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TELEPHONE SERVICE, SERVICE OPERATION AND  
HUMAN FACTORS

Operation of the international service

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**List of possible supplementary telephone  
services which may be offered to subscribers**

ITU-T E.300-series Recommendations – Supplement 1

(Formerly CCITT Recommendations)

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## **Supplement 1 to ITU-T E.300-series Recommendations**

### **List of possible supplementary telephone services which may be offered to subscribers**

#### **Summary**

This supplement lists the different supplementary services that were foreseen in 1988 for ISDN networks.

#### **Source**

Supplement 1 was approved in Melbourne (1988) and originally published in Blue Book, Fascicle II.2.

## FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSC Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

## NOTE

In this publication, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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## List of possible supplementary telephone services which may be offered to subscribers

The descriptions given here are considered provisional and require further study.

Numbers in parentheses following the designation of most services refer to the CEPT handbook [1] where detailed operational requirements are given.

### 1 Supplementary services which might have implications for the international service

§§ 1.1 to 1.11 refer to services which might be standardized and which do not require technical studies.

#### 1.1 absent subscriber service (4.1)

*F: service des abonnés absents*

*S: servicio de abonado ausente*

##### 1) Definition

The possibility for a subscriber who cannot answer his calls, because he is absent, to divert these calls to:

- a manual answering service,
- another subscriber's number or
- an announcement.

##### 2) Description

A subscriber who knows he will be absent from his telephone can instruct the exchange to divert his incoming calls to:

- a manual answering service,
- another subscriber's number or
- an announcement giving appropriate information.

Some forms of the service are available to subscribers without a preliminary agreement with the Administration, but other forms require such an agreement. An indication that the service is in operation should be given to the diverting subscriber. Outgoing calls are available normally.

##### 3) Remarks

CCITT should undertake studies on:

- indications given to calling and called subscriber;
- additional charges if any when diverting the call to a distant number.

##### 4) Market data

Generally considered of medium interest. Terminating equipment providing diversion to announcements in widespread use in some countries.

##### 5) General operational requirements

If diverting a call lengthens the post-dialling delay experienced by a caller, it may be necessary to advise the caller that his call is being diverted.

If diverting a call would result in the caller having to pay additional charges, a warning should be given to the caller before the call is diverted.

To minimize complaints from called subscribers and callers for wrongly programmed call transfers, some check should be provided.

Difficulties may arise if a subscriber receiving diverted calls diverts them again to yet another number.

Some subscribers may, instead of using an absent subscriber service, use answering machines on their own premises. Some Administrations may also decide to provide such facilities at the exchange. The degree of sophistication provided may vary considerably. Some may only give a fixed announcement common to all customers using the service, others may allow messages to be recorded. Which type is used and to what extent may vary from one country to another according to the technological or social situation.

A large majority of customers will accept a reply by a recorded announcement as a satisfactory alternative to an operator.

Certain categories of subscribers (e.g. doctors) have special requirements and prefer a service especially adapted to their professional field. This may be a manual answering service provided by the Administration, or by a private agency or special arrangements for diversion to other numbers.

Calls should only be diverted if the resulting standards of transmission are adequate.

When the service is activated the special dial tone may be given to the controlling subscriber.

#### 6) *Charging principles*

### 1.2 **do not disturb service (5.1)**

*F: service "ne pas déranger"*

*S: servicio "no molestar"*

#### 1) *Definition*

The possibility for a subscriber, who does not wish to answer his telephone during a period of time, to divert incoming calls.

#### 2) *Description*

Do not disturb services are used by subscribers that do not wish to be disturbed by incoming calls for a certain period of time. They can request that incoming calls are diverted to an operator, an answering machine in the exchange, or another telephone number.

The diversion can be switched on and off by an operator (manual) or by the subscriber himself (automatic).

#### 3) *Remarks*

#### 4) *Market data*

A little market information is available but it is considered to be of medium interest only. Nevertheless this is a service which should be available to customers.

#### 5) *General operational requirements*

It is in the interest of the Administration if calling subscribers can leave messages and be informed:

- of the reason for call diversion
- when the number can be reached again
- where more information can be obtained.

In this way incoming calls are answered and can be charged and ineffective new attempts are avoided.

Automatic deactivation is desirable because no indication is given to the called subscriber when incoming calls arrive.

Administrations should provide an attractive form of do not disturb service in order to avoid undesirable subscriber forms of the service.

The time during which a do not disturb service can be activated should be limited.

The automatic forms of the service are preferred.

Outgoing calls should normally be possible.

When the service is activated a special dial tone may be given for outgoing calls reminding the service holder of the special condition of his line.

If during a period when the facility is in operation, the renter requires to know whether a message has been left, a special code may be allocated for this purpose, or a password agreed with the exchange may be used.

6) *Charging principles*

Charging principles should be in accordance with Recommendation E.232.

1.3 **diversion if number busy service (6.3)**

*F: service de transfert d'appel en cas de numéro occupé*

*S: servicio de transferencia de llamadas en caso de línea ocupada (transferencia por ocupación)*

1) *Definition*

The possibility for a subscriber who cannot receive calls, because his number is busy, to have these calls diverted.

2) *Description*

A subscriber who does not wish incoming calls to his number to be unsuccessful because he is busy speaking, can instruct the exchange to immediately divert his incoming calls to either a manual answering service, or another subscriber's number.

Some forms of service are available to subscribers without prearrangement with the Administration but other forms require prearrangement. The other subscriber's number may be one number, one number of a predetermined group or the first available number in a sequence.

3) *Remarks*

CCITT should undertake studies on:

- indication given to calling and called subscriber;
- additional charges, if any, when diversion is to a distant subscriber number.

4) *Market data*

5) *General operational requirements*

As services permit the completion of calls which would otherwise have met busy conditions, increased revenue and a better use of the available equipment may result.

Services may be of value for a subscriber whose line or lines are occasionally overloaded.

In conventional switching systems it is not possible to change the routing of a call in the switching network itself. It is therefore necessary in those circumstances to divert it from the diverting number. If limitations of transmission or charging justify it, it may be necessary to refuse a diversion request to a nominated number too far from the diverting exchange, and possibly divert the call to the operator, or a recorded announcement.

While a service is activated under subscriber's control it may be desirable to return a warning indication to the diverting termination.

The number to which the incoming call is diverted need not belong to the controlling subscriber.

It may be necessary to advise the caller that his call is being diverted if the post-dialling delay is lengthened by diversion.

From the Administration's point of view use of a service should not be allowed to perpetuate the unsatisfactory situation where a subscriber has basically an inadequate incoming traffic capacity.

An appropriate indication should be returned to the caller if diversion causes call charges greater than those that would have applied if the call had been connected normally to the diverting number.

6) *Charging principles*

#### 1.4 **customer dialled operator assisted call**

*F: communication établie par l'abonné et assistée par une opératrice*

*S: asistencia de operadora en comunicaciones establecidas por el abonado*

##### 1) *Definition*

With prior indication from a subscriber, an operator may be associated with an automatically dialled call at the appropriate stage to determine if the wanted person is available.

The subscriber gives this indication as part of his call set-up procedure

Implementation requires special equipment in the long-distance switching equipment and associated operator positions.

##### 2) *Description*

##### 3) *Remarks*

##### 4) *Market data*

Of low interest to customers. However, some Administrations are introducing this service to increase operator productivity.

##### 5) *General operational requirements*

##### 6) *Charging principles*

#### 1.5 **freephone service (7.5)**

*F: service "libre-appel"*

*S: servicio de cobro revertido automático*

##### 1) *Definition*

A subscriber can be allocated a special (freephone) number and the charge for all calls to this number are paid by him instead of by the callers.

##### 2) *Description*

Subscribers who wish to pay for calls made to them can rent a special freephone number. Calls made to this freephone number are routed either to the subscriber's existing telephone number or on to access lines specifically provided for the purpose of receiving freephone calls.

##### 3) *Remarks*

A freephone service can be provided across international boundaries. CCITT recommendations regarding billing and accounting arrangements may be required.

Where an international freephone service is provided i.e. where callers in one country can, by dialling a freephone number in that country, gain access to a destination address (service provider) in another country, international requirements dictate that the called number must return an answer signal over the international network to the freephone network of the originating country.

Many networks are protected by a "time-out" where calls are cleared if the answer signal is not received within a pre-determined time. Depending on the arrangements by which freephone service is provided the "time-out" condition may need to be removed from the part of the network between the caller and the equipment offering the basic freephone facility in his country. Basic freephone facilities can be provided by a freephone exchange or network of exchanges to provide freephone number translation and call routing, absorption of answer billing/accounting information and network management statistics. These facilities may be provided as an integral part of modern digital networks.

Freephone subscribers may place particular value on numbers which are easy to remember. However, this may entail the allocation of hypothetical numbers and the provision of translation facilities which may only prove economic when sited at nodal centres.

##### 4) *Market data*

Already exists in some countries and is becoming increasingly popular.

5) *General operational requirements*

The freephone number format should be consistent with the national number format of the country. The freephone code should be standard for the whole of the country (e.g. 800 in USA) and where possible the same code should be used to provide national and international freephone service.

Network management arrangements should pay particular attention to the need to prevent congestion in the network, particularly in relation to applications involving response to television quiz games or advertising campaigns, etc.

Subscribers should be required to rent adequate access lines to meet demand and minimize ineffective attempts. The freephone service is liable to misuse and subscribers should be warned of this liability and expect to bear any resulting call charges. Regards should be made to the limitation of payphones in the various systems.

6) *Charging principles*

6.1) National charging arrangements will depend on the limitations of the arrangements used to provide the freephone facilities. A single freephone centre may for example use path of entry to determine the area from which the call originated and charge accordingly.

A freephone network may determine charging on the basis of distance between the node at which the freephone call enters the network and the node in which the freephone service is connected. There are other alternatives.

6.2) International charging arrangements require a method of billing a service provider in another country and may also require special accounting arrangements. There are 3 basic methods:

- a) The originating Administration provides the destination Administration with the billing information relating to freephone calls to service providers in the destination country. The destination Administration would then bill the service provider for call charges and account the calls as if they were originated in the destination country, (a procedure similar to the billing and accounting of collect calls). A special accounting rate might be required to reimburse the country of origin for the cost of providing the freephone facility.
- b) The originating Administration would require the service provider in the destination country to provide a legal representative in the country of origin to which the bill for call charges could be sent. The calls would be accounted as ordinary outgoing çinternational direct dialling (IDD) calls.
- c) The originating Administration would send the bill directly to the service provider's address in the destination country. The calls will be accounted as ordinary IDD calls.

1.6 **wide area telephone service (7.6)**

*F: service téléphonique à l'intérieur d'une zone déterminée*

*S: servicio telefónico concertado en grandes zonas*

1) *Definition*

For a flat rate charge, a subscriber may make an unlimited number of calls within a prescribed area from a particular telephone termination without the registration of call charges.

2) *Description*

3) *Remarks*

4) *Market data*

Already exists and very popular in some countries. Appears to be of interest also in other countries.

5) *General operational requirements*

6) *Charging principles*

1.7 **automatic transferred debiting of charges (7.4)**

*F: service de transfert automatique d'imputation de taxes*

*S: servicio de transferencia automática de las tasas imputadas*

1) *Definition*

The automatic debiting to a subscriber's account of charges for calls made from any telephone by persons nominated by that subscriber and identified by the use of a secret code

This is similar to the existing credit card service but does not involve an operator. It must be provided for throughout a network.

2) *Description*

3) *Remarks*

For international use there would have to be a study of changes to operating and accounting procedures for manual credit card service.

4) *Market data*

5) *General operational requirements*

6) *Charging principles*

1.8 **radio paging (10.3)**

*F: service radioélectrique d'appel unidirectionnel*

*S: servicio móvil de aviso a personas (servicio de radiobúsqueda)*

1) *Definition*

The service provides the subscriber with the facility, by means of portable equipment used in a given area, to receive an alert by radio initiated by any telephone in a public network.

The alert can be accompanied by a spoken message or visual coded display either entered by the caller or generated within the network.

2) *Description*

The mobile receiving equipment of a pocket sized nature has a unique identity enabling it to be selectively called using a common radio channel.

An alert is initiated by a telephone on a public network using a direct dialling number, with or without the requirement to pass additional code digits on completion of the call through the public network. Alerts can be made to one or more receivers using a single number and restricted to predetermined geographical zones in agreement with the renter.

Additional alerts with distinctive tones can be incorporated in a single receiver but individually activated by separate calling numbers.

3) *Remarks*

Under study in Study Group II

CCIR standardized in 1982 a uni-directional signalling system radio-paging code No. 1 to use on the radio channels for alerting receivers and providing text messages.

CCITT should undertake studies on international access to national radio-paging services with particular attention to the indication given to the caller.

4) *Market data*

Already exists in some countries and is becoming increasingly popular.

5) *General operational requirements*

The service should provide access to a radiopager using a normal telephone number and advise the caller that the pager is being automatically called. In the case of a manual service the caller should be advised that the pager will be called and the appropriate voice message or coded display transmitted.

6) *Charging principles*

When used internationally the caller should be charged in accordance with international direct dialling (IDD) service and standard called subscriber answered conditions returned. The subscriber may be charged for having the service. This special charge may be fixed nationally.

1.9 **direct dialling-in** (12.1)

*F: sélection directe d'un poste supplémentaire*

*S: marcación directa de extensiones*

1) *Definition*

Calls can be dialled from a telephone line connected to the public network directly to extensions in a PABX.

2) *Description*

Direct Dialling-In (DDI) can be realized when the last digits in the directory number of a PABX correspond to the number series of the extensions within the PABX. These last digits are sent from the exchange to the PABX, which automatically establishes a connection to the extension without assistance of the PABX operator.

3) *Remarks*

The dialled number must not exceed the number of digits of international numbers (Recommendation E.163).

4) *Market data*

Already exists in many countries.

5) *General operational requirements*

A call to a number in the DDI numbering range shall be routed to the appropriate extension at the PABX.

Trunk offering may be required via the DDI route from an operator of the public telephone network to a busy extension line, irrespective of whether the extension line is busy with a call in the PABX or with an external call to or from the public telephone network. The call from the operator of the public telephone network is then to be routed to an appropriate PABX operator or extension.

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

Calls to numbers outside a DDI numbering plan within the public exchange and calls to unassigned numbers within an exchange DDI numbering range may immediately be re-routed according to normal public exchange interception rules.

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

6) *Charging principles*

*Note* – Numbers 1.10 to 1.20 (below) refer to services which might be standardized but require further studies in CCITT Study Groups before being handled in Study Group II.

1.10 **incoming call barring** (3.2)

*F: service de limitation des appels d'arrivée*

*S: servicio de prohibición de llamadas entrantes*

1) *Definition*

The ability of the Administration or the subscriber to prevent all or certain incoming calls to a telephone line.

No variants identified so far.

2) *Description*

3) *Remarks*

This service can cause multiple repeat attempts and/or unnecessary use of operator services.

CCITT should undertake studies on:

- indications given to the calling subscriber;
- interworking between this service and the absent subscriber service and do not disturb service;
- interexchange signalling if only calls from certain numbers should be barred.

4) *Market data*

5) *General operational requirements*

6) *Charging principles*

#### 1.11 **registration of incoming calls (4.2)**

*F: service d'enregistrement de communications d'arrivée*

*S: servicio de registro de llamadas entrantes*

1) *Definition*

The registration of details of all incoming calls to a particular telephone line (e.g. caller's number, time ringing commences, time of answer or time of abandonment, time of release, but excluding the recording of speech).

2) *Description*

3) *Remarks*

CCITT should undertake studies on interexchange signalling allowing sending of different kinds of information.

4) *Market data*

5) *General operational requirements*

Subject to national law and regulations concerning secrecy in telecommunications the service could be provided when required by connection of a device in the exchange to the subscriber's line or by program instruction.

This service could be useful to subscribers (e.g. emergency services) who may require detailed information of incoming calls.

Provision of the service could possibly act as a deterrent to malicious or nuisance callers.

6) *Charging principles*

#### 1.12 **completion of calls to busy subscribers service (6.1)**

*F: service d'aboutissement d'appels adressés à des abonnés occupés*

*S: servicio de compleción de llamadas a abonado ocupado*

1) *Definition*

The possibility for a subscriber who reaches a busy number to have the call completed when the line becomes free without generating a second call or waiting on the line.

2) *Description*

The subscriber who has found the called party busy can activate the service during or after the call and wait for establishment of the connection.

When the service is activated, the line of the called party is tested. When this line becomes free the calling party is rung and when he answers the called party is rung. The time during which the line of the called party is tested is limited. If the calling party is found busy the service is deactivated.

The service may be manual, semiautomatic or automatic.

3) *Remarks*

Applications in PBXs and local public exchanges are suitable but, for long-distance and international use, if the service is controlled only from the originating exchange, it may cause difficulties, such as:

- long holding times;
- multiple automatic reattempts.

CCITT should undertake studies on interexchange signalling to overcome the disadvantages mentioned.

4) *Market data*

5) *General operational requirements*

According to the manner of realization of the services, consideration should be given to:

- the length of the time during which the system attempts to set up a call,
- the frequency of the attempts to complete a call in order to avoid congesting the network unnecessarily,
- the recall sequence to ensure that the calling subscriber has answered the recall before the called subscriber is rung.

Special measures may be necessary to ensure that the operation of the service does not interfere with normal outgoing and incoming service on both lines.

Special consideration should be given to the requirements when one or both subscribers are involved in diversion arrangements.

Special consideration should be given to the provision of the services to special categories of subscriber lines, e.g. payphones, PBX lines with DDI, etc.

It appears more convenient to adopt a realization of the service based on a continuous check of the called subscriber's state in order to set up the connection as soon as possible (called party free). This realization is only feasible for subscribers belonging to the same exchange or different exchanges of an SPC type and connected by advanced signalling systems. This condition is not, at present, the general case.

Though provision of the service is likely to be advantageous both from the Administration and the subscriber's point of view, the numerous operational and technical problems associated with the automatic services will make them very difficult to provide in the near future.

When the service is activated the line of the called party is continuously tested. When this line becomes free the calling party is rung and when he answers the called party is rung.

It may be necessary to advise the calling party which call completion is being offered (if, for example, the service has been activated on more than one call).

The number of call completions activated at the same time to the line of a called busy party may be limited, e.g. to one.

6) *Charging principles*

1.13 **automatic transferred charge call (7.9)**

*F: service d'appel avec transfert automatique de taxe*

*S: servicio de transferencia automática de la tasa de la comunicación*

1) *Definition*

With prior indication and mutual agreement between the two parties, the automatic debiting to a called subscriber's account of relevant charges for a call made to his telephone number.

No variants have been identified so far.

2) *Description*

3) *Remarks*

CCITT should undertake studies on:

- how the service is established;
- agreement procedures between the calling and the called party (additional interexchange signalling may be required).

- 4) *Market data*
- 5) *General operational requirements*
- 6) *Charging principles*

#### 1.14 **remote call forwarding (7.11)**

*F: service de réacheminement des appels*

*S: servicio de teletransferencia de llamadas*

##### 1) *Definition*

The possibility for a subscriber to obtain a telephone number in another area and have all calls to that number automatically forwarded at his cost to a telephone number in his premises.

##### 2) *Description*

A subscriber who wants to receive calls at his premises at low cost for callers in a certain (distant) area can be allocated a telephone number in that area. All calls received by the allocated number are automatically forwarded through the public switched network to a telephone number at the subscriber's premises. The allocated number can be a telephone number in another country and the service will only be available on pre-arrangement with the Administration concerned.

##### 3) *Remarks*

##### 4) *Market data*

##### 5) *General operational requirements*

The provision of the service requires an arrangement between the subscriber and the Administration concerned.

Forwarded calls are treated as normal incoming calls. The calling subscriber may be informed by a recorded announcement that his call will be forwarded without extra cost.

In the case of international use, any promotional activities aimed at customers abroad should be coordinated among Administrations concerned to avoid problems.

Forwarding should be possible to any telephone number except payphones subject to compatibility limitation. Due regard must be given to transmission limitations. It may not be suitable for data transmission.

Sufficient remote call forwarding (RCF) features and facilities are necessary so as not to interfere with or impair any services offered by the telephone company. Call forwarding should not be offered again at the terminating telephone.

The allocated telephone number may appear in its local directory listing associated with the name and address of the terminating location.

##### 6) *Charging principles*

The caller is charged for the call to the allocated number only; the charge related to the forwarded part of the call is applied to the subscriber having the service.

- As the service is only available on pre-arrangement with the Administration, a service provision charge and a recurring rental charge may be applied.
- The charge may be related to the number of lines provided with the service.

#### 1.15 **three party services (11.1)**

*F: service comportant un troisième correspondant*

*S: servicio tripartito*

##### 1) *Definition*

The possibility for a busy subscriber to hold the existing call and make a call to a third party. The following arrangements may then be possible: the ability to switch between the two calls, the introduction of a common speech path between the three parties and the connection of the other two parties.

## 2) *Description*

These services will permit a subscriber to place an existing call into a suspended state and make a call to a third party. When the third party answers, the subscriber may then make use of the following options, as available, in any appropriate order:

- switch from one call to the other as required, secrecy being provided between the two calls;
- introduce a common (three-way) speech path;
- connect the other two parties together.

## 3) *Remarks*

CCITT should undertake study on:

- transmission limitations;
- charging and accounting when the other two parties enter into communication.

## 4) *Market data*

Widely used in some countries by business subscribers.

## 5) *General operational requirements*

With this service the subscriber may be involved in two simultaneous outgoing calls and it will be necessary to provide the ability to register charges accurately under these conditions.

Difficulties may be experienced in recording charges for this service on a meter situated at the subscriber's premises.

If the other parties to a three party service call also have this service available it is possible for subscribers to establish a complex chain of interconnections. It may be necessary to prevent or limit such interconnections.

The hold-for-enquiry mode in its simple form would permit a busy subscriber to make an enquiry call, then release it and return to the original call. However, having the ability to retain both calls, and switch from one to the other as required, will increase considerably the usefulness of this service. Another feature which might prove useful would enable the user to retain the enquiry call but release the original call, i.e. to specify which of the two calls should be released.

It is desirable that the subscribers should be able to revert from three way conversation to the normal "single call" state and subsequently use the three party service again.

All three party services require the register recall feature.

### *Hold for enquiry*

An enquiry call may be made to any subscriber's number, provided such a call is not inhibited by another service.

If Subscriber A should clear whilst either the original call or the enquiry call is in the suspended call path state, calling conditions shall be applied to Subscriber A's terminal. On answer the call shall proceed as if Subscriber A had released the other call and switched to the held call. If Subscriber A does not answer within a specified period the held subscriber shall be advised that Subscriber A has cleared.

### *Three-way conversation*

When Subscriber A is connected by a speech path to Subscriber B or C, the other connection being held, it shall be possible for Subscriber A to establish a 3-way conversation and subsequently revert to the enquiry mode. The options in hold for enquiry shall then be available.

If Subscriber A should clear during a 3-way conversation, then the call paths shall be released. If Subscriber B or C should clear, the connection between A and the other subscriber should revert to that appropriate for a normal call.

### *Transfer of an established call*

When the hold-for-enquiry option only is being employed, it shall be possible for Subscriber A to signal that the transfer of the held call to the subscriber to which he is connected by a call path is required.

Following the procedure described, the elected subscriber only shall receive a recorded announcement informing him that he has been nominated to pay call charges for the transferred call and advising him on the signal to give if he agrees to pay call charges. If he does not agree he should clear. If he agrees, a call path shall be established between B and C, the charges for this call being debited to whichever of these is the elected subscriber, and Subscriber A shall be released.

If a clear condition from the elected subscriber is detected the connections between A, B and C shall be released.

6) *Charging principles*

The subscriber originating a call, whether an original or enquiry call, shall incur the normal charges for that call.

Periods when a subscriber is in the suspended call path state shall be considered as chargeable time.

It shall be possible to impose, in addition to normal call charges as described, a fixed fee debited to Subscriber A on selection of any one of the three options available. The fee shall be determined by:

- i) the option selected;
- ii) any previous option selected.

In addition to the call fixed fee charges, it should be possible to impose on Subscriber A a periodic charge while hold-for-enquiry or 3-party connection options are in use. It shall be possible to apply different periodic charges to each of these options.

When a call is released, charging for that call shall cease.

Following the call transfer, charges shall be levied against the paying subscriber at the rate applicable to a call set up normally between the 2 subscribers.

1.16 **conference call services (11.2)**

*F: service de communication conférence*

*S: servicio de comunicación pluripartita (o de conferencia múltiple)*

1) *Definition*

The service provides the possibility to connect a number of specified subscribers on the same telephone call.

2) *Description*

These services enable a subscriber to establish connections simultaneously with more than one subscriber using a common speech path. The calls may be set up by an operator, or the information for setting up the call may be registered by the Administration, but leaving it to the subscriber either to activate the call or to control it completely. Where the services are fully subscriber controlled, the calls can be set up simultaneously or sequentially.

Conference calls are normally of two types:

- bidirectional calls in which each participant can listen and speak whenever he wishes to intervene in the conversation;
- unidirectional calls in which only one of the participants can speak, the other participants being able only to listen.

However, a conference call may consist of a combination of both types of call defined above.

3) *Remarks*

4) *Market data*

5) *General operational requirements*

There seems to be a need in future switching systems for an automatic service which does not require operator assistance in setting up conference calls. Any such automatic service should provide security facilities to prevent unauthorized access.

The number of participants may be limited for operation and/or transmission or other technical reasons.

There may be a certain demand for connection and disconnection of participants during a conference call in progress.

The customer is used to certain conveniences offered by operator connected conference calls. Control procedures in automatic service should therefore be both clear and simple.

6) *Charging principles*

(See Recommendations E.151 and D.110.)

1.17 **calling number indication** (14.3)

*F: service d'indication du numéro du demandeur*

*S: servicio de indicación del número del abonado que llama*

1) *Definition*

A service whereby the calling subscriber's number can be identified by means of a visual or verbal indication at the called terminal.

No variants have been identified so far.

2) *Description*

3) *Remarks*

The service could cause ineffective use of the network (repeat attempts or long holding times) should the called subscriber refuse to answer the call because he is informed of the calling subscriber's number.

The service requires extended interexchange and local network signalling to enable transmission of the calling subscriber's number.

4) *Market data*

1.18 **subscriber's alpha-numerical display** (14.4)

*F: service d'affichage alphanumérique de renseignements relatifs aux abonnés*

*S: servicio de visualización alfanumérica en el aparato telefónico*

1) *Definition*

The visual display at a subscriber's telephone terminal of information sent to or received from the public telephone network. This display comprises outgoing and/or incoming information.

No variants have been identified so far.

2) *Description*

3) *Remarks*

Applications regarding outgoing information are suitable.

Regarding incoming information, the same problem applies for this service as for the calling number indication service.

There may also be a need to indicate the calling subscriber's name.

4) *Market data*

1.19 **private number ringing signal**

*F: service de signal d'appel d'un numéro particulier*

*S: servicio de señal de llamada individualizada*

1) *Definition*

Each member of a family is given different identification (ID) codes. If the calling party wants a particular member he dials the ID code related to that member. The called member can know he is wanted by a particular kind of ringing signal.

2) *Description*

3) *Remarks*

Requires extended interexchange and possibly local network signalling.

4) *Market data*

1.20 **voice mailbox service (VMS)**

*F: service de boîte aux lettres téléphonique*

*S: servicio de buzón telefónico*

1) *Definition*

(Under study.)

2) *General Description*

Recent advances in technology have allowed the voice mailbox to evolve and market research has indicated a potential for this type of service.

The renter of a mailbox (subscriber) is provided with a mailbox telephone number which he can publicize to customers, clients, business associates, friends, etc.

Callers are answered by a personalized announcement which can either invite the caller to leave a message or impart information.

As an optional feature of VMS, the mailbox may be programmed to alert a radiopager each time a message is left in the mailbox or to call certain telephone numbers and deliver messages.

The subscriber may retrieve his messages either from a push button phone by dialling the same number as callers and then entering a security code and system command or, by dialling an alternative number (known only to him) from a rotary dial phone.

Retrieval from push button phones allows sophisticated control of message playback and mailbox facilities, e.g. repeat message, retain message, switch pager on/off, switch recording service on/off, change personalized announcement, etc. These facilities can be provided from rotary dial phones if the subscriber has a hand-held tone generator. Otherwise retrieval from rotary dial phones may be limited to simple one-time playback of all messages in the mailbox.

Systems may allow tailoring of individual mailboxes to meet subscribers' needs regarding message length, number of messages stored at any one time, retention period, etc.

The number of simultaneous calls to a subscriber's mailbox is limited only by the capacity of the VMS equipment, e.g. a 32 port system could theoretically be handling 32 simultaneous calls to the same mailbox number.

3) *Remarks*

VMS offers the following benefits:

- elimination of successive reciprocal call attempts in order to establish a single communication;
- elimination of time-zone constraints;
- optional indication on a radiopager whenever a message is left;
- retrieval at the convenience of the subscriber;
- access to people on the move;
- 24-hour service;
- no need to talk to callers directly;
- messages heard in the caller's own voice.

4) *Market data*

Although services may initially have close ties with radiopaging, they are likely to rapidly evolve a separate identity and be sold on the strength of their own intrinsic benefits.

5) *General operational requirements*

(Under study.)

6) *Charging principles*

Initially subsets of a wide range of facilities may be contained in the service offerings at fixed periodic tariffs. The offerings may be elaborated in the light of customer reaction. The tariffs may be increased as additional facilities are opted for and usage sensitive billing may be introduced to account for variations in message length, message holding time, overcalls and computer resource usage.

## 2 **Supplementary services without implications for the international service**

### 2.1 **abbreviated dialling services (1.1)**

*F: service de numérotation abrégée*

*S: servicio de marcación abreviada*

1) *Definition*

The possibility for a subscriber to make a call by dialling a short code instead of the full telephone number.

2) *Description*

Subscribers may have certain telephone numbers stored by the telephone network and each of these numbers is given a corresponding abbreviated number. The stored numbers may be local, national and international. When a short code which includes the abbreviated number is dialled, it is converted by the network into the called subscriber's telephone number. The call is then processed as a normal telephone call. Abbreviated dialling may be available on demand or on a subscription basis. The number registration can be done either by the subscriber, or, on request, by the Administration.

3) *Remarks*

Although this service can be provided from the exchange, in many cases it can be provided by sophisticated subscriber terminals.

4) *Market data*

Many Administrations are planning to provide this service.

### 2.2 **alarm call services (2.1)**

*F: service du réveil*

*S: servicio de despertador*

1) *Definition*

The possibility for a user to cause an alarm call or calls to be made to his line at a time or times specified in advance by him, and to hear an appropriate announcement when the call is answered.

2) *Description*

The user can order the network to call his line at times specified by him; upon answer of the call the user will get an appropriate verbal announcement indicating the character of the call.

The alarm call service may be offered on a manual, semiautomatic or automatic basis.

To meet different subscriber needs the services may be offered on either an occasional or regular use basis, viz:

- The occasional alarm call service covers only the 24-hour period immediately following the time at which the call was booked. The subscriber, however, may have the possibility to order more than one alarm call to be made to his line within a 24-hour period.
- The regular alarm call service covers a number of 24-hour periods. The subscriber can order the alarm calls to be made either every day for a specified number of days, or on specified days of the calendar week for a specified number of weeks. The days of a calendar week may be chosen as consecutive days or according to an established order.

The services are available to subscribers without prearrangement with the Administration.

In principle, the manual and the semiautomatic forms of the service offer the same possibilities as the automatic versions. Unlike the automatic forms, however, the manual and the semiautomatic forms would require no special subscriber procedures to meet the subscriber needs in question.

3) *Remarks*

The service is wholly provided within the local exchange.

It is an automation of an existing manual service which has been available for many years.

4) *Market data*

2.3 **automatic booked call (2.2)**

*F: service de demande automatique d'une communication*

*S: servicio de llamadas automáticas prefijadas*

1) *Definition*

With prior information from a subscriber, a call may be made automatically from his telephone termination, to a particular number or service (excluding the alarm call service) at a specific date and time.

2) *Description*

3) *Remarks*

Service wholly provided within the local exchange. Will require special memory capacity.

4) *Market data*

2.4 **diary service (2.3)**

*F: service de rappel de date*

*S: servicio de agenda*

1) *Definition*

With prior indication from a subscriber, a call is made automatically to his telephone number at a specific date and time, and when an answer condition is detected a recorded message is connected to this telephone termination to remind him of a particular event, e.g. birthday of a relative. Two versions of the series are envisaged:

a) the recorded message is dictated by the subscriber in each case;

b) the recorded message is selected from a variety of pre-stored messages.

2) *Description*

3) *Remarks*

Wholly local exchange based; requires long-term storage of information.

4) *Market data*

2.5 **restriction in the outgoing direction service (3.1)**

*F: service de limitation des communications de départ*

*S: servicio de restricción de llamadas salientes*

1) *Definition*

The possibility for a subscriber to prevent all or certain outgoing calls and/or service control operations from his telephone line.

2) *Description*

These services are used by subscribers to prevent unauthorized use of their telephone lines. When the restriction is activated all calls or calls to certain destinations are blocked. Keys or keywords are required for deactivation. Incoming calls are received normally.

The restrictions can be either permanently applied to a line by the Administration on the request of the subscriber, or applied to a line by the subscriber without the assistance of the Administration.

In the case of subscriber control, the subscriber can either just switch the restriction on and off, or select the type of restriction when he activates the service.

3) *Remarks*

Purely local service. Could be provided as PBX features. Emergency calls may be excluded.

4) *Market data*

## 2.6 **PBX line hunting services (12.2)**

*F: service de recherche de ligne libre dans un commutateur privé*

*S: servicio de captura de línea (líneas de salto)*

1) *Definition*

The automatic selection of a free line from a group of lines serving a subscriber, on receipt of a call to that subscriber's general directory number.

2) *Description*

Line hunting may take the following two main forms:

- a) sequential search where the search for a free line always starts with the same line and then follows a fixed order;
- b) random search where the search for a free line does not start with the same line each time. This covers a range of search procedures, e.g.:
  - random start point and then fixed order;
  - start point is the last seized line plus one and then fixed order, etc.

The hunting procedures are only initiated when the general directory number (GDN) is called. One line in the group is directly associated with the GDN, the other individual lines in the group may also be allocated normal individual telephone numbers and when these other individual numbers are called, the calls are processed in the normal way, without hunting.

The subscriber may, under certain conditions, have the ability to reduce the number of lines forming the group or, alternatively, inhibit the automatic selection, or switch from random to sequential hunting.

3) *Remarks*

Purely local service.

4) *Market data*

Required by nearly all multi-number group users.

## 2.7 **subscriber call charge meter (7.1)**

*F: service d'indicateur de taxe au domicile de l'abonné*

*S: servicio de contadores de tasas en el domicilio del abonado*

1) *Definition*

Meters at the subscriber's premises showing call charge units debited.

2) *Description*

3) *Remarks*

Provided from local exchange.

4) *Market data*

A service used extensively

## 2.8 **automatic verbal announcement of charges applied service (7.2)**

*F: service d'indication automatique verbale des éléments de taxation*

*S: servicio de indicación automática verbal de la tasa de la comunicación*

### 1) *Definition*

The possibility for a user to request a verbal announcement of either total or individual call charges.

### 2) *Description*

A user may request an announcement giving the charge for a call, each call of a series or the total call charges registered against his line. The request may be made before, during or after a call.

### 3) *Remarks*

Provided from local exchange.

### 4) *Market data*

Automation of an existing manual service (AD and C) with extensions to cover more than one call. Usage likely to be high.

## 2.9 **printed record of duration and charge of calls service (7.3)**

*F: service d'enregistrement écrit des éléments de taxation*

*S: servicio de registro impreso de la duración y la tasa de las comunicaciones*

### 1) *Definition*

The possibility for a subscriber to get a specific printed record of called number, duration and charge of calls.

### 2) *Description*

These services make it possible for the subscriber to get a specific printed record on, for example, charges imposed on him for normal telephone calls and/or possibly supplementary services.

The services imply storage and/or printout of data on a suitable media within the network. The data or part of it will be made available to the subscriber normally in the form of a printed record.

Manual, semiautomatic or automatic services are offered.

Services may either be fully Administration controlled, or partly or fully subscriber controlled.

The category may either be fixed-programmed by the Administration at provision or selected by the subscriber at his activation of the service.

The fully subscriber controlled services imply printout of data for all calls of a certain category or for any particular (outgoing) call chosen by the subscriber. The requests for printout of data for a particular call can be made before, during or after a call.

### 3) *Remarks*

A service to provide subscribers with itemized billing of all calls. Provided from local exchange.

### 4) *Market data*

Demand for this service could be significant.

## 2.10 **automatic credit card service (7.7)**

*F: service automatique de cartes de crédit*

*S: servicio automático con tarjeta de crédito*

### 1) *Definition*

Payment of call charges is made by placing a credit card in a specially adapted telephone or by calling the credit number. A telephone bill will be sent to the credit card holder later.

2) *Description*

3) *Remarks*

This service could create billing problems for Administrations.

4) *Market data*

#### 2.11 **selective accounting (7.10)**

*F: service de comptabilité sélective*

*S: servicio de contabilidad selectiva*

1) *Definition*

A number of separate telephone accounts are associated with an exchange termination and the account to which charges for a particular call are to be debited is identified when making the call.

2) *Description*

3) *Remarks*

4) *Market data*

Most likely from business users who need to differentiate on the allocation of costs, e.g. legal professions.

#### 2.12 **customer recorded information service (8.3)**

*F: service particulier d'information enregistrée*

*S: servicio de información grabada por el abonado*

1) *Definition*

This service gives to the customer the possibility of distributing information transmitted from recording equipment to calling subscribers.

2) *Description*

3) *Remarks*

Could be provided from local exchange based equipment or terminal equipment at customer's premises.

4) *Market data*

#### 2.13 **public recorded information service (8.4)**

*F: service public d'information enregistrée*

*S: servicio de información pública grabada*

1) *Definition*

Recorded information of public interest provided by the telecommunications Administrations, possibly in cooperation with appropriate public or private institutions, is given to subscribers calling the respective service numbers.

2) *Description*

3) *Remarks*

Access to service may well be at the local exchange.

4) *Market data*

#### 2.14 **emergency call service (9.1)**

*F: service d'appels d'urgence*

*S: servicio de llamadas de emergencia*

1) *Definition*

A caller is given a fast and easy means of giving information about an emergency situation to the appropriate emergency organization (e.g. fire department, police, ambulance).

- 2) *Description*
- 3) *Remarks*  
An existing service.
- 4) *Market data*  
High demand.

#### 2.15 **centrex service**

*F: service centrex*

*S: servicio céntrex*

- 1) *Definition*  
The provision to subscribers, by means of a specially equipped public telephone exchange, of services normally available only in PABXs (e.g. automatic internal dialling, operators' desk, client access to network, direct dialling-in, transfer of calls).
- 2) *Description*
- 3) *Remarks*
- 4) *Market data*  
North America and Japan have shown a high demand.

#### 2.16 **babyphone (14.6)**

*F: service d'appels à destination d'un poste dont le combiné est décroché*

*S: servicio de llamadas a un teléfono descolgado*

- 1) *Definition*  
A service providing for a call to be made to a telephone in the "off hook" condition for the purpose of audible supervision at the called subscriber's premises.
- 2) *Description*
- 3) *Remarks*  
Has local application only.
- 4) *Market data*

#### 2.17 **transmission of a verbal message (14.1)**

*F: service de transmission d'un message verbal*

*S: servicio de transmisión de un mensaje verbal*

- 1) *Definition*  
At the request of a caller (whether a subscriber or not), a short message is transmitted by an operator, either to one or several telephone numbers at a specified time, or to a specified person (whether a subscriber or not) when he calls the operator.
- 2) *Description*
- 3) *Remarks*  
Could be provided locally or on a national basis.  
Has charging and accounting implications.  
Could be an automated service.
- 4) *Market data*

2.18 **universal access number** (14.5)

*F: service de numéros universels*

*S: servicio de números universales*

1) *Definition*

A customer with several installations in different parts of the country can be reached from anywhere in the country by dialling one given number. Calls from subscribers on exchanges in predetermined areas of the country will be routed to installations chosen (with certain restrictions) for the area in question by the customer having the service.

2) *Description*

3) *Remarks*

Requires cost/demand study before agreement.

Has numbering problems.

4) *Market data*

2.19 **message relay** (14.7)

*F: service de transmission de messages*

*S: servicio de retransmisión de mensajes (mensaje diferido)*

1) *Definition*

A caller, whether a subscriber or not, may dictate a message into recording equipment and require that it is passed to a particular telephone number by the following morning.

2) *Description*

3) *Remarks*

4) *Market data*

2.20 **interruption of a call in progress** (6.7)

*F: service d'interruption d'une conversation en cours*

*S: servicio de llamada preferente*

1) *Definition*

Intervention by an operator, interrupting a call in progress, in order to allow another incoming call to be offered.

2) *Description*

3) *Remarks*

Manual "call waiting" service.

4) *Market data*

Low demand.

2.21 **fixed destination call services** (1.2)

*F: service d'appels à destination fixe*

*S: servicio de llamada de línea directa*

1) *Definition*

The possibility for a subscriber to set up a call to a predetermined telephone number by lifting the handset only.

2) *Description*

When the subscriber lifts the handset or the lifting condition is given by automatic equipment, the exchange sets up automatically either immediately or after a time-out a connection to a predetermined telephone number. This telephone number may be local, national, international, or the number of an operator service. The fixed destination call may be available on demand or on a subscription basis. The number registration can be done either by the subscriber, or, on request, by the Administration.

- 3) *Remarks*  
Beneficial to the aged and handicapped.
- 4) *Market data*

## 2.22 **pick-up facility** (10.2)

*F: service de prise d'une communication établie*

*S: servicio de facilidad de telecaptura*

- 1) *Definition*  
A subscriber being away from his telephone can pick up a call on his line by dialling his own number and/or possibly a special code from any other telephone, after having been informed by means of a paging system that there is such a call.
- 2) *Description*
- 3) *Remarks*  
Mainly applies to PABXs or closed user groups.
- 4) *Market data*

## 2.23 **call waiting services** (6.4)

*F: service d'appels en instance*

*S: servicios de indicación de llamada en espera*

- 1) *Definition*  
A subscriber engaged on an existing call is given an indication that a caller is attempting to obtain connection to his number.
- 2) *Description*  
A subscriber A engaged on an existing call with subscriber B is given an indication that a caller, subscriber C, is attempting to obtain connection. Subscriber A may answer by replacing the handset (acceptance by clearing). Alternatively, he may ignore or reject the indication and continue with the existing call, terminate the existing call and answer subscriber C or hold the existing call and answer subscriber C (acceptance without clearing).  
The call waiting indication may be controlled by the called subscriber or the calling subscriber.
- 3) *Remarks*  
A possible variation where the calling rather than the called subscriber controls the service is considered undesirable.
- 4) *Market data*  
Medium interest shown in USA.

## 2.24 **dual telephone numbers**

*F: service de numéros de téléphone doubles*

*S: servicio de duplicidad de números telefónicos*

- 1) *Definition*  
Two telephone numbers are given to one subscriber. One number is known to the public while the other is revealed by the subscriber only to a limited number of persons. When the subscriber applies call diversion or do not disturb services to the first number, the people using the second number will still be connected.
- 2) *Description*
- 3) *Remarks*
- 4) *Market data*

2.25 **voice dialling**

*F: service de numérotation par la voix*

*S: servicio de marcación por la voz*

1) *Definition*

Verbal indication of a telephone number or name activates call set-up without the dialling operation.

Could be implemented in the exchange or in subscriber terminal equipment.

2) *Description*

3) *Remarks*

4) *Market data*

2.26 **number repetition service (6.2)**

*F: service de répétition de numéro*

*S: servicio de repetición del último número marcado*

1) *Definition*

The possibility for the subscriber to repeat a previously dialled number by dialling a short code.

2) *Description*

The service can be provided in a form where either the subscriber requests the registration of the number if the call cannot be completed, or the number of each outgoing call is registered automatically. The subscriber can repeat this number by dialling a short code.

3) *Remarks*

4) *Market data*

2.27 **lecture call (11.3)**

*F: service de communication conférence unilatérale*

*S: servicio de conferencia múltiple unidireccional*

1) *Definition*

A lecture call is an established connection between one caller and two or more parties, in which the speech path is used in a unidirectional way from the caller to the other connected parties. The call may be set up either by an operator, or by an automatic device programmed by the caller from his own telephone.

2) *Description*

3) *Remarks*

4) *Market data*

## APPENDIX I

### Telephone services, considered as nonsupplementary

(These services appeared in earlier lists of supplementary services)

#### I.1 **payphone service (7.8)**

*F: service publiphone*

*S: servicio telefónico de previo pago*

1) *Definition*

A service offered by means of a special equipment permitting outgoing telephone calls after insertion of adequate coins, tokens or coded cards and, without payment, incoming calls. Outgoing calls to certain services (e.g. emergency service) may be admitted without payment.

2) *Description*

3) *Remarks*

Includes public telephones and private telephones, which may be used in two modes, "private mode" and "coin-box mode".

4) *Market data*

High interest.

#### I.2 **directory inquiry service (8.1)**

*F: service de renseignements concernant les listes d'abonnés*

*S: servicio de información sobre guías telefónicas*

1) *Definition*

Callers can be informed of subscribers' telephone numbers, and, possibly, also of their names and addresses.

2) *Description*

3) *Remarks*

See Question 2/II [3].

4) *Market aspects*

#### I.3 **general telecommunications information service (8.2)**

*F: service de renseignements généraux sur les télécommunications*

*S: servicio de información general sobre telecomunicaciones*

1) *Definition*

A service given by an operator or a machine using the most common languages explaining the telecommunications services and facilities in a country.

2) *Description*

3) *Remarks*

4) *Market data*

#### I.4 **interception of calls** (13.1)

*F: service d'interception d'appels*

*S: servicio de interceptación de llamadas*

##### 1) *Definition*

Calls which, for reasons such as those listed below, cannot reach the wanted number may be intercepted and diverted to an operator, an answering machine, or a tone to give the caller the appropriate information:

- change of a particular number including indication of new number;
- renumbering of a group of numbers or a change of dialling code;
- wrong information in telephone directory;
- dialling of an unallocated code;
- dialling of a number or numbers allowed by the numbering plan but not yet allocated or no longer in service;
- route(s) out of order;
- route(s) congested;
- subscriber's line temporarily out of order;
- suspension of service owing to nonpayment.

##### 2) *Description*

##### 3) *Remarks*

Indication signals should be standardized to be useful for foreign subscribers.

##### 4) *Market data*

#### I.5 **priority** (6.5)

*F: service de priorité*

*S: servicio de prioridad*

##### 1) *Definition*

In telephone exchanges provision is made to give preferential treatment concerning the order of path or circuit selection to certain calls.

##### 2) *Description*

##### 3) *Remarks*

For exceptional overload conditions, Administrations should control priority arrangements for essential services.

##### 4) *Market data*

#### I.6 **malicious call identification services** (14.2)

*F: service d'identification d'appels malveillants*

*S: servicio de identificación de llamadas maliciosas*

##### 1) *Definition*

At the discretion of the Administration, assistance is given to ascertain the origin of malicious, nuisance or obscene calls.

##### 2) *Description*

After prearrangement with the Administration, a subscriber will be given the possibility to request identification of calls received by him. The service may be provided by manual intervention or automatic means and may be offered on all calls or only certain calls specified by the subscriber. The data received at the identification (calling subscriber's number, identity of the incoming line, time of the incident, etc.) will be made available to the Administration.

3) *Remarks*

Used on an international basis, the service requires agreement among the countries involved. To allow flexible use, the interexchange signalling must allow sending of the calling subscriber's number.

4) *Market data*

5) *General operational requirements*

The use of the services may be restricted due to certain legal requirements which may differ from country to country.

The manual service can normally be provided to a limited extent depending on the existing administrative and technical possibilities.

Modern exchange and signalling systems make it possible to provide automatic services with extended possibilities regarding identification of the caller's number.

The services shall be provided and withdrawn after prearrangement between the subscriber and the Administration in accordance with national legal requirements.

Provision of the service on an international basis requires agreement between the Administrations concerned.

Among the automatic services, those which allow request by the subscriber during a call are preferred.

**References**

- [1] CEPT *Handbook on services and facilities offered to the subscribers in modern telephone systems.*
- [2] CCITT – Question 16/II, Contribution COM II-No. 1, Study Period 1985-1988, Geneva, 1985.
- [3] CCITT – Question 2/II, Contribution COM II-No. 1, Study Period 1985-1988, Geneva, 1985.



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