

**Recommendation T/CAC S 10.4 E**  
**(Cannes 1983, revised in Odense 1986, Vienna 1989 (CAC) and Athens 1992)**  
Formerly Recommendation T/SF 31-04 E

**INTERCOMMUNICATION ASPECTS OF AN  
INTEGRATED SERVICE DIGITAL NETWORK (ISDN)**

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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The European Conference of Post and Telecommunications Administrations

considering

- the existing and growing number of different types of telecommunications services, and terminals,
- the growing variety of networks which support these services,
- the growing customer expectation for integrated telecommunications between similar service regardless of network boundaries, and in some cases between dissimilar terminals,
- a particular new service may not be viable unless it has Intercommunication with existing similar services,

recommends

that network and terminal designers adopt wherever appropriate the guidelines set out in this Recommendation with the object of causing network and services to work together in a manner likely to satisfy markets needs.

Note. This Recommendation does not apply to terminals capable of supporting more than one service.

## 1. REQUIREMENTS

### Requirements between ISDN Bearer Services

- that the ISDN offers customers a range Bearer Services to satisfy particular requirements. The range of Bearer Services offered by one particular ISDN may not completely correspond with that offered by another ISDN;
- that intercommunication between the same or similar ISDN Bearer Services must therefore be provided in order to satisfy customer needs. This intercommunication should take account of the capabilities of the Bearer concerned and likely customer applications.

### Requirements between ISDN and non-ISDN Bearer Service

- that customers using ISDN Bearer Services will require the ability to communicate with other customers on other networks. Intercommunication must therefore be provided between certain ISDN Bearer Services and Bearer Services on other networks, particularly in the early stages of the introduction of the ISDN.

### Requirements for Teleservices

- that customers using existing Teleservices provided by the ISDN will require to communicate with customers on the same Teleservices provided by other networks;
- that in a similar manner customers using new Teleservices provided by ISDN will benefit from the ability to communicate with customers on similar existing Teleservices.

### Detailed Requirements for Intercommunication

- that the detailed requirements for intercommunication of ISDN services with other services are shown in Annexes 2 to 4.

## 2. GUIDANCE ON QUALITY

- that interworking should not degrade the quality of service normally experienced by each of the connected customers;
- that for intercommunication the target should be not to degrade the quality of service normally experienced by each of the connected customers.

## 3. GUIDANCE ON FACILITIES

- that interworking should not degrade the facilities normally available to each of the connected customers;
- that for intercommunication the target should be not to degrade the facilities normally available to each of the connected customers.

## 4. GUIDANCE ON OPERATION PROCEDURES

- that for interworking the operational procedures should not differ from those normally performed by each of the connected customers;

- that for intercommunication departures from normal operational procedures should be minimal and the affected parties suitably advised.

5. **FACTORS TO BE TAKEN INTO ACCOUNT WHEN CONSIDERING THE PROVISION OF SERVICE INTERCOMMUNICATION**

- Technical
- Cost
- Market gains form service intercommunication versus possible loss of new network market
- Market demand and elasticity
- Community of interest
- National Factors
- International factors

6. **FACTORS TO BE TAKEN INTO ACCOUNT WHEN CONSIDERING THE PROVISION OF NETWORK INTERWORKING**

- Existence of similar services on each network
- Technical feasibility
- Cost
- Market gains from Network interworking versus possible loss of new network markets
- Market demand and elasticity
- Community of interest
- National factors
- International factors

7. **DEFINITIONS**

7.1 **Intercommunication (Between Services)**

The ability to provide commercially viable communication between one customer terminal intended to offer one type of service and another customer terminal intended to offer a similar or different type of service.  
(Examples could be Telephone-Radiopager; Low Speed-High Speed Data.)

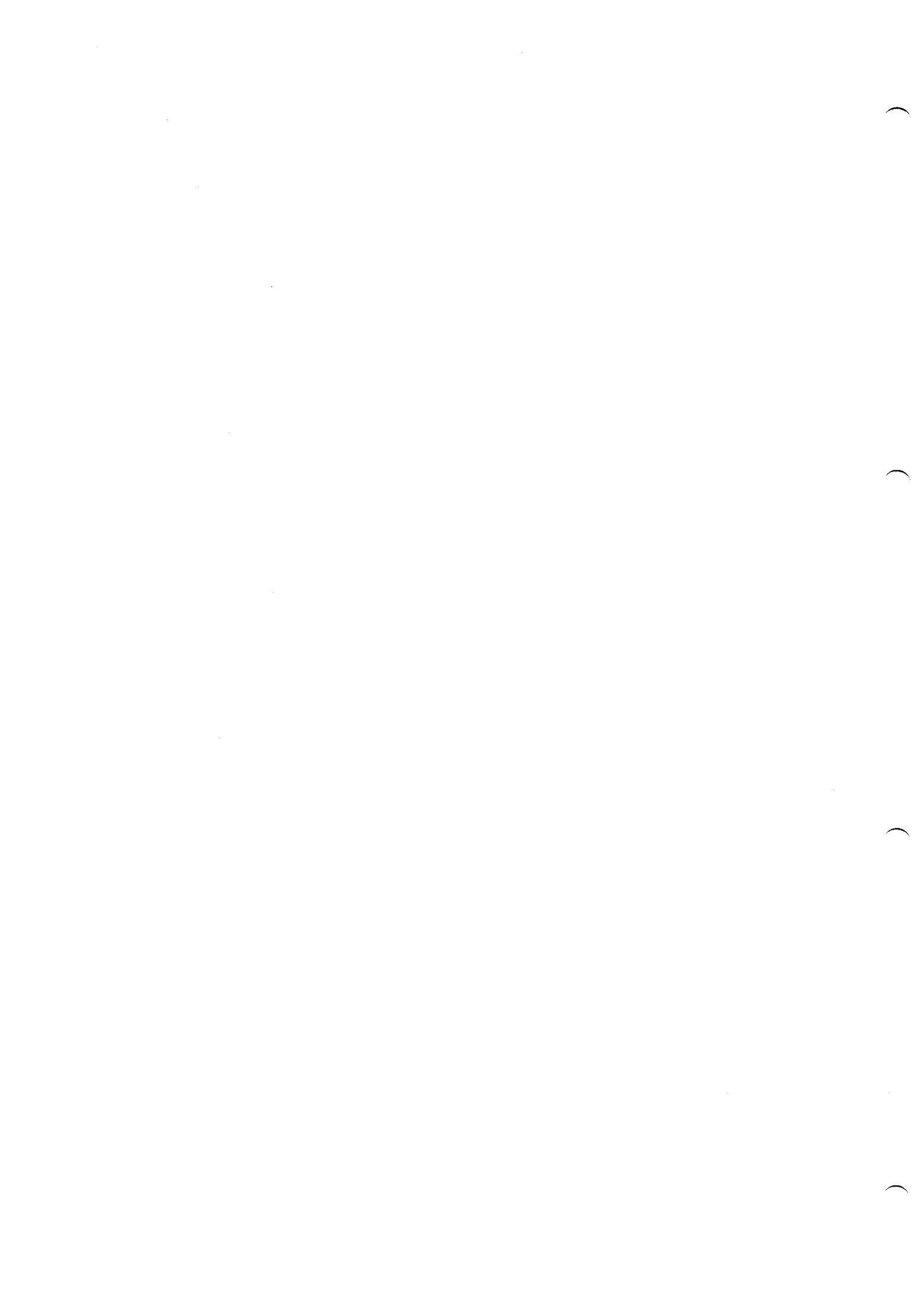
7.2 **Interworking (Between Networks)**

The ability to provide commercial viable communication between terminals served by one type of network and terminals served by another type of network. (Examples could be: PSTN-ISDN; Telex Network-Packet Switched Network.)

Note. In these definitions the term "commercially viable communication" is taken to mean communication of a quality and price likely to satisfy the users.

7.3 **Relationship between Service Intercommunication and Network Interworking**

Service intercommunication may exist between terminals served by one network or different networks. Network interworking is necessary to allow service Intercommunication or connection of the same service between different networks (see Annex 1).

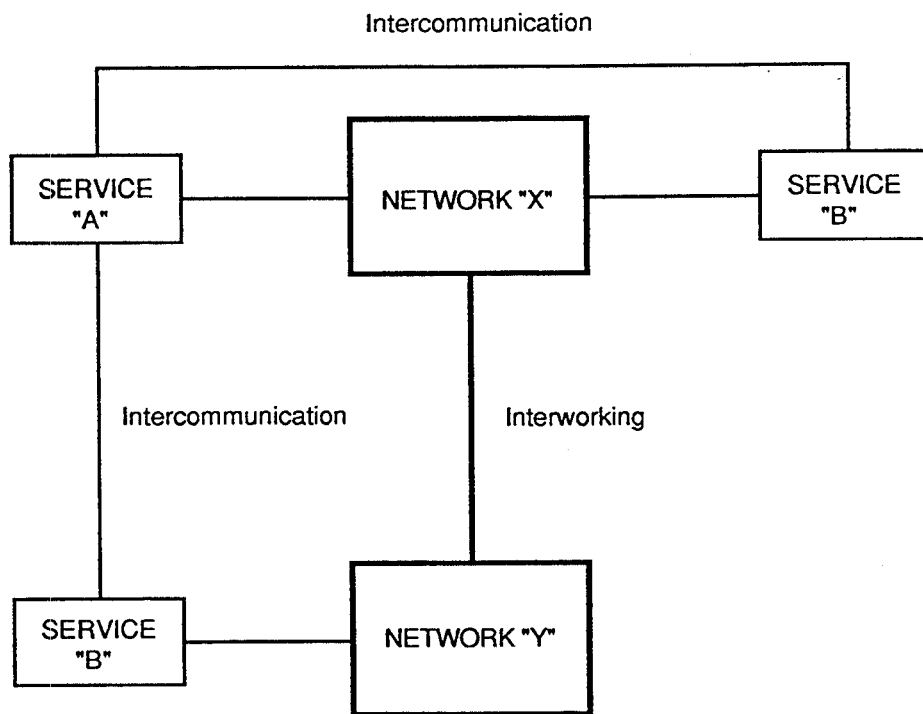


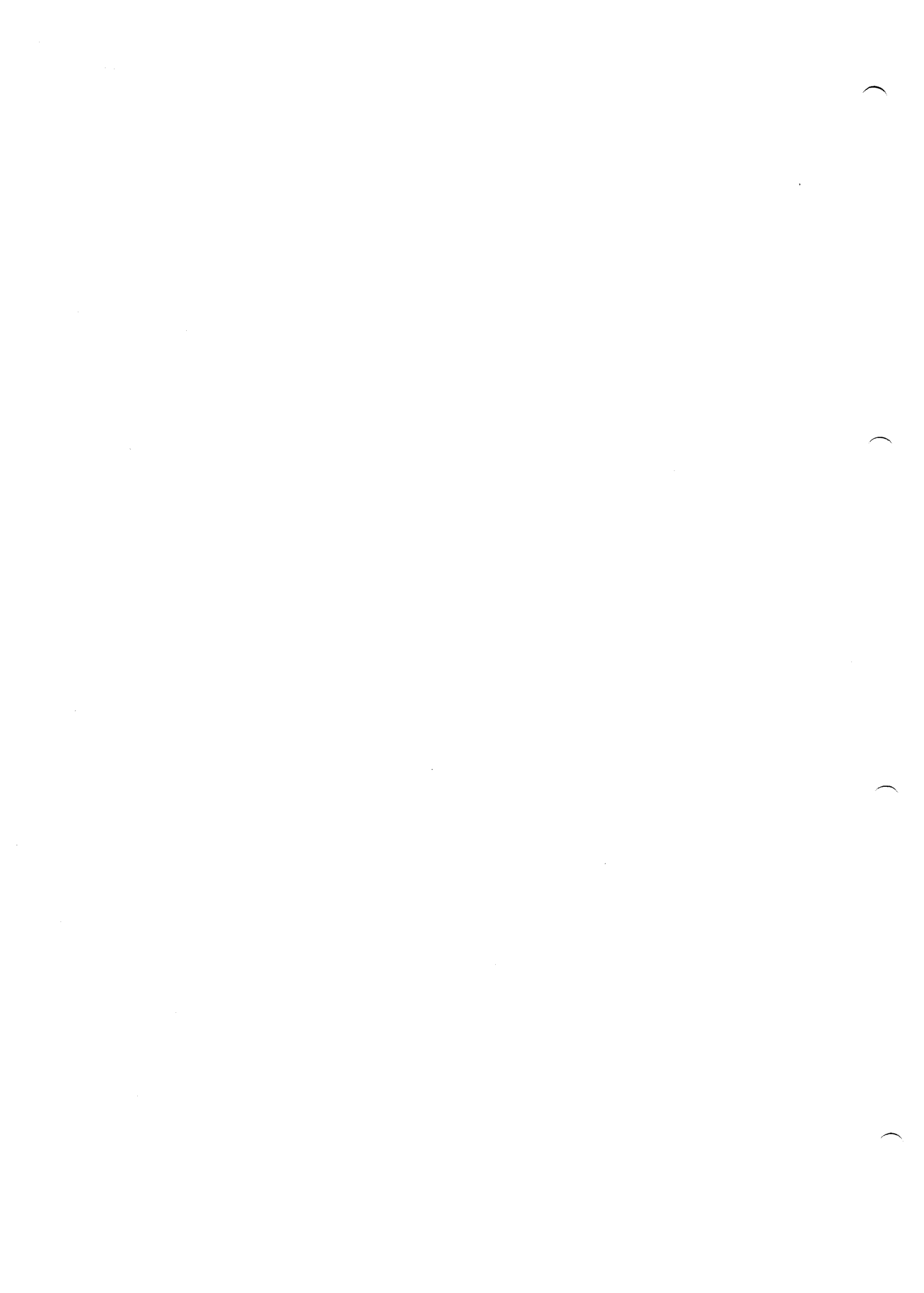
INTERCOMMUNICATION AND INTERWORKING

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Annex 1

INTERCOMMUNICATION AND INTERWORKING





INTERCOMMUNICATION - OVERVIEW

Annex 2

INTERCOMMUNICATION - OVERVIEW

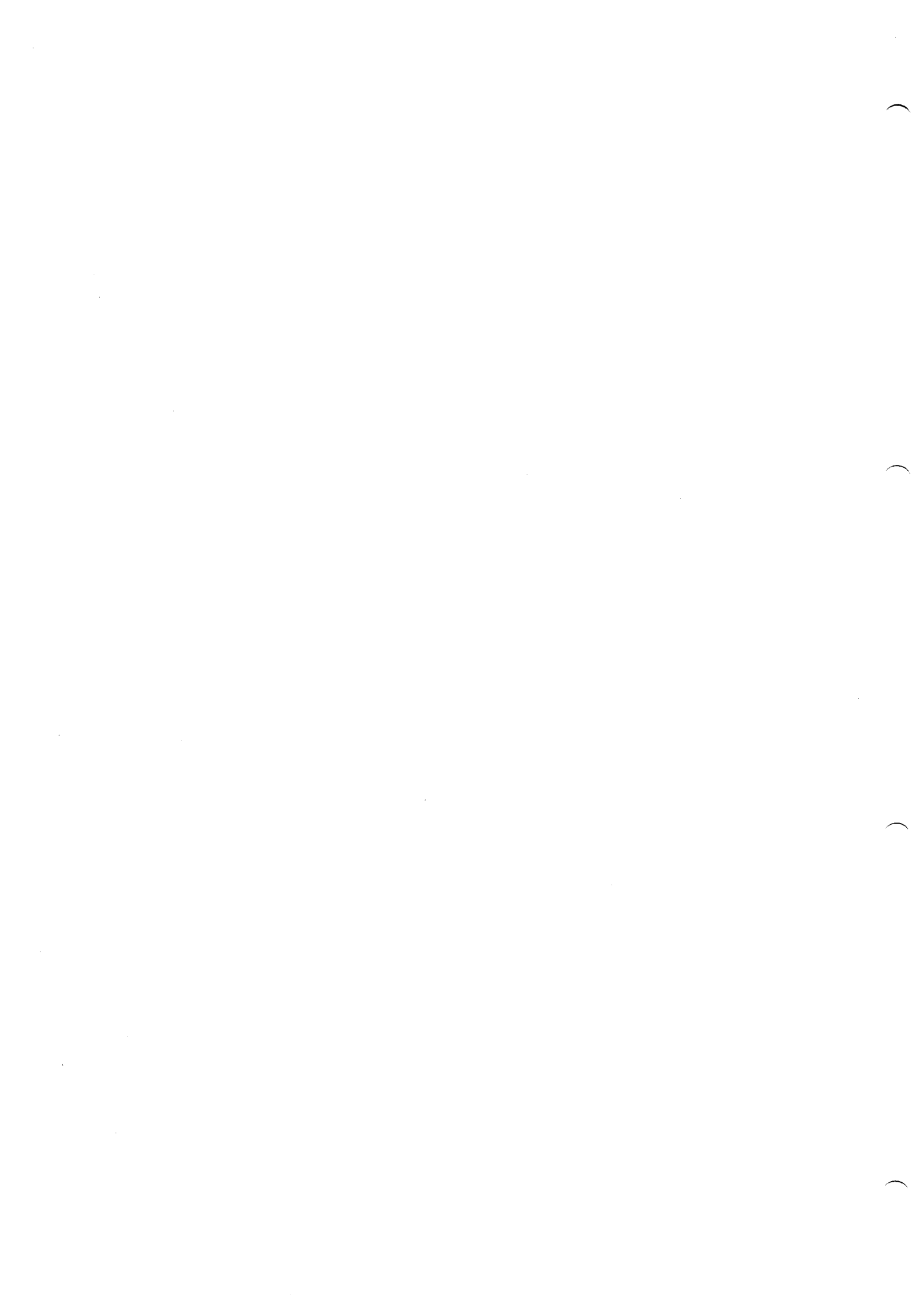
ISDN TELESERVICES	ISDN BEARER SERVICES	OUTSIDE NETWORKS (TELESERVICES OR BEARER SERVICES)						
		ISDN	PSTN	PSPDN	GSPDN	PLMN Analog	PLMN Digital <sup>4)</sup>	TELEX
Telephony 3.1 kHz	Circuit Mode, 64 kbit/s for speech	x	-	-	-	-	-	-
	Circuit Mode, 64 kbit/s for 3.1 kHz audio	-	x	-	-	x	x	-
Telephony 7 kHz	Circuit Mode, 64 kbit/s unrestricted	x	-	-	-	-	-	-
Videotelephony	Circuit Mode, 64 kbit/s unrestricted	x	-	-	-	-	-	-
	Circuit Mode, 64 kbit/s for 3.1 kHz audio	-	x <sup>1)</sup>	-	-	x <sup>1)</sup>	x <sup>1)</sup>	-
	Circuit Mode, 2 x 64 kbit/s unrestricted	x	-	-	-	-	-	-
Videotex	Circuit Mode, 64 kbit/s for 3.1 kHz audio	x	x <sup>3)</sup>	-	-	-	-	-
	Circuit Mode, 64 kbit/s unrestricted	x	-	-	-	-	-	-
Teletex	Circuit Mode, 64 kbit/s unrestricted	x	-	x	x	-	-	(x)
Telefax Group 4	Circuit Mode, 64 kbit/s unrestricted	x	(-)	-	x	-	-	-
Telefax Group 3	Circuit Mode, 64 kbit/s for 3.1 kHz audio	x	x	-	-	-	x	-
For "data communications"	Circuit Mode, 64 kbit/s unrestricted	x	-	-	x	-	x	-
	Circuit Mode, 64 kbit/s for 3.1 kHz audio	x <sup>3)</sup>	x	-	-	-	x	-
	Packet Mode Virtual Circuit X.31, case A, B-channel	x	-	x	-	-	-	-
	Packet Mode Virtual Circuit X.31, case B, B-channel	x	-	x	-	-	-	-
	Packet Mode Virtual Circuit X.31, case B, D-channel	x	-	x	-	-	-	-

Legend:

ISDN Integrated Services Digital Network  
 PSTN Public Switched Telephone Network  
 PSPDN Packet-Switched Public Data Network  
 PLMN Public Land Mobile Network

Notes:

1. Only for voice communication
2. May involve access via PSTN for information provided
3. For data communication between terminals with TA a/b
4. GSM





**TELESERVICE INTERCOMMUNICATION REQUIREMENTS  
DUE TO THE INTRODUCTION OF ISDN**

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**Annex 3**

**TELESERVICE INTERCOMMUNICATION REQUIREMENTS  
DUE TO THE INTRODUCTION OF ISDN  
(MINIMUM SET OF INTERCOMMUNICATION REQUIREMENTS)**

This section covers service intercommunication requirements as seen by the customer.

**1. SERVICE TO BE PROVIDED ON THE ISDN (1) TO GET ACCESS TO A SERVICE ON PRESENT NETWORK INCLUDING CONVERSION FACILITIES**

i)	Telephony 3.1 kHz	Telephony 3.1 kHz (PSTN) Telephony 7 kHz (ISDN) Video Telephony
ii)	Telephony 7 kHz	Telephony 3.1 kHz (PSTN) Telephony 3.1 kHz (ISTN) Video Telephony
iii)	Video Telephony	Telephony (PSTN, ISDN 3.1 kHz, ISDN 7 kHz)
iv)	Videotex	Videotex (PSTN) (2)
v)	Teletex	Teletex (PSTN, CSPDN, PSPDN) Telex
vi)	Telefax	Telefax Gr. 3 (PSTN) Telefax Gr. 4 (CSPDN)
vii)	Mixed Mode (Textfax)	See paragraph 2.
ix)	MHSS (3)	MHSS (PSTN, CSPDN, PSPDN)

This list is not comprehensive and other services may be included.

Notes.

- (1) As seen at the ISDN interface without the use of Terminal Adaptor.  
 (2) May involve access via PSTN for information provided.  
 (3) Only electronic mailbox services.

Legend:

ISDN	Integrated Service Digital Network
PSTN	Public Switched Telephone Network
CSPDN	Circuit Switched Public Data Network
PSPDN	Packet Switched Public Data Network
MHSS	Message Handling System Service
TTX	Teletex
TID	Terminal Identification

**TELESERVICE INTERCOMMUNICATION REQUIREMENTS  
DUE TO THE INTRODUCTION OF ISDN**

**2. INTERCOMMUNICATION BETWEEN TELEMATIC TERMINALS (TEXT AND FAX) CONNECTED TO DIFFERENT NETWORKS (PSTN, CSPDN, PSPDN AND ISDN)**

To From	Group 3	Group 4 Class 1	Group 4 Class 2	Group 4 Class 3, ie. Mixed Mode	Basic TTX
Group 3	Required	Required	Required	Required	Not required
Group 4 Class 1, ie. Fax	Required	Required	Required	Required Fax only	Not required
Group 4 Class 2 Fax only	Required	Required	Required	Required Fax only	Not required
Group 4 Class 3, ie. Mixed mode	Required	Required Fax only	Required	Required	Required
Basic TTX	Not required	Not required	Required Text only	Required Text only	Required

Note.

Terminal identification (TID) for telematic terminals:

The TID contains the dialing information to set up the call to the terminal required. The first part of the TID (field 1) needs possible changes in the presentation. This matter is being studied in CCITT (Com. I, II, VII and VIII...). An urgent solution is required.

**3. SERVICE REQUIREMENTS FOR INTERCOMMUNICATION BETWEEN DIFFERENT TELEMATIC SERVICES**

- i) Textfax - Teletex  
Intercommunication only within the Teletex mode
- ii) Telefax Gr. 4 - Telefax Gr. 3  
Gr. 4 downward compatibility preferred
- iii) Textfax - Telefax Gr. 3  
Intercommunication only within the Telefax mode
- iv) Textfax - Telefax Gr. 4  
Intercommunication only within the Telefax mode
- v) Textfax - Telex  
Intercommunication only within the Telex mode by using a conversion facility

Note 1.

Characteristics:           - IA No. 2  
                                  - 69 characters/line  
                                  - CR and LF

**TELESERVICE INTERCOMMUNICATION REQUIREMENTS  
DUE TO THE INTRODUCTION OF ISDN**

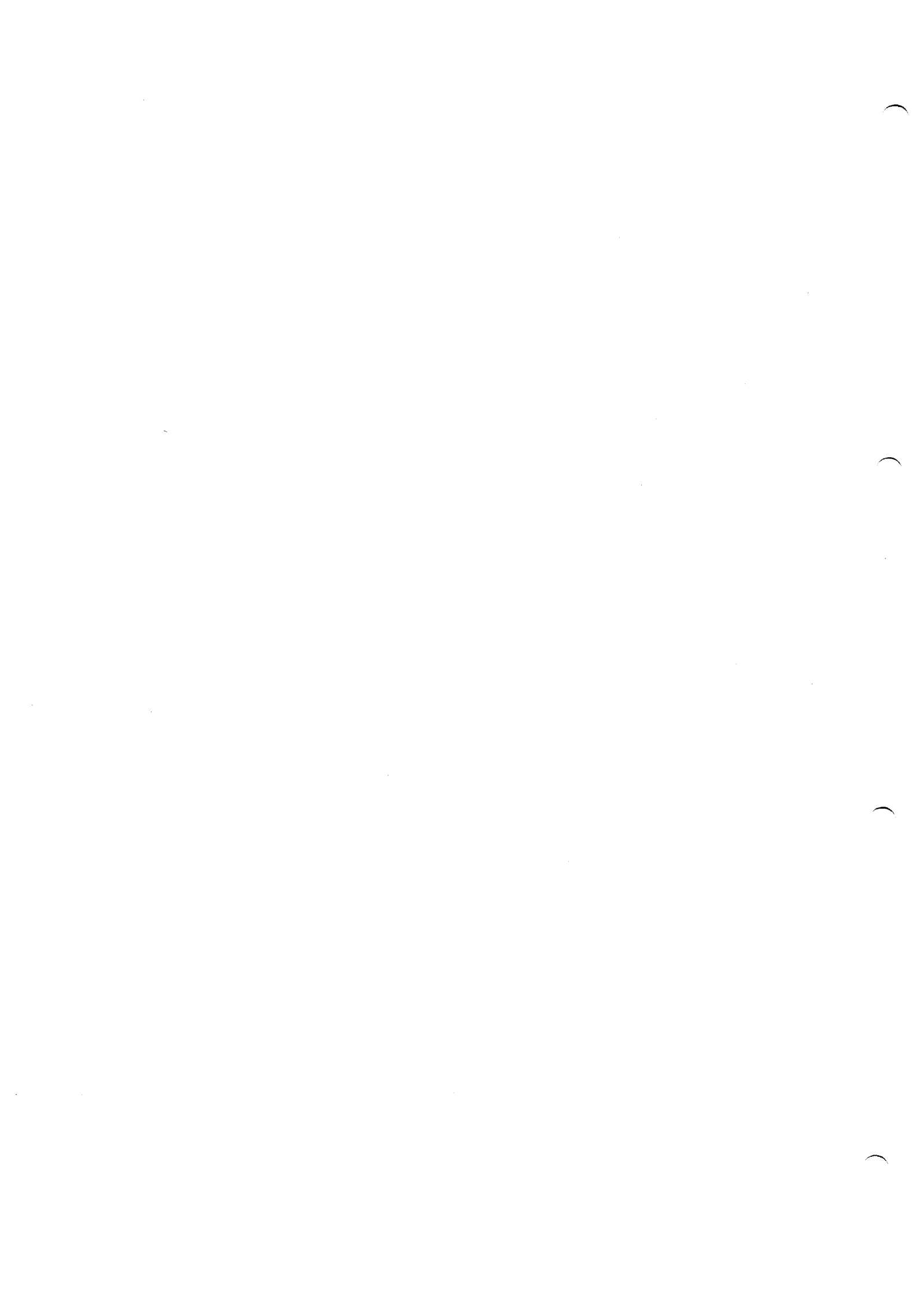
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Speed and code-conversion as well as protocol adaptation is done by the conversion facility

- vi) Teletex - Videotex  
Intercommunication only within the Videotex mode by using only character coded information

Note 2.

- Characteristics:
- Teletex character repertoire (CCITT T.61)
  - Format:
    - 40 characters/line
    - 22 lines/page
  - Presentation of the TID



**SPECIFIC REQUIREMENTS FOR INTERCOMMUNICATION/INTERWORKING  
BETWEEN ISDN AND PSTN**

**Annex 4**

**SPECIFIC REQUIREMENTS FOR INTERCOMMUNICATION/INTERWORKING  
BETWEEN ISDN AND PSTN**

Requested Network Capability		Network Reaction	Result of the Call Attempt	Service Degradation	Information to ISDN Customer
Basic Call	ISDN to	BC-Speech	Call Completed	QoS as for PSTN	Connection to PSTN
		BC-3.1 kHz	Call Completed	QoS as for PSTN	Connection to PSTN
	PSTN	BC-64 kbit/s	Call Rejected (Note 1)	Not Applicable	No Digital Access to Called Party
		PSTN to ISDN (Note 2)	Call Completed	QoS as for PSTN	IW has occurred Calling User ISDN
Supplementary Services TUP+ - Preferred			Call Completed	See add. info	See add. info
Supplementary Services TUP+ - Mandatory			Call Rejected	Not Applicable	Incompatibility with Called Party

Note 1. The call may be completed to PSTN subscriber with digital access (digital connectivity). In this case the calling customer should be informed that the called subscriber does not belong to the ISDN.

Note 2. Digital connectivity can be provided if the PSTN subscriber has a digital access.

Legend:

BC: Bearer Capability

QoS: Quality of Service

Two cases of interworking are considered:

- a) Call from a PSTN subscriber to an ISDN subscriber.
- b) Call from an ISDN subscriber to a PSTN subscriber.

**Additional Information in Relation to Supplementary Services**

The following notations are used:

No limitations = The supplementary service is offered to the ISDN subscriber as in a full ISDN environment, i.e. without degradation.

No relevant = No need for the ISDN subscriber to use the supplementary service.

**SPECIFIC REQUIREMENTS FOR INTERCOMMUNICATION/INTERWORKING  
BETWEEN ISDN AND PSTN**

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1. **CALL WAITING (APPLIES WHEN SUBSCRIBED TO BY THE CALLED CUSTOMER)**
  - a) No limitations.
  - b) Not relevant.
  
2. **CALLING LINE IDENTIFICATION PRESENTATION (APPLIES WHEN SUBSCRIBED TO BY THE CALLED CUSTOMER)**
  - a) Can be provided if signalling capabilities are available. It should not be provided if secret number facilities are not available and the secrecy cannot be guaranteed.
  - b) Not relevant.
  
3. **DIRECT DIALLING IN (APPLIES WHEN SUBSCRIBED TO BY THE CALLED CUSTOMER)**
  - a) No limitations.
  - b) Not relevant.
  
4. **CLOSED USER GROUP**
  - a) Not relevant; no need for indication to the called subscriber.
  - b) CUG call attempts are rejected and calling subscriber receives the indication of call not allowed.
  
5. **TERMINAL SELECTION (APPLIES WHEN SUBSCRIBED TO BY THE CALLED NUMBER)**
  - a) No limitations.
  - b) Not relevant.
  
6. **USER TO USER SIGNALLING**
  - a) Impossible; if the called subscriber sends UUS, the network responds with the indication of impossibility to deliver the information.
  - b) Impossible; if the calling subscriber sends UUS, the network responds with the indication of impossibility to deliver the information.
  
7. **SUB-ADDRESS**
  - a) Impossible; if the called subscriber sends SA, the network responds with the indication of impossibility to deliver the information
  - b) Impossible; if the calling subscriber sends SA, the network responds with the indication of impossibility to deliver the information

**SPECIFIC REQUIREMENTS FOR INTERCOMMUNICATION/INTERWORKING  
BETWEEN ISDN AND PSTN**

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**8. TERMINAL PORTABILITY (CAN APPLY DURING EITHER OUTGOING OR INCOMING)**

- a) No limitations.  
b) No limitations.

SUPPLEMENTARY SERVICE	ISUP/TUP+ MANDATORY	ISUP/TUP+ PREFERRED
Call Waiting		X
Calling Line Identification Presentation		X
Direct Dialling-in		X
Closed User Group/OA		X
Closed User Group	X	
Terminal Selection		X
User-to-User Signalling		X
Sub-addressing		X
Three Party Service		X

Table of the required signalling capabilities needed for supplementary services from the service point of view.

Note 1. A call with a service mark ISUP/TUP+ mandatory must be rejected if a suitable route is not available.

Note 2. When an ISUP/TUP+ route is preferred, but not available, the call will be allowed to mature over non ISUP/TUP+ routes to the destination, even though the required supplementary service may not be available via the alternative signalling systems.

