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Bearer Services supported by a GSM PLMN

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Bearer Services supported by a GSM PLMN

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ETSI GSM

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Recommendation: GSM 02.02

Title: BEARER SERVICES SUPPORTED BY A GSM PLMN

List of Contents:

0. Scope
1. Framework for describing bearer services
2. List of bearer service attributes
3. List of individual bearer services
4. Description of individual bearer services
5. List of bearer service categories
6. List of bearer services

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0. SCOPE

The purpose of this recommendation is to describe and define a recommended set of bearer services, to be provided to GSM PLMN subscribers by a GSM PLMN, in connection with other networks. This Recommendation should also be used as a basis for defining the corresponding required mobile network capabilities which are specified by means of the "GSM PLMN connection type" concept, defined in GSM Recommendation 03.10.

Bearer services not included in this recommendation should not be introduced unilaterally by a mobile network operator, if the provision of this service requires that the GSM signalling Recommendations are modified.

The definitions of the quality of service attributes are given in recommendation 02.08.

1. FRAMEWORK FOR DESCRIBING BEARER SERVICES

Bearer services are described by attributes, which are intended to be independent. These attributes are described and defined in recommendation GSM 02.01. They are grouped into four categories :

- i) Information transfer attributes, which characterise the network capabilities for transferring information from one user access point in a GSM PLMN (originating PLMN), as defined in recommendation GSM 02.01 and GSM 04.02 to an appropriate [user] access point of a terminating network as defined in GSM 02.01 (the terminating network may include another GSM PLMN or the originating GSM PLMN).
- ii) Access attributes, which describe the means for accessing network functions or facilities as seen at the access point in the PLMN (see GSM 02.01).
- iii) Interworking attributes, which describe properties of the terminating network and its access point. The terminating network may include another GSM PLMN or the originating PLMN (see GSM 02.01).
- iv) General attributes, which deal with the service in general.

Figure 1/GSM 02.02 shows the relation between the groups of attributes and their fields of applicability.

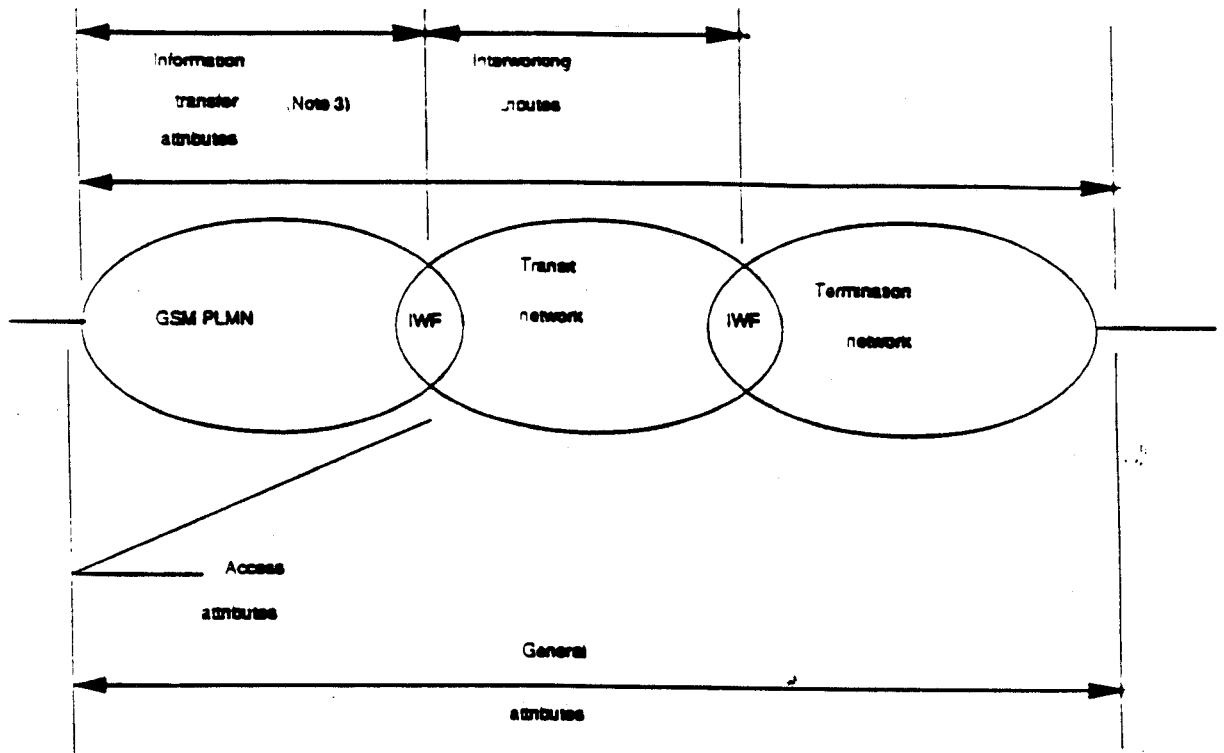


Fig. 1/GSM 02.02. Relation between the groups of attributes and fields of applicability

- Note 1: A transit network may not exist for a bearer service.
- Note 2: Communication may be established from both ends in principle.
- Note 3: The information transfer and access attributes associated with a bearer service end to end communication relates to a direct peer-to-peer communication of TE to TE, or TE to a network gateway (supporting for example PSTN interworking).

2. LIST OF BEARER SERVICE ATTRIBUTES

Table 1/GSM 02.02 gives the list of the attributes and the principles for categorizing bearer services. For the definitions and possible values of these attributes, see recommendation GSM 02.01.

		Dominant attributes	Secondary attributes	Qualifying attributes
		Define bearer service category	Define bearer service within a category	Further qualify a bearer service
1 Information transfer	1 Information transfer mode	X		
	2 Information transfer rate	see note 1		
	3 Information transfer capability	X		
	4 Structure	X		
	5 Establishment of communication			X
	6 Communication configuration			X
	7 Symmetry			X
2 Access attributes	8 Access channel and rate			X
	9.1 Signalling access			X
	9.2 Information access		X	
	9.3 Information access structure		X	
3 Interworking with terminating network	12 Interworking possibilities		X	
4 General	10 Supplementary services			X
	11 Quality of service			X
	13 Operational commercial			X

Table 1/GSM 02.02. List of attributes for bearer services

Note: Within the GSM PLMN the "Information transfer rate" attribute is not indicated, this is because the user may access the PLMN at either an "S" or "R" reference point. In addition, the "Information transfer rate" at other reference points within the PLMN assumed or otherwise may be different.

The description of the bearer services is based upon the list of attributes as given in table 1/GSM 02.02. Attributes nos. 1,2,3 and 4 are called "Dominant attributes". They are used to identify a particular bearer service category.

Attributes nos. 9.2, 9.3 and 12 are called "Secondary attributes". They are used to identify particular bearer services within an individual bearer service category.

All other attributes are used to further specify and qualify a bearer service within an individual bearer service category. They are called "Qualifying attributes".

3. LIST OF BEARER SERVICE CATEGORIES AND BEARER SERVICES

Table 2/GSM 02.02 gives the list of bearer service categories and the associated dominant attributes.

Table 3/GSM 02.02 Presents an overview of the bearer services with their associated dominant and secondary attributes. It is the addition of the secondary attributes which differentiate the bearer service categories from the bearer services. These secondary attributes primarily relate to the users interface at the mobile station e.g 9.6 kbit/s V32 synchronous and the interworking function required to the differing networks e.g PSTN, ISDN, PLMN, etc.

The "bearer service name" column is the generic name for the bearer services with the same dominant and secondary attributes. The "bearer service category" number column, indicates the number of the bearer service category the bearer service belongs to. All bearer services associated with a bearer service category are described in Annex A, in the data sheet numbered by the bearer service category number in Table 2.

The "Quality of service attribute" column refers to two different values of quality of service (Transparent T and Non-Transparent NT) as described in recommendation Q2.08.

Table 4/GSM 02.02 lists the access interfaces at the mobile station and where interworking is required, the access to the terminating network.

Table 5/GSM 02.02 lists the bearer services with specific terminating networks.

The recommended provision of the bearer services is marked by essential (E1, E2, E3, Ex) or additional (A, Ax) as defined in rec. 01.06, section 2.2. The provision of the bearer services may differ from that of the bearer service category they belong to. This reflects, primarily, the necessity of providing specific interworking functions within the network for that bearer service, e.g V.32 modem for connection to PSTN.

The recommended provision of a bearer service in Table 3 when related to data services of 4.8kbit/s and below, with regard to the use of either a full or half rate channel is for further study.

Bearer services are numbered for ease of identification, the first two digits represent the basic attributes, the third digit represents the terminating network e.g PLMN, with the fourth digit representing the access at the mobile station and by inference, where necessary the access to the terminating network through the interworking function (see table 4). These numbers are not intended to be used for any other purpose.

Because the information transfer rate depends on the reference point assumed in the GSM PLMN, transit or terminating network, the attribute value is marked as "Not applicable".

Services not mentioned are not provided.

4. DESCRIPTION OF INDIVIDUAL BEARER SERVICES

Each bearer service category has been provided with a data sheet which contains values for all its attributes and comments and if appropriate annexes to it are contained in Appendix A.

5. LIST OF BEARER SERVICE CATEGORIES

NUMBER	DATA SHEET No	BEARER SERVICE CATEGORY NAME
1	1 With T	Circuit Mode Unstructured with Unrestricted digital capability Transparent
2	1 With NT	Circuit Mode Unstructured with Unrestricted digital capability Non Transparent
3	2	Pad services
4	3	Packet Service
5	4 With T	Circuit mode Unstructured with Alternate Speech /Unrestricted Digital capability Transparent
6	4 With NT	Circuit mode Unstructured with Alternate Speech /Unrestricted Digital capability Non Transparent
7	5 With T	Circuit mode Unstructured with Speech followed by unrestricted digital capability Transparent
8	5 With NT	Circuit mode Unstructured with Speech followed by unrestricted digital capability Non Transparent
9	6 With T	3.1 kHz Ex PLMN Transparent
10	6 With NT	3.1 kHz Ex PLMN Non Transparent

Table 2/GSM 02.02. List Of PLMN bearer service categories

6. LIST OF BEARER SERVICES

No	Bearer Service cat No	Bearer service Name	Quality of service attrib. value	Recommended provision in terminating network					
				PLMN	PSTN	ISDN	CSPDN	PSPDN	Direct Access
				0	1	2	3	4	5
21	1 9	Data circuit Duplex Asynchronous 300 bit/s	T	E2	E2	Ex			A
	2 10	Data circuit Duplex Asynchronous 300 bit/s	NT	E2	E2	Ex			A
22	1 9	Data circuit Duplex Asynchronous 1200 bit/s	T	E2	E2	Ex			A
	2 10	Data circuit Duplex Asynchronous 1200 bit/s	NT	E2	E2	Ex			A
23	1 9	Data circuit Duplex Asynchronous 1200/75 bit/s	T	FS	FS	FS			A
	2 10	Data circuit Duplex Asynchronous 1200/75 bit/s	NT	FS	FS	FS			A
24	1 9	Data circuit Duplex Asynchronous 2400 bit/s	T	A	A	Ex			A
	2 10	Data circuit Duplex Asynchronous 2400 bit/s	NT	A	A	Ex			A
25	1 9	Data circuit Duplex Asynchronous 4800 bit/s	T	A	A	Ex			A
	2 10	Data circuit Duplex Asynchronous 4800 bit/s	NT	A	A	Ex			A

26	1 9	Data circuit Duplex Asynchronous 9600 bit/s	T	A	A	Ex			A
	2 10	Data circuit Duplex Asynchronous 9600 bit/s	NT	A	A	Ex			A
31	1 9	Data circuit Duplex Synchronous 1200 bit/s	T	A	A	Ax			A
32	1 9	Data circuit Duplex Synchronous 2400 bit/s	T	A	A	Ax			A
33	1 9	Data circuit Duplex Synchronous 4800 bit/s	T	A	A	Ax			A
34	1 9	Data circuit Duplex Synchronous 9600 bit/s	T	A	A	Ax			A
41	3 9	PAD Access circuit Asynchronous 300 bit/s	T			FS		E2	A
	3 10	PAD Access circuit Asynchronous 300 bit/s	NT			FS		E2	A
42	3 9	PAD Access circuit Asynchronous 1200 bit/s	T			FS		E2	A
	3 10	PAD Access circuit Asynchronous 1200 bit/s	NT			FS		E2	A
43	3 9	PAD Access circuit Asynchronous 1200/75 bit/s	T			FS		A	A
	3 10	PAD Access circuit Asynchronous 1200/75 bit/s	NT			FS		A	A
44	3 9	PAD Access circuit Asynchronous 2400 bit/s	T			FS		A	A
	3 10	PAD Access circuit Asynchronous 2400 bit/s	NT			FS		A	A
45	3 9	PAD Access circuit Asynchronous 4800 bit/s	T			FS		A	A
	3 10	PAD Access circuit Asynchronous 4800 bit/s	NT			FS		A	A
46	3 9	PAD Access circuit Asynchronous 9600 bit/s	T			FS		A	A
	3 10	PAD Access circuit Asynchronous 9600 bit/s	NT			FS		A	A
51	4	Data Packet Duplex Synchronous 2400 bit/s	T	E3		FS		E3	FS
	4	Data Packet Duplex Synchronous 2400 bit/s	NT	FS		FS		FS	FS
52	4	Data Packet Duplex Synchronous 4800 bit/s	T	E3		FS		E3	FS
	4	Data Packet Duplex Synchronous 4800 bit/s	NT	FS		FS		FS	FS
53	4	Data Packet Duplex Synchronous 9600 bit/s	T	A		FS		A	FS
	4	Data Packet Duplex Synchronous 9600 bit/s	NT	FS		FS		FS	FS
61	5	Alternate Speech/Unrestrict Digital (unres. dig. section of service offers the same service as Services 21-34)	T for Unres dig	A	A	Ax			A

	6	Alternate Speech/Unrestrict Digital (unres. dig. section of service offers the same service as Services 21-34)	NT for Unres dig	A	A	Ax			A
71	1	12 kbit/s Unrestricted dig.		A					A
81	7	Speech followed by data (unres. dig. section of service offers the same service as Services 21-34)	T for Unres dig	A	A	A			A
	8	Speech followed by data (unres. dig. section of service offers the same service as Services 21-34)	NT for Unres dig	A	A	A			A

Table 3/GSM 02.02

Bearer services utilising a set of attributes within a bearer service category and their recommended provision

Access Interface at the MS attribute 9.2 and where necessary at the IWF	Code for fourth figure in bearer service No
Analogue 4 wire	0
V21 DTE/DCE interface	1
V22 DTE DCE interface	2
V22 bis DTE DCE interface	3
V23 DTE DCE interface	4
V26 ter DTE DCE interface	5
V32 DTE DCE interface	6
X21	7
X25	8
S interface	9
Undefined interface	a

Table 4/GSM 02.02

Coding of fourth figure in bearer service

Number	Recommended provision
2101	E2
2111	E2
2121	Ex
2151	A
2202	E2
2212	E2
2222	Ex
2252	A
2304	FS
2314	A
2324	FS
2354	FS
240A	A
2416	A
242A	FS
245A	A
250A	A
2516	A
252A	FS
255A	A
260A	A
2616	A
262A	FS
265A	A
3102	A
3112	A
3203	A
3205	A
3207	A
3213	A
3215	A
3227	Ax
3237	A
3306	A
3307	A
3316	A
3327	Ax
3337	A
3406	A
3407	A
3416	A
3427	Ax
3437	A
4121	FS
4141	E2
4151	A

4222	FS
4242	E2
4252	A
4324	FS
4344	A
4354	A
442A	FS
444A	A
445A	A
452A	FS
454A	A
455A	A
462A	FS
464A	A
465A	A
5108	E3
5128	FS
5148	E3
5158	FS
5208	E3
5228	FS
5248	E3
5258	FS
5308	A
5328	FS
5348	A
5358	FS
6101	A
6102	A
6103	A
6104	A
6105	A
6106	A
6109	A
611(1-9 AS ABOVE)	A
612(1-9 AS ABOVE)	Ax
615(1-9 AS ABOVE)	A
710A	A
715A	A
81** (same as service 61)	A

Table 5/GSM 02.02

List of GSM bearer services

Annex A

(to recommendation GSM 02.02)

Description of individual bearer services

BEARER SERVICE CATEGORY 1

CIRCUIT MODE UNSTRUCTURED WITH UNRESTRICTED DIGITAL CAPABILITY
TRANSPARENT

1) DEFINITION

An unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) Sub-rate information streams which are rate adapted.
- ii) Transparent support of services i.e Quality of service attribute is set for transparent value.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

BEARER SERVICE CATEGORY 2

CIRCUIT MODE UNSTRUCTURED WITH UNRESTRICTED DIGITAL CAPABILITY
NON TRANSPARENT

1) DEFINITION

An unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) Sub-rate information streams which are rate adapted.
- ii) Non transparent support of services i.e Quality of service attribute is set for non transparent value.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 1	TITLE OF BEARER SERVICE : Circuit mode Unstructured with unrestricted digital capability transparent /non transparent
1	<p>INFORMATION TRANSFER</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
2	<p>INFORMATION TRANSFER RATE</p> <p>Not Applicable</p>
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by</p> <p>/group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>

TITLE OF BEARER SERVICE : Circuit mode Unstructured with unrestricted digital capability										NUMBER 1		
ACCESS CHANNEL AND RATE (at access point 1/2)												
12k bit/s	9.6kbit/s	4.8kbit/s	2.4kbit/s	1.2kbit/s	1200/75 bit/s	300bit/s	64kbit/s (MIC)					
9.1 SIGNALLING ACCESS (at access points 1/2)												
manual	X	X		X	X	X	X	X	X		X	
X21		X										
I440/450							X					X
V25 bis								X				
X32												
X28												
9.2 INFORMATION ACCESS PROTOCOL (at access point 1/2)												
G711												
I450/451												X
X25												
V22 bis									X			
V26 Ter									X			
V32	X											
X21		X										
V21												X
V22		X'							X'		X	
V23											X	
X28												
X29												
9.3 INFORMATION ACCESS STRUCTURE (at access point 1/2)												
SYNCHR	X	X		X	X	X	X	X	X	X	X	X
ASYNCH		X						X	X	X	X	X

1 Note 1 : The V22 DTE/DCE interface is used as an example of this type of access. Any DTE/DCE interface could be used which has an Asynchronous capability, with the user rate changed where necessary.

Data sheet No 1	<p>TITLE OF BEARER SERVICE : Circuit mode Unstructured with unrestricted digital capability transparent /non transparent</p>												
10	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>												
11	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values, one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <table data-bbox="454 747 909 1017"> <tr> <td data-bbox="454 747 588 774">Transparent</td> <td data-bbox="588 747 729 774">Asynchronous</td> <td data-bbox="729 747 909 774">Non Transparent</td> </tr> <tr> <td data-bbox="493 791 548 858"><input checked="" type="checkbox"/></td> <td data-bbox="588 814 729 836"></td> <td data-bbox="784 791 838 858"><input checked="" type="checkbox"/></td> </tr> <tr> <td data-bbox="454 911 588 937">Transparent</td> <td data-bbox="588 911 729 937">Synchronous</td> <td data-bbox="729 911 909 937">Non Transparent</td> </tr> <tr> <td data-bbox="493 955 548 1021"><input checked="" type="checkbox"/></td> <td data-bbox="588 977 729 999"></td> <td data-bbox="784 955 838 1021"><input type="checkbox"/></td> </tr> </table>	Transparent	Asynchronous	Non Transparent	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Transparent	Synchronous	Non Transparent	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Transparent	Asynchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>											
Transparent	Synchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input type="checkbox"/>											
12	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required, for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>												
13	<p>OPERATIONAL COMMERCIAL</p>												

BEARER SERVICE CATEGORY 3

PAD SERVICES

1) DEFINITION

An unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) Sub-rate information streams which are rate adapted.
- ii) Access to a packet assembler/disassembler function.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 1	TITLE OF BEARER SERVICE : Pad services
1	<p>INFORMATION TRANSFER</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
2	<p>INFORMATION TRANSFER RATE</p> <p>Not Applicable</p>
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by</p> <p>/group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>

TITLE OF BEARER SERVICE: Pad services										NUMBER 2
ACCESS CHANNELS AND RATE (at access point 1/2)										
	12k bit/s	9.6kbit/s	4.8kbit/s	2.4kbit/s	1.2kbit/s	1200/75 bit/s	300bit/s			64kbit/s (via MIC)
9.1 SIGNALLING ACCESS (at access points 1/2)										
manual	X	X	X	X	X	X	X			
X21										
I440/450										X
V25 bis										
X32										
X28	X		X	X	X	X	X			
9.2 INFORMATION ACCESS PROTOCOL (at access point 1/2)										
G711										
I450/451										X
X25										
V22 bis										
V26 Ter										
V32										
X21										
V21									X	
V22	X ²		X ¹	X ¹	X					
V23						X				
X28										
X29										
9.3 INFORMATION ACCESS STRUCTURE (at access point 1/2)										
SYNCHR										
ASYNCH	X		X	X	X				X	X

2 Note 1: The V22 DTE/DCE interface is used as an example of this type of access. Any DTE/DCE interface could be used which has an Asynchronous capability, with the user rate changed where necessary.

Data sheet No 2	TITLE OF BEARER SERVICE : Pad services
10	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>
11	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values. one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <p>Transparent Non Transparent</p> <p><input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
12	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required. for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>
13	OPERATIONAL COMMERCIAL

BEARER SERVICE CATEGORY 4

PACKET SERVICE

1) DEFINITION

An unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) Access to a X25 public data network (Recommendation 07.03,) using X32 or X31 case A access
- ii) Utilisation of X31 case B access (Virtual circuit bearer service)

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 3	TITLE OF BEARER SERVICE : Packet mode service
1	<p>INFORMATION TRANSFER (Note: circuit if using X32/X31 case A : packet if using X31 case B)</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
2	INFORMATION TRANSFER RATE
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by /group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>

Data sheet No 3	TITLE OF BEARER SERVICE : Packet mode service
10	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>
11	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values, one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <p>Transparent Non Transparent</p> <p style="text-align: center;"> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> </p>
12	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required, for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>
13	OPERATIONAL COMMERCIAL

BEARER SERVICE CATEGORY 5

**CIRCUIT MODE UNSTRUCTURED WITH ALTERNATE SPEECH UNRESTRICTED
DIGITAL CAPABILITY TRANSPARENT**

1) DEFINITION

An Alternate speech/unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) The unrestricted digital capability allows the use of sub-rate information streams which are rate adapted.
- ii) The capability to swap between speech and data during a call.
- iii) Transparent support of services i.e the quality of service attribute value is set to transparent.

It is intended that where either the speech or data service requires the use of a full rate channel and the other service requires the use of a half rate channel, that a full rate channel will be reserved for the duration of the call, with a half rate channel remaining unused for the period where the service only requires a half rate channel.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

BEARER SERVICE CATEGORY 6

CIRCUIT MODE UNSTRUCTURED WITH ALTERNATE SPEECH UNRESTRICTED
DIGITAL CAPABILITY NON TRANSPARENT

1) DEFINITION

An Alternate speech/unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) The unrestricted digital capability allows the use of sub-rate information streams which are rate adapted.
- ii) The capability to swap between speech and data during a call.
- iii) Non transparent support of services i.e the quality of service attribute value is set to non transparent.

It is intended that where either the speech or data service requires the use of a full rate channel and the other service requires the use of a half rate channel, that a full rate channel will be reserved for the duration of the call, with a half rate channel remaining unused for the period where the service only requires a half rate channel.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 4	TITLE OF BEARER SERVICE : Circuit mode Unstructured with alternate speech/unrestricted digital capability transparent/non transparent
1	<p>INFORMATION TRANSFER</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
2	<p>INFORMATION TRANSFER RATE</p> <p>Not Applicable</p>
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by</p> <p>/group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>

TITLE OF BEARER SERVICE : CCT MODE UNST WITH A.L.T SPEECH/UNKRES DIG TRAN/NON TRAN										NUMBER 4		
ACCESS CHANNEL AND RATE (at access point 1/2)												
12k bit/s	9.6kbit/s	4.8kbit/s	2.4kbit/s	1.2kbit/s	1200/75 bit/s	300bit/s			6.4kbit/s (via NIIC)			
SIGNALLING ACCESS (at access points 1/2)												
9.1												
manual	X	X	X	X	X	X						
X21												
I440/450										X		
V25 bis				X								
X32												
X28												
9.2	INFORMATION ACCESS PROTOCOL (at access point 1/2)											
G711											X	
I450/451												
X25				X								
V22 bis												
V26 Ter			X									
V32	X											
X21												
V21										X		
V22		X ¹		X ³	X							
V23								X				
X28												
X29												
9.3	INFORMATION ACCESS STRUCTURE (at access point 1/2)											
SYNCHR	X		X	X	X	X	X	X	X		X	
ASYNCH		X				X	X	X	X	X	X	

3 Note 1 : The V22 DTE/DCE interface is used as an example of this type of access. Any DTE/DCE interface could be used which has an Asynchronous

Data sheet No 4	<p>TITLE OF BEARER SERVICE : Circuit mode Unstructured with alternate speech/unrestricted digital capability transparent/non transparent</p>												
10	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>												
11	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values, one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <table data-bbox="446 798 906 1072"> <tr> <td data-bbox="446 798 580 820">Transparent</td> <td data-bbox="729 798 906 820">Non Transparent</td> </tr> <tr> <td data-bbox="487 842 539 909"><input checked="" type="checkbox"/></td> <td data-bbox="588 864 729 887">Asynchronous</td> </tr> <tr> <td data-bbox="780 842 832 909"><input checked="" type="checkbox"/></td> <td data-bbox="780 864 832 887"></td> </tr> <tr> <td data-bbox="446 964 580 986">Transparent</td> <td data-bbox="729 964 906 986">Non Transparent</td> </tr> <tr> <td data-bbox="487 1008 539 1075"><input checked="" type="checkbox"/></td> <td data-bbox="588 1030 729 1052">Synchronous</td> </tr> <tr> <td data-bbox="780 1008 832 1075"><input type="checkbox"/></td> <td data-bbox="780 1030 832 1052"></td> </tr> </table>	Transparent	Non Transparent	<input checked="" type="checkbox"/>	Asynchronous	<input checked="" type="checkbox"/>		Transparent	Non Transparent	<input checked="" type="checkbox"/>	Synchronous	<input type="checkbox"/>	
Transparent	Non Transparent												
<input checked="" type="checkbox"/>	Asynchronous												
<input checked="" type="checkbox"/>													
Transparent	Non Transparent												
<input checked="" type="checkbox"/>	Synchronous												
<input type="checkbox"/>													
12	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required, for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>												
13	<p>OPERATIONAL COMMERCIAL</p>												

Note : This bearer service will utilise a full rate channel for the duration of the call (if either the speech capability or data capability indicates it as necessary), i.e either the speech or data portion of the call may only utilise a half rate channel, however the full channel capability should be retained.

: The access interface at the mobile station is assumed to be different for the data and the speech usage. Some means must be provided to select the speech/data capability.

BEARER SERVICE CATEGORY 7

CIRCUIT MODE UNSTRUCTURED WITH SPEECH FOLLOWED BY UNRESTRICTED
DIGITAL CAPABILITY TRANSPARENT

1) DEFINITION

A speech followed by unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) The unrestricted digital capability allows the use of Sub-rate information streams which have been rate adapted.

- ii) With this service the intention is to establish a speech call in the first instance and then at some time while the call is in progress for the user to be able to switch to the data capability. It is intended that if this swap causes a change from a full channel usage to a half rate channel usage, that the remaining half rate channel will be released i.e the user is unable to swap back again.

- iii) Transparent support of services i.e quality of service attribute value is set for transparent.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

BEARER SERVICE CATEGORY 8

CIRCUIT MODE UNSTRUCTURED WITH SPEECH FOLLOWED BY UNRESTRICTED
DIGITAL CAPABILITY NON TRANSPARENT

1) DEFINITION

A speech followed by unrestricted bearer service provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) The unrestricted digital capability allows the use of Sub-rate information streams which have been rate adapted.
- ii) With this service the intention is to establish a speech call in the first instance and then at some time while the call is in progress for the user to be able to switch to the data capability. It is intended that if this swap causes a change from a full channel usage to a half rate channel usage, that the remaining half rate channel will be released i.e the user is unable to swap back again.
- iii) Non transparent support of services i.e quality of service attribute value is set for non transparent.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 5	TITLE OF BEARER SERVICE : Circuit mode Unstructured with speech followed by unrestricted digital capability transparent/non transparent
1	<p>INFORMATION TRANSFER</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
2	<p>INFORMATION TRANSFER RATE</p> <p>Not Applicable</p>
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by</p> <p>/group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>

TITLE OF BEARER SERVICE : CCT MODE UNSTR WITH SPEECH FOLLOWED BY UNRES DIG CAPABILITY TRANS/NON TRANS		ACCESS CHANNEL AND RATE (at access point 1/2)										NUMBER 5	
		12k bit/s	9.6kbit/s	4.8kbit/s	2.4kbit/s	1.2kbit/s	1200/75 bit/s	300bit/s	64kbit/s (via MIC)				
8													
9.1		SIGNALLING ACCESS (at access points 1/2)											
manual		X	X	X	X	X	X	X	X	X	X		
X21													
I440/450													X
V25 bis									X				
X32													
X28													
9.2		INFORMATION ACCESS PROTOCOL (at access point 1/2)											
G711													
I450/451													X
X25													
V22 bis								X					
V26 Ter						X							
V32		X											
X21													
V21												X	
V22			X ¹					X ⁴	X	X			
V23										X			
X28													
X29													
9.3		INFORMATION ACCESS STRUCTURE (at access point 1/2)											
SYNCHR		X		X	X	X	X	X	X	X			X
ASYNCH			X				X	X	X	X	X		X

4 Note 1 : The V22 DTE/DCE interface is used as an example of this type of access. Any DTE/DCE interface could be used which has an Asynchronous capability, with the user rate changed where necessary.

<p>Data sheet No 5</p>	<p>TITLE OF BEARER SERVICE : Circuit mode Unstructured with speech followed by unrestricted digital capability transparent/non transparent</p>												
<p>10</p>	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>												
<p>11</p>	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values, one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <table data-bbox="479 747 929 853"> <tr> <td data-bbox="479 747 608 769">Transparent</td> <td data-bbox="613 809 754 831">Asynchronous</td> <td data-bbox="758 747 929 769">Non Transparent</td> </tr> <tr> <td data-bbox="519 787 569 853"><input checked="" type="checkbox"/></td> <td></td> <td data-bbox="805 787 856 853"><input checked="" type="checkbox"/></td> </tr> </table> <table data-bbox="479 904 929 1010"> <tr> <td data-bbox="479 904 608 926">Transparent</td> <td data-bbox="613 966 746 988">Synchronous</td> <td data-bbox="758 904 929 926">Non Transparent</td> </tr> <tr> <td data-bbox="519 944 569 1010"><input checked="" type="checkbox"/></td> <td></td> <td data-bbox="805 944 856 1010"><input type="checkbox"/></td> </tr> </table>	Transparent	Asynchronous	Non Transparent	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Transparent	Synchronous	Non Transparent	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Transparent	Asynchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>											
Transparent	Synchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input type="checkbox"/>											
<p>12</p>	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required, for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>												
<p>13</p>	<p>OPERATIONAL COMMERCIAL</p>												

BEARER SERVICE CATEGORY 9

3.1 KHZ EX PLMN TRANSPARENT

1) DEFINITION

A Bearer Service based on the 3.1 kHz Ex PLMN bearer service category provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) This service supports the use of Sub-rate information streams which have been rate adapted.
- ii) The capability to the requirement to select a modem at the interworking function.
- iii) Transparent support of services i.e quality of service attribute value is set for transparent.

It is intended that this service should utilise an unrestricted digital connection within the PLMN, but that it should be used to select the "3.1 kHz Audio" service when interworking to the ISDN. It is not intended that this service should support the transmission of speech or voiceband data directly, within the PLMN, as the ISDN bearer service does within the ISDN.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

BEARER SERVICE CATEGORY 10

3.1 KHZ EX PLMN NON TRANSPARENT

1) DEFINITION

A Bearer Service based on the 3.1 kHz Ex PLMN bearer service category provides information transfer between R/S reference points. It may therefore be used to support various user applications. Examples include:

- i) This service supports the use of Sub-rate information streams which have been rate adapted.
- ii) The capability to the requirement to select a modem at the interworking function.
- iii) Non transparent support of services i.e quality of service attribute value is set for non transparent.

It is intended that this service should utilise an unrestricted digital connection within the PLMN, but that it should be used to select the "3.1 kHz Audio" service when interworking to the ISDN. It is not intended that this service should support the transmission of speech or voiceband data directly, within the PLMN, as the ISDN bearer service does within the ISDN.

User information is transferred over a Bm or Lm channel; signalling is provided over a Dm channel.

2) ATTRIBUTE VALUES

Data sheet No 6	TITLE OF BEARER SERVICE : 3.1 kHz Ex PLMN transparent /non transparent
1	<p>INFORMATION TRANSFER</p> <p>CIRCUIT PACKET</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
2	INFORMATION TRANSFER RATE
3	<p>INFORMATION TRANSFER CAPABILITY</p> <p>Unrestricted digital speech 3.1kHz Ex PLMN</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p> <p>Alternate speech Alternate speech Speech followed by</p> <p>/group 3 facsimile /Unres Digital Unres Digital</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
4	<p>STRUCTURE</p> <p>Structured Service data unit integrity Unstructured</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p>
5	<p>ESTABLISHMENT OF COMMUNICATION</p> <p>Demand</p> <p><input checked="" type="checkbox"/></p>
6	<p>COMMUNICATION CONFIGURATION</p> <p>Point to point Point to multipoint</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/></p>
7	<p>SYMMETRY</p> <p>Unidirectional Bi-Directional symmetric Bi-Directional asymmetric</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>

TITLE OF BEARER SERVICE : 3.1 KIIZ EX PLMN TRANS/NON TRANS										NUMBER 6
ACCESS CHANNEL AND RATE (at access point 1/2)										
	12k bit/s	9.6kbit/s	4.8kbit/s	2.4kbit/s	1.2kbit/s	1200/75 bit/s	300bit/s	64kbit/s (via NITC)		
SIGNALLING ACCESS (at access points 1/2)										
9.1										
manual		X	X	X	X	X	X			
X21										
1440/450										X
V25 bis					X					
X32										
X28										
9.2	INFORMATION ACCESS PROTOCOL (at access point 1/2)									
G711										X
1450/451										
X25							X			
V22 bis										
V26 Ter			X							
V32	X									
X21										
V21									X	
V22		X ¹			X					
V23									X	
X28										
X29										
9.3	INFORMATION ACCESS STRUCTURE (at access point 1/2)									
SYNCHR	X		X	X	X	X	X	X		X
ASYNCH		X	X		X	X	X		X	X

5 Note 1 : The V22 DTE/DCE interface is used as an example of this type of access. Any DTE/DCE interface could be used which has an Asynchronous

Data sheet No 6	<p>TITLE OF BEARER SERVICE : 3.1 kHz Ex PLMN transparent /non transparent</p>												
10	<p>SUPPLEMENTARY SERVICES</p> <p>The description of these services are contained in recommendation 02.04</p>												
11	<p>QUALITY OF SERVICE</p> <p>This attribute has two sets of values, one for the transparent support of data services the other for the non-transparent support of data services. For the definition of transparent and non-transparent concepts refer to recommendation 01.04 and 03.10. For the quality of service parameters associated with both options refer to recommendation 02.08.</p> <table data-bbox="462 763 917 1028"> <tr> <td data-bbox="462 763 588 785">Transparent</td> <td data-bbox="603 763 729 785">Asynchronous</td> <td data-bbox="744 763 917 785">Non Transparent</td> </tr> <tr> <td data-bbox="493 807 556 873"><input checked="" type="checkbox"/></td> <td data-bbox="603 829 729 851"></td> <td data-bbox="791 807 854 873"><input checked="" type="checkbox"/></td> </tr> <tr> <td data-bbox="462 917 588 940">Transparent</td> <td data-bbox="603 917 729 940">Synchronous</td> <td data-bbox="744 917 917 940">Non Transparent</td> </tr> <tr> <td data-bbox="493 962 556 1028"><input checked="" type="checkbox"/></td> <td data-bbox="603 984 729 1006"></td> <td data-bbox="791 962 854 1028"><input type="checkbox"/></td> </tr> </table>	Transparent	Asynchronous	Non Transparent	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Transparent	Synchronous	Non Transparent	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Transparent	Asynchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>											
Transparent	Synchronous	Non Transparent											
<input checked="" type="checkbox"/>		<input type="checkbox"/>											
12	<p>INTERWORKING POSSIBILITIES</p> <p>Intercommunication with services in the PSTN, PSPDN, ISDN, CSPDN, PLMN and DIRECT ACCESS is required, for specific applications refer to Table 3. Changes to the capabilities as a result of this may be necessary. Interworking capabilities are contained in recommendations 09.01, 09.02, 09.03, 09.04, 09.05, 09.06 and 09.07.</p>												
13	<p>OPERATIONAL COMMERCIAL</p>												