A neither accepts nor rejects the CCBS recall before the CCBS recall time expires, then the CCBS request should be canceled.

Cancellation of a CCBS request by whatever cause should have the effect that this request is removed from the destination CCBS request queue.

If user A does not wait for the CCBS recall to a particular user B but makes another call to that (busy) user B and re-initiates CCBS, then the network should not accept this as a new CCBS request. User A should be informed that the request is not accepted because a CCBS request has already been stored against the requested user B.

3.2.5. *Interrogation*

None identified.

3.3. **Stimulus Mode Procedures**

The service code 37 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 37 #

3.3.4. *Deactivation*

37 (* SI)

3.3.5. *Invocation*

* 37 (* SI) #

3.3.6. *Interrogation*

 # 37 (SI) #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The calling party shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

When calling and called users belong to different networks, then CCBS should be possible if both networks support the supplementary service along the communication path between the two users. In particular, it should be possible to activate CCBS on a call meeting busy between an ISDN and a PSTN user and vice versa, if CCBS is supported for the PSTN user.

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

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

If user A has subscribed to CCBS and places a call to a user B who has subscribed to CW and user B is given the call waiting indication, CCBS invocation is not allowed.

If user B cannot be given the call waiting indication, user A will receive busy indication and will be able to invoke CCBS to user B.

A CCBS recall may invoke call waiting at user A, when this user subscribes to CW and his access is in the appropriate condition.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

Not applicable.

6.4.2. Single Step Call Transfer (SCT)

Not applicable.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

When a busy customer for whom one or more outgoing CCBS requests have been suspended becomes idle, then the handling of the outgoing CCBS requests should have priority over the handling of possible stored incoming CCBS requests for the same customer.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

If the conference controller attempts to establish a call to a party and encounters busy, the conference controller may invoke CCBS to that party, provided the conference controller has also subscribed to CCBS.

When the called party becomes idle and the controller is still involved in the conference, then the CCBS recall to the conference controller will occur by means of a normal call waiting procedure. Now the controller may put the conference on hold, complete the CCBS call, and add that call to the conference. When the conference controller has a conference call active, CCBS may be applied to its line. For determination of busy, the conference call appears the same as a two-party call.

6.8.2. **Meet-Me Conference (MMC)**

A CCBS request shall not be allowed against a conference number.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

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

1) CFU activated by B before A requests CCBS on B:
   If the call to destination B is forwarded to C by CFU and C is busy, then a CCBS request, if made by user A, shall be rejected. User A shall be informed that the CCBS request has been rejected with short time denial as the reason.

2) CFU activated by B after A requests CCBS on B:
   If destination B activates CFU after A has requested CCBS, then the CCBS shall be canceled.

Assume CCBS and CFU are activated by user A: If user A activates CCBS to any destination and either has activated or subsequently activates CFU, then the CCBS recall shall not be forwarded but shall be given to user A at the original termination.

6.10.2. Call Forwarding Busy (CFB)

Assume A calls B, B is busy and has CFB activated to C.

1) CFB activated by B before A requests CCBS on B:
   If B has activated CFB and is busy, and the forwarded-to user C is also busy, then any CCBS subsequent request by A shall be applied to the originally called user B.

2) CFB activated by B after A requests CCBS on B:
   If destination B activates CFU after A has requested CCBS, then the CCBS request shall still be applied to the originally called user B.

Assume CCBS and CFB are activated by user A: If user A activates CCBS to any destination and either has activated or subsequently activates CFB, then, if user A is busy, the CCBS recall shall not be forwarded but shall be given to user A at the original termination.

6.10.3. Call Forwarding No Reply (CFNR)

Assume A calls B, B does not reply and has CFNR activated to C.

1) CFNR activated by B before A requests CCBS on B:
   If A calls B and the call is forwarded on no reply to C and C is busy, any request by A for CCBS shall be rejected with user A being given short term denial as reason.

2) CRNR activated by B after A requests CCBS on B:
   If user B activates CFNR after user A has requested CCBS on B, then the CCBS recall shall be connected to the forwarded-to party C, if it meets no reply conditions at B.

Assume CCBS and CFNR are activated by user A: If user A activates CCBS to any destination and either has activated or subsequently activates CFNR, then the CCBS recall shall not be forwarded, if it meets no reply conditions at A.

Note: If the CCBS recall time has a shorter duration than the CFNR no reply time, then the no reply condition at A will never occur for a CCBS recall.

6.10.4. **Call Deflection (CD)**

Calling user (A): If a call to the called user (B) is forwarded to user C by CD and C is busy, then a CCBS request by user A shall be rejected. User A shall be informed that the CCBS request has been rejected with short term denial as reason.

Called user (B): If B invokes CCBS in association with an outgoing call and has CD activated, the CCBS recall shall be given to user B at his original location. However, user B would not be allowed to deflect this recall.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFU-S.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFB-S.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFNR-S.

6.11. **Freephone (FPH)**

When a user activates CCBS towards a freephone number, the invocation of the service (completion of a call) should take place in relation to the freephone number.

If this cannot be completed in an introductory phase, CCBS towards a freephone number shall be rejected.

6.12. **Line Hunting (LH)**

When the whole hunting group is busy, CCBS refers to the general direction number.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

If user B subscribes to MSN: No impact.

If user A subscribes to MSN, the MSN number provided on the initial call setup shall be used when making the CCBS recall to user A; if no MSN number was specified on the initial

call setup request, then user A shall be recalled with his default number.

6.15. Private Numbering Plan (PNP)

No impact.

6.16. Priority (PRI)

No impact.

6.17. Remote Control of Supplementary Services (RCSS)

Not applicable.

6.18. Sub-addressing (SUB)

The calling sub-address, if provided in the initial call setup request, shall be used when making the CCBS recall to user A.

The called sub-address, if provided in the initial call setup request, shall be used when offering the CCBS call to user B.

6.19. Terminal Portability (TP)

No impact.

6.20. Three-Party Service (3PTY)

No impact.

6.21. User-to-User Signalling (UUS)

Calling user: The network shall not store User-to-User Information (UUI) sent in association with the original call. A user may provide UUI on the CCBS recall acceptance.

Called user: If a called user is network determined user busy, the UUI transfer to the calling party shall not apply.

If the called user is user determined user busy, it may include UUI for the calling user in the call rejection message.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All single line customers.

7.2. Charging

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

7.3. Quality of Service

If the CCBS supplementary service is invoked and results in a call which involves more than one network, e.g. the call involves different PSTNs or ISDNs of different countries, or even different continents, a decrease in quality of service parameters may arise.

Depending on national implementations, networks may provide some precautions, e.g. limit the number of international border crossings and/or satellite hops, and therefore, the invocation of the CCBS supplementary service may be rejected by some networks in some cases.

Annex 8

CONFERENCE SERVICES

Conference Services is a group of supplementary services which allows more than 3 participants to communicate bidirectional among themselves.

The group includes the following two supplementary services:

1. Conference Call, Add-on (CONF)

2. Meet-Me Conference (MMC)

Annex 8.1

CONFERENCE CALL, ADD-ON (CONF)

Operational Requirements

1. DEFINITION

The Conference Call, Add-on (CONF) supplementary service provides a user with the possibility to have a multi-connection call with simultaneous two-way communication between more than two parties.

2. DESCRIPTION

2.1. General Description

When CONF is invoked, conference resources are allocated to the served user and any calls indicated by the service request are added to the conference. Once a conference is active, parties may be added, disconnected, isolated (i.e. prevented from communicating with the conference), reattached, or split (i.e. removed from the conference but remain connected to the conference controller). The conference controller can place its connection to the conference on hold, retrieve the conference, end the conference, or disconnect itself from the conference.

The differences between CONF and Meet-Me Conference (MMC) are:

1. For CONF the served user, i.e. the conference controller, shall order the conference and connect the conferees.
   For MMC all participants shall call the conference. In addition, the served user shall order in advance the conference resources in the network.

2. For CONF the served user, i.e. the conference controller, is charged for the whole conference.
   For MMC every conferee is charged for participating in the conference. In addition, the served user is charged for the use of the conference resources.

2.2. Denomination of Users

The served user, i.e. the conference controller, is considered as the calling party. The conferees are considered as called parties.

2.3. Specific Terminology

Conference controller: The user that orders and manages the conference. Also mentioned as the served user.

Conferees: Others except the conference controller participating in the conference.

Served user: See conference controller.

To isolate: To prevent a conferee from communicating with the conference.

To split: To remove the conference controller and a conferee from the conference and keep them connected.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services carrying speech.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

The supplementary service is provided after prearrangement with the network operator. The subscription parameters include the maximum number of conferees allowed in a conference call.

Withdrawal of the service is made by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

The subscription parameters including the maximum number of conferees allowed in a conference call are registered at the provision.

Erasure shall happen at withdrawal.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

3.1.4.1. Beginning the Conference Call from the Idle State

The served user invokes the CONF according to the subscription parameters and gives the maximum number of conferees.

A successful invocation shall result in allocation of conference resources in the network for the number of parties indicated.

After invocation the connection to the conference shall be put on hold and the conferees are called one by one and connected to the conference.

3.1.4.2. Managing the Conference

In the active state of the conference, the conference controller has the following options:

1) Terminate the entire conference.

2) Put the conference on hold, i.e. put its own connection to the conference on hold. The remaining parties in the conference can communicate with each other. The conference controller may make an enquiry call.

3) Create a private communication with one of the parties. This results in the fact that the conference controller and the designated party are split from the conference but still connected together. The remaining parties can continue communication.

4) Explicitly disconnect one or more of the parties on a one at a time basis.

5) Negotiate transfer of the conference call control to a conferee. This user must subscribe to CONF. The new conference controller shall be charged for the remaining part of the conference or until a new transfer of conference control occurs. The controlling user cannot retire before having transferred the conference call control to another conferee.

   Note: If the conference controller clears by "hanging up", this is interpreted as a request for termination of the entire conference.

6) 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.

7) Isolate a conferee. The conference controller can request that a specified party be prevented from communicating with the conference without being removed from it.

8) Re-attach a conferee previously isolated or split.

In the active state any of the conferees can:

1) Put his connection to the conference on hold. In this state the conferee may make an enquiry call.

2) Disconnect his connection to the conference.

Note 1: If the conference is on hold and the conference controller clears by "hanging up", this is interpreted after a short time (typically 5 secs.) as a request for termination of the entire call. However, during the short timeout the conference controller is alerted and informed that the conference is still on hold, thus enabling the conference controller to retrieve the conference.

Note 2: If the conference controller 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 conference controller.

3.1.5. *Interrogation*

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

Interrogation of the provision of the service shall be possible.

During the active state of the conference the conference controller shall be able to interrogate the network for the status and identity of the conferees.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

None identified.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

3.2.4.1 Beginning a Conference Call from an Active Call

The served user, who has an existing active call, may put the existing call on hold and invoke the CONF supplementary service with an indicated maximum number of conferees. The party on the active call shall be the first conferee. The other conferees shall be called one by one and connected to the conference.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

The service code 71 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

CONFERENCE CALL, ADD-ON (CONF)

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

3.3.5.1. Invocation from Idle

* 71 * SI #

3.3.5.2. Invocation from Active Call

The active call is put on hold by using switching order 2

(R) 2

Note: (R) indicates a push on an R-button, if necessary.

Furthermore, CONF is invoked by

* 71 * SI #

3.3.5.3. Addition of a New Conferee

(R) 2 - EC - (R) 3

Note: EC = An enquiry call

3.3.5.4. Isolate Conferee

(R) 6 * CPN #

Note: CPN = The number of the current conferee.

3.3.5.5. Split Conferee

(R) 4 * CPN #

3.3.5.6. Reattach Isolated Conferee

(R) 3 * CPN #

3.3.5.7. Reattach Split Conferee

(R) 3 * CPN #

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 71 #

3.3.6.2. Interrogation of a Conferee

(R) 2 *# 71 * CPN #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If a user tries to invoke CONF and the network cannot comply with that request, the network will deny the request and explain the reason for denial.

Possible reasons for non-compliance are:

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

If the network cannot satisfy the request to add an additional conferee (e.g. if the conference call has been cleared or if the maximum number of conferees allowed has already been reached) the conference controller will receive indication that the request is denied, with the reason for failure.

5. INTERWORKING AND INTERCOMMUNICATION

The conference controller has to be an ISDN subscriber. The conferees may belong to any network intercommunicating with the ISDN.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

Conference controller: No impact.

Conferees: They do not receive COLP information of parties being added to the conference.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

If a CUG user has set up the first leg of a conference call using a CUG, then all subsequent connected conferees must belong to the same CUG.

A CUG user having outgoing access shall not be allowed to set up an add-on conference using the outgoing access.

If a CUG member has set up a conference he cannot add any incoming call to this conference.

Note: The only case where not all CUG restrictions are met is the following: If a non-CUG user tries to set up a conference with CUG users who belong to different CUGs but have incoming access, this will be possible.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

If the conference controller attempts to establish a call to a party and receives busy, the conference controller may invoke CCBS to that party, provided the conference controller has also subscribed to CCBS.

When the conference controller is informed that the called party is no longer busy, it may place the conference on hold, complete the CCBS call, and add that call to the conference. When the conference controller has a conference call active, CCBS may be applied to its line. For determination of busy, the conference call appears the same as a two-party call.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

Interconnection between CONF and MMC shall not be allowed.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

If the conference controller attempts to establish a conference call to a user that has CFU activated and the appropriate forwarding conditions are met, the forwarded-to user shall be alerted and can be added to the conference.

6.10.2. **Call Forwarding Busy (CFB)**

If the conference controller attempts to establish a conference call to a user that has CFB activated and the appropriate forwarding conditions are met, the forwarded-to user shall be alerted and can be added to the conference.

6.10.3. **Call Forwarding No Reply (CFNR)**

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

6.10.4. **Call Deflection (CD)**

If the conference controller attempts to establish a conference call to a user that invokes CD and the appropriate deflection conditions are met, the deflected-to user will be alerted and can be added to the conference.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

When a terminal manages two or more associated calls, invocation of TP shall not be allowed.

6.20. **Three-Party Service (3PTY)**

Interconnection between CONF and 3PTY shall not be allowed.

6.21. **User-to-User Signalling (UUS)**

Conference controller: User-to-User Information (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 communication between the conference controller and any particular conferee.

Conferees: UUI can be sent to and received from the conference controller. UUI will not be transferred between the conferees in association with the conference call.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

Mainly business customers but in reality all customers.

7.2. Charging

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

Annex 8.2

MEET-ME CONFERENCE (MMC)

Operational Requirements

1. DEFINITION

The Meet-Me Conference (MMC) supplementary service provides a user with the ability to arrange for a conference between more than two participants with all participants accessing the conference themselves.

2. DESCRIPTION

2.1. General Description

The MMC service is activated for a specified period booked in advance by the served user.

In due time, each participant in the conference has to dial a special number which has been allocated to the booked conference in order to access to the conference.

The differences between MMC and Conference Call, Add-on (CONF) are:

1. For MMC all participants shall call the conference. In addition, the served user shall order in advance the conference resources in the network.
   For CONF the served user, i.e. the conference controller, shall order the conference and indicate the conferees. The conferees are called from the conference resources.

2. For MMC every conferee is charged for participating in the conference. In addition, the served user is charged for the use of the conference resources.
   For CONF the served user, i.e. the conference controller, is charged for the whole conference.

2.2. Denomination of Users

The served user as well as the conferees are all to be considered as calling parties.

2.3. Specific Terminology

Served user: The user who booked the conference.

Conferees: The other participants in the conference.

2.4. **Applicability to Telecommunication Services**

This supplementary service shall be applicable to all basic telecommunication services carrying speech traffic.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Provision may be general without any prior arrangement with the network operator.

Withdrawal may be general for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

This service requires a preliminary booking of a conference period to be made by the served user by using an appropriate user procedure.

The following information shall be provided by the served user and shall be registered in the network:

- date of the conference or regular,
- starting time,
- end time or duration,
- number of simultaneous participants.

If the registration is accepted, a conference number and a conference resource shall be temporarily allocated to the conference. The number shall be given to the served user who shall communicate it to the other participants.

Only a limited number of simultaneous participants (eg. 10) can be booked for the conference.

3.1.2.2. Erasure

Erasure by the served user using an appropriate procedure is used to cancel a conference before it starts.

Erasure shall happen automatically by clearing the conference.

3.1.3. *Activation and Deactivation*

3.1.3.1. Activation

The MMC service is activated for a specified period booked in advance by the served user.

The time between booking and activation of the conference may be limited.

3.1.3.2. Deactivation

Not applicable.

3.1.4. *Invocation and Operation*

3.1.4.1. Access to the Conference

In due time, each participant (served user and conferees) shall dial the number allocated to the booked conference for access to the conference.

A call to the conference received before the starting time shall be rejected as a call to an unallocated number. In this case an indication related to "unallocated number" shall be sent to the calling user.

However, if a call is received less than T minutes (e.g. T = 2) before the starting time, the call shall be connected and an indication shall be sent to the calling user in order to indicate that the conference will start soon. No communication shall be possible between the participants before the starting time of the conference.

Every new call shall be rejected when the booked number of simultaneous participants has been reached.

The service shall be invoked by the first participant dialling the number of the conference.

Specific information shall be sent to each calling participant before its connection to the conference. This information should proceed for the first participant as long as a second one has not been connected.

The access to a conference shall be allowed for the whole duration of the conference, if the booked number of simultaneous participants has not been reached.

During the conference an indication shall be sent to the participants each time a new participant is connected to the conference. The identification of new participants may be provided to the already connected ones.

3.1.4.2. Addition/Clearing of a Participant

At any time, a new participant may join the conference if the booked number of simultaneous participants has not been reached.

At any time, each participant can leave the conference by clearing the connection to the conference (normal release of a call). An indication shall be sent to all participants to inform them of the release of one participant. The release of one participant from the conference shall allow a new participant to be connected instead.

3.1.4.3. Conference Parameters Modification

During the conference, the served user can put his connection to the conference on hold and make an enquiry call to the booking service in order to request modifications of the conference duration and/or of the booked number of simultaneous participants.

3.1.4.4. Release of the Conference

At the end of the scheduled time of the conference, the conference is released and the participants still connected shall be released automatically. Before the release operation, an indication shall be sent to the participants in order to inform them that the conference is ending soon.

3.1.5. *Interrogation*

Interrogation of the registration of a conference shall be possible.

3.2. **Alternative Method for Users to Access the Service**

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

3.2.2.1. Registration

The preliminary booking of a MMC can be made with the assistance of an operator.

If the registration is accepted, a conference number and a conference resource shall be temporarily allocated to the conference. The number shall be given to the served user who shall communicate it to the other participants.

Only a limited number of simultaneous participants (eg. 10) can be booked for the conference.

3.2.2.2. Erasure

Erasure may be made with the assistance of an operator.

3.2.3. *Activation and Deactivation*

None identified.

3.2.4. *Invocation and Operation*

Network Operator Requirements

At any time, an operator shall have the possibility to be connected to the conference in progress or individually to each participant by means of a specific procedure. This shall allow the operator, e.g.:

- to check the transmission quality,
- to eject a participant by clearing the access,
- to contact the served user for administrative reasons.

A specific indication shall be sent to inform the participants of the intrusion of the operator.

During the conference, the operator shall be able to modify some parameters in response

to a modification request coming from the served user, e.g.:

- end time of the conference
- booked number of simultaneous participants.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

The service code 72 has been allocated for this service.

3.3.1. *Registration*

* 72 * SI1 * SI2 * SI3 * SI4 #

Note: SI1 = Date (DDMM)
SI2 = Starting time (HHMM),
SI3 = End time (HHMM) or duration.
SI4 = Number of simultaneous participants (NN).

3.3.2. *Erasure*

72 * CN

Note: CN = Allocated Conference Number

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 72 * CN (#)

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 72 #

3.3.6.2. Data Check

*# 72 * SI1 * SI2 * SI3 * SI4 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The user shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

The served user shall be an ISDN subscriber. The conferees may belong to any network intercommunicating with the ISDN.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Charges for the different connections to the conference: No impact [1])

Charges for the use of the conference resources: This charging information may be sent to the conference controller.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

Charges for the different connections to the conference: No impact.

Charges for the use of the conference resources: This charging information may be sent to the conference controller.

6.2. Call Waiting (CW)

Any participant should be able to receive an indication of a waiting call when participating in a MMC call. The participant may put the call on hold and subsequently answer the waiting call.

6.3. Call Hold (HOLD)

Any participant involved in an active conference may place the conference on hold and later retrieve the connection to the conference.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.4. *Call Transfer Services*

6.4.1. **Explicit Call Transfer (ECT)**

Any participant can invoke ECT in order to transfer their conference connection to another user after the connection to that user has been established.

6.4.2. **Single Step Call Transfer (SCT)**

A network may take appropriate measures to prevent a MMC call from being transferred by means of SCT.

6.5. *Number Identification Services*

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. *Call Barring Services*

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

A CCBS request shall not be allowed against a conference number.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

It should be possible for a participant to be involved alternatively in a MMC call as well as

in a CONF call. A network operator may take appropriate measures to prevent a MMC call from being connected to a CONF call.

6.8.2. **Meet-Me Conference (MMC)**

Not applicable.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

It should be possible for a participant to be involved alternatively in a 3PTY call as well as in an MMC call. A network operator may take appropriate measures to prevent a MMC call from being joined with another call into a 3PTY connection.

6.21. **User-to-User Signalling (UUS)**

UUS cannot be used when invoking MMC (services 1 or 2) and during the Meet-Me Conference (service 3).

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

All groups of customers.

7.2. Charging

Charging for participation is applied to each participant of the MMC and charging related to the conference (conference equipment, booking ...) is applied to the controlling subscriber.

Annex 9

DIRECT DIALLING IN (DDI)

Operational Requirements

1. DEFINITION

The Direct Dialling In (DDI) supplementary service enables a calling party to call a user on an ISPBX or other private systems directly from the public network without attendant intervention. A part of the ISDN number, which is significant to the user, is passed to the called party's premises.

2. DESCRIPTION

2.1. General Description

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

The essential difference between this supplementary service and Multiple Subscriber Number (MSN) concerns the length of the number sent to and processed by the called party's installation. In the DDI situation, the user (ISPBX) will be tailored on a per installation basis to receive the particular number of digits necessary to identify the terminals of this user (ISPBX).

With the MSN supplementary service, however, the network operator will fix the length of the number to be transmitted to the user's installation. It may comprise 1-4 of the last significant digits up to the full number. This number will be sent to the user network interface.

2.2. Denomination of Users

The served user is the called party. The calling party is using the service.

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

This service shall be provided after prearrangement with the network operator. The network operator shall allocate a set of ISDN numbers.

Withdrawal of DDI by the network operator shall be at the subscriber's request or for network operator reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

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.

Calls entering a Private Switched Network (PSN) may be re-routed within the PSN. This may lead to the situation where longer time for connecting the call is necessary as usual. Therefore, it may be necessary to send a message back to the public network indicating that the call setup is in progress in order to avoid problems due to timer expiration.

3.1.5. *Interrogation*

Not applicable.

3.2. Alternative Methods for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the called user is busy or does not answer, the procedures for basic calls will apply. 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 also be convenient.

5. INTERWORKING AND INTERCOMMUNICATION

No special considerations are identified.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5. *Number Identification Services*

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. *Call Barring Services*

6.6.1. **Closed User Group (CUG)**

CUG membership shall not be available on a per ISDN number basis, but instead, it shall be on the basis of the entire range of ISDN numbers applicable at an access or group of accesses.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

Not applicable.

6.10. *Diversion Services*

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

If the DDI supplementary service is provided to the served user of the MCID supplementary service, then the MCID supplementary service shall be provided either globally for the whole access or, as a network option, for specific ISDN numbers forming part of the DDI supplementary service, according to access arrangements. In both cases, the complete ISDN number of the called user shall be registered.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers, but specially those with ISPBX facilities.

7.2. Charging

It shall be possible to charge the subscriber accurately for the service. For example: Supplementary service provision may be part of the general subscription charges. Charges may include a subscription fee and a rental charge proportional to the quantity of numbers assigned.

7.3. Quality of Service

This supplementary service improves the ISDN capabilities of addressing, permitting the calling party to reach in a more concrete way a specific terminal at the called party's premises without external attendance.

Annex 10

DIVERSION SERVICES

Diversion Services is a group of supplementary services causing diversion of incoming calls to another address.

Diversion of the incoming calls may happen to all calls dependent on the condition of the called subscriber's line or reaction by the called subscriber or its installation or itself before the call is answered.

The group includes the following seven supplementary services:

1. **Call Forwarding Unconditional (CFU)**
2. **Call Forwarding Busy (CFB)**
3. **Call Forwarding No Reply (CFNR)**
4. **Call Deflection (CD)**
5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**
6. **Call Forwarding Busy to a Service Centre (CFB-S)**
7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Annex 10.1

CALL FORWARDING UNCONDITIONAL (CFU)

Operational Requirements

1. DEFINITION

The Call Forwarding Unconditional (CFU) supplementary service permits a served user to have 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 outgoing calls are unaffected. If CFU is activated, calls are forwarded no matter what is the condition of the termination.

2. DESCRIPTION

2.1. General Description

In normal situations, the CFU service is provided on a per access basis. (In these situations there is a one-to-one relationship between the ISDN number and the access). However, the network may recognise multiple numbers on a 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 recognised by the public network.

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

An indication that the forwarding service is active on a number is given to the forwarding customer each time an outgoing call is made according to the subscription options (subclause 3.1).

The maximum number of diversions to a single call is a network option with an upper limit of five. When counting the number of diversions, all types of diversions should be included.

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

2.2. Denomination of Users

The served user is a called party.

2.3. Specific Terminology

Calling party: The user who is originating a call to the served user. The calling party may also be called the A subscriber.

DTN: The Diverted-To Number. The number of the forwarded-to user. The number may also be called the C number.

Forwarded-to user: The user to whom the call shall be forwarded. The forwarded-to user may also be called the C subscriber.

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

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CFU is provided after prearrangement with the network operator.

CFU subscription is dependent on the basic service parameter. 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.

The service can be offered with four subscription options. The 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
Served user receives notification that a call has been forwarded	- No - Yes
Calling party receives notification that the call has been forwarded	- No - Yes
Served user receives notification that CFU is currently activated	- No - Yes
Served user releases the number to the forwarded-to user	- No - Yes

This service will be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

At registration the served user must supply:

- the forwarded-to number with the relevant sub-address, if necessary,
- an indication of the basic service(s) concerned,
- possibly the ISDN number for which CFU should apply (e.g. MSN).

According to the needs, this information profile may be different for each basic service subscribed to by the served user.

As a network option, verification of the forwarded-to number should be accomplished, if possible, before accepting the CFU registration.

When the served user registers CFU, the network shall 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 registered.

3.1.2.2. Erasure

Erasure shall be possible.

3.1.3. *Activation and Deactivation*

If the served user has registered CFU, the served user may use the activation procedure.

If a single number can be used by more than one terminal, activation of CFU shall be possible from any terminal using this number. As a service option activation/deactivation may be restricted to selected terminals (e.g. by use of a keyword).

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

3.1.4. *Invocation and Operation*

When CFU is active, all incoming calls shall be forwarded without being offered to the served user. According to the subscription option selected, the served user could receive notification of call forwarding, but will not be able to answer the incoming call.

The forwarded-to user shall receive an indication that the call has been forwarded, possibly with the cause. The cause shall be the appropriate forwarding condition. 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 party receives a notification that the call has been forwarded.

Call forwarding applies only to subscribed basic services. Calls to an ISDN number requesting a basic service which is not subscribed to shall not be forwarded.

Within an ISDN or tandem ISDNs the total number of all forwardings for each call shall be limited. The maximum number shall be limited to five for each call. When counting the number of diversions, all types of diversions shall be included. This is to prevent infinite looping.

3.1.5. *Interrogation*

Interrogation of the provision of the service and the stable states shall be possible. The network response may include all information that was supplied in the last activation procedure for each basic service.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3 Stimulus Mode Procedures

The service code 21 has been allocated for this service.

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* 21 * DTN #

Note: DTN = The Diverted-To Number.

3.3.1.2. Registration without Activation

* 21 * DTN * 0 #

3.3.2. *Erasure*

21 * 0

3.3.3. *Activation*

* 21 #

3.3.4. *Deactivation*

21

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 21 #

3.3.6.2. Data Check

*# 21 * DTN #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the network cannot accept a registration or activation request, the served user shall receive a notification that the operation was unsuccessful. Examples of the reasons for rejection are:

- Service not subscribed to
- Basic service to which relevance is requested is not subscribed to
- Service not available by administrative reasons
- Terminal/user not allowed for service access
- Use of an operator access prefix
- Insufficient information
- Forwarded-to number is a special number (e.g. police)
- Forwarded-to number is served user's number
- Forwarded-to number is outside CUG restrictions
- Forwarded-to number is not in use
- Service not registered

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

If the user does not specify completely the CFU request to be deactivated (e.g. the basic service and/or the user's number), the network shall reject the deactivation request with appropriate cause.

If the network cannot accept a user's request for deactivation, the rejection cause shall be returned to the user, e.g.:

- Incorrect ISDN number.

If the network deactivates CFU without the served user having requested deactivation (e.g.

when an exceptional condition occurs), the served user shall receive notification along with the cause.

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

If the forwarded call cannot be completed to the forwarded-to destination, then the network shall clear the call. Specifically, if CFU has been invoked, then the call shall be cleared back to the originating exchange and the calling party shall 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. INTERWORKING AND INTERCOMMUNICATION

If the forwarded-to number is not within the ISDN, 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.

In case of interworking, appropriate tones and/or announcements should be provided.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Served user: No information will be given.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information is not transferred to the served user.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information may be transferred to the served user when the call is cleared.

6.2. Call Waiting (CW)

Calling party: No impact.[1])

Served user: CFU takes precedence over CW, however CFU could be activated while a call is waiting without changing the status of that call.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

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

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

If user C has subscribed to CFU, then the transferred call shall be forwarded to another user, D.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

Served User: If subscribed to, the served user can receive the calling line identification of all calls which have been forwarded.

Forwarded-to user: A forwarded-to user with CLIP active shall receive the number of the calling party as well as the served user. In the case of multiple forwarding the answering party shall receive indication of the calling party, the first forwarding party, and the last forwarding party. In the case one or more of the mentioned parties have CLIR active, its number shall be replaced by an indication that the number is not available.

6.5.2. Calling Line Identification Restriction (CLIR)

Calling party: When CLIR is activated, the calling line identification must not be presented to the forwarded-to user unless the forwarded-to user has an override category.

6.5.3. Connected Line Identification Presentation (COLP)

If the calling party has COLP activated, it shall receive the line identity of the forwarded-to user associated with the CFU notification.

6.5.4. Connected Line Identification Restriction (COLR)

No number must be presented to the calling party unless this party has an override category.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be

met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

Calling party/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.

Served user: CFU can only be activated, if CUG restrictions between the served user and the forwarded-to user are met.

6.6.2. Outgoing Call Barring (OCB)

When CFU has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the version of OCB that has been activated, i.e. in this case there exists no interaction between the two services.

After OCB has been activated, registration of CFU can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.7. Completion of Calls to Busy Subscribers (CCBS)

a) CFU activated by B before A requests CCBS on B:
If the call to destination B is forwarded to C by CFU and C is busy, then a CCBS request, if made by user A, shall be activated. User A shall be informed that CCBS has been activated. If user A activates CCBS and subsequently activates CFU, the CCBS recall shall be given to user A at his original location.

b) CFU activated by B after A requests CCBS on B:
If destination B activates CFU after user A has requested CCBS, then the CCBS request shall be canceled.

c) CCBS activated by B to another destination D:
If user B activates CCBS to another destination D and either has already activated or subsequently activates CFU, then the CCBS recall shall be given to B at his original location.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

Calling party: If a conference controller attempts to establish a conference call and calls a user with CFU active, the forwarded-to user shall be alerted and can be added to the conference.

Forwarded-to user: A forwarded-to user can establish a conference using an existing forwarded call, as a network option.

A call that has been forwarded to the conference controller can be added to an existing conference.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

Not applicable.

6.10.2. **Call Forwarding Busy (CFB)**

The invocation of CFU takes precedence over CFB.

6.10.3. **Call Forwarding No Reply (CFNR)**

The invocation of CFU takes precedence over CFNR.

6.10.4. **Call Deflection (CD)**

CFU takes precedence over CD.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

CFU-S shall have precedence over CFU.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

The forwarding shall be charged to the FPH customer.

It shall be a network operator option to provide for one of the following situations:

1: Freephone calls arriving at a termination shall not be subject to CFU in operation at that termination. Such calls shall be offered at that termination in the normal manner. Redirection of FPH calls shall be achieved by network operator registration.

2: Freephone calls arriving at a termination shall be subject to CFU in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFU shall also apply to Freephone calls.

6.12. Line Hunting (LH)

Calling party: No impact.

Served user: CFU may be assignable to all or part of the hunting group. When forwarding is only required on part of the hunting group, the forwarding customer must specify, at activation, which access the service is to be invoked from. Procedures for the operation of this service in association with part of a hunt group need to be completed. In general, CFU takes precedence over LH.

Forwarded-to user: Forwarded calls shall be treated as normal calls when completing to a multi-line hunt group user.

6.13. Malicious Call Identification (MCID)

Forwarded-to user: MCI may be invoked for single and multiple forwarded calls. In this case, the numbers of the original calling and the last forwarding users are registered.

6.14. Multiple Subscriber Numbers (MSN)

No impact.

6.15. Private Numbering Plan (PNP)

No impact.

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. Priority (PRI)

No impact.

6.17. Remote Control of Supplementary Services (RCSS)

No impact.

6.18. Sub-addressing (SUB)

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

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

Incoming calls: UUS shall follow the forwarded call.

Outgoing calls: No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

Residential and business customers.

7.2. **Charging**

The served user shall be charged for the forwarded leg of the call.

Annex 10.2

CALL FORWARDING BUSY (CFB)

Operational Requirements

1. DEFINITION

The Call Forwarding Busy (CFB) supplementary service permits a served user to send to another number all incoming calls, or just those associated with a specified basic service, addressed to the served user's ISDN number and meeting busy. The served user's outgoing calls are unaffected.

2. DESCRIPTION

2.1. General Description

In normal situations, the CFB service is provided on a per access basis. (In these situations there is a one-to-one relationship between the ISDN number and the access). However, the network may recognise multiple numbers on a 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.

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. For multiple access installations, it may be possible for the user to specify on activation, if the service is applicable to a specific access or all accesses associated with that installation.

Note 2: A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

An indication that the forwarding service is active on a number is given to the forwarding customer each time an outgoing call is made according to the subscription options (subclause 3.1).

The maximum number of diversions to a single call is a network option with an upper limit of five. When counting the number of diversions, all types of diversions should be included.

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

2.2. Denomination of Users

The served user is a called party.

2.3. Specific Terminology

Busy definition is according to the recommendation T/CAC S 10.1, clause 8.

Calling party: The user who is originating a call to the served user. The calling party may also be called the A subscriber.

DTN: The Diverted To Number. The number of the forwarded-to user. The number may also be called the C number.

Forwarded-to user: The user to whom the call shall be forwarded. The forwarded-to user may also be called the C subscriber.

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

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CFB is provided after prearrangement with the network operator.

Call Forwarding Busy subscription is dependent on the basic service parameter. 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.

The service can be offered with four subscription options. The 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 the same as for CFU:

CALL FORWARDING BUSY (CFB)

Subscription Options	Value
Served user receives notification that a call has been forwarded	- No - Yes
Calling party receives notification that the call has been forwarded	- No - Yes
Served user receives notification that CFB is currently activated	- No - Yes
Served user releases the number to forwarded-to user	- No - Yes

This service shall be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

At registration the served user must supply:

- the forwarded-to number, with the relevant sub-address if necessary,
- an indication of the basic service(s) concerned,
- possibly the ISDN number for which CFB should apply (e.g. MSN).

According to the needs, this information profile may be different for each basic service subscribed to by the served user.

As a network option, verification of the forwarded-to number should be accomplished, if possible, before accepting the CFB registration.

When the served user activates CFB, the network shall return notification of acceptance or rejection of the request. This notification shall include the number of the forwarded-to user to whom the call forwarding is active.

3.1.2.2. Erasure

Erasure shall be possible.

3.1.3. *Activation and Deactivation*

If the served user has subscribed to CFB, the served user shall use the activation procedure.

If a single number can be used by more than one terminal, activation of CFB shall be possible from any terminal using this number. As a service option activation/deactivation may be restricted to selected terminals (e.g. by use of a keyword).

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 activation of CFB to be overridden.

3.1.4. *Invocation and Operation*

When 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 shall be forwarded. In case of NDUB, the call is not offered to the served user.

In the case of UDUB the call is offered to the served user. Normal call setup information shall already have been provided to the served user. When the forwarding attempt is started, the served user shall receive notification that a call has been forwarded.

In the case of NDUB the call is not offered to the served user, and according to the selected subscription option the served user could receive notification of call forwarding, but shall not be able to answer the incoming call.

The forwarded-to user shall receive an indication that the call has been forwarded, possibly with the cause. The cause shall be the appropriate forwarding condition. 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 party receives a notification that the call has been forwarded.

Call Forwarding Busy applies only to subscribed basic services. Calls to an ISDN number requesting a basic service which is not subscribed to shall not be forwarded.

Within an ISDN or tandem ISDNs the total number of all forwardings for each call should be limited. The maximum number of such connections should be limited to five for each call. When counting the number of diversions, all types of diversions shall be included. This is to prevent infinite looping.

3.1.5. *Interrogation*

Interrogation of the provision of the service and the stable states shall be possible. The network response may include all information that was supplied in the last activation procedure for each basic service.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 67 has been allocated for this service.

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* 67 * DTN #

Note: DTN = The Diverted-To Number.

3.3.1.2. Registration without Activation

* 67 * DTN * 0 #

3.3.2. *Erasure*

67 * 0

3.3.3. *Activation*

* 67 #

3.3.4. *Deactivation*

67

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 67 #

3.3.6.2. Data Check

*# 67 * DTN #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the network cannot accept a registration or activation request, the served user shall receive a notification that the operation was unsuccessful. Examples of the reasons for rejection are:

- Service not subscribed to
- Basic service to which relevance is requested is not subscribed to
- Service not available for administrative reasons
- Terminal/user not allowed service access
- Use of an operator access prefix
- Insufficient information
- Forwarded-to number is a special number (e.g. police)
- Forwarded-to number is served user's number
- Forwarded-to number is outside CUG restrictions
- Forwarded-to number is not in use
- Service not registered

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

If the user does not specify completely the CFB request to be deactivated (e.g. the basic service and/or the user's number), the network shall reject the deactivation request with ap-

propriate cause.

If the network cannot accept a user's request for deactivation, the rejection cause shall be returned to the user, e.g.:

- incorrect ISDN number.

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

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

If the forwarded call cannot be completed to the forwarded-to destination, then the network shall clear the forwarded leg of the call. Specifically, if CFB has been invoked and CFNR has not occurred, then the call shall be cleared back towards the calling party, and the calling party shall 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. INTERWORKING AND INTERCOMMUNICATION

If the forwarded-to number is not within the ISDN, 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.

In case of interworking, appropriate tones and/or announcements should be provided.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICE IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Served user: No information shall be given.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information is not transferred to the served user.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information may be transferred to the served user when the call is cleared.

6.2. **Call Waiting (CW)**

Calling party: No impact.[1]) If the served user is NDUB, CFB shall take place and the call is not offered. If the served user is not NDUB, the call shall be offered. If the served user's response is UDUB, then CFB shall take place.

Served user: No interaction. That is if the user is not NDUB, CW shall take place. If the user is NDUB, CFB shall take place.

Forwarded-to user: A forwarded call shall invoke CW.

6.3. **Call Hold (HOLD)**

No impact.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

User C may be busy when the transferred call is received. If user C has subscribed to CFB, the call shall then be forwarded according to the registration of CFB.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

Served user: If subscribed to, the served user can receive the calling line identification of all calls which have been forwarded.

Forwarded-to user: A forwarded-to user with CLIP active shall receive the number of the calling party as well as the served user. In the case of multiple forwarding the answering party shall receive indication of the calling party, the first forwarding party, and the last forwarding party. In the case one or more of the mentioned parties have CLIR active, its number shall be replaced by an indication that the number is not available.

6.5.2. **Calling Line Identification Restriction (CLIR)**

Calling party: When CLIR is activated, the calling line identification shall not be presented to the forwarded-to user associated with the CFB notification, unless the forwarded-to user has an override category.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.3. **Connected Line Identification Presentation (COLP)**

If the calling party has COLP activated, it shall receive the line identity of the forwarded-to user.

6.5.4. **Connected Line Identification Restriction (COLR)**

No number must be presented to the calling party unless this party has an override category.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

Calling party/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.

Served user: CFB can only be activated, if CUG restrictions between the served user and the forwarded-to user are met.

6.6.2. **Outgoing Call Barring (OCB)**

When CFB has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the version of OCB that has been activated, i.e. in this case there exists no interaction between the two services.

After OCB has been activated, registration of CFB can only be made to destinations which are within the limitations of the OCB version that has been activated.

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

a) CFB activated by B before A requests 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 shall be applied to the originally called user B.

b) CFB activated by B after A requests CCBS on B:
If B has activated CFB after A's request for CCBS on B, the CCBS recall shall still be applied to the originally called user B.

c) CCBS activated by B:
If user B activates CCBS and either has already activated or subsequently activates CFB, then the CCBS recall shall be given to B at his original location.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

Calling party: If a conference controller attempts to establish a conference call and calls a user with CFB active, the forwarded-to user shall be alerted and can be added to the conference.

A call that has been forwarded to the conference controller cannot be added to an existing conference.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

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

The invocation of CFU takes precedence over CFB.

6.10.2. **Call Forwarding Busy (CFB)**

Not applicable.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

In case of NDUB (Network Determined User Busy), the incoming call is not offered to the served user and CFB takes precedence over Call Deflection.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

CFB-S shall have precedence over CFB.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

The forwarding shall be charged to the FPH customer.

It shall be a network operator option to provide for one of the following situations:

1: Call forwarding of FPH calls encountering busy shall be done with reference to a service centre and not according to any CFB service in operation at the called termination.

2: FPH calls arriving at a termination shall be subject to CFB in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFB shall also apply to FPH calls.

6.12. **Line Hunting (LH)**

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

6.13. **Malicious Call Identification (MCID)**

Forwarded-to user: MCID may be invoked for forwarded calls. In this case, the numbers of the calling and forwarding users are registered.

6.14. **Multiple Subscriber Numbers (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

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

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

Incoming calls: UUS shall follow the forwarded call.

Outgoing calls: No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

Residential and business customers.

7.2. **Charging**

The served user shall be charged for the forwarded leg of the call.

Annex 10.3

CALL FORWARDING NO REPLY (CFNR)

Operational Requirements

1. DEFINITION

The Call Forwarding No Reply (CFNR) supplementary service permits a served user to send to another number 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. The served user's outgoing calls are unaffected.

2. DESCRIPTION

2.1. General Description

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

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.For multiple access installations, it may be possible for the user to specify on activation, if the service is applicable to a specific access or all accesses associated with that installation.

Note 2: A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

Note 3: The two following conditions of CFNR are possible:

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 2 is considered herein.

An indication that the forwarding service is active on a number is given to the forwarding customer each time an outgoing call is made according to the subscription options (subclause 3.1).

The maximum number of diversions to a single call is a network option with an upper limit of five. When counting the number of diversions, all types of diversions should be included.

For a given ISDN number, this service (including options) may be subscribed to for each

basic service to which the user of the number subscribes, or collectively for all the basic services to which the user subscribes. Since subscription is on an ISDN number basis, the same CFNR subscription will apply to all terminals using this number.

2.2. Denomination of Users

The served user is the called party.

2.3. Specific Terminology

Calling party: The user who is originating a call to the served user. The calling party may also be called the A subscriber.

CFNR time: The time before the forwarding shall take place.

DTN: The Diverted-To Number. The number of the forwarded-to user. The number may also be called the C number.

Forwarded-to user: The user to whom the call shall be forwarded. The forwarded-to user may also be called the C subscriber.

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

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

CFNR is be provided after prearrangement with the network operator.

Call Forwarding No Reply subscription is dependent on the basic service parameter. 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.

The service can be offered with four subscription options. The 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
Served user receives notification that a call has been forwarded	- No - Yes
Calling party receives notification that the call has been forwarded	- No - Yes
Served user receives notification that CFNR is currently activated	- No - Yes
Served user releases the number to forwarded-to user	- No - Yes

CFNR time-out is a network operator option.

This service will be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

At registration the served user must supply:

- the forwarded-to number with the relevant sub-address, if necessary,
- the CFNR time if other than the default time is used,
- information to what basic service this information is connected,
- possibly the ISDN number for which CFNR should apply (e.g. MSN).

According to the needs, this information profile may be different for each basic service subscribed to by the served user.

As a network option, verification of the forwarded-to number should be accomplished, if possible, before accepting the CFNR registration.

When the served user activates CFNR, the network 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.

3.1.2.2. Erasure

Erasure shall be possible.

3.1.3. *Activation and Deactivation*

If the served user has subscribed to CFNR, the served user shall use the activation procedure.

If a single number can be used by more than one terminal, activation of CFNR shall be

possible from any terminal using this number. As a service option activation/deactivation may be restricted to selected terminals (e.g. by use of a keyword).

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 activation of CFNR to be overridden.

3.1.4. *Invocation and Operation*

When CFNR is active all incoming calls shall be offered to the served user as usual. If the served user does not reply within the specified CFNR time, the call shall be forwarded and the served user shall no longer be able to answer the incoming call.

According to the selected subscription option, the served user shall receive notification of call forwarding.

The forwarded-to user shall receive an indication that the call has been forwarded, possibly with the cause. The cause shall be the appropriate forwarding condition. When multiple forwarding occurs, the reason for forwarding given to the forwarded-to user shall relate to the last forwarding user in the chain.

CFNR applies only to subscribed basic services. Calls to an ISDN number requesting a basic service which is not subscribed to shall not be forwarded.

Within an ISDN or tandem ISDNs the total number of all forwardings for each call should be limited. The maximum number should be limited to five for each call. This is to prevent infinite looping.

3.1.5. *Interrogation*

Interrogation of the provision of the service and the stable states shall be possible. The network response may include all information that was supplied in the last registration procedure for each basic service.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 61 has been allocated for this service.

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* 61 * DTN #

Note: DTN = The Diverted-To Number.

3.3.1.2. Registration without Activation

* 61 * DTN * 0 #

3.3.2. *Erasure*

61

3.3.3. *Activation*

* 61 #

3.3.4. *Deactivation*

61

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 61 #

3.3.6.2. Data Check

*# 61 * DTN #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the network cannot accept a registration or activation request, the served user shall receive a notification that the operation was unsuccessful. Possible causes are:

- Service not subscribed to
- Basic service to which relevance is requested is not subscribed to
- Service not available by administrative reasons
- Terminal/user not allowed for service access
- Use of an operator access prefix
- Insufficient information
- Forwarded-to number is a special number (e.g. police)
- Forwarded-to number is served user's number
- Forwarded-to number is outside CUG restrictions
- Forwarded-to number is not in use
- Not allowed CFNR time chosen

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

If the user does not specify completely the CFNR request to be deactivated (e.g. the basic service and/or the user's number), the network shall reject the deactivation request with appropriate cause.

If the network cannot accept a user's request for deactivation, the rejection cause shall be returned to the user, e.g.:

- Incorrect ISDN number.

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

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

If the forwarded call cannot be completed to the forwarded-to destination then, as a network operator option, the network may either:

a) clear the forwarded leg of the call and continue to alert the forwarding user, or

Note: With this option alerting of the forwarding user would not have been interrupted.

b) clear the forwarded leg of the call and notify the calling party of the rejection, possibly with reason.

Note: With this option, the alerting of the forwarding user shall have ceased on invocation of the CFNR service.

5. INTERWORKING AND INTERCOMMUNICATION

If the forwarded-to number is not within the ISDN, 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.

In case of interworking, appropriate tones and/or announcements should be provided.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Called user: No information will be given.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, the charging information is not transferred to the forwarding user.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, the charging information may be transferred to the forwarding user when the call is

cleared.

6.2. Call Waiting (CW)

Calling party: No impact.[1])

Served user: If the served user has CFNR activated, then a waiting call shall still be offered to the served user. If no answer is received to this call during the specified period, then the CFNR service becomes invoked and the call is forwarded.

Forwarded-to user: A forwarded call can invoke CW.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

Note: Where a network supports the option to transfer an answered call to the user C, the transferred call will be forwarded to another user D, if user C has activated the CFNR and user C does not answer before the CFNR time expires.

6.4.2. Single Step Call Transfer (SCT)

No impact.

Note: If user C, who has activated CFNR, does not answer the forwarded call, then upon expiration of the CFNR time, the call shall be forwarded to another user D.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

Served user: If subscribed to, the called user can receive the calling line identification of all calls which have been forwarded.

Forwarded-to user: A forwarded-to user with CLIP active shall receive the number of the calling party as well as the forwarding user. In the case of multiple forwarding the answering party shall receive indication of the calling party, the first forwarding party, and the last forwarding party. In the case one or more of the mentioned parties have CLIR active, its number shall be replaced by an indication that the number is not available.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. Calling Line Identification Restriction (CLIR)

Calling party: When the CLIR is applicable and activated, the calling line identification shall not be presented to the forwarded-to user, unless the forwarded-to user has an override category.

6.5.3. Connected Line Identification Presentation (COLP)

If the calling party has COLP activated, it shall receive the line identity of the forwarded-to user associated with the CFNR notification.

6.5.4. Connected Line Identification Restriction (COLR)

No number shall be presented to the calling party unless this party has an override category. The latter is a national option.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

Calling party/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: CFNR can only be activated if CUG restrictions between the served user and the forwarded-to user are met.

6.6.2. Outgoing Call Barring (OCB)

When CFNR has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the version of OCB that has been activated, i.e. in this case there exists no interaction between the two services.

After OCB has been activated, registration of CFNR can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.7. Completion of Calls to Busy Subscribers (CCBS)

a) CFNR activated by B before A requests CCBS on B:
If A calls B and the call is forwarded on no reply to C and C is busy, any request by A for CCBS shall be rejected with user A being given a short term denial as the reason.

b) CFNR activated by B after A requests CCBS on B:
If user B activates CFNR after user A has requested CCBS on B, then the CCBS recall shall be connected to the forwarded-to party C, if it meets no reply conditions at B.

c) CCBS activated by B:
If user B activates CCBS and either has already activated or subsequently activates CFNR, then the CCBS recall shall be given to B at his original location.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

Calling party: If a conference controller attempts to establish a conference call and calls a user with CFNR active, the forwarded-to user shall be alerted and can be added to the conference.

Forwarded-to user: A forwarded-to user can establish a conference using an existing forwarded call, as a network option.

A call that has been forwarded to the conference controller can be added to an existing conference.

6.8.2. Meet-Me Conference (MMC)

No impact.

6.9. Direct Dialling In (DDI)

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

The invocation of CFU takes precedence over CFNR.

6.10.2. Call Forwarding Busy (CFB)

No impact.

6.10.3. Call Forwarding No Reply (CFNR)

Not applicable.

6.10.4. Call Deflection (CD)

No impact.

6.10.5. Call Forwarding Unconditional to a Service Centre (CFU-S)

No impact.

6.10.6. Call Forwarding Busy to a Service Centre (CFB-S)

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

CFNR-S shall have precedence over CFNR.

6.11. **Freephone (FPH)**

The forwarding shall be charged to the FPH customer.

It shall be a network operator option to provide for one of the following situations:

1) FPH calls arriving at a termination shall not be subject to CFNR in operation at that termination. Such calls shall continue to be offered at that termination, i.e. the service is not available to FPH customers except under control of the service centre.

2) FPH calls arriving at a termination shall be subject to CFNR in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFNR shall also apply to FPH calls.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

Forwarded-to user: MCID may be invoked for single and multiple forwarded calls. In this case, the numbers of the original calling and the last forwarding users are registered.

6.14. **Multiple Subscriber Numbers (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

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

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

Calls originated by a user with CFNR activated:

Since CFNR does no affect the served user's ability to make outgoing calls, a user with CFNR activated can send and receive UUI in association with an ongoing call or at the setup of a new call.

Calls incoming to a user with CFNR activated:

- Before forwarding: No impact for service 1. In service 2 UUI is transferred to the original called user.
- During forwarding: In service 2 UUI is not guaranteed to be transferred to the forwarded-to user before CFNR is completed.
- After forwarding: The same as for CFU.

7. **COMMERCIAL CONSIDERATIONS**

7.1. **Customer Segment**

Residential and business customers.

7.2. **CHARGING**

The served user shall be charged for the forwarded leg of the call.

Annex 10.4

CALL DEFLECTION (CD)

Operational Requirements

1. DEFINITION

The Call Deflection (CD) supplementary service allows the served user to respond to an incoming call offered by the network by requesting redirection of that call to another address specified in the response.

This redirection is only allowed before the called user has answered the call.

2. DESCRIPTION

2.1. General Description

The deflecting functions are implemented in the network and they are invoked by the terminal on a call by call basis.

The maximum number of diversions to a single call is five. When counting the number of diversions, all types of diversions should be included.

2.2. Denomination of Users

The served user is the called party.

2.3. Specific Terminology

Calling party:	The user who is originating a call to the served user. The calling party may also be called the A subscriber.
Deflected-to user:	The user to whom the call shall be deflected. The deflected-to user may also be called the C subscriber.
DTN:	The Diverted To Number. The number of the deflected-to user. The number may also be called the C number.
Served user:	The user of a particular ISDN number who is requesting that calls to his number be deflected. This user may also be referred to as the deflecting user or the called user. The served user may also be called the B subscriber.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

The user can adapt the service by programming terminals according to his specific needs.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

This service is provided after pre arrangement with the network operator. Provision is made on a per ISDN number basis, independently of the basic services subscribed to by the user.

Subscription Options	Value
Calling party receives notification that the call has been deflected	- No - Yes
Served user releases the number to the deflected-to user	- No - Yes

The service will be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

The network offers incoming calls to the served user's installation according to the normal procedures.

Verification of the deflected-to number is inherent in the basic call.

Terminals which are compatible with the incoming call can then respond normally to the incoming call offer or, if activated, by invoking the Call Deflection service with an appropriate message. This appropriate message will contain the call deflecting request and the deflected-to address.

This invocation can be either an automatic response from the terminal to the offered call or may be the result of an action by the terminal's user while the call is awaiting answer.

If the user has subscribed to the service, the network performs the call deflecting towards the indicated address and clears the call to the served user with a positive acknowledgement.

As a subscription option, the deflected-to user will receive an indication that the call has been deflected.

According to the subscription option selected, the calling party could receive notification of call deflecting.

If CD is invoked by an action of the called terminal's user, the ringing tone at the calling side should continue.

When multiple deflecting occurs the reason for deflection given to the deflected-to user should relate to the last deflecting user in the chain.

3.1.5. *Interrogation*

Interrogation of the provision of the service shall be possible.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 66 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 66 #

3.3.6. *Interrogation*

*# 66 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

Automatic Terminal Invocation

If the network cannot accept the call deflection request from the terminal or from the called number, it shall release this terminal by sending a negative acknowledgement with cause identification to the called user. Examples of the reasons for rejection are:

- Service not subscribed to
- Basic service to which relevance is requested is not subscribed to
- Service not available for administrative reasons
- Terminal/user not allowed service access
- Use of an operator access prefix
- Insufficient information
- Deflected-to number is a special number (e.g. police)
- Deflected-to number is served user's number
- Deflected-to number is not in use
- Supplementary service incompatibility

Manual Invocation

If the network cannot accept the call deflection request from the called user, it shall send a negative acknowledgement with cause identification to the called user. Normal call handling procedure will then apply. Examples of the reasons for rejection are:

- Service not subscribed to
- Use of an operator access prefix
- Insufficient information
- Deflected-to number is a special number (e.g. police)
- Deflected-to number is served user's number
- Incoming call has been answered by another terminal (See note)
- The call has already been diverted
- Supplementary service incompatibility

Note: In a point-to-multipoint configuration, the network shall only accept a call deflection request if it receives no positive response message (alerting, connect) to the incoming call from other terminals.

5. INTERWORKING AND INTERCOMMUNICATION

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

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

In case of interworking, appropriate tones and/or announcements should be provided.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICE IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

Served user: No information will be given.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

When a call is deflected and the deflecting user is charged for the deflected part of the call, the charging information is not transferred to the deflecting user.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

When a call is deflected and the deflecting user is charged for the deflected part of the call, the charging information may be transferred to the deflecting user when the call is cleared.

6.2. Call Waiting (CW)

Calling party: No impact.[1])

Served user: CD can be invoked in response to a waiting call offering.

Deflected-to user: A deflected call can invoke CW.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

A deflected-to user with CLIP active shall receive the calling party's number as well as the served user's number.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

In the case of multiple forwarding the answering party shall receive indication of the calling party, the first forwarding party and the last forwarding party. In the case one or more of the mentioned parties have CLIR active, its number shall be replaced by an indication that the number is not available.

6.5.2. Calling Line Identification Restriction (CLIR)

Calling party: When CLIR is activated, no number identification must be presented to the served user or the deflected-to user unless they have an override category.

6.5.3. Connected Line Identification Presentation (COLP)

If the calling party has COLP activated, it shall receive the connected line identity of the deflected-to user associated with Call Deflection notification.

6.5.4. Connected Line Identification Restriction (COLR)

If the deflected-to user has COLR activated, the calling party shall be informed that the connected line information is not available. If the calling party has an override category, it shall receive the number.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end.

Calling party/deflected-to user: When a call is deflected, a new check of the CUG restrictions is performed at the deflected-to destination. The CUG information sent to the deflected-to destination is the same CUG information that was sent from the originating network.

Served user: Call Deflection can only be invoked, if CUG restrictions between the served user and the deflected-to user are met.

6.6.2. Outgoing Call Barring (OCB)

After OCB has been activated, invocation of CD can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.7. Completion of Calls to Busy Subscribers (CCBS)

Calling party (A): If a call to the served user (B) is deflected to a user C by CD and C is met busy, then a CCBS request by A shall be rejected. A shall then be informed that the CCBS request has been rejected with short term denial as the reason.

Served user (B): If B invokes CCBS in association with an outgoing call and has Call Deflection activated, the CCBS recall will be given to user B at his original location. However, user B would not be allowed to deflect this recall.

6.8. *Conference Services*

6.8.1. **Conference Call, Add-on (CONF)**

Calling party: If a conference controller attempts to establish a conference call and calls a user with CD active, and the appropriate deflection conditions are met, the deflected-to user will be alerted and can be added to the conference.

Deflected-to user: A deflected-to user can establish a conference using an existing call, as a network option.

A call that has been deflected to the conference controller can be added to an existing conference.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

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

CFU takes precedence over CD.

6.10.2. **Call Forwarding Busy (CFB)**

In case of Network Determined Use Busy (NDUB) the incoming call is not offered to the served user and CFB takes precedence over CD.

If a NDUB condition is not met, the incoming call is offered to the served user and invocation of either CFB or CD depends of the user's response.

6.10.3. **Call Forwarding No Reply (CFNR)**

The incoming call is offered to the served user and invocation of either CD or CFNR depends on the user's response.

6.10.4. **Call Deflection (CD)**

Not applicable.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. Call Forwarding No Reply to a Service Centre (CFNR-S)

No impact.

6.11. Freephone (FPH)

The deflected call will be charged to the FPH customer.

It shall be an network operator option to provide for one of the following situations:

1) FPH calls arriving at a termination will not be subject to CD in operation at that termination, i.e. the service is not available to FPH customers except under control of the service center.

2) FPH calls arriving at a termination will be subject to CD in operation at that termination. Such calls will be deflected in the normal manner, i.e. CD will also apply to FPH calls.

6.12. Line Hunting (LH)

No impact.

6.13. Malicious Call Identification (MCID)

Deflected-to user: MCID may be invoked for single and multiple forwarded/deflected calls. In this case, the numbers of the original calling and the last forwarding/deflecting users are registered.

6.14. Multiple Subscriber Numbers (MSN)

No impact.

6.15. Private Numbering Plan (PNP)

No impact.

A user who subscribes to PNP may use the PNP number to identify the deflected-to user, when activating the service.

PNP calls which undergo deflection to a PNP group member of the same PNP group will use the PNP number for identification of the calling user, deflecting user, and deflected-to user. Notification for calls deflected between PNPs will use E.164 numbers.

6.16. Priority (PRI)

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

Served user: The sub-address associated with the original called party is delivered to this called party and should not be deflected if the call is deflected.

Deflected-to user: Sub-address can be part of the deflected-to address (if registered in the served user's installation in association with the deflected-to number).

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

Residential and business customers.

7.2. **Charging**

The calling party is charged for his call to the original called user and the called user is charged for the deflected part of the call.

Annex 10.5

CALL FORWARDING UNCONDITIONAL TO A SERVICE CENTRE (CFU-S)

Operational Requirements

1. DEFINITION

The Call Forwarding Unconditional to a Service Centre (CFU-S) supplementary service provides the user with the possibility of having all incoming calls forwarded to a service centre. During the registration phase the service centre has to accept the request from the user.

2. DESCRIPTION

2.1. General Description

This supplementary service involves three parties:
- the served user characterised by an address for incoming calls,
- the network operator, and
- the service provider, i.e. the provider of the service centre.

When the service is registered and activated by the served user all incoming calls to the served user's address shall be forwarded to the service centre by the network.

The served user's address shall be provided to the service centre on delivery of the forwarded calls.

The served user's outgoing calls shall be independent of the CFU-S supplementary service.

The handling of the forwarded calls in the service centre is outside the scope of this recommendation.

2.2. Denomination of Users

This supplementary service is used by the served user for incoming calls.

2.3. Specific Terminology

Calling party:	The party generating the forwarded call to the served user.
Network operator:	The provider of the network providing the CFU-S service.

Served user:	The customer using the service to have incoming calls forwarded to a service centre.
Service centre number:	The address for the calls forwarded to the service centre.
Service provider:	The provider of the service centre.
Served user:	The customer using the service to have incoming calls forwarded to a service centre.

2.4. Applicability to Telecommunication Services

The CFU-S supplementary service is mainly relevant for the telephony services and other voice services. It is, however, relevant to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Considering the need for the service providers to be able to provide the service centre services without the need to involve the network operator every time a customer requests the service from a service centre, CFU-S shall be generally provided to all users connected to the network.

Withdrawal shall be possible on served user's request or for network operator reasons.

3.1.2. *Registration and Erasure*

At the served user's registration of the service, a connection shall be established to the wanted service centre that has to accept the registration, before the registration is effective.

Depending on the user procedure the service may be activated automatically at the registration.

Erasure of the service may be made by the served user or by the service centre. The other party involved, the served user or the service centre, shall be informed accordingly by an appropriate indication.

3.1.3. *Activation and Deactivation*

Activation shall be possible by a separate user procedure.

The first activation may happen automatically at the registration depending on the registration procedure used.

Deactivation shall be possible by a user procedure.

Deactivation shall happen automatically at erasure of the service.

3.1.4. *Invocation and Operation*

Invocation shall be automatical for all incoming calls in periods where the service is active.

All forwarded calls are to be delivered to the service centre with an indication of the forwarding number and the number of the calling party, if available.

3.1.5. *Interrogation*

The served user shall, at any time, be able to interrogate the state of the service.

When the service is registered, the involved service centre shall, at any time, be able to interrogate the state of the service.

At data check performed by the served user when the service is registered, a connection to the service centre shall be switched through the network.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

A service centre shall be able to register the service on behalf of the served user. Such a registration shall include an online accept from the served user by a user procedure.

The service provider shall, at any time, be able to erase the service.

3.2.3. *Activation and Deactivation*

The service provider shall, after duly controlled request from the served user, be able to activate and deactivate the service on behalf of the served user.

3.2.4. *Invocation and Operation*

None identified.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

The service code 23 has been allocated for this service.

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* 23 * SCN #

Note: SCN = Service Centre Number.

3.3.1.2. Registration without Activation

* 23 * SCN * 0 #

3.3.2. *Erasure*

23 * 1

3.3.3. *Activation*

* 23 #

3.3.4. *Deactivation*

23

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 23 #

3.3.6.2. Data Check

*# 23 * SCN #

3.3.7 *Acceptance of Procedures made by the Service Centre*

Acceptance by the served user of procedures made by the service centre is given by a switching order.

The switching order 9 is used.

(R) 9

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

After a number of consecutive forwarded calls not answered by the service centre, the served user shall be informed accordingly by an appropriate indication.

5. INTERWORKING AND INTERCOMMUNICATION

Incoming calls to the served user shall be forwarded independent of the fact that the call origins from another network, e.g. PSTN.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

At registration of the service, the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the scope of the AOC-S network supplementary service.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

After the release of a call forwarded to the service centre, the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the scope of the AOC-E network supplementary service.

6.2. Call Waiting (CW)

No impact. [1])

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

Calling party: If the calling party has the CLIR service active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user shall be informed accordingly at the registration of the service.

6.5.3. Connected Line Identification Presentation (COLP)

The calling party shall receive the number of the served user, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact. It shall be possible for a service centre to be member of a CUG.

6.6.2. Outgoing Call Barring (OCB)

No impact.

6.7. Completion of Calls to Busy Subscriber (CCBS)

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFU-S.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

CFU-S shall have precedence over CFU.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Not applicable.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

Calls to the GDN shall be forwarded to the service centre.

Calls to hunting numbers shall not be forwarded.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

Only calls to numbers with CFU-S active shall be forwarded.

6.15. **Private Numbering Plan (PNP)**

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

The service is for all groups of customers.

7.2. Charging

Charging shall be possible for the following items:

1. Per event: Registration, erasure, activation, deactivation, and forwarding of a call.
2. Per call: Time of the forwarded call.
3. Charging for the call from the calling party to the served user is independent of the service.
4. Charging for the service centre service is outside the telecommunication service.

Annex 10.6

CALL FORWARDING BUSY TO A SERVICE CENTRE (CFB-S)

Operational Requirements

1. DEFINITION

The Call Forwarding Busy to a Service Centre (CFB-S) supplementary service provides the user with the possibility of having incoming calls meeting busy forwarded to a service centre. During the registration phase the service centre has to accept the request from the user.

2. DESCRIPTION

2.1. General Description

This supplementary service involves three parties:
- the served user characterised by an address for incoming calls,
- the network operator, and
- the service provider, i.e. the provider of the service centre.

When the service is registered and activated by the served user, incoming calls to the served user's address meeting busy are forwarded to the service centre by the network.

The served user's address shall be provided to the service centre on delivery of the forwarded calls.

The served user's outgoing calls shall be independent of the CFB-S supplementary service.

The handling of the forwarded calls in the service centre is outside the scope of this recommendation.

2.2. Denomination of Users

This supplementary service is used by the served user for incoming calls.

2.3. Specific Terminology

Calling party:	The party generating the forwarded call to the served user of the service.
Network operator:	The provider of the network providing the CFB-S service.

Served user:	The customer using the service to have incoming calls meeting busy forwarded to a service centre.
Service centre number:	The address for the calls forwarded to the service centre.
Service provider:	The provider of the service centre.

2.4. Applicability to Telecommunication Services

The CFB-S supplementary service is mainly relevant for the telephony services and other voice services. It is, however, relevant to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Considering the need for the service providers to be able to provide the service centre services without the need to involve the network operator every time a customer requests the service from a service centre, CFB-S shall be generally provided to all users connected to the network.

Withdrawal shall be possible on served user's request or for network operator reasons.

3.1.2. *Registration and Erasure*

At the served user's registration of the service, a connection shall be established to the wanted service centre that has to accept the registration, before the registration is effective.

Depending on the user procedure the service may be activated automatically at the registration.

Erasure of the service may be done by the served user or by the service centre. The other party involved, the served user or the service centre, shall be informed accordingly by an appropriate indication.

3.1.3. *Activation and Deactivation*

Activation shall be possible by a separate user procedure.

The first activation may happen automatically at the registration depending on the registration procedure used.

Deactivation shall be possible by a user procedure.

Deactivation shall happen automatically at erasure of the service.

3.1.4. *Invocation and Operation*

Invocation shall be automatical for incoming calls meeting busy in periods where the service is active.

All forwarded calls are to be delivered to the service centre with an indication of the forwarding number and the number of the calling party, if available.

3.1.5. *Interrogation*

The served user shall, at any time, be able to interrogate the state of the service.

When the service is registered, the involved service centre shall, at any time, be able to interrogate the state of the service.

At data check performed by the served user when the service is registered, a connection to the service centre shall be switched through the network.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

A service centre shall be able to register the service on behalf of the served user. Such a registration shall include an online accept from the served user by a user procedure.

The service provider shall, at any time, be able to erase the service.

3.2.3. *Activation and Deactivation*

The service provider shall, after duly controlled request from the served user, be able to activate and deactivate the service on behalf of the served user.

3.2.4. *Invocation and Operation*

None identified.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

3.3.1. *Registration*

3.3.1.1. Registration with activation

* SC * SCN #

Note: SCN = Service Centre Number.

3.3.1.2. Registration without activation

* SC * SCN * 0 #

3.3.2. *Erasure*

SC * 1

3.3.3. *Activation*

* SC #

3.3.4. *Deactivation*

SC

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# SC #

3.3.6.2. Data Check

*# SC * SCN #

3.3.7. *Acceptance of Procedures done by the Service Centre*

Acceptance by the served user of procedures made by the service centre is given by a switching order.

The switching order 9 is used.

(R) 9

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

After a number of consecutive forwarded calls not answered by the service centre, the served user shall be informed accordingly by an appropriate indication.

5. INTERWORKING AND INTERCOMMUNICATION

Incoming calls to the served user shall be forwarded independent of the fact that the call origins from another network e.g. PSTN.

In cases where the forwarding number cannot be given to the service centre, it shall be informed of the reason why.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

At registration of the service, the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the scope of the AOC-S network supplementary service.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

After the release of a call forwarded to the service centre, the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the scope of the AOC-E network supplementary service.

6.2. Call Waiting (CW)

CFB-S shall have precedence over CW.

6.3. Call Hold (HOLD)

No impact. [1])

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

Calling party: If the calling party has the CLIR service active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user shall be informed accordingly at the registration of the service.

6.5.3. **Connected Line Identification Presentation (COLP)**

The calling party shall receive the number of the served user of the service, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact. It shall be possible for a service centre to be member of a CUG.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFB-S.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

CFB-S shall have precedence over CFB.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Not applicable.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

Calls to the GDN shall be forwarded to the service centre.

Calls to hunting numbers shall not be forwarded.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

Only calls to numbers with CFB-S active shall be forwarded.

6.15. **Private Numbering Plan (PNP)**

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

The service is for all groups of customers.

7.2. Charging

Charging shall be possible for the following items:

1. Per event: Registration, erasure, activation, deactivation, and forwarding of a call.
2. Per call: The time of the forwarded call.
3. Charging for the call from the calling party to the served user is independent of the service.
4. Charging for the service centre service is outside the telecommunication service.

Annex 10.7

CALL FORWARDING NO REPLY TO A SERVICE CENTRE (CFNR-S)

Operational Requirements

1. DEFINITION

The Call Forwarding No Reply to a Service Centre (CFNR-S) supplementary service provides the user with the possibility of having not replied incoming calls forwarded to a service centre. During the registration phase the service centre has to accept the request from the user.

2. DESCRIPTION

2.1. General Description

This supplementary service involves three parties:
- the served user characterised by an address for incoming calls,
- the network operator, and
- the service provider, i.e. the provider of the service centre.

When the service is registered and activated by the served user, not replied incoming calls to the served user's address shall be forwarded to the service centre by the network.

The served user's address shall be provided to the service centre on delivery of the forwarded calls.

The served user's outgoing calls shall be independent of the CFNR-S supplementary service.

The handling of the forwarded calls in the service centre is outside the scope of this recommendation.

2.2. Denomination of Users

This supplementary service is used by the served user for incoming calls.

2.3. Specific Terminology

Calling party:	The party generating the forwarded call to the served user of the service.
Network operator:	The provider of the network providing the CFNR-S service.

Served user:	The customer using the service to have not replied incoming calls forwarded to a service centre.
Service centre number:	The address for the calls forwarded to the service centre.
Service provider:	The provider of the service centre.

2.4. Applicability to Telecommunication Services

The CFNR-S supplementary service is mainly relevant for the telephony services and other voice services. It is, however, relevant to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Considering the need for the service providers to be able to provide the service centre services without the need to involve the network operator every time a customer requests the service from a service centre, CFNR-S shall be generally provided to all users connected to the network.

Withdrawal shall be possible on served user's request or for network operator reasons.

3.1.2. *Registration and Erasure*

At the served user's registration of the service, a connection shall be established to the wanted service centre that has to accept the registration, before the registration is effective.

Depending on the user procedure the service may be activated automatically at the registration.

Erasure of the service may be made by the served user or by the service centre. The other party involved, the served user or the service centre, shall be informed accordingly by an appropriate indication.

3.1.3. *Activation and Deactivation*

Activation shall be possible by a separate user procedure.

The first activation may happen automatically at the registration depending on the registration procedure used.

Deactivation shall be possible by a user procedure.

Deactivation shall happen automatically at erasure of the service.

3.1.4. *Invocation and Operation*

Invocation shall be automatical for not replied incoming calls in periods where the service is active.

All forwarded calls are to be delivered to the service centre with an indication of the forwarding number and the number of the calling party, if available.

3.1.5. *Interrogation*

The served user shall, at any time, be able to interrogate the state of the service.

When the service is registered, the involved service centre shall, at any time, be able to interrogate the state of the service.

At data check performed by the user, when the service is registered, a connection to the service centre shall be switched through the network.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

A service centre shall be able to register the service on behalf of the served user. Such a registration shall include an online accept from the served user by a user procedure.

The service provider shall, at any time, be able to erase the service.

3.2.3. *Activation and Deactivation*

The service provider shall, after duly controlled request from the served user, be able to activate and deactivate the service on behalf of the served user.

3.2.4. *Invocation and Operation*

None identified.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

3.3.1. *Registration*

3.3.1.1. Registration with Activation

* SC * SCN #

Note: SCN = Service Centre Number.

3.3.1.2. Registration without Activation

* SC * SCN * 0 #

3.3.2. *Erasure*

SC * 1

3.3.3. *Activation*

* SC #

3.3.4. *Deactivation*

SC

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# SC #

3.3.6.2. Data Check

*# SC * SCN #

3.3.7. *Acceptance of Procedures made by the Service Centre*

Acceptance by the user of procedures made by the service centre is given by a switching order.

The switching order 9 is used.

(R) 9

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

After a number of consecutive forwarded calls not answered by the service centre, the served user shall be informed accordingly by an appropriate indication.

5. INTERWORKING AND INTERCOMMUNICATION

Incoming calls to the served user shall be forwarded independent of the fact that the call origins from another network, e.g. PSTN.

In cases where the forwarding number cannot be given to the service centre, it shall be informed of the reason why.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

At registration of the service the served user shall be given information about the telecommunication charges for the service. The service centre charges are outside the scope of the AOC-S network supplementary service.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

Not applicable. The served user is referred to use the AOC-E supplementary service.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

After the release of a call forwarded to the service centre, the telecommunication charges for the forwarded part of the call shall be given to the served user in an appropriate indication. The service centre charges are outside the scope of the AOC-E network supplementary service.

6.2. Call Waiting (CW)

No impact. [1])

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

Calling party: If the calling party has the CLIR service active, the calling party's number may not be given to neither the served user nor the service centre.

Served user: The number of the served user shall be given to the service centre independent of the fact that the served user has CLIR active. The served user shall be informed accordingly at the registration of the service.

6.5.3. **Connected Line Identification Presentation (COLP)**

The calling party shall receive the number of the served user of the service, if available.

As a network option, the number of the service centre may be given to the calling party together with the number of the served user. The indication of the service centre number together with the served user's number depends on an agreement between the served user and the service centre.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact. It shall be possible for a service centre to be member of a CUG.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

Incoming calls: Not applicable.

Outgoing calls: CCBS shall have precedence over CFNR-S.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

CFNR-S shall have precedence over CFNR.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Not applicable.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

Only calls to numbers with CFNR-S active shall be forwarded.

6.15. **Remote Control of Supplementary Services (RCSS)**

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

The service is for all groups of customers.

7.2. Charging

Charging shall be possible for the following items:

1. Per event: Registration, erasure, activation, deactivation, and forwarding of a call.
2. Per call: The time of the forwarded call.
3. Charging for the call from the calling party to the served user is independent of the service.
4. Charging for the service centre service is outside the telecommunication service.

Annex 11

FREEPHONE (FPH)

Operational Requirements

1. DEFINITION

The Freephone (FPH) supplementary service allows the served user to be reached from all or part of the country with a freephone number and to be charged for this type of calls. The served user may have more installations.

2. DESCRIPTION

2.1. General Description

FPH allows the served user who wants to receive calls at his expense, free of network charges to the callers (see note 1), to be allocated a freephone number. Calls to the freephone number shall be routed to the subscriber.

Service subscription may include a number of additional facilities customising the service to specific subscriber needs.

In particular, the served user may have incoming calls routed to his installation(s) or rejected according to a set of features, e.g.:

- Calling user's originating area
- Time of day/day/date
- Call distribution.

A network operator may offer several optional features;

- Type of service request (based on the bearer capability)
- Calling line identity
- Personal identification of the calling user.

As a subscription facility, the served user can access the network to modify the call handling profile, with some restrictions however.

Access for control/interrogation will require an authorisation procedure. Possible mechanisms may include the identification of the authorised installation/terminal and passwords.

Since freephone numbers are part of the national numbering scheme, user wanting to receive FPH calls from one or more foreign countries shall have a freephone number in every actual country.

Two methods of service provision are envisaged for provision of an international freephone service.

Method 1
The served user contracts with the operator of the network where the freephone calls shall terminate. The service is provided on the basis of a bilateral arrangement between the originating and terminating network operator.

Method 2
The served user contracts with the operator of the network where the freephone calls are originated. The operator of the originating network is responsible for routing the call to an ordinary ISDN number and for the call logging and subsequent billing of the served user.

With this method the served user may require access to a service centre in the originating network in order to modify his call handling profile.

As a network operator option, the served user may ask the network to provide reports containing statistical information on the freephone traffic to his installations.

As a network operator and customer option, the served user may obtain statistical information on freephone incoming calls which may include itemised billing from the network.

The information to be provided may be one or a combination of the following:

- calling party's number
- routing area
- destination installation
- time and date
- duration
- charge
- call result (connected, busy, barred, not answered).

Note 1: Initially, a certain number of charging units may be applied by some network operators to the calling party.

Note 2: For some destination countries the method 2 implementation may be subject to legal/regulatory constraints.

2.2. Denomination of Users

This service is a service for the called party.

2.3. Specific Terminology

Alternative Destination:
The alternative destination to which calls are rerouted may be:
1) a customer installation,
2) a predefined recorded announcement provided by the network, or
3) a customised recorded announcement provided by the network.

Call Distribution:
This facility allows the served user to specify within a given routing area the proportion of freephone calls (traffic windows) that shall be routed to each of his installations. Other

criteria may apply to the distribution of calls to each installation.

Call Gaping:
Network facility to restrict the number of freephone calls to a served user to prevent congestion of the network.

Call Limiter:
Specifies the maximum number of simultaneous calls to a served user's installation. This limiter may be set by the network operator in order to detect mass calling. A situation in which further freephone calls cannot presumably be completed due to a traffic peak to a given destination. This limiter may also be set by the served user to a lower limit than set by the network operator in order that further calls which the served user's installation is not able to handle can be routed to an alternative destination.

Call Queuing:
The possibility for a served user to have freephone calls meeting busy at the scheduled destination placed in a queue and connected as soon as free condition is detected. As a network operator option, the calling party may be given an indication that its freephone call is in a queue.
Queuing mechanisms may be employed by any network. The management of such mechanisms is purely a network operator matter and is outside the scope of this recommendation.

Call Rerouting:
The possibility for a served user to have freephone calls meeting busy or no positive response at the scheduled destination routed to an alternative destination.

Catchment Area:
The area from which the served user has agreed to receive freephone calls. Freephone calls originated outside the catchment area are rejected.

Freephone Call:
A call made to the freephone number.

Freephone Number:
The freephone number consists of the service prefix followed by digits assigned by the network operator to a served user at subscription. They have to be dialled after the service access code by the user, when making a freephone call.

Non-running Record:
A record containing instructions for freephone call handling not in operation.
The served user may control which record is running or not running.

Origin-Dependent Routing:
This facility allows the served user to specify the destination installation(s) according to the routing area from which the call was originated.

Queue Length:
Specifies the maximum number of freephone calls that can be placed in a queue. The queue length may be time-dependent. The maximum length shall be agreed between the served user and the contracting network operator.

Routing Area:
The area from which calls using a given freephone number are routed to one destination or

to a set of destinations according to other requirements. A routing area may coincide or may be a apart of the catchment area.

Running Record:
A record containing instructions for freephone call handling actually in operation.

Served User:
The customer who has subscribed to the freephone service. The served user may have several installations (each corresponding to an ISDN number) reachable through one freephone number.

Service Access Code:
Digits assigned by a network operator to the freephone service. They have to be dialled by the calling customer, when making a freephone call.

Time-Dependent Control:
The facility allows the served user to specify criteria (such as time of day, day of the week, specific dates) for time-dependent catchment area, routing areas, traffic windows, routings, etc.

Time Window:
The time interval in which freephone calls are to be routed to a given installation. Outside the time window freephone calls are barred or routed to a different destination.

Traffic Window:
The percentage of freephone calls to be routed to a given installation.

2.4. Applicability to Basic Telecommunication Services

The Freephone service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Provision of this service requires an arrangement between the network operator and the served user. Provision may also be dependent on a bilateral arrangement between network operators, when calls are to be routed outside the originating network.

Withdrawal of this service will be at the request of the served user or for administrative reasons.

3.1.2. *Registration and Erasure*

Following the arrangement between the network operator and the subscriber, the network operator provides the initial registration of the served user profile in the network.

The served user profile is made by two sets of parameters:

- Parameters under the exclusive responsibility of the network operator (e.g. the freephone

number), and

- Parameters that can be modified by both the network operator and the subscriber.

These parameters are stored in a record used by the network to handle freephone calls (running record). It is possible for the network operator and for authorised served users to register non-running records that represent alternative records, thus allowing the served user to activate any record from the range registered against his freephone number. There must be one running record for each freephone number. The maximum number of records that a served user may have stored on a freephone number is limited to N.

The served user's access to register records is subject to:

- a previous agreement with the network operator
- a check on the authorisation
- a restriction on the set of parameters
- a restriction on the range of values to be given to parameters.

Note: Complex control changes made by the served user may require special terminal equipment. The changes that should be allowed from an ISDN telephone set need to be agreed as the method of accessing the network and the control procedures used will be different depending on the method of control used by the served user.

The registration of records is also possible through network operator action.

Parameters that can be modified by registration of a new record are:

- Catchment area
- Routing areas
- Time windows
- Traffic windows
- Alternative destinations
- Queue length
- Type of call
- Call distribution
- Call rerouting
- Call limiter

Consistency of records is checked by the network at registration.

The served user can erase non-running records, either directly or through network operator action.

3.1.3. *Activation and Deactivation*

The served user can activate or deactivate a record, either directly or through network operator action.

From the calling user's point of view, the service may be active or not, depending on the routing program contained in the running record.

3.1.4. *Invocation and Operation*

The service is invoked by the calling user.

Calling User
During the call setup phase the calling user dials the FPH number consisting of the service prefix followed by the digits identifying the served user.

Calling user procedures to call a freephone subscriber in another country are the same as those used for a national freephone call.

The calling user shall receive network indications about the success or failure of the request.

Served User
Incoming calls are presented as ordinary calls but may, as an option, have an indication that they are coming via the freephone service and, as a further, option the served user may receive the called freephone number.

Network Operations
The network performs the following operations:

- Identifies the service request according to the service access code and possibly type of service request (based on a bearer capability);

- Handles the freephone call according to the running record of the served user;

- Routes the call to the appropriate destination;

- Charges the call by creating a record for billing purposes. In carrying out the routing of a FPH call, the network may utilise a number of techniques, such as call distribution, time-dependent control, or call gaping (see subclause 2.3). The management and utilisation of these mechanisms is purely a network matter and is outside the scope of this recommendation.

3.1.5. *Interrogation*

The served user shall be able interrogate the service by means of an appropriate control procedure.

The network, following a positive validation of the customer access, shall provide the required information on parameter values of the subscriber profile. This feature is possible for both the running and the non-running records.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

Not yet available.

4. USERS REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

In the case of unsuccessful outcome the calling user as well as the called party shall be informed accordingly.

5. INTERWORKING AND INTERCOMMUNICATION

When interworking between PSTN and ISDN occurs, no additional FPH requirements are necessary over and above those for the basic call.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. AOC, Charging Information at Call Setup Time (AOC-S)

Calling user: No impact.[1])

Called user: Advice of charge information shall not be sent to the called FPH user.

6.1.2. AOC, Charging Information During the Call (AOC-D)

Calling user: No impact.

Called user: Advice of charge information shall not be sent to the called FPH user.

6.1.3. AOC, Charging Information at the End of a Call (AOC-E)

Calling user: No impact.

Called user: Advice of charge information shall not be sent to the called FPH user.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

Callers to freephone numbers shall not be given the connected line identity but the Freephone number. A possible national option shall allow disclosure of the connected line identity.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact.

6.6.2. Outgoing Call Barring (OCB)

No impact.

6.7. Completion of Calls to Busy Subscriber (CCBS)

When a user activates CCBS towards a freephone number, the invocation of the service (completion of a call) shall take place in relation to the freephone number.

If this cannot be completed in an introductory phase, CCBS towards a freephone number should be rejected.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

No impact.

6.8.2. Meet-Me Conference (MMC)

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

The forwarding shall be charged to the freephone customer.

It shall be a network operator option to provide for one of the following situations:

A) Freephone calls arriving at a termination shall not be subject to CFU in operation at that termination. Such calls shall be offered at that termination in the normal manner. Redirection of freephone calls shall be achieved by rerouting by the network.

B) Freephone calls arriving at a termination shall be subject to CFU in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFU shall apply to freephone calls.

6.10.2. **Call Forwarding Busy (CFB)**

The forwarding shall be charged to the freephone customer.

It shall be a network operator option to provide for one of the following situations:

A) Call forwarding of freephone calls encountering busy shall be made with reference to the network and not according to CFB service in operation at the called termination.

B) Freephone calls arriving at a termination shall be subject to CFB in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. Call Forwarding on Busy shall also apply to freephone calls.

6.10.3. **Call Forwarding No Reply (CFNR)**

The forwarding shall be charged to the freephone customer.

It shall be a network operator option to provide for one of the following situations:

A) Freephone calls arriving at a termination shall not be subject to CFNR in operation at that termination. Such calls shall continue to be offered at that termination, i.e. the service is not available to freephone customers except under control of the network.

B) Freephone calls arriving at a termination shall be subject to CFNR in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFNR shall also apply to freephone calls.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

Not applicable.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

Mainly business customers.

7.2. Charging

Charges collected from the served user may consist of several components. Some examples are detailed below:

1) A Fixed component may include:

- An admission fee;
- A rental charge at certain intervals;
- An additional charge for subscribed service features. In particular, the use of the following service features may be charged:
  - Number of installations
  - Provision of international service
  - Ability to register, erase, activate, deactivate records
  - Ability to interrogate the service centre
  - Extension of catchment area
  - Call distribution
  - Time-dependent control
  - Handling of unsuccessful calls: queuing, rerouting
  - Provision of statistical information
  - Provision of itemised charging

2) The variable per call component may include:

- Ordinary charge for successful calls based on call duration, distance, time and day, etc.

- A network operator option, charge for unsuccessful calls due to:

  - insufficient dimensioning of user network interface and/or served user resources
  - service advertisement not in agreement with the running record (e.g. outside the catchment area)

- Additional charge for the use of specific service features. In particular, the use of the following service features may be charged:

  - Interrogation
  - Registration of a new record
  - Registration of a record
  - Call queuing
  - Call rerouting
  - Statistical information

Initially, a certain number of charging units may be applied by some network operators to the calling user.

Annex 12

LINE HUNTING (LH)

Operational Requirements

1. DEFINITION

The Line Hunting (LH) supplementary service enables incoming calls to a customer on a pertinent number to be connected to an idle B-channel in a group of interfaces.

2. DESCRIPTION

2.1. General Description

The hunting process should only be initiated, when the pertinent ISDN number is called. The pertinent number is called the General Directory Number (GDN).

One interface in the group may directly be associated with the GDN. The other individual interfaces in the hunting group may be allocated individual numbers and, when any of those individual numbers is called, the calls shall be treated in the normal way without hunting.

The customer may have the ability to reduce the number of interfaces forming the hunting group, remove single interfaces from the hunting group, inhibit the LH, or switch from one search method to another.

The following hunting methods may be provided:

- Sequential hunting, where the hunting for a free interface always starts with the same interface and then follows a fixed order.

- Random hunting, where the hunting for a free interface does not start with the same interface each time. This covers a range of hunting procedures, e.g. random starting point and then fixed order, or starting with the last seized line plus one and then fixed order.

- Uniform hunting, where the interface being free for the longest time is selected.

- Hunting on available ISDN numbers, or addresses, rather than on interfaces.

The interfaces in a LH group will normally be contained within one node. As an option the interfaces may encompass more than one node.

Outgoing calls from interfaces in a hunting group are unaffected by the LH supplementary service.

2.2. Denomination of User

LH is used by called users to ensure that incoming calls will reach an idle interface.

2.3. Specific Terminology

GDN:	General Directory Number: The number to be called for invoking LH.
Random hunting:	A range of hunting procedures, e.g. random starting point and then fixed order, or starting with the last seized line plus one and then fixed order.
Sequential hunting:	Hunting for a free interface always starting with the same interface and then following a fixed order.
Uniform hunting:	The B-channel having been free for the longest time is selected.

2.4. Applicability to Basic Telecommunication Services

This supplementary service is applicable to all circuit switched basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

LH will be provided on subscription basis.
For each subscription the following are specified:

Subscription Option	Values
Selection Method	- Sequential - Random - Uniform
Members	- List of 2 or more interfaces

Note that a LH group may be combined of basic and primary rate interfaces.

Withdrawal is done by the network operator at the subscriber's request or for administrative reasons

3.1.2. *Registration and Erasure*

Registration shall be made at the provision.

The user may have the possibility to change the hunting method and the members of the hunting group.

Erasure shall happen at withdrawal.

3.1.3. *Activation and Deactivation*

Activation and deactivation may be made by user procedures.

3.1.4. *Invocation and Operation*

An incoming call to the GDN on which LH is active will be offered to an available interface in the manner predefined at the registration.

Once an interface has been selected, normal call setup procedures apply and the LH procedure are considered as completed.

3.1.5. *Interrogation*

Interrogation of the membership of a LH group and the GDN should be possible from all interfaces in the hunting group.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 47 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 47 #

3.3.4. *Deactivation*

47

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

 # 47 (SI) #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If no idle B-channel is available, the LH is unsuccessful and a busy indication shall be returned to the calling party.

If no compatible terminal on a selected interface responds, no further LH action shall take place and the call shall be released.

If the offered call is rejected at an interface, the call shall be released with normal procedures. No further hunting shall be provided.

5. INTERWORKING AND INTERCOMMUNICATION

Calls to and from a line hunting group are to be considered as normal calls.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. AOC, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. AOC, Charging Information During the Call (AOC-D)

No impact.

6.1.3. AOC, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

CW should not be invoked at calls to the GDN.

6.3. Call Hold (HOLD)

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve HOLD in the public network.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve ECT in the public network.

6.4.2. Single Step Call Transfer (SCT)

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve SCT in the public network.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

Incoming calls: No impact.

Outgoing calls: The GDN should be given as the calling line identification furnished by the network.

An individual number allocated to an interface in the hunting group or a DDI/MSN number may be given as a complement of calling line identification, if the user gives this number in a call setup. This number will be sent to the other party complementing the GDN.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

Incoming calls: The GDN should be given.

Outgoing calls: No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

Incoming calls: When a free interface of a LH group has been found, any CUG restrictions must be met before the connection will be established.

Outgoing calls: No impact.

6.6.2. Outgoing Call Barring (OCB)

When the network interfaces forming a LH group are connected to a private network at the user, terminals connected to this private network must not be able to serve OCB in the public network. OCB in the public network may be served by the controller of the private network.

6.7. Completion of Calls to Busy Subscriber (CCBS)

Incoming calls: CCBS should relate to the GDN.

Outgoing calls: CCBS may only be activated, when the calling interface is to be identified by an individual ISDN number or a DDI number.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

Incoming calls, for conferees: No impact.

Outgoing calls: When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve CONF in the public network, as conference controller.

6.8.2. Meet-Me Conference (MMC)

No impact.

6.9. Direct Dialling In (DDI)

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

When CFU and LH are both activated on the GDN number, CFU should take priority.

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve CFU in the public network. CFU in the public network may be served by the controller of the private network.

6.10.2. Call Forwarding Busy (CFB)

If the outcome of the LH is unsuccessful CFB may be invoked.

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve CFB in the public network. CFB in the public network may be served by the controller of the private

network.

6.10.3. **Call Forwarding No Reply (CFNR)**

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve CFNR in the public network. CFNR in the public network may be served by the controller of the private network.

6.10.4. **Call Deflection (CD)**

When the network interfaces forming a hunting group are connected to a private network at the user, terminals connected to this private network must not be able to serve CD in the public network. CD in the public network may be served by the controller of the private network.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Calls to the GDN shall be forwarded to the service centre.

Calls to hunting numbers shall not be forwarded.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Calls to the GDN shall be forwarded to the service centre.

Calls to hunting numbers shall not be forwarded.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

Not applicable.

6.13. **Malicious Call Identification (MCID)**

Incoming calls: No impact.

Outgoing calls: The GDN number is given.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

Not applicable.

6.20. **Three-Party Service (3PTY)**

When the network interfaces forming a LH group are connected to a private network at the user, terminals connected to this private network must not be able to serve 3PTY in the public network. 3PTY in the public network may be served by the operator in the private network.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

Multiline customers with or without a private network.

7.2. Charging

Served user: LH may be charged on a subscription basis.

Calling party: Normal charging shall apply.

7.3. Quality of Service

LH must not reduce the quality of the used telecommunication service.

Annex 13

MALICIOUS CALL IDENTIFICATION (MCID)

Operational Requirements

1. DEFINITION

The Malicious Call Identification (MCID) supplementary service enables a user to request that the source of an incoming call is identified and registered in the network.

2. DESCRIPTION

2.1. General Description

The MCID supplementary service gives the possibility to obtain, by an appropriate request, the storage and registration of the following items:

- called party's number
- calling party's number
- time and date of the request
- optionally: calling party's sub-address (if provided by the calling user).

For national calls the location of the storage and registration functions is a matter of implementation. For international calls, storage and registration may be performed in both networks.

This supplementary service can either be invoked during or after the active phase of the call, but before the called party has cleared.

Optionally, the supplementary service will be automatically invoked by the network on calls that are not answered.

As a national option, the called party's request may invoke, besides the above storage and registration, the holding of the connection until the intervention of the network operator.

2.2. Denomination of Users

Customers called by unknown parties making malicious calls.

2.3. Specific Terminology

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services which carrying speech traffic, although it may optionally be used for other circuit switched services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

This service shall be provided and withdrawn after prearrangement with the network operator.

The network may provide a subscription option which allows automatical invocation of the MCID service on unanswered calls to the served user.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

The called party can invoke the MCID supplementary service by an appropriate procedure. Such an invocation will only be successful if it is made after the call answering and before the call clearing by the called user.

If, as a national option, the service may be invoked automatically on unanswered calls. The network shall store and register information on all or certain calls that are not answered.

Restrictions must be applied to automatical invocation in order to avoid excessive registration of call information on unanswered calls. Such restrictions may consist of, e.g.:

- automatical invocation only on short unanswered calls, i.e. those which are terminated within a certain time interval after delivery;
- automatical invocation only during certain periods of the day.

If holding of the connection is not required, the clearing phase follows the normal procedure or, as a national option:

1) The called party disconnects first: Normal clearing applies.

2) The calling party disconnects first:

   a) The service has been invoked: Normal clearing applies.

b) The service has not been invoked: A timeout is started:

- If the time-out expires before the called party clears, the connection is released according to normal procedures;

- If the time-out expires in the absence of clearing by the called party then, as a national option, the network may or may not invoke the supplementary service releasing after the connection in both cases;

- If the time-out expires before the supplementary service is invoked, the connection will be released after the storage and registration of the data (calling and called numbers, date and time).

If holding of the connection may be required, the network acts as follows:

1) The called party disconnects first:

a) The service has been invoked before the disconnection: The connection is held and it is released only by a network operator intervention.

b) The service has not been invoked: Normal clearing applies.

2) The calling party disconnects first:

a) The service has been invoked: The connection is held and is released only by a network operator intervention.

b) The service has not been invoked: A time-out is started:

- If the time-out expires before the called party clears, the connection is released according to normal procedures;

- If the time-out expires in the absence of clearing by the called party, the network may, as a national option, invoke the supplementary service and the connection is then held and cannot be released other than by the intervention of the network operator;

- If the time-out expires before the supplementary service is invoked, the above case (a) applies.

When the connection is held, the calling party interface is put into a particular condition, i.e. the call reference is maintained and the B-channel involved in the malicious call is blocked for both outgoing and incoming calls.

3.1.5. *Interrogation*

Interrogation should be possible.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 39 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 39 #

3.3.6. *Interrogation*

*# 39 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

The invocation of MCID will only be successful if it is made after call answering and before the call clearing by the called user.

If an invocation request is received from the called party either before answer or after the called party has cleared, then the network will not invoke MCID.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

When interworking between ISDN and PSTN occurs, the number of the calling customer may not be available; it may, however, be possible to register and store certain information about the routing of the call depending on the capabilities of the PSTN.

Where such interworking applies on a national call, this available information shall be stored and registered in a location appropriate for that network. For international calls, the storage and registration of available information is dependent on any agreement between the network operators.

5.2. **Interworking with Private ISDNs**

A served user (i.e. a disturbed party) on a private ISDN shall be able to send a MCID invocation request to the public ISDN in case of an incoming public to private network call.

Private ISDNs shall technically be able to support and complement the public MCID service beyond the public network boundary by identifying a malicious caller on the private ISDN on an outgoing private to public network call. This interworking case applies only when a special arrangement between the two network operators exists.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

The transferring user cannot invoke MCID on a call after transfer of that call has been invoked. If user B (or C) successfully invokes MCID after transfer has been completed, then the network shall register, in addition to the call information of the original call, the number of the transferred-to user (user C or B, respectively).

6.4.2. Single Step Call Transfer (SCT)

The transferring user cannot invoke MCID on a call after transfer of that call has been

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

invoked. If user B (or C) successfully invokes MCID after transfer has been completed, then the network shall register, in addition to the call information of the original call, the number of the transferred-to user (user C or B, respectively).

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

Even if the calling number is a secret (restricted) number, it may be available at the storage and registration location in either national or international communications, subject to agreements between network operators for non-disclosure of CLIR. In such situations where agreements apply, it is possible to identify malicious calls, even if the calling number is restricted.

6.5.3. Connected Line Identification Presentation (COLP)

No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact.

6.6.2. Outgoing Call Barring (OCB)

No impact.

6.7. Completion of Calls to Busy Subscriber (CCBS)

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

The conference controller is not allowed to invoke MCID.

For the conferees: No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

The number of the calling party, including DDI digits, is registered/stored.

6.10. ***Diversion Services***

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

MCID may also be invoked for a forwarded call. In this case, the numbers of the calling and forwarding parties are registered.

6.10.2. **Call Forwarding Busy (CFB)**

MCID may also be invoked for a forwarded call. In this case, the numbers of the calling and forwarding parties are registered.

6.10.3. **Call Forwarding No Reply (CFNR)**

MCID may also be invoked for a forwarded call. In this case, the numbers of the calling and forwarding parties are registered.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

Not applicable.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

As a network operator option: When the MCID supplementary service is invoked, the calling sub-address, if provided by the calling user, may be registered with the call information.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

The availability of this service depends on different legal considerations for each country.

7.2. Charging

The charges may consist of an admission fee and/or a rental charge based on the time the service is provided.

Annex 14

MULTIPLE SUBSCRIBER NUMBER (MSN)

Operational Requirements

1. DEFINITION

The Multiple Subscriber Number (MSN) supplementary service provides the possibility of assigning multiple ISDN numbers to a single interface. In this way, the addressing of terminals on a basic access may be achieved by applying a set of ISDN numbers to the single basic access.

2. DESCRIPTION

2.1. General Description

The MSN supplementary service allows the calling party e.g.:

1) To dial from a line connected to a public network directly to terminals connected to a basic access which has subscribed to MSN (e.g. in a passive bus configuration);

2) To indicate the terminal number to the network when originating calls, e.g. for calling purposes, for notification to the called party, or for application of supplementary services.

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

The essential difference between this supplementary service and Direct Dialling In (DDI) concerns to the length of the number sent to and processed by the user's installation. In the DDI situation the user (ISPBX) will be tailored on a per installation basis to receive the particular number of digits necessary to identify the terminals of the user (ISPBX).

With the MSN supplementary service, however, the network operator will fix the length of the number to be transmitted to the user's installation. It may comprise 1-4 last significant digits up to the full ISDN number. This number will be sent to the user's network interface.

The digit(s) significant for the terminal differentiation is (are) an integral part of the ISDN numbering scheme.

2.2. **Denomination of Users**

The served user is the called party.

2.3. **Specific Terminology**

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

This service shall be provided after prearrangement with the network operator.

The network operator shall allocate a set of ISDN numbers (not necessarily consecutive numbers).

Withdrawal of the MSN by the network operator shall be upon request by the subscriber or for network operator reasons.

The maximum number of MSN per access shall be a network option.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

The destination number sent by the calling user will be analysed in the local exchange of the called (served) user. If the called user subscribes to this supplementary service, the local exchange sends the available part of the ISDN number or at least the relating digit(s) identical to the last digit(s) of the ISDN number.

Terminals compatible to the MSN service will react on a call as follows:

- If MSN digit(s) equal to their preadjusted identity is (are) presented, they react to it in a predetermined way.
- If there is a setup message without MSN digit(s), the terminal will interpret it as a normal call.

Terminals not compatible to the MSN service will react on a call as follows:

- Whether there is (are) MSN digit(s) or not, the call will be interpreted as a normal call.

In outgoing calls, a terminal compatible to the MSN service, may insert its terminal identity within the originating address information of the setup message. The network will carry this identity unchanged. The ISDN number of the calling terminal will then be sent to the called user with the incoming call setup message.

It is possible to allocate one ISDN number to one or more terminals. Similarly, one terminal may allow the assignment of one or more than one number. Further, as a network operator option, a specific digit or sequence of digits may be allocated to enable all terminals, in a point-to-point configuration, to react in the same way as if the supplementary service MSN would not be subscribed to.

3.1.5. *Interrogation*

Not applicable.

3.2. Alternative Methods for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

An ISDN number, generated by a terminal at a MSN interface, shall be discarded by the network, unless this number is subscribed to by this interface.

Terminals not compatible with the MSN supplementary service and receiving a call request containing multiple subscriber number digit(s) shall interpret it as a basic call.

5. INTERWORKING AND INTERCOMMUNICATION

No special considerations are identified.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

In case of interaction with other supplementary services, these services could be applicable to the individual MSN rather than to the subscriber access.

6.1. *Advice of Charge Services*

6.1.1. **Advice of Charge, Charging Information at Call Setup Time (AOC-S)**

No impact.[1])

6.1.2. **Advice of Charge, Charging Information During the Call (AOC-D)**

No impact.

6.1.3. **Advice of Charge, Charging Information at the End of the Call (AOC-E)**

No impact.

6.2. **Call Waiting (CW)**

No impact.

6.3. **Call Hold (HOLD)**

No impact.

6.4. *Call Transfer Services*

6.4.1. **Explicit Call Transfer (ECT)**

No impact.

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. *Number Identification Services*

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

Different CUGs can be assigned to each MSN. The network cannot guarantee that a given CUG matches beyond the access towards the user. As the CUG assignment to the MSN is the full responsibility of the user, this may lead to restricted applicability of a combination of the CUG and MSN supplementary services.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

No impact.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

Only calls to numbers with CFU-S active shall be forwarded.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

Only calls to numbers with CFB-S active shall be forwarded.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

Only calls to numbers with CFNR-S active shall be forwarded.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

If the MSN supplementary service is provided to the served user of the MCID supplementary service, MCID invocation shall be provided either globally for the whole access or on a per MSN basis according to access arrangements.

6.14. **Multiple Subscriber Number (MSN)**

Not applicable.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers.

7.2. Charging

Supplementary service provision may be part of the general subscription accounting.

Charges may include a subscription fee and a rental charge proportional to the quantity of numbers assigned to a MSN subscriber. Call charges are a national matter.

7.3. Quality of Service

This supplementary service improves the ISDN capabilities of addressing, enabling the calling party to reach in a more concrete way a specific terminal at the called party's premises.

Annex 15

PRIVATE NUMBERING PLAN (PNP)

Operational Requirements

1. DEFINITION

The Private Numbering Plan (PNP) supplementary service allows a subscriber to define and use a PNP for communication across one or more networks between nominated users' access interfaces. A PNP provides a group of users with the capability to place calls by using digit sequences having different structures and meanings than those provided by the public numbering plan.

2. DESCRIPTION

2.1. General Description

Application of this service shall allow a customer to use PNP to establish calls between nominated user access interfaces whilst using the resources of one or more networks. For example, a business having multiple offices could have a numbering plan which would appear the same to all users regardless of their geographical location. A business can also assign Private Numbers (PN) to locations outside the business (e.g. business customers, suppliers, etc.) and allow the business users to reach these locations via the assigned PNs that are part of the PNP of the business. (The locations outside the business in this example are not considered PNP group members of the business.)

2.2. Denomination of Users

This service is used at the establishment of a call by the calling user (user A).

2.3. Specific Terminology

ISDN number:	A number conforming to the numbering plan and structure specified in the CCITT Recommendation E.164.
PN:	Private Number.
PNP call:	A PNP call is a call which is made by a PNP group member to a private number that is part of the PNP of the same group.
PNP group:	A PNP group consists of the set of users who use the same PNP to make and receive PNP calls.

PNP group member:	A PNP group member is a user who can make and receive PNP calls within a PNP group.
Virtual PNP group member:	A virtual PNP group member is a user to whom a PNP group member can make PNP calls, but who cannot make PNP calls within that PNP group.
PNP Group identification (PNG):	A PNP Group identification (PNG) is a piece of information which is used to distinguish between the different PNP groups.

2.4. Applicability to Telecommunication Services

The PNP supplementary service is applicable to all telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

3.1.1.1. Provision

The PNP supplementary service is subscribed to by arrangement with the network operator.

3.1.1.2. Withdrawal

Withdrawal of the PNP supplementary service is made by the network operator upon request by the customer or for network operator reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

The network operator may provide the capability to register and change the PNP from the user terminal equipment.

3.1.2.2. Erasure

Not applicable.

3.1.3. *Activation and Deactivation*

The PNP supplementary service is activated at provision and deactivated by withdrawal under the control of the network operator.

3.1.4. *Invocation and Operation*

The calling party places a call by using the PNP.

3.1.5. *Interrogation*

The network operator may provide the capability to interrogate the PNP from the user's terminal.

3.2. Alternative Method for Users to Access the Service

Not applicable.

3.3. Stimulus Mode Procedures

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

For unsuccessful outcome due to incorrect use of the PNP, e.g. use of a number which does not have a defined network location, the calling party shall receive a recorded message or tone and/or an appropriate message in the D-channel.

5. INTERWORKING AND INTERCOMMUNICATION

A PNP supplementary service can operate over several networks.

5.1. Interworking with non-ISDNs

It is envisaged that the PNP supplementary service can be used to reach destinations on any non-ISDNs with which the ISDN interworks. When interworking with a PSTN, private numbers must be translated to and from the E.164 numbers by the PNP network operator.

5.2. Interworking with private ISDNs

Private ISDNs can contain multiple PNPs and these PNPs may also contain users which are attached to the public ISDN. Thus, the private ISDN and the public ISDN shall identify the PNP, when calls on which the PNP supplementary service was involved across the access between the public ISDN and the private ISDN.

Note that in this case, it is the private network operator who subscribes to the public network PNP supplementary service.

When interworking with a public ISDN, private numbers must be translated to and from E.164 numbers by the PNP supplementary service.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

Assume that user A has an established call with user B and wishes to transfer this call with user B to user C. The numbers presented to the users B and C after successful transfer shall be in accordance with the PNP, if all users are group members of the same PNP. Otherwise, the numbers shall be in accordance with the ISDN (E.164) numbering plan.

6.4.2. Single Step Call Transfer (SCT)

Assume that user A has an established call with user B and wishes to transfer this call with user B to user C. The numbers presented to the users B and C after successful transfer shall be in accordance with the PNP, if all users are group members of the same PNP. Otherwise, the numbers shall be in accordance with the ISDN (E.164) numbering plan.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

The calling user has a private number and can also have a public number. If no ISDN number exists, the default number of the access can be used.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

The called user has a private number and can also have a public number. If no ISDN number exists, the default number of the access can be used.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

CUG restrictions must be met for all calls established by means of PNP.

6.6.2. **Outgoing Call Barring (OCB)**

OCB may apply to both PNP numbers and ISDN E.164 numbers.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

CCBS request may be placed against a PNP number.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

Multiple PNP numbers can be assigned to an access by subscribing to the DDI supplementary service.

When a user subscribes to both DDI and PNP then DDI will deliver the PNP numbers to the called user on calls made to PNP group members of the calling user's PNP group. Instead, as a user option, the DDI may always use the ISDN number.

Calls using ISDN numbers will be presented as normal calls by the DDI supplementary service.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number may be used to identify the forwarding user. If this user can also be uniquely identified by an ISDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

PNP calls which undergo forwarding to a PNP group member of the same PNP group will use the PNP number for identification of the calling user, forwarding user, and forwarded-to user. Notification for calls forwarded between PNPs will use E.164 numbers.

If a non-PNP call is forwarded to a PNP group member of the forwarding user's PNP group, the identification of the users shall be:

- Information about the calling user to the called (forwarding) user shall be in accordance with the ISDN E.164 numbering plan;

- Information about the original call (calling party's address and original called number) shall be presented to the forwarded-to user in accordance with the ISDN E.164 numbering plan, while the information about the forwarding call (called party's number and last forwarding number) shall be presented in accordance with the PNP;

- Information to the calling user shall be in accordance with the ISDN E.164 numbering plan.

If a PNP call is forwarded to a (non-PNP) ISDN number or a virtual PNP group member, the identification of the users shall be:

- Information about the calling user to be served (forwarding) user shall be:

  a) in accordance with the PNP, if the forwarding user is a PNP group member of the calling user's PNP group, or

  b) in accordance with the ISDN E.164 numbering plan, if the forwarding user is a virtual PNP group member of the calling user's PNP group;

- Information to the forwarded-to user shall be in accordance with the ISDN (E.164) numbering plan;

- Information to the calling user shall be:

  a) in accordance with the ISDN E.164 numbering plan, when the PNP call is forwarded to a (non-PNP) ISDN number, or

  b) in accordance with the PNP, when the PNP call is forwarded to a virtual PNP group member, if a PNP number is available; otherwise, an E.164 number is used.

6.10.2. **Call Forwarding Busy (CFB)**

See subclause 6.10.1, Call Forwarding Unconditional (CFU).

6.10.3. **Call Forwarding No Reply (CFNR)**

See subclause 6.10.1, Call Forwarding Unconditional (CFU).

6.10.4. **Call Deflection (CD)**

A user who subscribes to PNP may use the PNP number to identify the deflected-to user, when activating the service.

PNP calls which undergo deflection to a PNP group member of the same PNP group will use the PNP number for identification of the calling user, deflecting user, and deflected-to user. Notification for calls deflected between PNPs will use E.164 numbers.

If a non-PNP call is deflected to a PNP group member of the deflecting user's PNP group, the identification of the users shall be:

- Information about the calling user to the called (deflecting) user shall be in accordance with the ISDN E.164 numbering plan;

- Information about the original call (calling party's address and original called number) shall be presented to the deflected-to user in accordance with the ISDN E.164 numbering plan, while the information about the deflecting call (called party's number and last deflecting number) shall be presented in accordance with the PNP,

- Information to the calling user shall be in accordance with the ISDN E.164 numbering plan.

If a PNP call is deflected to a (non-PNP) ISDN number or a virtual PNP group member, the identification of the users shall be:

- Information about the calling user to the served (deflecting) user shall be:

  a) in accordance with the PNP, if the forwarding user is a PNP group member of the calling user's PNP group, or

  b) in accordance with the ISDN E.164 numbering plan, if the deflecting user is a virtual PNP group member of the calling user's PNP group;

- Information to the deflected-to user shall be in accordance with the ISDN (E.164) numbering plan;

- Information to the calling user shall be:

  a) in accordance with the ISDN E.164 numbering plan, when the PNP call is deflected to a (non-PNP) ISDN number, or

  b) in accordance with the PNP, when the PNP call is deflected to a virtual PNP group member, if a PNP number is available; otherwise, an E.164 number is used.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

Not applicable.

6.12. **Line Hunting (LH)**

A specific private number may be used in the selection algorithm for LH.

6.13. **Malicious Call Identification (MCID)**

When a call is established using a PNP number and when MCID supplementary service is invoked against the call, the registered information includes the E.164 calling party's number.

6.14. **Multiple Subscriber Number (MSN)**

Multiple PNP numbers can be assigned to an access by subscribing to the MSN supplementary service.

When a user subscribes to both MSN and PNP then MSN shall deliver the PNP number to the called user on calls made to PNP group members of the calling user's PNP group. Instead, as a user option, MSN may always use the ISDN number.

Calls using ISDN numbers will be presented as normal calls by the MSN supplementary service.

6.15. **Private Numbering Plan (PNP)**

Not applicable.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

All customers and business customers in particular.

7.2. Charging

PNP may be charged with a rental fee.

7.3. Quality of Service

If the PNP supplementary service is provided and results in a call involving more than one network, e.g. the call involves different PSTNs or ISDNs, especially of different countries, or even different continents, a decrease in quality of service parameters may arise.

Depending on national implementations, networks may provide some precautions, e.g. limit the number of international border crossings and/or satellite hops, and therefore, the provision of the PNP supplementary service may be rejected by some networks in some cases.

Annex 16

PRIORITY
(PRI)

Operational Requirements

1. DEFINITION

The Priority (PRI) supplementary service provides preferential treatment to calls originating from and/or addressed to certain numbers in order of path selection.

2. DESCRIPTION

2.1. General Description

This service provides preferential treatment to calls:

a) originating from subscriber's lines with A-subscriber priority category as described below, i.e. A-priority and/or

b) addressed to certain emergency numbers, i.e. B-priority in order of path selection at ISDN.

For A-priority, subscriber's lines are classified into two A-priority categories which are:

1) Subscribers with first order for all calls

2) Subscribers with first order for priority (1) on a per call basis

Only one B-priority category is envisaged.

2.2. Denomination of Users

A-priority is applicable to calling users. B-priority is applicable to called emergency numbers.

Priority service is used at the establishment of the call.

2.3. Specific Terminology

None identified.

2.4. **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1. *Provision and Withdrawal*

The provision of this service requires arrangements between the subscriber and the network operator. It can also be set for administrative reasons.

The network operator can withdraw the service at the request of the subscriber or for administrative reasons.

3.1.2. *Registration and Erasure*

Priority will be given to the subscriber by the network operator, which has full control of the registration.

All changes to priority information are made by the network operator.

3.1.3. *Activation and Deactivation*

After provision of the A-priority service, the subscriber may activate and deactivate the service by using a control procedure.

B-priority will always be activated by the network operator after provision.

3.1.4. *Invocation and Operation*

When the service is provided for all calls, it will automatically be invoked by the network at call setup. For a call based on a request, it will be invoked by the user using a service code as a part of a call setup. For this service option, invocation is possible only for the calling terminal in A-priority category 2.
For calls to B-priority numbers, this service is automatically invoked by the network depending on the access dialled, i.e. calls to fire, rescue and ambulance services.

Calls originating from subscriber's lines with appropriate A-subscriber priority category will be treated as priority calls at the sending exchange as well as at transit and incoming exchanges. This means that a priority call will have a preferential access to all network resources necessary for call setup. When a priority call meets congestion in the network, the call is not released but waits for the first junction line to be free.

This supplementary service does not give priority to access a busy subscriber. For this purpose other supplementary services may be used.

The preferential treatment of priority calls within the network should e.g. include the following functions:

- Extended waiting times before time-out of network units;
- Waiting for a first junction line to become free on the route.

3.1.5. *Interrogation*

Interrogation of the provision and activation of the priority service should be possible.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 74 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 74 #

3.3.4. *Deactivation*

74

3.3.5. *Invocation*

Not applicable.

3.3.6. *Interrogation*

*# 74 #

4. **USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME**

If the priority call is not connected due to the congestion, the call will be canceled after a time-out (e.g. 5 secs.).

When a priority call is addressed to a destination served by a network operator that does not provide this service, the call will then proceed as a normal call.

5. **INTERWORKING AND INTERCOMMUNICATION**

When the originating user and the destination user belong to different networks, then the priority call will be treated as a normal call, if all networks involved do not support the priority service.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact.[1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.2. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

Recall is not a priority call.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15 **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

If, at some point, there is more than one priority call waiting for service, the first in, first out principle is to be followed.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. **COMMERCIAL CONSIDERATIONS**

7.1. **Customer Segment**

A-priority: Public authorities, business customers.

B-priority: Emergency service providers (e.g. doctors, hospitals, emergency centres, fire brigades, police).

7.2. **Charging**

A charge for admission and a rental charge may apply to a subscriber with A- or B-priority. Charges for the connections with A-priority may be higher than for normal connections. Connections to B-priority numbers may be charged as normal connections.

Annex 17

REMOTE CONTROL OF SUPPLEMENTARY SERVICES (RCSS)

Operational Requirements

1. DEFINITION

The Remote Control of Supplementary Services (RCSS) supplementary service enables the user to control certain supplementary services associated with its access from other accesses.

2. DESCRIPTION

2.1. General Description

This supplementary service allows a customer to register, erase, activate, deactivate, and interrogate supplementary services on his own access(es) by means of a control procedure sent remotely via the network.

To protect the network accesses from unauthorised changes, a keyword (KW) must be used as part of the control procedure for RCSS. The keyword may be the same or different from the normal keyword which may be needed to control supplementary services directly from the access being controlled. The use of the RCSS keyword negates the need for other keywords, i.e. only one keyword shall be used for this service irrespective of what service is being remotely controlled.

It shall not be possible to control or interrogate a service using remote control unless that service has been provided to the address being remotely controlled.

A control or interrogation request made by means of RCSS shall cause the same results as if requested directly from the controlled access. All normal indications shall be provided to the remote customer.

The RCSS supplementary service shall apply to the basic access and the primary access.

2.2. Denomination of User

All customers with supplementary services provided.

2.3. Specific Terminology

None identified.

2.4. Applicability to Basic Telecommunication Services

This supplementary service is applicable to all basic telecommunication services

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Provision of this facility may require an agreement between the network operator and the customer. The network operator shall be able to make this service available on demand.

Withdrawal of this supplementary service will be at the customers request or for administrative reasons.

3.1.2. *Registration and Erasure*

Registration of the keyword for use of RCSS shall be made directly from the access to be remotely accessed for RCSS. As an option, it may be possible to change the keyword remotely.

3.1.3. *Activation and Deactivation*

By use of a control procedure the controlling customer shall activate and deactivate RCSS directly from its access.

3.1.4. *Invocation and Operation*

Invocation of RCSS shall be made by means of a control procedure from any network access providing suitable signalling is available.

All information messages relevant to individual supplementary services will be provided to the remote controlling customer using the same announcements that would be received, if changes had been made directly from the access being controlled.

Busy at the home access must not prevent RCSS.

Accesses with call barring or diversion facilities activated shall be accessible for remote control of service commands.

Once a remote control command has been accepted, the supplementary services provided by the controlled access shall be identical to the service as would have been provided by normal control procedures used locally from the access.

An access being remotely controlled shall be available locally for outgoing calls and changes made by this means shall not affect calls already set up or which are in the process of being set up.

If an access is being controlled from more than one source at a time and the service requests are incompatible, then only the last request will be accepted.

Changes made via remote control should have equal status as changes made directly from the access.

All compatibility requirements and limitations of the individual supplementary services shall apply.

RCSS requests shall not be diverted or barred by any supplementary service activated on the home access.

If RCSS is also available in the PSTN, an intercommunication between the ISDN and the PSTN apply. RCSS over the intercommunication should be possible.

3.1.5. *Interrogation*

It shall be possible to interrogate provision, registration, and activation of the RCSS supplementary services.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 06 has been allocated for this service.

3.3.1. *Registration*

* 06 * KW #

3.3.2. *Erasure*

06 * 1

3.3.3. *Activation*

* 06 #

3.3.4. *Deactivation*

06

3.3.5. *Invocation*

From remote access

* 06 * CPN * KW * SC (* SI) #

Note: CPN = Access to be remotely controlled.

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 06 #

3.3.6.2. Data Check

*# 06 * KW #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If invocation of RCSS is rejected, information about the reason for the rejection shall be given.

Indication of unsuccessful results of a remote operation requested by RCSS shall be given with the normal announcements.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking between ISDN, Non-ISDN and PSTN

If the RCSS supplementary service is available in the PSTN and intercommunication between the ISDN and the PSTN applies, the RCSS supplementary service shall be possible.

5.2. Interworking between Public and Private ISDNs

The RCSS supplementary service shall be supported across the interface between the public and private ISDN networks.

5.3. Interworking between ISDN and Mobile Networks

The RCSS supplementary service shall be supported across the interface between the ISDN and mobile networks.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.1.3. **Advice of Charge, Charging Information at the End of the Call (AOC-E)**

No impact.

6.2. **Call Waiting (CW)**

No impact.

6.3. **Call Hold (HOLD)**

Not applicable.

6.4. ***Call Transfer***

6.4.1. **Explicit Call Transfer (ECT)**

Not applicable.

6.4.2. **Single Step Call Transfer (SCT)**

Not applicable.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

Note: An access with the OCB supplementary service activated can be remotely controlled.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

Not applicable.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

Not applicable.

6.8.2. **Meet-Me Conference (MMC)**

Not applicable.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

Note: An access with the CFU supplementary service activated can be remotely controlled.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

Note: An access with the CFB supplementary service activated can be remotely controlled.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

Note: An access with the CFNR supplementary service activated can be remotely controlled.

6.10.4. **Call Deflection (CD)**

Not applicable.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

Not applicable.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

Not applicable.

6.21. **User-to-User Signalling (UUS)**

No impact.

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

Residential and small business customers.

7.2. Charging

It should be possible to charge for rental and usage of this supplementary service over and above any charges for use of the service being accessed.

The charges for this supplementary service shall be billed to the access being remotely accessed. These charges should include all relevant charges for the access to and the change of the supplementary service being controlled and charges for the use of RCSS.

Annex 18

SUB-ADDRESSING (SUB)

Operational Requirements

1. DEFINITION

The Sub-addressing (SUB) 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 party, is delivered unaffected to the called (served) user. Only the served user defines the significance of the sub-address.

2. DESCRIPTION

2.1. General Description

The called user can give some supplementary possibilities to his calling partys, if they are previously initiated. 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 having lower priority of implementation and will not be dealt with in the initial phase. However, interworking compatibility between terminals should be supported in any case.

Size of sub-address:
A sub-address of up to four octets should be used for the first implementation. However, there is a long term requirement to have a sub-address of 20 octets for OSI compatibility.

2.2. Denomination of Users

The calling party as well as the called party.

2.3. Specific Terminology

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

Note 1: As described above, four 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 communication. For any fixed communication, the real value of the MALSAN parameter will be the shortest length accepted by all crossed exchanges.

MALSACS: Maximum Authorised Length of Sub-address for Any fixed Called Subscriber. The maximum number of octets that will be sent to a called subscriber's installation according to his own prearrangement with the network operator.

2.4. Applicability to Telecommunication Services

This supplementary service is applicable to all basic telecommunication services.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

Calling subscriber:
Calling subscriber provision is without any arrangement with the network operator. However, a prior arrangement might be introduced for exceeding the initial value (4 characters) of the MALSAN parameter.

Called subscriber:
Called subscriber provision may be general without any arrangement or by prior arrangement with the network operator; and in the second case this will define the MALSACS parameter.

Withdrawal is made by the network operator at the subscriber's request or for administrative reasons.

Note: A network operator may apply a standard value of MALSACS to all subscribers.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

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

Calling party side:
During the call setup phase the calling party 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 also inserts 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's installation.

This sub-address information is used by the called user's terminals 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 party, the destination exchange always provides a normal call offering to the called user's 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 Connected Line Identification Presentation).

3.1.5. *Interrogation*

It shall be possible for a customer to interrogate the provision of the service.

When the service is provided, the customer shall be able to interrogate the actual parameter values.

3.2. Alternative Method for Users to Access the Service

3.2.1. *Provision and Withdrawal*

None identified.

3.2.2. *Registration and Erasure*

Not applicable.

3.2.3. *Activation and Deactivation*

Not applicable.

3.2.4. *Invocation and Operation*

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

Sub-address has no significance for called party:
When the 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. PBX) 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 shall be discarded by the network.
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 party.

3.2.5. *Interrogation*

None identified.

3.3. Stimulus Mode Procedures

The service code 89 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 89 * SI #

3.3.6. *Interrogation*

*# 89 * SI #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the sub-address cannot be transmitted to the destination side, an indication shall be sent to the calling party.

5. INTERWORKING AND INTERCOMMUNICATION

According to national rules, SUB may not be applicable if at least one of the two parties is not an ISDN subscriber.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No impact.

6.1.3. Advice of Charge, Charging Information at the End of the Call (AOC-E)

No impact.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

No impact.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

No impact.

6.4.1. Single Step Call Transfer (SCT)

No impact.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact, i.e. if the calling party subscribes to CLIP, both the calling party's sub-address, if provided by the calling party, and the calling party's number are presented to the called

---

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

user.

6.5.2. **Calling Line Identification Restriction (CLIR)**

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

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact, i.e. if the connected party subscribes to sub-addressing and the calling user subscribes to COLP, both the connected party's sub-address, if provided by the connected party, and the connected party's number are presented to the calling party.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

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 party.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

No impact.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. *Diversion Services*

6.10.1. Call Forwarding Unconditional (CFU)

The sub-address associated with the originally 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.

6.10.2. Call Forwarding Busy (CFB)

The sub-address associated with the originally 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.

6.10.3. Call Forwarding No Reply (CFNR)

The sub-address associated with the originally 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.

6.10.4. Call Deflection (CD)

The sub-address associated with the originally 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's installation) in association with the forwarded-to number.

6.10.5. Call Forwarding Unconditional to a Service Centre (CFU-S)

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.10.6. Call Forwarding Busy to a Service Centre (CFB-S)

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.10.7. Call Forwarding No Reply to a Service Centre (CFNR-S)

Sub-addressing shall be ignored and no sub-address shall be forwarded to the service centre.

6.11. Freephone (FPH)

No impact. Sub-address charging on a per call basis applies to the called freephone subscriber. Should the called party not subscribe to SUB, the sub-address is rejected, but the call may be allowed to proceed.

6.12. Line Hunting (LH)

No impact.

6.13. **Malicious Call Identification (MCID)**

In case of MCID invocation, no sub-address information is registered.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

Not applicable.

6.19. **Terminal Portability (TP)**

No impact.

6.20. **Three-Party Service (3PTY)**

No impact.

6.21. **User-to-User Signalling (UUS)**

Simultaneous use of SUB and UUS shall not be allowed.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

Business Customers.

7.2. Charging

In case of usage based charging:

Outgoing calls:
When dialling a sub-address no more than four 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 network operator's own policy in this matter.

Incoming calls:
Each network operator 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 the user's installation, particularly, when the called subscriber does not respond.

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

Annex 19

TERMINAL PORTABILITY (TP)

Operational Requirements

1. DEFINITION

The Terminal Portability (TP) supplementary service allows a user to move a terminal from one socket to another within one given basic access during the active 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.

Use of TP in the call establishment and in the call clearing phases is not possible.

2. DESCRIPTION

2.1. General Description

This supplementary service is intended for application to the basic access.

A terminal having one or more active calls can be moved from one socket to another provided that an appropriate signalling procedure is performed. Such a 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 sides.

Note: For a given access it is only possible to suspend one call of the same teleservice at the same time.

This supplementary service allows a user

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

2.2. Denomination of Users

This supplementary service is applicable to all groups of subscribers.

2.3. Specific Terminology

None identified.

2.4. Applicability to Telecommunication Services

TP applies to some interactive telecommunication services requiring the attendance of a human being, e.g. Telephony, Videotelephony.

However, the network will not take any action to restrict its applicability.

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

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

TP does not apply to non-interactive services such as Facsimile, Teletex, Mixed-mode etc. The relative terminals should not provide for the above-mentioned capabilities.

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

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

This supplementary service may be provided after prearrangement with the network operator or be available on a general basis.

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

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

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

A user wishing to invoke the supplementary service has to suspend the call by sending an appropriate request optionally with a call identity limited to two characters. The network, when receiving this request, performs the following actions:

- stores the call identity value, if specified (if no call identity is specified, the network

allocates a null value);

- reserves the B-channel involved in the connection until the call is resumed or an appropriate time-out expires. This time-out shall be selectable by the network operator 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 and an indication to the remote user.

When receiving the acknowledgement message the terminal, shall inform the user that he can physically disconnect the terminal.

The user can resume the call within the appropriate time-out by sending an appropriate request (if no call identity was specified, it is not mandatory to specify the call identity in the resumption request). When receiving this request the network performs the following actions:

- Re-establishment of the call

- Sending of an acknowledgement to the controlling user and an indication to the remote user

3.1.5. *Interrogation*

Not applicable.

3.2. Alternative Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 79 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

* 79 (* CI) #

Note: CI = Call Identity.

3.3.6. *Interrogation*

Not applicable.

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If not able to satisfy neither the suspension nor the resumption of a call, the network may reject the requests and send an appropriate indication.

If the controlling user does not resume within the specified time-out, 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 while suspended, a subsequent resume request by the controlling user will be rejected by the network with an appropriate indication.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

Not applicable.

Note: TP has only local significance.

5.2. Interworking with Private ISDNs

When a the remote party is on a different network from that of the served user (e.g. one user on a private ISDN and the other user on a public ISDN), an indication shall be sent to the remote party's network for forwarding to the remote party.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

While a call is suspended, no charging information is sent to the user.

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

If the charging rate changes while a call is suspended (e.g. due to the use of different charge periods for different periods of the day), the new charging rate shall be given when the call is resumed.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

On resumption of the call, the sending of charging information shall start again and the

following information may be given:

- Updated cumulative charge;
- Updated charging rates.

If the call is cleared while the call is suspended at the calling party's basic access, then no charging information shall be given to that party.

6.1.3. **Advice of Charge, Charging Information at the End of the Call (AOC-E)**

If the call is cleared while the call is suspended at the calling party's basic access, then no charging information is given to that party.

6.2. **Call Waiting (CW)**

A waiting call cannot be suspended.
A terminal cannot suspend an active call, when CW is in operation on that terminal.

6.3. **Call Hold (HOLD)**

A terminal cannot suspend an active call, when HOLD is in operation on that terminal.
A held call must not be suspended.

6.4. ***Call Transfer Services***

6.4.1. **Explicit Call Transfer (ECT)**

No impact. [1])

6.4.2. **Single Step Call Transfer (SCT)**

No impact.

6.5. ***Number Identification Services***

6.5.1. **Calling Line Identification Presentation (CLIP)**

No impact.

6.5.2. **Calling Line Identification Restriction (CLIR)**

No impact.

6.5.3. **Connected Line Identification Presentation (COLP)**

No impact.

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.5.4. **Connected Line Identification Restriction (COLR)**

No impact.

6.6. ***Call Barring Services***

6.6.1. **Closed User Group (CUG)**

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

The served user cannot be recalled, if TP has been invoked.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

When a terminal manages a CONF, TP is not available.

6.8.2. **Meet-Me Conference (MMC)**

No impact.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

If the called user suspends a call, then MCID for that call cannot be invoked while the call is suspended.
If the calling user clears while the call is suspended by the called user, the called user cannot resume the call and hence not invoke the MCID for that call.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

The Terminal Portability service may be invoked simultaneously at both ends of the call.

6.20. **Three-Party Service (3PTY)**

The network will prevent the served user of 3PTY from invoking TP.

6.21. **User-to-User Signalling (UUS)**

Not compatible, i.e. whilst the call is suspended no user-to-user information can be sent or received. The network shall not store any user-to-user information while the call is suspended.

7. COMMERCIAL CONSIDERATIONS

7.1. **Customer Segment**

All customers.

7.2. **Charging**

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

As a national option, TP may not be charged separately. The charges may then be included in the charges for the ISDN access.

Annex 20

THREE-PARTY SERVICE (3PTY)

Operational Requirements

1. DEFINITION

The Three-Party (3PTY) supplementary service enables a user to establish a three-party conversation, i.e. a simultaneous communication between the served user and two other parties.

2. DESCRIPTION

2.1. General Description

2.1.1. *Beginning the Three-Party Service*

The served user, user A, who is involved in at least two calls (one active and at least one call on hold), each of which may be an incoming or outgoing call, can join the active and one held call together into a three-way conversation by requesting 3PTY. Both calls shall be answered prior to the invocation of 3PTY.

2.1.2. *Controlling the Three-way Conversation*

During an active three-way conversation the served user can:

1) disconnect one of the parties;
2) disconnect the entire three-way conversation;
3) explicitly choose one party to have a private communication with that party. This action will result in a situation similar to that before the invocation of 3PTY.

Note: *3PTY shall be canceled by the user action listed above.*

2.2. Denomination of Users

Users with one call active and at least one call on hold.

Note: For the original calls, the served user may have been either the calling or called party.

2.3. Specific Terminology

Served user: During the invocation and the active phase the service is under the control of the served user, i.e. the one by whom the service was invoked. This

user is also referred to as user A.

Remote parties: The parties involved in the two calls that are joined together into a three-way conversation (user A with user B, and user A with user C).

2.4. Applicability to Telecommunication Services

3PTY is applicable to all telecommunication services carrying speech.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

3PTY is provided to after prearrangement with the network operator.

Withdrawal of the service is made by the network operator upon request by the subscriber or for administrative reasons.

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Not applicable.

3.1.4. *Invocation and Operation*

3.1.4.1. Beginning the Three-Party Service

The served user, user A, who is involved in at least two calls (one active call and at least one call on hold), each of which may be an incoming or outgoing call, can request that the network joins the active call and one specified call on hold together into a three-way conversation. Both calls shall be answered prior to the invocation of 3PTY.

Note: The served user is responsible for ensuring that the two calls are compatible.

3.1.4.2. Managing the Three-way Conversation

Served user:
During an active three-way conversation the served user can:

1) Disconnect one of the parties.
   This shall result in a single active call between the served user and the other party. 3PTY shall automatically be terminated.
2) Disconnect the entire three-way conversation.
   Both calls shall be cleared.
3) Explicitly choose one party to have a private communication with that party.
   This shall result in the termination of 3PTY with the release of resources allocated for the three-way conversation. The served user is able to explicitly indicate the party which

shall remain active afterwards, while the call with the other party shall be put on hold. This action will result in a situation similar to that before the invocation of 3PTY.

Note: If the served user wants to rejoin the two calls into a three-way conversation, it has to request 3PTY.

Remote parties
Either of the remote parties (users B or C) is able to disconnect from the three-way conversation.
This shall result in the termination of 3PTY. A single active call shall remain between the served user and the other party.

All participants of the three-way conversation shall receive a notification at the invocation and the cancellation of this supplementary service.

An indication is to be sent to the remote parties, when a new party is connected.

Note: During an interim period of time some networks may not support the sending of notifications to the remote users.

3.1.5. *Interrogation*

Interrogation of the provision of this supplementary service should be possible.

3.2. Alternate Method for Users to Access the Service

None identified.

3.3. Stimulus Mode Procedures

The service code 95 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

Not applicable.

3.3.4. *Deactivation*

Not applicable.

3.3.5. *Invocation*

Invocation of this supplementary service is made by use of switching order 3.

(R) 3

3.3.6. *Interrogation*

*# 95 #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If a user attempts to invoke 3PTY and the network cannot accept that request, the network shall reject the request with an appropriate cause.

Possible reasons for rejection are:

- Service not subscribed to
- Resources cannot be allocated
- Subscriber restrictions not met (e.g. Closed User Group)
- Calls not in an appropriate state (e.g. both calls on hold)
- Use of service code procedure instead of switching order for the invocation of the service.

If the request is rejected, the calls remain in the same state as they were before the attempt to invoke 3PTY.

5. INTERWORKING AND INTERCOMMUNICATION

5.1. Interworking with Non-ISDNs

The served user must be an ISDN subscriber. The other parties may belong to any non-ISDN network.

In case of interworking users B and C may not be notified of changes occurring.

5.2. Interworking with Private ISDNs

A private ISDN can transfer the service invocation request (at service invocation time) to a public ISDN. The three-way conversation shall then, as seen by the public ISDN, be treated as the normal 3PTY.

The users B and C may belong to any private ISDN network.

Appropriate notifications will be accepted from a private ISDN and transferred through the public ISDN, if the service provider resides in a private ISDN.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1. *Advice of Charge Services*

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No impact. [1])

6.1.2. Advice of Charge, Information During the Call (AOC-D)

Charges for different connections to the three-way conversation: No impact.

Charges for the use of resources allocated for the three-way conversation: This charging information may be sent to the served user. However, in some networks no charging information can be given in this case, e.g. due to off-line processing of the charges.

6.1.3. Advice of Charge, Information at the End of a Call (AOC-E)

Charges for different connections to the three-way conversation: No impact.

Charges for the use of resources allocated for the three-way conversation: This charging information may be sent to the served user. However, in some networks no charging information can be given in this case, e.g. due to off-line processing of the charges.

6.2. Call Waiting (CW)

No impact.

6.3. Call Hold (HOLD)

Any party involved in a three-way conversation shall be able to put the connection to the three-way conversation on hold and later to retrieve it.
While the connection of one party to the three-way conversation is held, the other parties shall be able to continue to communicate.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

Served user:
The served user who has invoked 3PTY is not able to invoke ECT in order to transfer either of the calls involved. The served user shall cancel 3PTY in order to be able to transfer either of the calls involved in the three-way conversation.

6.4.2. Single Step Call Transfer (SCT)

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[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

Served User:
The served user who has invoked 3PTY is not able to invoke SCT in order to transfer either of the calls involved. The served user shall cancel 3PTY in order to be able to transfer either of the calls involved in the three-way conversation.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

For the successful invocation of 3PTY any CUG restrictions applied to one call shall match with any restrictions applied to the other call.

6.6.2. Outgoing Call Barring (OCB)

For the successful invocation of 3PTY any OCB restrictions must be met by the served user.

6.7. Completion of Calls to Busy Subscriber (CCBS)

No impact.

6.8. *Conference Services*

6.8.1. Conference Call, Add-on (CONF)

It shall be possible for each party of a three-way conversation to be involved alternatively in the three-way conversation and an add-on conference.

Served user:
In order to convert a three-way conversation into an CONF the served user shall cancel the 3PTY first and then invoke CONF from the active call. Subsequently, the held call can be added to the conference.

Add-on conference controlled by another party:
The network shall not be required to prevent that a leg of one of the remote parties can be part of an add-on conference controlled by that party.

6.8.2. **Meet-Me Conference (MMC)**

It shall be possible for a participant to be involved separately in a three-way conversation as well as in a MMC call.

The network may take appropriate measures to prevent a MMC call from being joined with another call into a three-way conversation.

6.9. **Direct Dialling In (DDI)**

No impact.

6.10 ***Diversion Services***

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

No impact.

6.10.2. **Call Forwarding Busy (CFB)**

No impact.

6.10.3. **Call Forwarding No Reply (CFNR)**

No impact.

6.10.4. **Call Deflection (CD)**

No impact.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

Not applicable.

6.18. **Sub-addressing (SUB)**

No impact.

6.19. **Terminal Portability (TP)**

Served user:
When a terminal manages a three-way conversation, TP shall not be available.

Remote parties:
No impact.

6.20. **Three-Party Service (3PTY)**

It shall be possible for both parties of a three-way conversation to be involved alternatively in another three-way conversation.

Served user:
It is not possible to invoke 3PTY, if one or both calls involved are part of one or two other three-way conversation(s).

Remote parties:
The network shall not be required to prevent that a leg to one of the other parties can be part of another three-way conversation controlled by that party.

6.21. User-to-User Signalling (UUS)

UUS, Service 3, cannot be transferred between remote users (users B and C).

7. COMMERCIAL CONSIDERATIONS

7.1. Customer Segment

This supplementary service is applicable to all groups of subscribers, especially those dealing with intermediary activities.

7.2. Charging

The controlling party is to be charged for the use of 3PTY. Charging of the original calls shall continue independently of invocation of 3PTY.

Annex 21

USER-TO-USER SIGNALLING (UUS)

Operational Requirements

1. DEFINITION

The User-to-User Signalling (UUS) supplementary service allows 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.

2. DESCRIPTION

2.1. General Description

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 shall be passed transparently (i.e. without modification of contents) through the network. Normally, the network shall not interpret or act upon this information.

The user can transfer User-to-User Information (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.

In a point-to-multipoint arrangement at the called party, the following Service 1 UUI transfer shall be allowed:

- In the forward direction: UUI can be sent only if it is ascertained in either the initial setup or the first clearing request. In the case of premature clearing, UUI shall be delivered to terminals which have at this point in time already acknowledged the call.

- In the backward direction: UUI can be sent from the called party to the calling party with the alerting indication. However, it shall be the called party's responsibility to avoid contention.

- If the call never reaches the active phase (e.g. in the case of call rejection), several call rejection causes may be received from the called party. In this case, the network shall choose the UUI (if any) associated with the call rejection cause which is selected to be sent to the calling party. If multiple responses with the same rejection cause is received,

the first one shall be sent to the calling party.

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 acceptance of the call at the distant exchange). This same UUI may, as a network operator option, be received by the terminating exchange and delivered to the user during the active phase of the call.

UUS Service 2 shall be applicable only to point-to-point configurations.

Note: This service is applicable to private ISDNs, where the network regards the private ISDN as a user. This means that the network has fulfilled its, task when it has delivered the UUI to the private ISDN. All indications and the charging shall be handled accordingly.

Service 3

During the active phase of a call the UUI is transferred independently of call control messages.

Note: A selected terminal is the terminal behind the called interface that the network operator considers or elects as the terminal to be in the active phase of a call.

Services 1, 2, and 3, allows the transmission of 128 octets per message as a maximum.

Note: During an interim period of time, some networks may support 32 octets on one or more of the services; 32 octets will always be supported. Restrictions may apply to calls requesting more than 32 octets.

Limitations are also placed on the number of messages per time unit for Service 3. The flow control of each direction shall be operated independently.

2.2. Denomination of Users

Depending of the service the user may be the calling or the called party.

2.3. Specific Terminology

User-to-User Information (UUI): The information transferred by the service UUS.

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.

A selected terminal is the terminal behind the called interface that the network operator considers or elects as the terminal to be in the active phase of a call.

2.4. Applicability to Basic Telecommunication Services

Restrictions can only be identified for basic telecommunication services which are based on the packet modes step 1 and step 2.

3. METHOD FOR USERS TO ACCESS THE SERVICE

3.1. Normal Method for Users to Access the Service

3.1.1. *Provision and Withdrawal*

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

3.1.2. *Registration and Erasure*

Not applicable.

3.1.3. *Activation and Deactivation*

Services 1 and 2 shall be requested by the calling party at the setup of a call, if UUI transfer is desired in either direction. Service 3 may be requested by the calling party at call setup or during the active state of the call or, as a network operator option, by the called party during the active phase of the call.

Note: Depending on the network connection selected at call setup, the request for Service 3 may fail during the setup or during the active phase of the call.

Once a UUS service is activated, the network shall accept UUI in both directions according to the subscription of the served user.

Note: Activation means implicit request or explicit request with acceptance for UUS. Invocation means submission of UUI.

Services 2 and 3 shall be explicitly requested. Service 1 may be explicitly or implicitly requested. The service is implicitly requested, when UUI is included in the call request (i.e. the service is requested at the same time, as it is invoked).

A network providing Service 1 shall support the implicit service request from users.

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

As a call setup option users shall be able to specify whether the requested UUS service(s) is (are) required for the call, i.e. if the call should be completed or not, if UUI cannot be passed. If the UUI required indication is given by the user, the call shall not be completed, if UUI cannot be passed to the destination user. If the UUI required indication is not given by the user, the call shall be completed even if UUI cannot be passed. If Service 1 is implicitly requested or if Service 3 is requested during the call, it cannot be requested as "UUI required".

For Services 2 and 3 the network shall confirm the UUS service request. This confirmation shall be preceded by an end-to-end check by the network for service availability.

For Services 2 and 3 the network shall check the service availability with the destination user. No response from the destination user shall be taken as a network rejection to the UUS request. The network shall explicitly indicate to the originating user whether the

requested service has been successfully activated or not. In the case of unsuccessful activation, the network shall indicate whether the condition is due to unavailability of the destination of the user or not (see clause 4).

Note: The term originating and destination refers to the origination and destination of the UUS request.

When Service 1 is explicitly requested, the network shall inform the destination user of the request. The destination party should accept or reject the activation as described for Services 2 and 3.

When Service 1 is explicitly requested, the destination party can include UUI when accepting the UUS request.

When Service 1 is implicitly requested, the service is active for the call, i.e. the destination party is not required to send an implicit response. However, the remote party can include UUI in the call response (e.g. for user-to-user negotiation).

3.1.4. *Invocation and Operation*

A user wishing to send UUI will be informed by the network as part of a 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.

3.1.4.1. Service 1

An ISDN user can transfer UUI when initiating a call. When the service has been activated, either user can include UUI when accepting, rejecting, or clearing a call.

Note: A calling user can request UUI transfer with a call setup and terminate the call before a connection is established.

3.1.4.2. Service 2

Any time between activation of Service 2 and connection of the call, an ISDN user can transfer UUI (i.e. up to two messages in each direction) to the other user involved in the call.

3.1.4.3. Service 3

After Service 3 has been activated, an ISDN user may transfer UUI (during the active phase of the call) to the other party of the call.

Network flow control mechanisms shall exist after the call has been answered to restrict UUS message flow in each direction.

If UUS messages are received at a rate which exceeds the flow control limit set by the network, the network shall discard the messages that cannot be handled and shall respond to the first discarded message with a control indication.

When the flow control restrictions are removed then, if a UUS message has been discarded due to that restriction, an indication shall be given that further UUS messages can be accepted. Otherwise, no indication shall be given.

No network flow control mechanism shall exist for control of receiving UUS messages.

3.1.5. *Interrogation*

It shall be possible to interrogate the provision of the service.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 36 has been allocated for this service.

3.3.1. *Registration*

Not applicable.

3.3.2. *Erasure*

Not applicable.

3.3.3. *Activation*

* 36 #

3.3.4. *Deactivation*

36

3.3.5. *Invocation*

* 36 * UUI #

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 36 #

3.3.6.2. Data Check

Not applicable.

4. **USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME**

4.1. **Activation and Deactivation**

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:

- Service not subscribed to

- Calling or called user is not an ISDN user
- Protocol error
- Necessary interoffice signalling connectivity does not exist between sending and receiving users
- User constraints prohibit activation/invocation of the service between the calling and the called users (e.g. CUG, icb)
- Network congestion

Note: If UUI contained in a setup message cannot be transferred for reasons 2 or 5, notification will not be provided until after the network has received a response to the setup message, since the network does not know in advance whether UUI can be transferred or not.

When the invocation of Service 2 or 3 is not understood by the network operator or by the called user, no explicit rejection is sent to the calling user. This lack of acknowledgement must be interpreted as a rejection.

4.2. Invocation and Operation

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

UUI sent at the end of a call need 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 shall be delivered correctly.

Under circumstances of network congestion, network failure or if the authorised amount of user generated information has been reached, the network may discard UUI of Service 2 and 3.

Note: Users desiring to have confirmed UUI delivery should employ their own end-to-end protocols (i.e. acknowledgement of receipt by another UUI).

In case of excessive UUI length, no truncation is performed by the network operator. UUI information shall be discarded and, as a network operator option, the sending user shall be informed.

For Service 1, if there is no UUI in the call request (implicit request) or if there is no explicit request for Service 1, neither the calling party nor the called party can send/receive UUI in call control messages.

5. INTERWORKING AND INTERCOMMUNICATION

If an explicit request for Service 1 with UUI, indicated as "UUI not required", is sent to an ISDN network only supporting implicit request, the UUI shall be transferred to the remote party. If the remote party replies with UUI, the served user's network can generate an explicit acceptance. The explicit acceptance with UUI shall be sent to the served user. If the remote party does not reply with UUI, the served user's network shall send an explicit rejection to the served user.

5.1. **Intercommunication with Non-ISDNs**

UUI can be delivered only when a non-ISDN network provides a means of conveying the UUI.

5.2. **Intercommunication with Private ISDNs**

UUI can be delivered only when both users are ISDN subscribers.

6. INTERACTION WITH OTHER SUPPLEMENTARY SERVICES

6.1. Advice of Charge Services

6.1.1. Advice of Charge, Charging Information at Call Setup Time (AOC-S)

No information concerning charges for UUS shall be given.

6.1.2. Advice of Charge, Charging Information During the Call (AOC-D)

No information concerning charges for UUS shall be given.

6.1.3. Advice of Charge, Charging Information at the End of a Call (AOC-E)

No information concerning charges for UUS shall be given.

6.2. Call Waiting (CW)

Calling user:
Any UUI included in the call setup message shall 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 CW user also uses UUI, he 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 clause 2 for restrictions on point-to-multipoint arrangements.

6.3. Call Hold (HOLD)

No impact.[1])

[1]) When "No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

6.4. *Call Transfer Services*

6.4.1. Explicit Call Transfer (ECT)

When ECT is invoked, any UUS service that has previously been activated on either leg shall be canceled by the network.

Note: No specific notification shall be sent to the parties on the resulting call, when an activated UUS service is no longer available.

It shall be the responsibility of the users on the resulting call to re-negotiate Service 3, if required.

6.4.2. Single Step Call Transfer (SCT)

When SCT is invoked, any UUS service that was requested or activated on the first call shall be canceled by the network.

When the second call is set up by the served user, any request for UUS shall be canceled by the network. However, if a setup request from the transferring user contains UUI (implicit request for Service 1), this UUI shall be delivered to the transferred-to user before this UUS service is canceled.

Note: No specific notification shall be sent to the parties on the resulting call, when an activated UUS service is no longer available.

It shall be the responsibility of the parties on the resulting call to re-negotiate Service 3, if required.

6.5. *Number Identification Services*

6.5.1. Calling Line Identification Presentation (CLIP)

No impact.

6.5.2. Calling Line Identification Restriction (CLIR)

No impact.

6.5.3. Connected Line Identification Presentation (COLP)

No impact.

6.5.4. Connected Line Identification Restriction (COLR)

No impact.

6.6. *Call Barring Services*

6.6.1. Closed User Group (CUG)

No impact.

6.6.2. **Outgoing Call Barring (OCB)**

No impact.

6.7. **Completion of Calls to Busy Subscriber (CCBS)**

Calling user: The network shall not store any UUI contained in the original call request. However, the calling party may include UUI in the response to the CCBS recall.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

Conference controller: UUI (Service 3) 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 with an identification of the sending conferee.

The same limitations on the amount of UUI (Service 3) which can be transferred between two users shall apply to communications between the conference controller and any particular conferee.

Conferees: UUI can be sent to and received from the conference controller. UUS (Service 3) shall not be transferred between the conferees in association with the conference call.

Services 1 and 2 shall not be available in conjunction with a conference. However, on calls which are set up to potential conferees outside the conference, these services shall be available.

6.8.2. **Meet-Me Conference (MMC)**

The UUS supplementary service cannot be used when invoking the MMC (Services 1 and 2) and during the MMC (Service 3).

6.9. **Direct Dialling In (DDI)**

No impact.

6.10. ***Diversion Services***

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

Calls originated by a user with CFU activated:
Since CFU 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 ongoing call or at the setup of a new call.

Calls incoming to a user with CFU activated:
Any UUI or request for UUS that accompanies the setup request shall be forwarded with the call.

Note: As a network operator option, the forwarding of UUI and/or UUS requests can be restricted to the forwarding user who subscribes to the relevant UUS supplementary service.

After Forwarding:
UUS Service 3 may be requested during the active phase of the call.

6.10.2. Call Forwarding Busy (CFB)

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

Calls incoming to a user with CFB activated:
Any UUI or request for UUS that accompanies the setup request shall be forwarded with the call. However, if a user determined user busy condition exists, any UUI and/or request for UUS shall also be delivered to the forwarding user, when the call is offered.

Note: As a network operator option, the forwarding of UUI and/or UUS requests can be restricted to the forwarding user who subscribes to the relevant UUS supplementary service.

After Forwarding:
UUS Service 3 may be requested during the active phase of the call.

6.10.3. Call Forwarding No Reply (CFNR)

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:
Service 1: If the UUS service is explicitly requested and the forwarding user explicitly rejects the request, the UUS request and the UUI (if any) shall not be forwarded with the call. However, if the request was indicated as "UUI required", the call shall be rejected. In all other cases, the UUS request and/or UUI shall be forwarded with the call.
Service 2: If the UUS service is requested as "UUI not required", the call shall be forwarded without the UUS request. If the UUS service is requested as "UUI required", CFNR shall be overridden (i.e. the call is treated as if CFNR was not activated).
Service 3: Any request for Service 3 that accompanies the setup request shall be forwarded with the call.

Note: As a network operator option, the forwarding of UUI and/or UUS requests can be restricted to the forwarding user who subscribes to the relevant UUS supplementary service.

After Forwarding:
Service 3 may be requested during the active phase of the call.

6.10.4. **Call Deflection (CD)**

CD before alerting: See CFB (the call shall be treated as if the user determined user busy condition exists).

CD after alerting: See CFNR.

6.10.5. **Call Forwarding Unconditional to a Service Centre (CFU-S)**

No impact.

6.10.6. **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7. **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11. **Freephone (FPH)**

No impact.

6.12. **Line Hunting (LH)**

No impact.

6.13. **Malicious Call Identification (MCID)**

No impact.

6.14. **Multiple Subscriber Number (MSN)**

No impact.

6.15. **Private Numbering Plan (PNP)**

No impact.

6.16. **Priority (PRI)**

No impact.

6.17. **Remote Control of Supplementary Services (RCSS)**

No impact.

6.18. **Sub-addressing (SUB)**

Simultaneous use of SUB and UUS shall not be allowed.

6.19. **Terminal Portability (TP)**

Not compatible, i.e. whilst the call is in the suspended state no UUI can be sent or received. The user is responsible for information lost in this situation.

6.20. **Three-Party Service (3PTY)**

Service 1: No impact.

Service 2: Service 2 does not apply to calls that has been answered.

UUS Service 3: Served user: No impact:
Other parties: UUI can be sent to and received from the served user, UUI shall not be transferred between users B and C.

6.21. **User-to-User Signalling (UUS)**

Not applicable.

7. **COMMERCIAL CONSIDERATIONS**

7.1. **Customer Segment**

Business customers.

7.2. **Charging**

UUS may be charged as follows:

- On subscription (individually to Services 1, 2, and 3 or bundled as a network operator option);
- The amount (volume) of UUI transferred when passing the calling party's user network interface. 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).

Recommendation T/CAC S 10.8 E (T/SF 31-08)
(Vienna 1989(CAC))
Formerly Recommendation T/SF 31-08 E

USER CONTROL FUNCTIONS OF ISDN TERMINAL EQUIPMENT

Recommendation proposed by Working Group T/WG 7 "Services and Facilities" (SF)

Text of the Recommendation adopted by Commercial Action Committee

Content

1. GENERAL

It is expected that ISDN terminals will differ greatly, ranging from simple single service terminals to complex multi-service terminals.

A terminal can be seen as the gateway between the user and a service. A number of services will be provided by or through the network. If the gateway for these services is too narrow (if it is hard to handle services for the users), it will affect the use of the network services. Thus it is important to influence the functionality and quality of terminals.

From a human factor point of view difficulties can arise in handling services on all kinds of different terminals. To avoid those problems attention is needed for consistency and

uniformity in user procedures, i.e. the handling of calls and controlling supplementary services. Consistency and uniformity means that user procedures have similar elements and it is possible to use them in the same order. These elements should be easily recognizable to a user, thus allowing a user to use telecommunication services on all kinds of telecommunication equipments without previous training period.

Especially the different capabilities of the simple and the more complex terminal could cause other approaches in handling calls and services. Therefore it is necessary to develop a concept of handling calls and services that is applicable on both simple and complex terminals to avoid problems in understanding user procedures on different terminals.

It is not the intention to lay down rules for the construction of telecommunication terminals, as this is seen as the domain of manufacturers. But to provide guidelines that, when applicated, will result in a general approach to handling calls and services. These guidelines should be independent of a particular implementation.

Another matter of interest that is related with the above is the minimum set of functions that should be incorporated in a simple ISDN terminal.

In the ISDN a number of services will be available for the user. To make the use of these services easy and thus resulting in a higher and more efficient use of those services, the most simple terminal should have additional functions to those required by the basic service.

With these additional functions the minimum ISDN terminal should fit in the general approach mentioned above.

2. SCOPE

This document describes an approach, in the form of functions, for the handling of calls and the control of services on an ISDN terminal.

The functions are described as seen by the user, the exact location of those functions is not defined (terminal, network or else).

The approach is applicable on both voice and non-voice services (if "call" is used it means non-voice communication as well).

The concepts expressed in the introduction support, in general terms, the ergonomic concept which is considered as an important factor in terminal equipment harmonization.

Manufactures wishing their terminals to conform to a uniform method of controlling services should follow the principles within this Recommendation. It is not the intention that this Recommendation should be used as a basic of an approval specification for the connection of terminals to the network.

3. TERMINAL ELEMENTS

It is possible to distinguish two levels of terminal elements: a low level called *Physical Modules* and a high level called *Control Functions*.

Physical Modules

Physical Modules are tangible or visible parts that together form a telecommunication terminal.

Examples: numeric keypad, function keys, display, handset, etc.

Control Functions

Control Functions are functions that perform actions with the use of Physical Modules. Control Functions do not have a fixed relation with particular Physical Modules.

Example: "address selection"

1. a numeric keypad can be used to select an address;
2. to select an address from a list shown on a screen without using the keypad.

4. SUPPORT OF SERVICES

For the specification of services it is necessary to consider the functions that are available on the terminal.

As mentioned in the introduction this set of functions is not a restriction for the use of any kind of Physical Module by the manufactures.

This set of functions should support:
- call control (basic and switching orders),
- supplementary service procedures such as:
  - registration
  - erasure
  - activation
  - deactivation
  - invocation
  - interrogation

5. RECOMMENDATION OF CONTROL FUNCTIONS

Used terminology:

Active call

An active call is the call the user can control and interchange information with (send and/or receive). The number of calls that can be active at the same time depends on the nature of the calls and the type of terminal.

Inactive call

An inactive call is a call that is set on hold in the network or in the terminal (second B-channel).

Service procedure

A service procedure is one of the interactions between user and service (registration, erasure, activation, deactivation, invocation, interrogation).

Service element

A service element is a function that can be invoked within a service (e.g. alternate, add, split, isolate, reattach in three party service and add-on conference).

An ISDN terminal, single service or multi-service, with capability to access supplementary services, should have at least the following Control Functions, which can be grouped as indicated below:

a) *Call control functions*
   - START
   - STOP
   - ACCEPT
   - SERVICE
   - CONTROL

b) Input/Output functions
   - SELECT
   - EDIT
   - INDICATION

c) *Other functions*
   - DO
   - REJECT
   - INFO

These functions can operate independently or can be used in conjunction with each other. In the descriptions some examples of the latter situation are stated for every function.

It is also acceptable for the functions to be controlled automatically by terminals or the network, thereby removing the necessity for users to individually request each function required by the control procedure.

Descriptions of the functions:

START

This function initiates a call set-up procedure.

START can be used in combination with other functions, e.g. with SELECT and DO.

This function can be implemented in various ways. One way to realize this function is a function key "start". Pressing this key will invoke the function.

Other ways are for instance:

- Opening a window, representing a communication service, on the screen of a mouse-controlled system.
- Lifting the handset for starting a telephone call.

STOP

This function terminates the current active call.
If there are more calls active at a time, the user should indicate which call should be terminated.
The user should get an indication if there are still inactive calls.
STOP can be used in combination with other functions, e.g. with SELECT (if there are more active calls). This function can be implemented in various ways. One way to realize this function is a function key "stop". Pressing this key will invoke the function.
Other ways are for instance:
- Selecting a "stop" mark on a window that represents an active call.
- Replacing handset.

ACCEPT

This function provides acceptation of an incoming call. The incoming call is made active. ACCEPT is used alone or in combination with SELECT if there are more incoming calls. This function can be implemented in various ways. One way to realize this function a function key "accept".
Pressing this key will invoke the function.
Other ways are for instance:
- Selecting an "accept" mark on a window that represent an incoming call.
- Selecting this function from a menu.

SERVICE

This function initiates a supplementary service procedure.
SERVICE can be used in combination with other functions, e.g. SELECT, REJECT, DO and INFO.
This function can be implemented in various ways. One way to realize this function is a function key "service".
Pressing this key will invoke the function.
Other ways are for instance:
- Activating a supplementary service window in a mouse-controlled system.
- Selecting the function from a menu.

CONTROL

This function initiates invocation of a service element within a supplementary service or within the terminal.
CONTROL can be used in combination with other functions, e.g. SELECT and DO.
This function can be implemented in various ways. e.g.:
- Pressing a function key "control".
- Pressing a function key "alternate", "add", etc., thus combining also the SELECT and DO functions in it.

SELECT

This function provides a selection mechanism that can be used to select an address, a teleservice, a supplementary service, a service element or possibly other matters.
The function can be used either for direct input (e.g. typing in a telephone number) or as a selection means, giving the possibility to select an item displayed with an indication function.
SELECT can be used in combination with other functions, e.g. DO, REJECT, START, STOP, etc.
This function can be implemented in various ways. One way realize this function is to use function keys for the items that can be selected.
Other ways are for instance:
- Presentation of a menu, from which an item can be selected with a numeric key.
- Direct input of the item (inputting the address via a dial, keypad or keyboard).
- By typing a mnemonic which is converted into a "dial address" in an internal database.

EDIT

This function provides the possibility to modify information previously input to and stored by the terminal.
This function can be implemented in various ways. One way to realize this function is a function key "correction". Pressing this key will invoke the function (e.g. delete the last digit).
Other ways are for instance:
- Extensive edition facilities with cursor control, etc.

INDICATION

This function provides the user with visible and/or audible information.
The information can be:
- Feedback of typing.
- Information for use with the select function.
- Status information.
- Information from the network.
- Information from the other party.

This function can be implemented in various ways. Examples are:
- A message on a screen giving information about an incoming call.
- Pictograms on a graphic screen representing the state of a call.
- A means capable of giving verbal messages.

DO

This function provides the effectuation of a command or the effectuation of the action that is shown by means of an indication function.
DO can be used in combination with other functions, e.g. SELECT and INDICATION.
This function can be implemented in various ways. One way to realize this function is a function key "do".
Pressing this key will invoke the function.
Other ways are for instance:
- Pressing a mouse button after having selected an item on a screen.
- Typing "do" as a direct command.

REJECT

This function provides the release of the result of a command given before or the rejection of the action that is shown at an indication function.
REJECT can be used in combination with other functions, e.g. SELECT and INDICATION.
This function can be implemented in various ways. One way to realize this function is a function key "reject".
Pressing this key will invoke the function.
Other ways are for instance:
- Select a "reject" mark on a window representing an action or command.
- Select the function from a menu.

INFO

This function provides the possibility to get information about status and data in relation with a particular service or all services.
INFO can be used in combination with other functions, e.g. SERVICE and SELECT.
Information that is provided depends on the used combination.
This function can be implemented in various ways. One way to realize this function is a function key "info".
Pressing this key will invoke the function.
Other ways are for instance:
- Select an "info" item from a menu.
- Typing the word "info" followed by some parameters as a direct command.

6. EXAMPLES OF CONTROL PROCEDURES

Listed below are examples uses of the defined functions. The list is not exhaustive and other procedures not detailed are acceptable.

1. Call set up

Procedure:

START:	Function key "start"
SELECT:	Number via numeric keypad
DO:	Function key "do"
INDICATION:	Message on LCD (result)

2. Call acceptance

Procedure:

INDICATION:	Alerting signal and message on LCD
ACCEPT:	Function key "accept"
INDICATION:	Message on LCD (result)

3. More calls

Procedure:

START:	Function key "start"
SELECT:	Number
DO:	Function key "do"
INDICATION:	Message on LCD (connection)
	[one call active (A)]
START:	Function key "start"
	[one call inactive (A)]
SELECT:	Number
DO:	Function key "do"
INDICATION:	Message on LCD (connection)
	[one call active (B), one call inactive (A)]
CONTROL:	Function key "control"
	[one call active (A), one call inactive (B)]
STOP:	Function key "stop"
	[one call inactive (B)]
INDICATION:	Message on LCD (inactive connection)
CONTROL:	Function key "control"
	[one call active (B)]
STOP:	Function key "stop"

4. Registration

Procedure:

SERVICE:	Function key "service"
SELECT:	Indication of possible services on a display, select the service by typing a digit
SELECT:	Indication of possible service data on a display, select the data by typing "to be registered"
DO:	Function key "do" (effectuation of the registration)

5. **Erasure and/or Deactivation**

Procedure:

SERVICE:	Function key "service"
SELECT:	Indication of possible services on a display, select the service by typing a digit
REJECT:	Function key "reject" (effectuation of erasure"

6. **Activation**

Procedure:

SERVICE:	Function key "service"
SELECT:	Indication of possible services on a display, select the service by typing a digit
DO:	Function key "do" (effectuation of activation)

7. **Rejection of an incoming call**
(e.g. when Call Waiting S. Service is activated)

Procedure:

INDICATION:	Alerting signal and message on LCD
REJECT:	Function key "reject"

8. **Interrogation**

Procedure 1:

INFO:	Function key "info"
INDICATION:	Status of the current call(s) on display

Procedure 2:

SERVICE:	Function key "service"
INFO:	Function key "info"
INDICATION:	Status information on all (active) services

Procedure 3:

SERVICE:	Function key "service"
SELECT:	Indication of possible services on a display, select the service by typing a digit
INFO:	Function key "info"
INDICATION:	Information on a particular service

9. **Invocation of service element**

Procedure:

	[Conference call active]
SERVICE:	Function key "service"
SELECT:	Indication of possible service elements on a display, select the function by typing a digit
DO:	Function key "do"