Technical Specification Group Services and System Aspects
Meeting #6, Nice, France, 15-17 December 1999

***TSGS#6(99)520***

**Source:** **TSG SA1**

**Title:** **Various CRs to 22.002**

**Document for:** **Approval**

**Agenda Item:** **5.1.4**

| Status | Spec | CR | Rev | Phase | Subject | CAT | Vers | New Vers | TSG Meeting | TSG Doc.No. | Pres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 22.002 | 003 | | R99 | Addition of new general bearer service user data characteristics for 33.6kbit/s modem, FTM and multimedia calls | B | 3.1.0 | 3.2.0 | S1#06 | S1-991008 | No |
| | 22.002 | 004 | | R99 | 22.002 made only applicable to CS Domain. | C | 3.1.0 | 3.2.0 | S1#06 | S1-991075 | No |

**3GPP SA1 #6/ SMG1 #65**
**San Diego, USA, 29 Nov – 3 Dec**

***Document (99) 1008***
*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| 22.002 | CR | 003 | Current Version: | 3.1.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | SA #6 | for approval | X | strategic | | (for SMG use only) |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

| **Proposed change affects:** *(at least one should be marked with an X)* | (U)SIM | | ME | X | UTRAN / Radio | X | Core Network | X |
|---|---|---|---|---|---|---|---|---|

**Source:** TSG SA1 **Date:** 1999-11-30

**Subject:** Addition of new general bearer service user data characteristics for 33.6kbit/s modem, FTM and multimedia calls

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | X | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:**

Addition of 33.6kbit/s to Fixed Network User Rate.
General bearer service user data characteristics shall be enhanced to provide the Frame Tunnelling Mode (FTM) and Multimedia Calls to reflect N1 and N3 result of study.

a) 3G-H.324/M is used as the multimedia system for the CS domain.
b) "H.223 & H.245" which is a new indication is added to indicate 3G-H.324/M calls.
c) 3G-H.324/M calls are supported over 64kbit/s(UDI), 56kbit/s(RDI), 33.6kbit/s(3.1kHz audio), 28.8kbit/s(3.1kHz audio) and 32kbit/s(UDI)
d) 3G-H.324/M calls are provided by the use of synchronous general bearer service(BS 30).

**Clauses affected:**

**Other specs affected:**

| | | |
|---|---|---|
| Other 3G core specifications | | → List of CRs: |
| Other GSM core specifications | | → List of CRs: |
| MS test specifications | | → List of CRs: |
| BSS test specifications | | → List of CRs: |
| O&M specifications | | → List of CRs: |

**Other comments:**

help.doc

<--------- double-click here for help and instructions on how to create a CR.

## 3.1 General bearer service user data characteristics

The tables below describe the characteristics of the General Bearer Services. The indicated fixed network user rates are possible, but support of General Bearer Service does not imply support of all rates.

### 3.1.1 3,1 kHz Audio

| Fixed Network User Rate | Access Structure | Information Transfer Capability | QoS attributes | Note |
|---|---|---|---|---|
| 0.3 kbit/s | Asynch | 3,1 kHz | NT or T | note 2 |
| 1.2 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | notes 1 and 2 |
| 2.4 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | note 2 |
| 4.8 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | note 2 |
| 9.6 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 14.4 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 19.2 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 28.8 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 33.6 kbit/s | Asynch | 3.1 kHz | NT | |
| | Asynch | 3,1 kHz | NT | Note 3 |

NOTE 1: Not applicable to synchronous NT service.

NOTE 2: These services are also supported by the GSM Phase 2 Specifications.

NOTE 3: This is used with high speed modems such as V.90 (56kbit/s). Modem type = 'Autobauding Type 1' is selected. FNUR has no meaning in this case.

### 3.1.2 V.110 UDI

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 0.3 kbit/s | Asynch | V.110 | NT or T | note 2 |
| 1.2 kbit/s | Asynch, Synch | V.110 | NT or T | note 1<br>note 2 |
| 2.4 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 4.8 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 9.6 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 14.4 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 19.2 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 28.8 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 38.4 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 48 kbit/s | Synch | V.110 | T | |
| 56 kbit/s | Synch | V.110 | T (in a 64 kbit/s environment) | |

NOTE 1: Not applicable to synchronous NT service.

NOTE 2: These services are also supported by the GSM Phase 2 Specifications.

### 3.1.3 X.31 Flag Stuffing UDI

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 2.4 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 4.8 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 9.6 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 14.4 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 19.2 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 28.8 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 38.4 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 48 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 56 kbit/s | Synch | X.31 Flag Stuffing | NT | |

NOTE 1: These services are also supported by the GSM Phase 2 Specifications.

### 3.1.4 V.120

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 1.2 kbit/s | Asynch | V.120 | NT | |
| 2.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 4.8 kbit/s | Asynch, Synch | V.120 | NT | |
| 9.6 kbit/s | Asynch, Synch | V.120 | NT | |
| 14.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 19.2 kbit/s | Asynch, Synch | V.120 | NT | |
| 28.8 kbit/s | Asynch, Synch | V.120 | NT | note 1 |
| 38.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 48 kbit/s | Asynch, Synch | V.120 | NT | |
| 56 kbit/s | Asynch, Synch | V.120 | NT | note 2 |

NOTE 1: Requires a new code point in V.120 specification to be defined.

NOTE 2: Not applicable in a 56 kbit/s environment.

### 3.1.5 Bit Transparent Mode

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 56 kbit/s | Synch | Bit transparent | T (RDI) (in a 56 kbit/s environment) | |
| 64 kbit/s | Synch | Bit transparent | T (UDI) (in a 64 kbit/s environment) | |

### 3.1.6 PIAFS

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 32 kbit/s | Asynch | PIAFS | NT | |
| 64 kbit/s | Asynch | PIAFS | NT | |

### 3.1.X Frame Tunnelling Mode

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 56kbit/s | Asynch | X.31 flag stuffing | NT | |
| 64 kbit/s | Asynch | X.31 flag stuffing | NT | Note1 |

Note1: Not applicable in a 56kbit/s environment.

### 3.1.X Multimedia Call

| Fixed Network User Rate | Access Structure | Information Transfer Capability | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|---|
| 28.8 kbit/s | Synch | 3.1kHz Audio | H.223 & H.245 | T | |
| 32.0 kbit/s | Synch | UDI | H.223 & H.245 | T | |
| 33.6 kbit/s | Synch | 3.1kHz Audio | H.223 & H.245 | T | |
| 56 kbit/s | Synch | RDI | H.223 & H.245 | T | |
| 64 kbit/s | Synch | UDI | H.223 & H.245 | T | |

*TSG-SA Working Group 1 meeting #6*
**San Diego, 29 Nov – 03 Dec 1999**

***TSG S1 (99) 1075***
Agenda: 6.0

# 3G CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

**22.002** **CR** **004** Current Version: 3.1.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG SA#6 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)* USIM [X] ME [X] UTRAN [X] Core Network [X]

**Source:** SMG1/ SA WG1 **Date:**

**Subject:** 22.002 made only applicable to CS Domain.

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | X |
| D | Editorial modification | |

**Reason for change:** 22.002 does not describe PS domain requirements properly and the requirements are already included in other 22.-series specifications. Thus scope on 22.002 is only limited to CS domain. Further basic packet mode has been removed.

**Clauses affected:** All clauses

**Other specs affected:**

| | | |
|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: |
| Other 2G core specifications | [ ] | → List of CRs: |
| MS test specifications | [ ] | → List of CRs: |
| BSS test specifications | [ ] | → List of CRs: |
| O&M specifications | [ ] | → List of CRs: |

**Other comments:**

help.doc

<--------- double-click here for help and instructions on how to create a CR.

# 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN) (3G TS 22.002 version 3.1.0)

0 Scope

The present document defines a set of ~~CS domain~~Circuit Bearer Services to be provided to PLMN subscribers by a PLMN itself and in connection with other networks. This TS should also be used as a reference for defining the corresponding required mobile network capabilities.

~~Bearer Services not included in this TS that require modifications to the signalling specifications should not be introduced unilaterally by a mobile network operator.~~

# 0.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- For this Release 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).


[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] ~~GSM~~ TS 2~~0~~2.0~~0~~1: "~~Digital cellular telecommunications system (Phase 2+);~~ Principles of Circuit telecommunication services supported by a GSM Public Land Mobile Network (PLMN)".

[3] TS 22.004: " General on supplementary services".

[4] TS 27.001: " General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[5] TS 27.002: " Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[6] TS 27.003: " Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[7] TS 27.005: "Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[8] TS 29.002: " Mobile Application Part (MAP) specification".

~~[9] TS 29.006: " Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services".~~

[9~~10~~] TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[10~~1~~] TS 29.010: " Information element mapping between Mobile Station - Base Station System and BSS - Mobile-services Switching Centre (MS - BSS - MSC) Signalling procedures and the Mobile Application Part (MAP)".

[11~~2~~] TS 29.011: " Signalling interworking for supplementary services".

[12~~3~~] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipments with V-series type interface with provision for statistical multiplexing".

~~[14] TS 22.060: " General Packet Radio Service (GPRS); Service description; Stage 1"~~

~~[15] TS 27.060: "General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS"~~

~~[16] TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface"~~

[137] TR 21.905: "Vocabulary for 3GPP Specifications"

## 0.2 Abbreviations

Abbreviations used in this TS are listed in GSM 01.04 [1] and TR 21.905 [137].

# 1 Framework for defining Circuit Bearer Services

Bearer Services are described by attributes, which are intended to be independent. These attributes are described and defined in GSM TS 202.001 [2]. They are grouped into four categories:

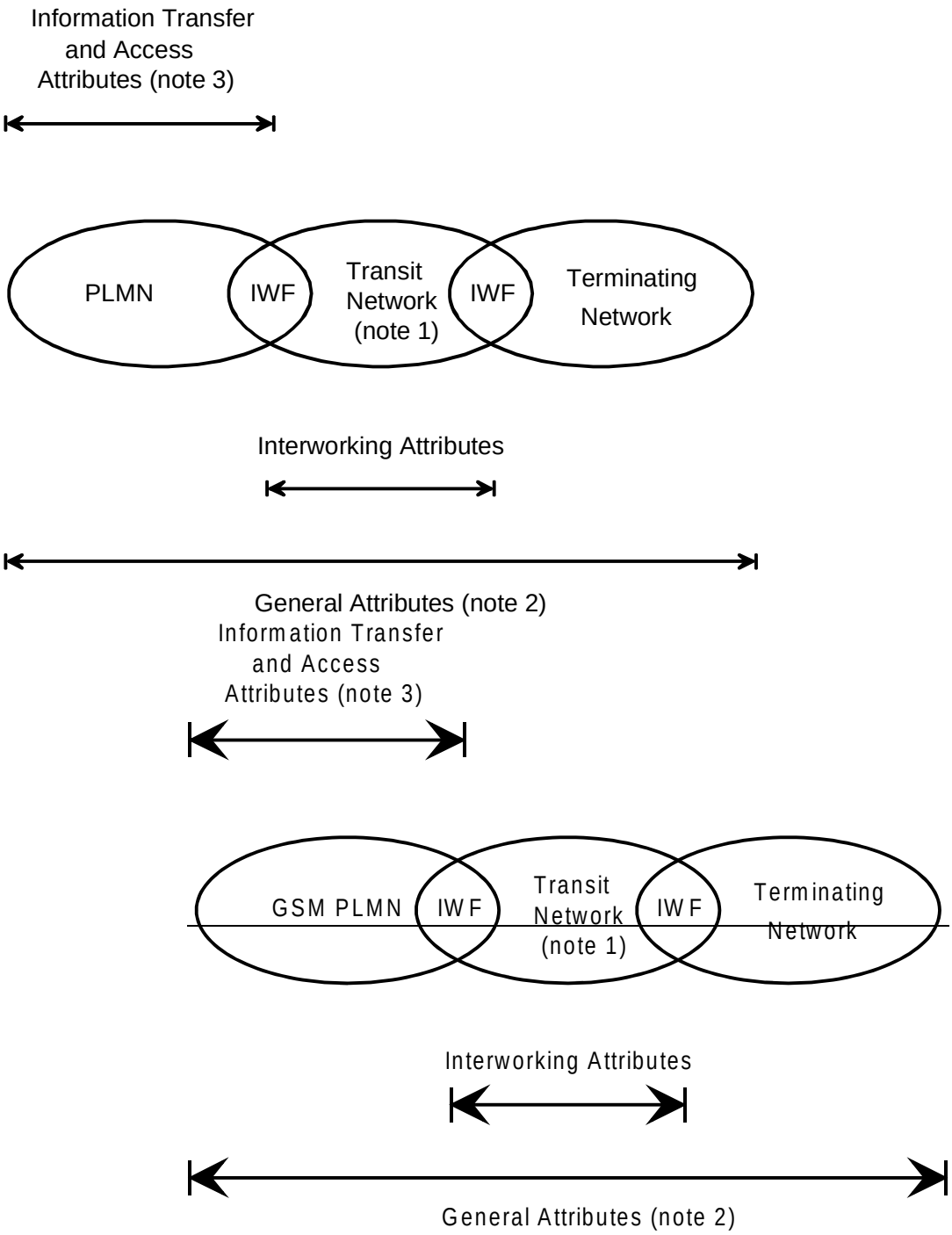
i) Information transfer attributes, which characterize the network capabilities for transferring information from a user access point in a PLMN to a user access point in another network. (Refer to GSM 0TS 22.001 [2] ).

ii) Access attributes, which describe the means for accessing network functions or facilities as seen at the access point in the PLMN (see GSM 02TS 22.001 [2]).

iii) Interworking attributes, which describe properties of the terminating network and its access point. The terminating network may include another PLMN or the originating PLMN.

iv) General attributes, which deal with the service in general.

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




NOTE 1: A transit network may not exist for a Bearer Service.
NOTE 2: Communication may be established from either end.
NOTE 3: The information transfer and access attributes of a Bearer Service relate to a direct peer-to-peer communication of:
- TE to TE;
- TE to a network gateway (supporting, for example, PSTN interworking); or
- network gateway to a TE.

**Figure 1: Relation between the groups of attributes and fields of applicability**

The following table lists the individual attributes in each of the four groups. The Bearer Service definitions in this specification are based on the "Minimal Set" of attributes.

**Table 1: List of Bearer Service attributes**

| | Minimal Set |
|---|---|
| **Information Transfer Attributes** | |
| Information Transfer Mode | X |
| Information Transfer Rate | X |
| Information Transfer Capability | X |
| Establishment of Communication | X |
| Symmetry | X |
| Communication Configuration | X |
| Data Compression | |
| **Access Attributes** | |
| Access Channel and Rate | |
| Signalling Access Protocols | |
| Information Access Protocols | |
| Information Access Structure | X |
| Information Access Rate | X |
| **Interworking Attributes** | |
| **General Attributes** | |
| Supplementary Services Provided | |
| Quality of Service | X |
| Operational and Commercial | |

Attributes that are not part of the minimal set provide further technical detail and are required to fully define the use of each Bearer Service.

~~General Packet Radio Service (GPRS) is specified in TS 22.060 [14].~~

See specifications [4], [5], [6], [7], ~~[15]~~ for information about the Signalling Access Protocols, Information Access Protocols and related access attributes.

Supplementary services are defined in TS 22.004 [3].

Intercommunication is required with services in the PSTN, ISDN~~, PDN, PSPDN~~ and other PLMNs. The capabilities that describe the Interworking Attributes are described in specifications [8] to [9~~10~~] ~~and [16]~~.

## 2 Bearer Service categories

All Bearer Service categories provide information transfer between the ~~R/S~~ reference points and allow the use of sub-rate information streams which are rate-adapted.

The Bearer Services can be grouped into the following categories:

- Unrestricted Digital Information (UDI);

  Provides the transfer of unrestricted digital information.

- 3,1 kHz (External to the PLMN);

  Used to select a "3,1 kHz audio" interworking function at the MSC. This service category is used when interworking with the ISDN or PSTN "3,1 kHz audio" service and includes the capability to select a modem at the interworking function. "External to the PLMN" indicates that the "3,1 kHz audio" service is only used outside of the PLMN, in the ISDN/PSTN. The connection within the PLMN, user access point to the interworking function, is an unrestricted digital connection.

~~- PAD;~~

~~Provides an asynchronous connection to a PAD. This enables PLMN subscribers to access a packet network (PSPDN/ISDN).~~

~~Note: From release 99 onwards only Basic PAD access is supported.~~

~~- Packet;~~

~~Provides a synchronous connection that enables PLMN subscribers to access a packet network (PSPDN/ISDN). See TS 29.006 [9] for service and interworking specifications.~~

~~NOTE: From release 99 onwards only Basic Packet access is supported;~~
~~General Packet Radio Service (GPRS). GPRS provides Internet (IP) and X.25 interworking with external networks. See TS 22.060 [14].~~

# 3 Bearer Services

This clause provides a list of the existing Bearer Services and indicates the values for each attribute in the minimal set. The following attributes have the same value for all Bearer Services. Their values are as follows:

Information Transfer Mode: "Circuit" ~~(note 1)~~;

Information Transfer Rate: Not applicable (note 1~~2~~);

Establishment of Communication: "Demand";

Symmetry: "Bi-directional Symmetric" ~~(note 3)~~;

Communication Configuration: "Point to point".

~~NOTE 1: GPRS (BS 70) requires "packet" information transfer mode.~~

NOTE 1~~2~~: The Information Transfer Rate attribute is not applicable because it depends on the reference point assumed in the PLMN, transit or terminating network.

~~NOTE 3: GPRS (BS 70) require a value of "Bi-directional Asymmetric".~~

All asynchronous NT Bearer Services may support data compression to enhance user data throughput.
NT Bearer Services 20 and 30 may support V.120 interworking, enabling data terminals connected to an ~~MS~~UE to interwork with V.120 [13] terminal adapters on the ISDN as shown in the figure 2 below.

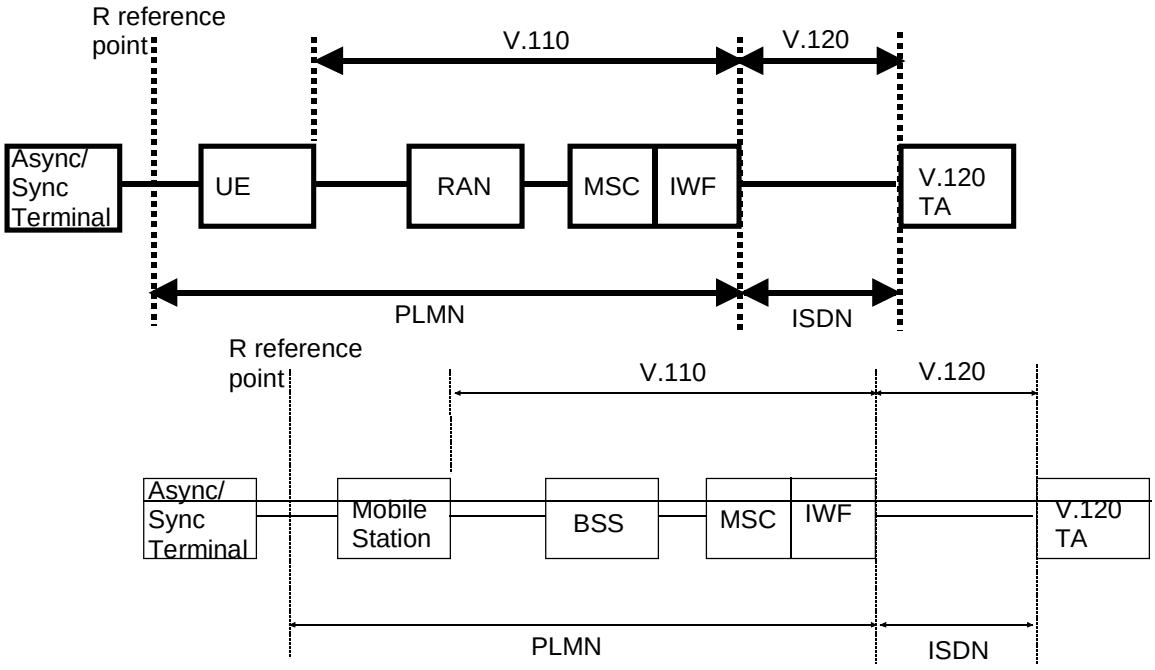



**Figure 2: Model of ~~GSM~~ V.120 Interworking**

Table 2 contains the list of the Bearer Services and the values for the remaining attributes in the minimal set.

**Table 2**

| Bearer Service Number | Bearer Service Name | Access Structure | Access Rate | Information Transfer Capability | QOS Attribute | Notes |
|---|---|---|---|---|---|---|
| 20 | Asynchronous General Bearer Service | Asynch | note 1 | note 1 | note 1 | See note 1 |
| 30 | Synchronous General Bearer Service | Synch | note 2 | note 2 | note 2 | See note 1 |
| ~~70~~ | ~~GPRS~~ | ~~Async~~ | ~~Variable~~ | ~~UDI~~ | ~~T or NT~~ | |

NOTE 1: This General Bearer is independent of any nominal rate. It is elaborated in more detail in subclause 3.1

NOTE 2: Please refer to subclause 3.1.

# 3.1 General bearer service user data characteristics

The tables below describe the characteristics of the General Bearer Services. The indicated fixed network user rates are possible, but support of General Bearer Service does not imply support of all rates.

## 3.1.1 3,1 kHz Audio

| Fixed Network User Rate | Access Structure | Information Transfer Capability | QoS attributes | Note |
|---|---|---|---|---|
| 0.3 kbit/s | Asynch | 3,1 kHz | NT or T | note 2 |
| 1.2 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | notes 1 and 2 |
| 2.4 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | note 2 |
| 4.8 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | note 2 |
| 9.6 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 14.4 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 19.2 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| 28.8 kbit/s | Asynch, Synch | 3,1 kHz | NT or T | |
| - | Asynch | 3,1 kHz | NT | Note 3 |

NOTE 1: Not applicable to synchronous NT service.

NOTE 2: These services are also supported by the GSM Phase 2 Specifications.

NOTE 3: This is used with high speed modems such as V.90 (56kbit/s). Modem type = 'Autobauding Type 1' is selected. FNUR has no meaning in this case.

## 3.1.2 V.110 UDI

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 0.3 kbit/s | Asynch | V.110 | NT or T | note 2 |
| 1.2 kbit/s | Asynch, Synch | V.110 | NT or T | note 1<br>note 2 |
| 2.4 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 4.8 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 9.6 kbit/s | Asynch, Synch | V.110 | NT or T | note 2 |
| 14.4 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 19.2 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 28.8 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 38.4 kbit/s | Asynch, Synch | V.110 | NT or T | |
| 48 kbit/s | Synch | V.110 | T | |
| 56 kbit/s | Synch | V.110 | T (in a 64 kbit/s environment) | |

NOTE 1: Not applicable to synchronous NT service.

NOTE 2: These services are also supported by the GSM Phase 2 Specifications.

## 3.1.3 X.31 Flag Stuffing UDI

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 2.4 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 4.8 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 9.6 kbit/s | Synch | X.31 Flag Stuffing | NT | note 1 |
| 14.4 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 19.2 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 28.8 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 38.4 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 48 kbit/s | Synch | X.31 Flag Stuffing | NT | |
| 56 kbit/s | Synch | X.31 Flag Stuffing | NT | |

NOTE 1: These services are also supported by the GSM Phase 2 Specifications.

### 3.1.4 V.120

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 1.2 kbit/s | Asynch | V.120 | NT | |
| 2.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 4.8 kbit/s | Asynch, Synch | V.120 | NT | |
| 9.6 kbit/s | Asynch, Synch | V.120 | NT | |
| 14.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 19.2 kbit/s | Asynch, Synch | V.120 | NT | |
| 28.8 kbit/s | Asynch, Synch | V.120 | NT | note 1 |
| 38.4 kbit/s | Asynch, Synch | V.120 | NT | |
| 48 kbit/s | Asynch, Synch | V.120 | NT | |
| 56 kbit/s | Asynch, Synch | V.120 | NT | note 2 |

NOTE 1: Requires a new code point in V.120 specification to be defined.

NOTE 2: Not applicable in a 56 kbit/s environment.

### 3.1.5 Bit Transparent Mode

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 56 kbit/s | Synch | Bit transparent | T (RDI) (in a 56 kbit/s environment) | |
| 64 kbit/s | Synch | Bit transparent | T (UDI) (in a 64 kbit/s environment) | |

### 3.1.6 PIAFS

| Fixed Network User Rate | Access Structure | User Information Layer 1 protocol | QoS Attribute | Notes |
|---|---|---|---|---|
| 32 kbit/s | Asynch | PIAFS | NT | |
| 64 kbit/s | Asynch | PIAFS | NT | |