INTERNATIONAL TELECOMMUNICATION UNION

ITU-T I.231.4

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

SERVICE CAPABILITIES – BEARER SERVICES SUPPORTED BY AN ISDN

CIRCUIT-MODE BEARER SERVICE CATEGORIES – CIRCUIT-MODE, ALTERNATE SPEECH / 64 kbit/s UNRESTRICTED, 8 kHz STRUCTURED BEARER SERVICE

ITU-T Recommendation I.231.4

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation I.231.4 was published in Fascicle III.7 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

Recommendation I.231.4

CIRCUIT-MODE BEARER SERVICE CATEGORIES – CIRCUIT-MODE, ALTERNATE SPEECH / 64 kbit/s UNRESTRICTED, 8 kHz STRUCTURED BEARER SERVICE

(Melbourne, 1988)

4 I.231.4 - **Circuit-mode, alternate speech / 64 kbit/s unrestricted, 8 kHz structured bearer service category**

4.1 *Definition*

This bearer service category provides the alternate transfer of speech or 64 kbit/s unrestricted digital information within the same call.

The request for this alternate capability and the initial mode desired by the user must be identified at call set-up time.

This bearer service category is provided for the support of multiple capability terminals or single capability terminals (Note 1).

For the speech mode of this bearer service category, the same applies as for the speech bearer service category. For the unrestricted mode of this bearer service category, the same applies as for the unrestricted (Note 2) bearer service category.

Note 1 - Initially, this service will only be applicable to multiple capability terminals. The use of this service by, and the network support of, single capability terminals is for further study, (e.g. how does a user change terminals). All references to single capability terminals reflect possible future enhancements and are subject to change and have only been included for information.

Note 2 - During an interim period some networks may only support restricted 64 kbit/s digital information transfer capability, i.e. information transfer capability solely restricted by the requirement that the all-zero octet is not allowed. For interworking, the rules given in the Appendix I of Recommendation I.520 should apply. The interworking functions have to be provided in the network with restricted capability. The ISDN with 64 kbit/s transfer capabilities will not be affected by this interworking, other than by conveying the appropriate signalling message to or from the ISDN terminal.

4.2. *Description*

4.2.1 *General description*

Once the connection is established, the user may repeatedly request via appropriate signalling messages, to alternate from speech mode to 64 kbit/s unrestricted digital mode, or vice versa. The in-call modification shall be provided on a per call basis.

4.2.2 *Specific terminology*

None identified.

4.2.3 *Qualifications on the applicability to telecommunications services*

None identified.

4.3 *Procedures*

4.3.1 *Provision/withdrawal*

This service shall be provided by prearrangement with the Administration.

4.3.2 *Normal procedures*

4.3.2.1 *Activation/deactivation/registration*

Not applicable.

4.3.2.2 *Invocation and operation*

At the start of the call the request for an alternate speech/64 kbit/s unrestricted call and the initial mode of either speech or 64 kbit/s unrestricted call must be identified. Following call set-up, the calling or called party may choose to modify the characteristics of the call during the conversation/data phase. During call establishment, the network shall choose a suitable route according to the information included in the set-up message.

Depending on the terminal capability type the following procedures will apply:

a) For multiple capability terminals the requesting user will send an *invoke in-call modification request* to the network.

b) For single capability terminals the requesting user will change over the connection from the first terminal to the second terminal before sending an *invoke in-call modification request* to the network.

The network will, on receipt of the *in-call modification request* from the calling/called party, check if that call modification is allowed and if the necessary resources are available.

If acceptable, the resources are reserved and an *invoke in-call modification request* is sent to the distant end. A timer will be started to supervise that the in-call modification is received successfully.

Depending on the terminal configuration at the destination end, the procedures will be the following:

a) For multiple capability terminals the distant user, if agreeing with the service changeover, will transmit a *return result indication* while the resources in the network are switched in, if reserved previously and the *call modification indication* will be sent to the initiating party.

b) For single capability terminals a call changeover will be performed from the first terminal to the second terminal. An *in-call modification return result* will be sent to the network which will switch in the resources, if reserved previously.

4.3.3 *Exceptional procedures*

4.3.3.1 *Activation/deactivation/registration*

Not applicable.

4.3.3.2 *Invocation and operation*

If the network fails to change resources on receipt of the *in-call modification return result*, the connection will be cleared with a cause indication "temporary failure".

If on receipt of a *call modification invocation request* an exchange determines that in-call modification is not allowed or not possible a *call modification return error indication* will be sent. Receipt of the *call modification return error indication* will cause the reserved resources to be freed and a *call modification return error indication to* be delivered to the initiating party.

In case of in-call modification failure, the initiating terminal after having received the *in-call modification return error indication*, will resume to transmit and receive the bit stream for the previous service.

4.3.4 *Alternative procedures*

None identified.

4.4 *Network capabilities for charging*

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

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

4.5 *Interworking requirements*

For further study.

4.6 *Interactions with supplementary services*

For further study.

4.7 *Attributes and values of attributes of the circuit-mode, alternate speech / 64 kbit/s unrestricted, 8 kHz structured bearer service category*

Information transfer attributes

1.	Information transfer mode:	circuit
2.	Information transfer rate:	64 kbit/s
3.	Information transfer capability:	alternately speech (Note 1) or unrestricted digital information
4.	Structure:	8 kHz integrity
5.	Establishment of communication:	demand/reserved/permanent
6.	Symmetry:	bidirectional symmetric/unidirectional
7.	Communication configuration:	point-to-point/multipoint

Access attributes

8.	Access channel:	B for user information, D for signalling (Note 2)
9.	Access protocol:	I-Series for D-channel

General attributes

10.	Supplementary services provided	for further study
11.	Quality of Service (Note 3)	
12.	Interworking possibilities	
13.	Operation and commercial aspects	

Note 1 - When crossing an international boundary between Administrations which employ different encoding laws, the network shall perform the necessary A-μ law conversion (see Recommendation G.711).

Note 2 - For reserved/permanent service the operational, administrative and maintenance (OAM) messages related to these services may be conveyed over the D-channel.

Note 3 - A short service changeover time (with a high probability of not being exceeded) has been tentatively identified as a requirement.

4.8 *Provision of individual circuit mode, alternate speech/64 kbit/s unrestricted, 8 kHz structured bearer services*

a) Overall provision[1)] : A

Note - Some networks will offer the speech phase of these services in a manner identical to the 3.1 kHz audio service.

b) Variations of secondary attributes:

	Establishment of communication	*Symmetry*	*Communication of configuration*	*Provision*[1)]
I.231.4/1	demand	bidirectional	pt-pt	E
I.231.4/2	reserved		pt-pt	A
I.231.4/3	permanent		pt-pt	E
I.231.4/4	demand		multipt	A
I.231.4/5	reserved		multipt	A
I.231.4/6	permanent		multipt	A

c) Access

Signalling and OAM (Note 1)		User information		Provision
Channel rate	Protocols	Channel and rate	Protocols	
D(16)	I.451 (Note 2)	B(64)	G.711/user-defined	E
D(64)	I.451 (Note 2)	B(64)	G.711/user-defined	E

Note 1 - Definition of protocols for OAM is for further study.

Note 2 - Demand services only; further study for reserved and permanent services. The protocols for initiating the changeover between speech and unrestricted digital information, and synchronizing this changeover are for further study.

4.9 *Dynamic description*

The dynamic description for this service needs further study and is not yet available.

1) The definition of E (essential) and A (additional) can be found in Recommendation I.230.