Source:	**TSG CN WG3**
Title:	**CRs on R99+ Work Item TEI [CS Data]**
Agenda item:	**7.11**
Document for:	**APPROVAL**

Introduction:

This document contains **5** CRs on **R99+** Work Item **TEI [CS Data]**, that have been agreed by **TSG CN WG3**, and are forwarded to TSG CN Plenary **meeting #16** for **approval**.

Doc-2nd-Level	Spec	CR	Rev	Subject	Cat	Version-Current	Phase	Workitem
N3-020304	27.001	077	1	Multislot clarification	F	5.1.0	Rel-5	TEI [CS Data]
N3-020314	29.007	052	1	Signalling of FTM calls	A	5.1.0	Rel-5	TEI [CS Data]
N3-020313	29.007	051	1	Signalling of FTM calls	A	4.3.0	Rel-4	TEI [CS Data]
N3-020312	29.007	050	2	Signalling of FTM calls	F	3.9.0	R99	TEI [CS Data]
N3-020281	29.007	048	1	Clarification to VMSC/HLR logic for modem/facsimile calls	F	5.1.0	Rel-5	TEI [CS Data]

CR-Form-v5

CHANGE REQUEST

⌘ **27.001** CR **077** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title: ⌘	Multislot clarification	
Source: ⌘	TSG CN WG3	
Work item code: ⌘	T.E.I [CS Data]	***Date:*** ⌘ 8 April 2002
Category: ⌘ **F**		***Release:*** ⌘ REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘	The text referring to HSCSD is misleading since it applies to 9.6 and 14.4 as well as HSCSD and should be changed.
Summary of change: ⌘	Text in Annex A is made applicable to a configuration with data rates 9.6kbit/s or higher, as opposed to only multislot configuration. Rate and modem type combination is clarified.
Consequences if not approved: ⌘	Misleading interpretation

Clauses affected: ⌘	Annex A
Other specs affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments: ⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex A (informative): List of Bearer Capability Elements

This annex lists the PLMN Bearer Capability Elements which need to be provided to support Terminal adaptation function to Interworking control procedures. Some parameters are ignored in UTRAN Iu mode although present in the BC-IE. The validity of parameter values may also differ from A/Gb mode to UTRAN Iu mode. The ignored parameters and the difference of parameter value validity in A/Gb mode and UTRAN Iu mode are listed in table B.5a in annex B.

============== **Next modified section** ==============

Asymmetry preference indication (Note 12)

This element is relevant between the MT and the BSS.

Value: - no preference
 - up link biased asymmetry preference
 - down link biased asymmetry preference

 NOTE 12: These GBS-related parameters are optional.

For a ~~multislot~~ configuration with data rates 9.6kbit/s or~~-~~ higher, the following applies to the parameters contained in the BC-IE:

- Half rate channels are not supported. The MS shall code the radio channel requirement as "Full rate support only MS" or "Dual rate support MS, full rate preferred". In the second case, the network shall assign full rate channel(s) only.

- The 'fixed network user rate' and 'other modem type' ~~(ref. table B.4a)~~ takes precedence over the 'user rate' and 'modem type', unless the 'modem type' indicates "autobauding".

- The ACC indicates which channel coding is acceptable and supported by the MS. In case of CE:NT the TCH/F4.8 and TCH/F9.6 acceptable is equivalent to the support of NIRR. If TCH/F4.8 acceptable only or TCH/F9.6 acceptable only or TCH/F14.4 acceptable only is indicated, the assigned channel type which can be chosen by the network is TCH/F4.8 or TCH/F9.6 or TCH/F14.4, respectively.

- The 'intermediate rate' parameter is overridden. The intermediate rate used per each TCH/F is derived from the chosen channel type:

channel type	IR per TCH/F
TCH/F4.8	8 kbit/s
TCH/F9.6	16 kbit/s
TCH/F14.4	intermediate rate is to be defined

- The user rate per TCH is derived from the chosen channel type:

channel type	user rate per TCH
TCH/F4.8	4.8 kbit/s
TCH/F9.6	9.6 kbit/s

 For CE:T, the padding procedure described in 3GPP TS 44.021 can be applied.

CR-Form-v6.1

CHANGE REQUEST

| ⌘ | **29.007** | CR | **048** | ⌘ **rev** | **1** | ⌘ | Current version: | **5.1.0** | ⌘ |

Spec Title: General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network ☐   Core Network **X**

Title:	⌘	Clarification to VMSC/HLR logic for modem/facsimile calls which are signalled as Speech.
Source:	⌘	TSG CN WG3

Work item code:	⌘	TEI [CS Data]	***Date:*** ⌘	02-04-02

Category:	⌘	**F**

Use one of the following categories:		*Use one of the following releases:*
F (correction)		*2 (GSM Phase 2)*
A (corresponds to a correction in an earlier release)		*R96 (Release 1996)*
B (addition of feature),		*R97 (Release 1997)*
C (functional modification of feature)		*R98 (Release 1998)*
D (editorial modification)		*R99 (Release 1999)*
Detailed explanations of the above categories can		*REL-4 (Release 4)*
be found in 3GPP TR 21.900.		*REL-5 (Release 5)*

Release: ⌘   REL-5

Reason for change:	⌘	To clarify the VMSC/HLR logic for modem/facsimile calls, which are signalled as speech.
Summary of change:	⌘	Clarified the logic in the HLR and VMSC/VLR by specifying the precedence of the stored BC-IE over the received BC-IE.
Consequences if not approved:	⌘	Inconsistency in VMSC/HLR logic and behaviour when modem/facsimile calls are signalled as speech.

Clauses affected:	⌘	10.2.2.3, 10.2.2.4 Annex A

Other specs affected:	⌘	☐ Other core specifications	⌘	
		☐ Test specifications		
		☐ O&M Specifications		

Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<div style="border:1px solid black; text-align:center;">

**** First Modified Section ****

</div>

10.2.2   Network interworking mobile terminated

…

10.2.2.3   Functions in HLR

According to the contents of the Compatibility Information, i.e. the ISDN BC, LLC and HLC received, the HLR applies one of the following alternatives:

1) no ISDN BC is received, or one from which a PLMN Basic Service cannot be deduced with the information Transfer Capability field set to "3,1 kHz audio" but without any associated modem type[1] in the ISDN BC and LLC, or without HLC indication of group 3 facsimile. Two cases shall be considered:

   a) the called MSISDN has a corresponding PLMN BC-IE stored in the HLR (see option a) of 9.2.2); then the service attached to this number in the HLR tables is applicable and the corresponding PLMN BC-IE is passed to the VLR in "provide roaming number". See figure 6;

   b) the called MSISDN has no corresponding PLMN BC-IE stored in the HLR (see option b in 9.2.2). In this case no PLMN BC is passed to the VLR in the "provide roaming number" message.

2) compatibility Information is received from which a PLMN Basic Service can be deduced, i.e. the ITC field in the ISDN BC received is "unrestricted digital" and the fields for the applicable user layer 1 protocol and user rate (except for the 64kbit/s case, see Note 22 Table 7B) are available (either in the ISDN BC or LLC), or the ITC field is "3,1 kHz audio", and a modem type, user rate, etc. is indicated but the HLC does not indicate "facsimile group 3". The received ISDN BC (and possibly LLC plus HLC) is then considered applicable regardless of the kind of MSISDN received (PLMN BC associated or not) and either the equivalent PLMN BC or the original ISDN BC/LLC is sent to the VLR. Additionally in both cases the originally received HLC may also be sent to the VLR, see figure 7.

   In exception to this the BC stored in the HLR is regarded valid if one of the following cases applies:

   - If ITC = UDI/RDI and User Rate = 32 kbit/s /56 kbit/s and User information layer 1 protocol = V.110, I.460/X.30 and the stored BC indicates FTM, PIAFS or Multimedia.

   - If ITC = 3,1 kHz audio and User Rate = 28.8 kbit/s and Modem Type = V.34 and the stored BC indicates Multimedia.

   When the HLR interworks with a phase 1 VPLMN (VLR/VMSC), then the HLR shall convert the ISDN BC to the equivalent PLMN BC, and forward to the VLR. In this case however no LLC can be forwarded.

3) Compatibility Information is received from which the PLMN Teleservice category Facsimile transmission can be deduced i.e. the ITC field in the ISDN BC received is "3,1kHz audio" and the HLC indicates "facsimile group 3" (see figure 7), the following two cases shall be considered:

   a) the called MSISDN has a corresponding PLMN BC stored in the HLR (either stating TS 61 or TS 62). In this case the service attached to the MSISDN in the HLR tables is applicable and the corresponding PLMN BC is passed to the VLR in the "provide roaming number" message, see also subclause 10.3.1.3;

   b) the called MSISDN has no corresponding PLMN BC stored in the HLR. In this case the HLR shall forward the appropriate PLMN BC to the VLR in line with the subscribers subscription to Teleservice TS 61 or 62.

   For TS 61 the value of the PLMN BC-IE parameter "Information Transfer Capability" shall be set to "alternate speech/facsimile group 3, starting with speech".

   In both cases the HLC IE should be passed to the VLR in the "provide roaming number" message.

---

[1]   "Modem type" in connection with the ITC value "3,1 kHz audio" means hereafter that either an ISDN BC modem type value is present or the autobauding modem function is indicated (see note 16 of table 7B)

Alternatively the HLR may forward the originally received ISDN/LLC/HLC, when interworking with a phase 2 VLR

4) In the case where Compatibility Information received does not allow for deducing a PLMN Bearer Service but an ISDN BC is received with the ITC field indicating "unrestricted digital", but without the fields indicating applicable "user layer 1 protocol", user rate, etc., neither in the ISDN BC or the ISDN LLC then the following shall apply. The call is managed as for an udi call according to subclause 9.2.2, i.e. either the "multi numbering" or "single numbering" scenario is applied depending on which capability is provided by home PLMN/HLR.

5) Compatibility information is received and the deduced ISDN BC indicates ITC field is "speech" and this value differs from the ITC field of the PLMN BC stored in the HLR, then the stored PLMN BC in the HLR is considered applicable and shall be sent to the VLR.

****** Next Modified Section ******

10.2.2.4   Functions in VMSC

At the VMSC, when the incoming call arrives, the LLC/HLC and the PLMN or ISDN BC associated with the MSRN is retrieved from the VLR. LLC and HLC are sent with the PLMN BC in general to the UE at call set-up. In particular, however the following rules apply:

1) If the Initial Address Message (IAM) contains no ISDN BC and there is no PLMN or ISDN BC/LLC/HLC retrieved from the VLR, the call is handled as subclause 9.2.2 case b.

2) If there is no ISDN BC in the IAM but a PLMN or ISDN BC/LLC/HLC was signalled in the "provide roaming number" message, the retrieved PLMN or ISDN BC/LLC/HLC applies.

3) If there is an ISDN BC in the IAM with the ITC field set to "3,1 kHz audio" but without any associated modem type or indication of facsimile group 3 in the HLC, the PLMN or ISDN BC/LLC/HLC retrieved from the VLR is considered as applicable when it exists. If no PLMN or ISDN BC is retrieved from the VLR, the call is handled as in subclause 9.2.2 case b.

4) If the ISDN BC received in the IAM has the ITC field set to the value "unrestricted digital information" and the fields for the applicable "user layer 1 protocol" and "user rate" (except for the 64kbit/s case, see note 22 table 7B) are available (either in the ISDN BC or ISDN LLC), or if 3,1 kHz audio and a modem type is indicated, this ISDN BC is applicable regardless of what has been retrieved from the VLR. In this case the ISDN BC shall be mapped to an appropriate PLMN BC (refer to table 7B).

   In exception to this the BC stored in the VLR is retrieved and send to the UE if one of the following cases applies:

   If ITC = UDI/RDI and User Rate = 32 kbit/s /56 kbit/s and User information layer 1 protocol = V.110, I.460/X.30 and the stored BC indicates FTM, PIAFS or Multimedia.

   If ITC = 3,1 kHz audio and User Rate = 28,8 kbit/s and Modem Type = V.34 and the stored BC indicates Multimedia.

5) If the ISDN BC received in the IAM has the ITC field set to the value "3,1kHz audio" and a HLC "facsimile group 3" is indicated, the PLMN BC retrieved from the VLR is applicable when it exists. If a PLMN BC-IE with the parameter "information transfer capability" set to "alternate speech/facsimile group 3, starting with speech" (stating TS61) is retrieved from the VLR, this shall be mapped to two PLMN BC-IE preceded by a repeat indicator, one representing speech, the other representing facsimile group 3.

   When no PLMN BC is retrieved from the VLR, either two PLMN BCs preceded by a repeat indicator (stating Teleservice TS 61), or a single PLMN BC-IE (stating TS 62), are sent in the setup message, depending whether TS 61 or TS 62 is subscribed (see also subclause 10.3.1.3).

   In case of TS 61, the order in which the two PLMN BC-IEs are sent towards the UE, in the setup message, is a network option.

6) If the ISDN BC received in the IAM has a ITC value "unrestricted digital information" but without applicable "user layer 1 protocol" and "user rate", etc. fields, neither in the ISDN BC nor ISDN LLC, then the PLMN or ISDN BC/LLC retrieved from the VLR is applicable, if available otherwise subclause 9.2.2 case b applies.

   In case of an ISDN BC/LLC/HLC was attached to the MSRN this shall be mapped to an appropriate PLMN BC (refer to table 7B). However in both cases (PLMN or ISDN BC attached) the PLMN specific parameters of the PLMN BC-IEs may be added/modified in line with procedures identified in subclause 9.2.2.

7) If the ISDN BC received in the IAM has the ITC field set to the value "Speech" and this value ~~the ITC field of the ISDN BC received with the IAM~~ differs from the ITC field of the BC stored in the VLR for this call, then the VLR BC/LLC/HLC is considered applicable. If no PLMN or ISDN BC is retrieved from the VLR, the call is handled as in subclause 9.2.2 case b.

In all cases when no PLMN or ISDN BC is retrieved from the VLR and no ISDN Compatibility information allowing deduction of a PLMN Bearer Service is available, then no PLMN BC is inserted by the VMSC and subclause 9.2.2 case b applies.

The mapping between PLMN and ISDN BCs is shown in table 7.

==
**** Next Modified Section ****
==

Annex A (informative):
SDLs

...

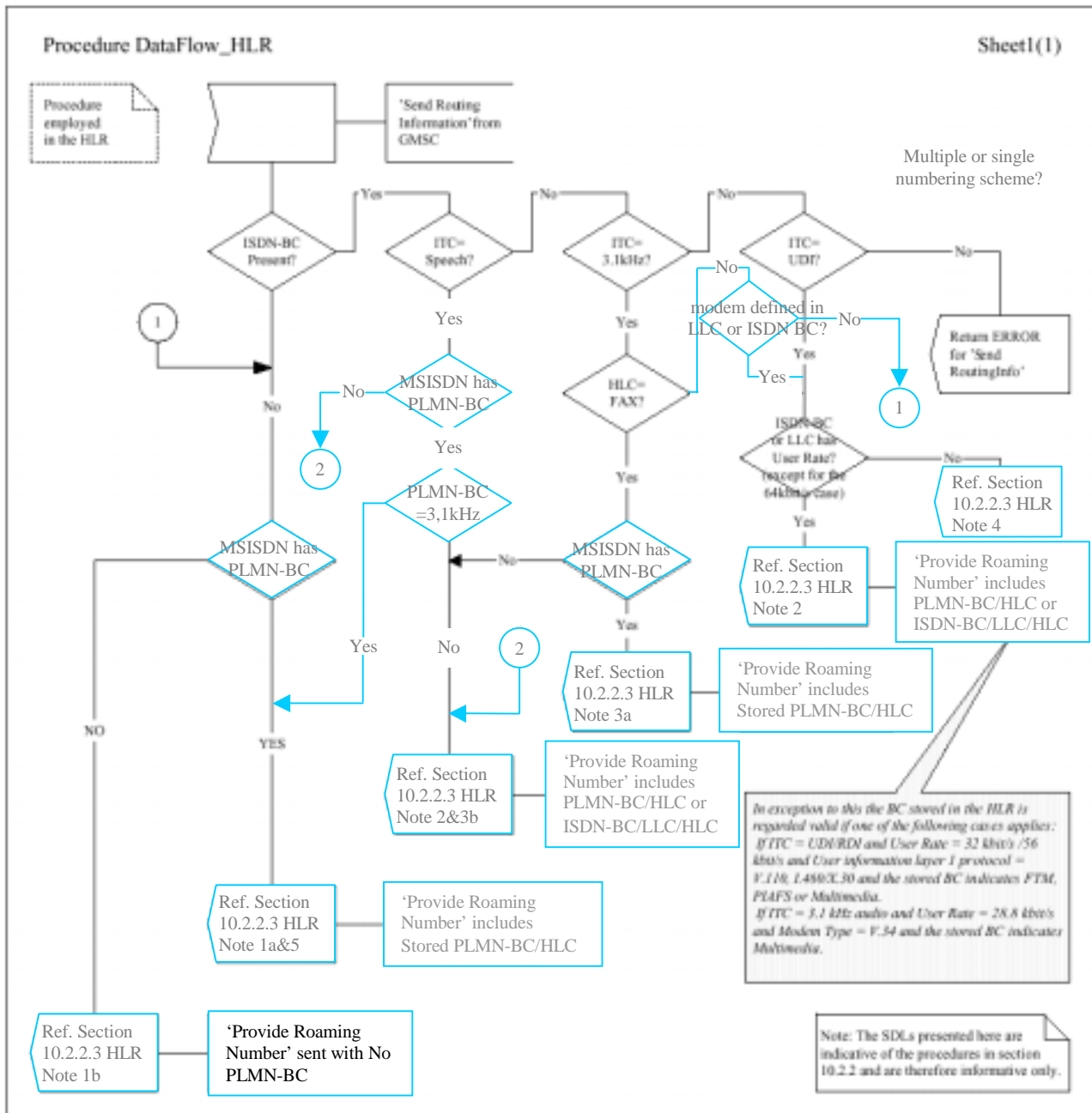Procedure DataFlow_HLR   Sheet1(1)
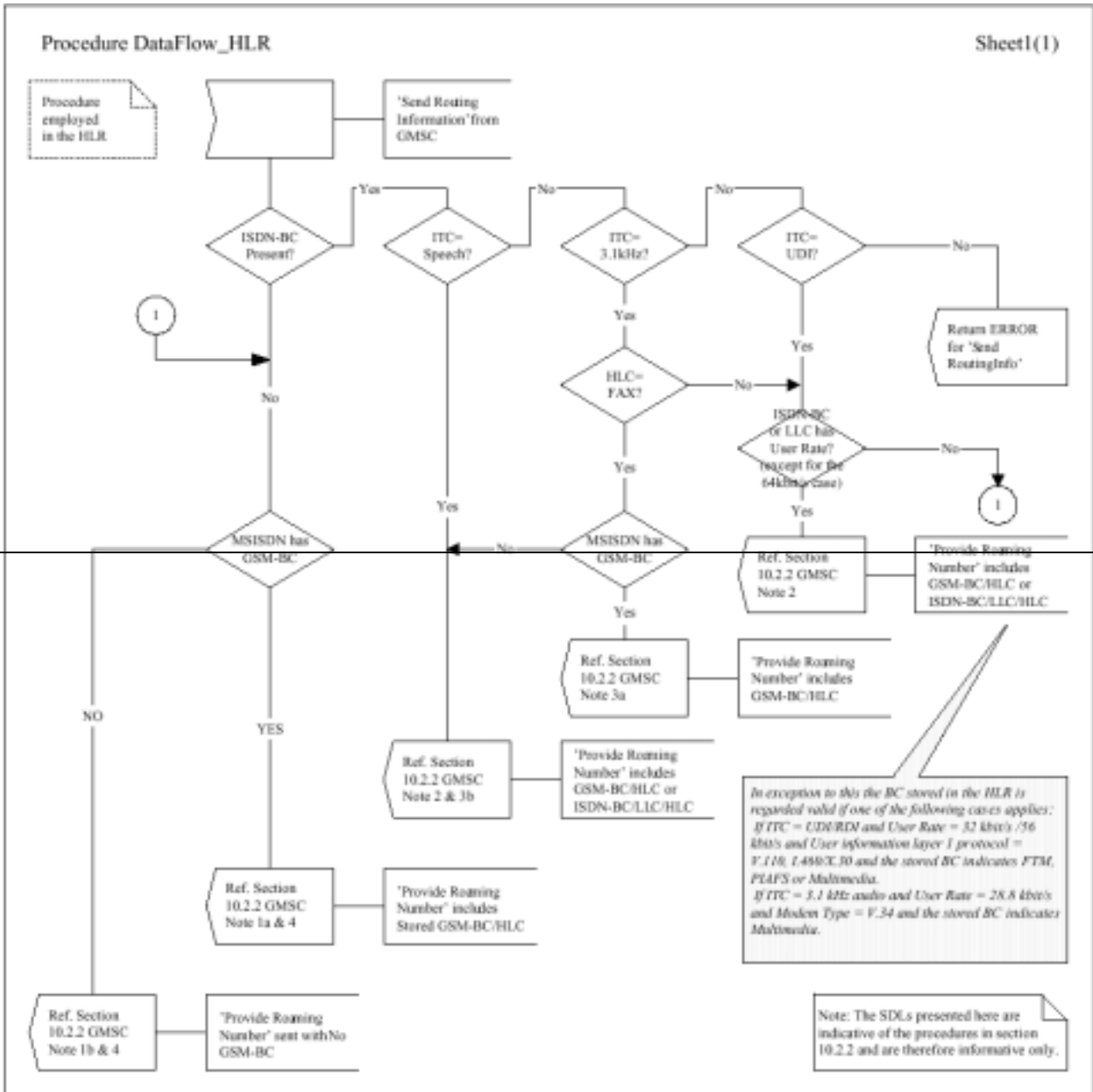
Figure A.1 (Sheet 1 of 1): Procedures in the HLR

****** End of Modified Section ******

CR-Form-v5

CHANGE REQUEST

⌘　　　　**29.007 CR 050**　　⌘ **rev 2** ⌘　Current version: **3.9.0** ⌘

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Proposed change affects: ⌘　(U)SIM ☐　ME/UE ☐　Radio Access Network ☐　Core Network **X**

Title:	⌘	Signalling of FTM calls	
Source:	⌘	TSG CN WG3	
Work item code:	⌘	TEI [CS Data]	***Date:*** ⌘ 2002-04-10
Category:	⌘	**F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
2　　(GSM Phase 2)
R96　(Release 1996)
R97　(Release 1997)
R98　(Release 1998)
R99　(Release 1999)
REL-4　(Release 4)
REL-5　(Release 5)

Reason for change:	⌘	FTM service is mapped to an ambiguous ISDN BC and thus not recognized at the terminating side.
Summary of change:	⌘	LLC shall be used to signal FTM.
Consequences if not approved:	⌘	Problems to set up FTM calls on the terminating side.

Clauses affected:	⌘	10.2.2.6

Other specs affected:	⌘	☐ Other core specifications ⌘	
		☐ Test specifications	
		☐ O&M Specifications	
Other comments:	⌘		

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10.2.2.6   Mapping Functions

The following tables (7A + 7B) show that only the ISDN BC is used for mapping (exceptions are indicated).

> NOTE: The ISDN/ PLMN BC-IE mapping shall be performed as specified in tables 7A and 7B. This shall be done to allow setup of a compatible end-to-end connection between two MSs or one MS and an ISDN terminal.

In the following tables 7A and 7B the comparison is drawn between parameters in the PLMN call set up request message and that of the ISDN call set up request message. In some cases no comparable values are available and these will be marked as such. In these cases reference will need to be made to the table of network interworking in 3GPP TS 29.007 to identify the appropriate choice. In some cases it is not necessary to support a particular option, and in this case those parameters will be annotated appropriately.

The PLMN parameters and values are as in 3GPP TS 24.008 in combination as in 3GPP TS 27.001. The ISDN parameters and values are as in Q.931 (05/98).

Table 7A: Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
3 #7..6	**Radio channel requirement** half rate channel full rate channel dual, full, rate preferred dual, half rate preferred		No comparable field
3 #5	**Coding Standard** GSM standard coding	3 #7..6	**Coding Standard** ITU-T standardized coding
3 #4	**Transfer mode** circuit mode packet mode (note7)	4 #7..6	Transfer mode circuit mode packet mode
3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN facsimile group 3 (note 1) other ITC (see octet 5a)	3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio 3,1 kHz audio no comparable value
5a #7..6	**Other ITC** restricted digital		(note 18)
4 #7	**Compression** (note 14) data compression allowed data compression not allowed		No comparable field
4 #6..5	**Structure** SDU integrity unstructured	4a #7..5	**Structure** (note 4)
4 #4	**Duplex mode** half duplex full duplex	5d #7	**Duplex mode** half duplex full duplex
4 #3	**Configuration** point to point	4a #4..3	**Configuration** (note 4)
4 #1	**Establishment** demand	4a #2..1	**Establishment** (note 4)
4	**NIRR** (note 12) no meaning Data ≤ 4.8kbit/s, FR nt, 6kbit/s radio interface is requested		No comparable field

(continued)

Table 7A (continued): Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
5 #5..4	**Rate adaptation** no rate adaptation (note 2) V.110, I.460/X.30 rate adaptation ITU-T X.31 flag stuffing (note 25) No comparable value(note 11) No comparable value(note 11) No comparable value(note 11) other rate adaptation (see octet 5a)	5 #5..1	**User information layer 1 protocol** no comparable value ITU-T standardized rate adaption V.110, I.460/X.30 ITU-T standardized rate adaption X.31 flag stuffing Recommendation G.711 µ-law Recommendation G.711 A-law (note 3) Recommendation G.721 32 kbit/s ADPCM and I.460 No comparable value
5a #5..4	**Other rate adaptation** V.120 (note 17) PIAFS (note 27) H.223 & H.245		No comparable value No comparable value H.223 & H.245 (note 26)
5 #3..1	**Signalling access protocol** I.440/I.450 X.21 X.28, ded.PAD, indiv.NUI (note 24) X.28, ded PAD, univ.NUI (note 24) X.28, non-ded PAD X.32		No comparable field
6 #1	**Synchronous/asynchronous** synchronous asynchronous	5a #7	**Synchronous/asynchronous** synchronous asynchronous (note 25)
6 #5..2	**User info. layer 1 protocol** default layer 1 protocol	5 #5..1	**User info. layer 1 protocol** see section under rate adaptation for 3GPP TS 24.008 above
6a #7	**Number of stop bits** 1 bit 2 bits	5c #7..6	**Number of stop bits** 1 bit 2 bits
6a #6	**Negotiation** In band neg. not possible no comparable value	5a #6	**Negotiation** In band neg. not possible In band neg. possible (note 10)
6a #5	**Number of data bits** 7 bits 8 bits	5c #5..4	**Number of data bits excluding parity if present** 7 bits 8 bits
6a #4..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s (note 7) 1.2 kbit/s / 75 bit/s (note 24) any value no comparable value	5a #5..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s 75 bit/s / 1.2 kbit/s 19.2 kbit/s (note 14) Ebits or inband negotiation (note 10)

(continued)

Table 7A (continued): Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
6b #7..6	**Intermediate rate** 8 kbit/s 16 kbit/s any value	5b #7..6	**Intermediate rate** (note 13) 8 kbit/s or not used 16 kbit/s or not used 32 kbit/s or not used (note 14)
6b #5	**NIC on Tx** does not require requires (note7)	5b #5b	**NIC on Tx** does not require requires (note 8)
6b #4	**NIC on Rx** cannot accept can accept (note 7)	5b #4	**NIC on Rx** cannot accept can accept (note 8)
6b #3..1	**Parity information** odd even none forced to 0 forced to 1	5c #3..1	**Parity information** odd even none forced to 0 forced to 1
6c #7..6	**Connection element** transparent non-transparent (RLP) both, transp. preferred both, non-transp. preferred		No comparable field
6c #5..1	**Modem type** none V.21 V.22 V.22bis V.23 (note 24) V.26ter V.32 modem for undef. interface autobauding type 1	5d #6..1	**Modem type** no comparable value (note 5) V.21 V.22 V.22bis V.23 V.26ter V.32 No comparable value (note 5) No comparable value (note 5, note 10)
7 #5..1	**User info. layer 2 protocol** X.25 link level ISO 6429, codeset 0 COPnoFICt videotex profile 1 (note 7) X.75 layer 2 modified (CAPI)	6	**User info.layer 2 prot.** (note 6) X.25 link level no comparable value no comparable value no comparable value X.25 link level
6d #5..1	**Fixed network user rate** (note 15) FNUR not applicable (note 7) 9,6 kbit/s 12 kbit/s (note 7) 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 33.6 kbit/s 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s	5a #5..1	**User rate** no comparable value 9,6 kbit/s 12 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s no comparable value 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s no comparable value (note 16)

(continued)

Table 7A (concluded): Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
6e #3..1	**Maximum number of traffic channels** 1 TCH 2 TCH 3 TCH 4 TCH 5 TCH 6 TCH 7 TCH (note 7) 8 TCH (note 7)		No comparable field
6f #4..1	**Wanted air interface user rate (note 23)** air interface user rate not applicable (note 7) 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 38,4 kbit/s 43,2 kbit/s 57,6 kbit/s interpreted by the network as 38.4 kbit/s (note 7)		No comparable field
6d #7..6	**Other modem type** (note 15) No other modem type V.34	5d #6..1	**Modem type** no comparable value V.34
6e #7..4	**Acceptable channel coding(s)** TCH/F4.8 acceptable (note 19) TCH/F9.6 acceptable TCH/F14.4 acceptable		No comparable field

6f
#7..5
	User initiated modification indicator (note 23)
	User initiated modification not
	   required
	User initiated modification upto 1
	   TCH/F may be requested
	User initiated modification upto 2
	   TCH/F may be requested
	User initiated modification upto 3
	   TCH/F may be requested
	User initiated modification upto 4
	   TCH/F may be requested
			No comparable field

6g #7..5	**Acceptable channel coding(s) (note 20)** TCH/F28.8 acceptable TCH/F32.0 acceptable TCH/F43.2 acceptable (note 22)		No comparable field
6g #4..3	**Asymmetry preference indication (Note 23)** no preference up link biased asymmetry preference down link biased asymmetry preference		No comparable field

The application rules for coding the information elements ISDN-BC/LLC/HLC as set out in ETR 018 and Q.931 (05/98) shall apply.

Other field values in the ISDN BC-IE not supported in 3GPP TS 24.008 are:

Information transfer rate: In this case default 64 kbit/s is selected.

Flow control on transmission: This shall be selected if outband flow control applies.

Flow control on reception: This shall be selected if outband flow control applies.

NOTE 0: Outband flow control is indicated by the absence of the UIL2P parameter for non-transparent connections.

User information layer 3 protocol: Octet 7 shall not be sent unless specific application rules are given for particular cases (to be defined by PLMN). End-to-end significant User Information layer 3 protocol shall be sent by LLC.

NOTE 1: In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and only a single PLMN BC is contained in the call set-up request then this shall be mapped to an ISDN BC with:

- coding standard: ITU-T;

- information transfer capability: 3,1 kHz audio;

- transfer mode: circuit;

- information transfer rate: 64 kbit/s;

- user layer 1 protocol: G711 A-law or µ-law (PCS-1900); and

- if an HLC is not present, the network will insert a "Facsimile group 2/3" HLC;

- if an HLC element is present, the network will pass it through unmodified.

In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and two PLMN BCs are contained in the call set-up request, then the same ISDN BC as mentioned above is created. If the first PLMN BC indicates "facsimile group 3" an HLC "facsimile group 2/3" will be inserted by the network (if not received from the MS). However if the first PLMN BC indicates "speech", the network will not send a HLC, irrespective where a HLC was received from the MS or not.

NOTE 2: This value is present in combination with information transfer capability parameter value "3,1 kHz audio Ex PLMN" or "facsimile group 3" and will therefore be mapped to the value "Recommendation G.711 A-law" or Recommendation G.711 µ-law" (PCS-1900) of the Q.931 (05/98) parameter user layer 1 protocol (see note 3).

NOTE 3: The value "Recommendation G.711 A-law" or "Recommendation G.711 µ-law" (PCS-1900) applies only when the Q.931 (05/98) parameter information transfer capability indicates "3,1 kHz audio" or "speech".

NOTE 4: When interworking with an ISDN according to ETS 300 102-1 octets 4a and 4b shall not be included because default values apply. In an ISDN according to Q.931 (05/98) these octets no more exist.

NOTE 5: In this case octet 5d shall not be included.

NOTE 6: Octet 6 shall not be sent unless specific application rules are given for a particular case (PLMN specified). End-to-end significant user information layer 2 protocol shall be sent by LLC.

NOTE 7: Not used for currently defined Bearer Services and Teleservices.

NOTE 8: These values will only be set if the "Information Transfer Capability" indicates "3,1 kHz audio", synchronous data transmission is used and octet 5b of the ISDN BC is present.

NOTE 9: (VOID).

NOTE 10: The PLMN BC-IE parameter value "autobauding modem type 1" will be mapped to the ISDN BC-IE parameter values "inband negotiation possible" and "user rate indicated by E-bits specified in ITU-T Recommendation I.460 or may be negotiated inband" (octet 5a of ISDN BC-IE). In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

NOTE 11: The ITC value of the PLMN BC-IE "speech", "3,1 kHz audio Ex PLMN" will indicate these requirements.

NOTE 12: For the use of NIRR see 3GPP TS 27.001.

NOTE 13: The value of the Intermediate Rate field of the ISDN Bearer Capability information element shall only depend on the values of the User Rate and the Information Transfer Capability in the same information element. The correspondence is:

Intermediate Rate = not used if User Rate > than 19.2 kbit/s.
Intermediate Rate = 32 kbit/s if User Rate = 19,2 kbit/s or 14.4 kbit/s.
Intermediate Rate = 16 kbit/s if User Rate = 9,6 kbit/s.
Intermediate Rate = 8 kbit/s otherwise.

In case of Audio calls the value of the Intermediate Rate may be set to "not used".

NOTE 14: If compression is supported by the MSC and "data compression allowed" is indicated, then the ISDN user rate for UDI calls shall be set as follows. If the parameter "FNUR" is present the ISDN user rate shall be set to this value. Otherwise the PLMN user rate shall be mapped to an equal or any higher ISDN user rate value (in case of V.110 the highest ISDN user rate shall be 19,2 kbit/s). The Intermediate Rate shall be set to an appropriate value.(see subclause 10.2.4.11).

In case of "3,1 kHz audio" the modem shall try to negotiate data compression and flow control (see subclause 9.2.4.11). In case of "autobauding type 1" high speed modems may be used (see note 10).

NOTE 15: User rate of the PLMN -BC is overridden by the fixed network user rate of the PLMN BC-IE if available. When the MT indicates „autobauding", „modem for undefined interface" or „none", the other modem type shall be set to „no other modem type"; any other value of the modem type is overridden by the other modem type value (see 3GPP TS 27.001). In UMTS, if octet 6d is not present in the PLMN BC, the MSC shall reject the call. The support of user rates lower than 9.6 kbit/s in UMTS are only possible in the scope of autobauding (see note 10).

NOTE 16: The ISDN-BC will consist of the octets 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

NOTE 17: V.120 interworking is selected.

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters. The LLC parameter Rate Adaptation will be set to "V.120".

When interworking with unrestricted 64 kbit/s networks the ISDN BC shall be coded according to note 16.

NOTE 18: When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an ITC = RDI.
When indirectly interworking with a restricted 64 kbit/s network the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	V.110/X.30
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
User rate:	56 kbit/s

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital"

NOTE 19: In case the MS signals an ACC containing TCH/F4.8 only and the network does not support TCH/F4.8 channel coding, then the MSC may act as if TCH/F9.6 were included in the ACC.

NOTE 20: Extension of the 'Acceptable channel codings' field in octet 6e in case EDGE channel codings are supported.

NOTE 21: Void

NOTE 22: Only applicable for non-transparent services.

NOTE 23: This parameter shall be included if EDGE channel codings are indicated in ACC. In cases where this parameter would not otherwise be included, the value is set to 'Air interface user rate not applicable' or 'User initiated modification not requested' or 'No preference'.

NOTE 24: This value was used by services defined for former GSM releases and does not need to be supported.

NOTE 25: The case of FTM is identified by Rate adaptation in the PLMN BC-IE set to "ITU-T X.31 flag stuffing", Connection element set to "non-transparent", and Synchronous/asynchronous set to "asynchronous". The MSC applies one of the following alternatives: The parameter values shall be set according to Note 16 in case FNUR is 64 kbit/s and according to Note 18 if Other ITC is RDI.

1) In the case FNUR=64 kbit/s
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded according to ETR 018 as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	(CCITT standardized rate adaptation X.31 HDLC flag stuffing) (note: the absence of octet 5 indicates that HDLC flag stuffing applies)
User information layer 2 protocol:	Recommendation X.25, link layer
User information layer 3 protocol:	Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

2) In the case FNUR=56 kbit/s and the MSC is directly connected to a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	RDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: RDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: (CCITT standardized rate adaptation X.31 HDLC flag stuffing) (note: the absence of octet 5 indicates that HDLC flag stuffing applies)
User information layer 2 protocol: Recommendation X.25, link layer
User information layer 3 protocol: Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

3) In the case FNUR=56 kbit/s and the MSC is indirectly interworking with a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110/X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 56 kbit/s

- If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital" and the LLC parameter User information layer 1 protocol will be set to "X.31 flag stuffing".

NOTE 26: In the case FNUR=64 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: H.223 and H.245

In the case FNUR=56 kbit/s the ISDN BC-IE shall be coded as in note 18.

In the case FNUR=32 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110, I.460 & X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 32 kbit/s

In the case FNUR=28.8 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	3,1 kHz Audio
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	G.711 A-law or μ-law
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
Modem type:	V.34
User rate:	28.8 kbit/s

In the case FNUR=33.6 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	3,1 kHz Audio
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	G.711 A-law or μ-law

NOTE 27: In the case the FNUR=32 kbit/s the ISDN BC-IE shall be coded for PIAFS as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	V.110, I.460 and X.30
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
User rate:	32 kbit/s

In the case of a FNUR=64 kbit/s the ISDN BC-IE shall be coded for PIAFS as in note 16.

Table 7B: Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
	no comparable field	3 #7..6	**Radio channel requirement** (note 1) half rate channel full rate channel both, half rate preferred both, full rate preferred
3 #7..6	**Coding standard** ITU-T standardized coding	3 #5	**Coding standard** GSM standardized coding
3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio no comparable value no comparable value 7 kHz audio video (note 23)	3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN (note2) facsimile group 3 (note 3) other ITC (see octet 5a) not supported not supported
		5a #7..6	**Other ITC** restricted digital
4 #7..6	**Transfer mode** circuit mode packet mode	3 #4	**Transfer mode** circuit mode circuit mode
4 #5..1	**Information transfer rate** 64 kbit/s		 no comparable field
	No comparable field	4 #7	**Compression** (note 18) data compression possible data compression not possible
	No comparable field (note 4)	(4) 4 #6..5	**Structure** (note 9) SDU integrity unstructured
4a #4..3	No comparable field (note 4)	4 #3	**Configuration** point-to-point (note 5)
	No comparable field	4 #2	**NIRR** (note 17) No meaning Data ≤ 4.8 kbit/s, FR nt, 6 kbit/s radio interface requested
4a #2..1	No comparable field (note 4)	4 #1	**Establishment** demand (note 5)
4b #7..6			
4b #5..1			

(continued)

Table 7B (continued): Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
5 #5..1	**User information layer 1 protocol** no comparable value ITU-T V.110, I.460 / X.30 G.711 A-law ITU-T X.31 flag stuffing no comparable value	5 #5..4	**Rate adaption** no rate adaption (note 11) V.110, I.460/X.30 rate adaption no comparable value ITU-T X.31 flag stuffing other rate adaption (see octet 5a)
	No comparable value H.221 & H.242(note 28) H.223 & H.245	5a #5..4	**Other rate adaptation** V.120 (note 24) PIAFS H.223 & H.245 H.223 & H.245
	no comparable field	5 #3..1	**Signalling access protocol** I.440/I.450 X.21 X.28, ded.PAD, indiv.NUI (note 26) X.28, ded.PAD, univ.NUI (note 26) X.28, non-ded.PAD X.32
	see above	6 #5..2	**User information layer 1 protocol** default layer 1 protocol
5a #7	**Synchronous / asynchronous** synchronous asynchronous	6 #1	**Synchronous/asynchronous** synchronous asynchronous
5a #6	**Negotiation** not possible inband neg, possible (note 16)	6a #6	**Negotiation** not possible no comparable value

(continued)

Table 7B (continued): Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
5a #5..1	**User rate** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s rate is indicated by Ebit as specified in rec. I.460 0,6 kbit/s 3,6 kbit/s 7,2 kbit/s 8 kbit/s 14,4 kbit/s 16 kbit/s 19.2 kbit/s 28.8 kbit/s 32 kbit/s 38.4 kbit/s 48 kbit/s 56 kbit/s 57.6 kbit/s 0,1345 kbit/s 0,1 kbit/s 75 bit/s / 1,2 kbit/s 1,2 kbit/s / 75 bit/s 0,110 kbit/s 0,2 kbit/s	6a #4..1	**User rate (note 18 and 29)** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s (note 13) (note 16) not supported not supported not supported not supported (note 20) not supported (note 20) (note 20) (note 20) (note 20) (note 20) (note 20) not supported not supported not supported not supported not supported not supported not supported
5b #7..6	**Intermediate rate** not used (note 19) 8 kbit/s 16 kbit/s 32 kbit/s	6b #7..6	**Intermediate rate** (note 6) (note 18) 8 or 16 kbit/s 8 kbit/s 16 kbit/s
5b #5	**NIC on Tx** (note 14) does not require requires	6b #5	**NIC on Tx** does not require requires (note 13)
5b #4	**NIC on Rx** (note 14) cannot accept can accept	6b #4	**NIC on Rx** cannot accept can accept (note 13)
5b #3	**Flow control on Tx** (note 15) Not Required Required		no comparable field
5b #2	**Flow control on Rx** (note 15) Cannot Accept Accept		no comparable field
5c #7..6	**Number of stop bits** 1 bit 2 bits not used 1.5 bits	6a #7	**Number of stop bits** 1 bit 2 bits no comparable value not supported

(continued)

Table 7B (continued): Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
5c #5..4	**Number of data bits** 7 bits 8 bits not used 5 bits	6a #5	**Number of data bits** 7 bits 8 bits no comparable value not supported
5c #3..1	**Parity information** odd even none forced to 0 forced to 1	6b #3..1	**Parity information** odd even none forced to 0 forced to 1
	no comparable field	6c #7..6	**Connection element** (note 1) transparent non-transparent (RLP) both, transp. preferred both, non-transp preferred
5d #7	**Duplex mode** half duplex full duplex	4 #4	**Duplex mode** half duplex (note 13) full duplex (note 5)
5d #6..1	**Modem type** reserved V.21 V.22 V.22bis V.23 V.26ter V.32 V.26 V.26bis V.27 V.27bis V.29 no comparable value	6c #5..1	**Modem type** (note 12) none (note 7) V.21 V.22 V.22bis not supported V.26ter V.32 not supported not supported not supported not supported not supported autobauding type 1 (note 16)
5a #5..1	**User rate** no comparable value 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 38,4 kbit/s 48 kbit/s 56 kbit/s no comparable value	6d #5..1	**Fixed network user rate** (note 20) FNUR not applicable 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s (note 27) 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s (note 22)
	Modem type no comparable value (note 21) V.34	6d #7..6	**Other modem type** No other modem type V.34

(continued)

Table 7B (concluded): Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
	No comparable field	6f #7..5	**User initiated modification indicator (note 1) (note 25)** User initiated modification not required User initiated modification upto 1 TCH/F may be requested User initiated modification upto 2 TCH/F may be requested User initiated modification upto 3 TCH/F may be requested User initiated modification upto 4 TCH/F may be requested
6 #5..1	**User information layer 2 protocol (note 10)** Q.921 (I.441) X.25, link level no comparable value	7	**User information layer 2 protocol (note 8)** no comparable value X.25, link level ISO 6429, codeset 0
7	**User information layer 3 protocol (note 10)** Q.931 (I.451) X.25, packet level		 not supported not supported

General notes:

1) Other ISDN BC parameter values than those listed in the table, if indicated in the BC-IE, will be rejected by clearing the call, exception see mapping note 4.

2) Only the PLMN BC parameter values listed in the table may be generated (comparable values) during a mobile-terminated call by mapping the ISDN BC parameter values, exception see (10).

3) According to Q.931 (05/98) and 3GPP TS 24.008, respectively, the octets are counted from 1 to n onwards; the bit position in a particular octet is indicated by #x..y, with {x,y} = 1..8 (bit 1 is the least and bit 8 the most significant bit).

4) If octets 5 to 5d of the ISDN BC are absent but present in the LLC, the LLC octets should apply for the mapping as indicated above. In the case of V.120 interworking (see note 24) these LLC octets shall apply.

5) If within the ISDN BC the parameters information transfer capability indicates "3,1 kHz audio" and user layer 1 protocol indicates "G711 A-law" or "G.711 μ-law" (PCS-1900) but no modem type is available and the HLC does not indicate "facsimile group 3", octets 5 to 5d of the LLC, if available, apply for the above mapping procedure.

6) The number of octets which shall be encoded for the PLMN BC-IE must comply to encoding rules in 3GPP TS 24.008 and the combination of the different parameter values shall be in accordance to 3GPP TS 27.001.

NOTES   regarding the mapping:

1) This PLMN parameter value is inserted according to user rate requirements and network capabilities / preferences.

2) This PLMN parameter value is inserted, if the information transfer capability in ISDN BC is "3,1kHz audio" and a comparable modem type is specified.

3) This PLMN parameter value is inserted, if the information transfer capability is "3,1 kHz audio" and the content of the HLC-IE, if any, indicates "facsimile group 2/3", (for details refer to subclause 10.2.2 case 3 for HLR action and case 5 for VMSC action). Note that via MAP the value "alternate speech/facsimile group 3 - starting with speech" shall be used, when TS 61 applies.

4) When interworking with an ISDN according to ETS 300 102-1, octets 4a and 4b may be present. The values are ignored and PLMN values are set according to notes 5 and 9.

5) This PLMN parameter value is inserted if the comparable ISDN parameter value is missing.

6) The value of the Intermediate Rate field of the GSM Bearer Capability information element shall only depend on the values of the user rate or the radio channel requirement in the same information element. If the connection element is "transparent", the value is 16 kbit/s, if the user rate is 9.6 or 12 kbit/s, and 8 kbit/s otherwise. For any other connection element setting the value is 16 kbit/s, if the radio channel requirements are "full rate" or "dual, full rate preferred", or "dual, half rate preferred", and 8 kbit/s, if the radio channel requirements is "half rate".

7) This PLMN BC parameter value is inserted, if the PLMN BC parameter "Information Transfer Capability" indicates "Unrestricted digital information", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech".

8) Where the network indicates "asynchronous" and connection elements "non-transparent", "both, transparent preferred" or "both, non-transparent preferred" , then the GSM BC should be forwarded without parameter user information layer 2 protocol, see also (10).

9) The PLMN parameter value shall be set to "unstructured" where the network indicates connection element "transparent". Where the network indicates connection elements "non transparent" "both, transparent preferred" or "both, non transparent preferred" the value of the parameter structure shall be set to "SDU Integrity".

10) Mapping of parameter values of this octet to PLMN BC parameters and values are subject to specific application rules, i.e. unless otherwise explicitly stated in an appropriate TS mapping to PLMN BC parameters shall not take place.

11) This value shall be used when the value of the PLMN BC parameter "Information Transfer Capability" indicates the value "3,1 kHz audio ex PLMN", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech" which is reserved for MAP operations.

12) The modem encoding of both Q.931 (05/98) and ETS 300 102-1 version 1 shall be accepted and mapped according to 3GPP TS 24.008.

13) Value not used for currently defined bearer services and Teleservices.

14) NIC is only supported in GSM for "3,1 kHz Ex PLMN audio" interworking with synchronous data transmission.

15) Because the required flow control mechanism can not be indicated to the MS (refer to 3GPP TS 27.001), the network shall check if the flow control mechanism selected by the MS and indicated in the CALL CONFIRMED message suits to the requirements requested by the ISDN terminal adaptor. In case of a mismatch the call shall be released in the IWF.

    Because an asymmetric flow control mechanism (with respect to transmitting and receiving side) is not supported in the PLMN, the different values of the ISDN BC-IE parameters "flow control on Tx" and "flow control on Rx" shall be interpreted in the following way:

    - "Flow control on Rx" set to "accepted" matches with "outband flow control", irrespective of the value of the parameter "flow control on Tx".

    - "Flow control on Rx" set to "not accepted" and "flow control on Tx" set to "not required" matches with "inband flow control" and "no flow control".

    - where "Flow control on Rx" is set to "not accepted" and "flow control on Tx" to "required" the call shall be released by the IWF.

16) If in case of 3,1 kHz audio interworking "inband negotiation possible" is indicated and the parameter user rate is set to "rate is indicated by E bits specified in Recommendation I.460 or may be negotiated inband" the user rate in the PLMN BC-IE shall be set according to a network preferred value, whereas the preferred value of the Radio Channel Requirement shall be considered. If ISDN-BC parameter modem type is present, its value shall be ignored. The PLMN-BC parameter modem type shall be set according to the user rate in case of connection element "transparent" and to "autobauding type 1" in case of connection element "non transparent", "both, transparent preferred" or "both, non transparent preferred". In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

    For unrestricted digital interworking the call shall be rejected if these values are indicated.
    If the PLMN-BC parameter modem type indicates "autobauding type 1" or "none", then the PLMN-BC parameter other modem type shall be set to "no other modem type".

17) For the use of NIRR see 3GPP TS 27.001. The VMSC shall set this parameter dependent upon its capabilities and preferences.

18) If compression is supported by the MSC, the value "data compression possible" may be set. Depending on the capabilities of the MSC, the user rate value and the intermediate rate value is set to an appropriate value.

19) Only applicable if the parameter ISDN-BC ITC indicates "3,1 kHz audio" and for "UDI" calls if User Rate > "19,2 kbit/s".

20) The user rate of the PLMN BC is set to the value for the fall-back bearer service. In case the mobile station does not support the fixed network user rate (i.e. the call confirmation message does not contain the fixed network user rate parameter), the network may release the call for a transparent connection element.

21) The modem type parameter of the PLMN -BC is taken into account, only.

22) In the case no LLC is received and the ISDN-BC received consists of octets 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64kbit/s

the following PLMN -BC parameters, shall be set to:

fixed network user rate:	64 kbit/s
connection element:	transparent
	bothNT or bothT (If IWF supports ~~FTM or~~ PIAFS)

The other parameters of the PLMN -BC shall be set to values indicating a fall-back service.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the ISDN-BC received consists of 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64kbit/s

the following PLMN BC parameters, shall be set to:

fixed network user rate:	64 kbit/s
connection element:	non-transparent
Synchronous/Asynchronous	asynchronous

all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the ISDN-BC received consists of 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	RDI
Transfer mode:	circuit
Information transfer rate:	64kbit/s

the following PLMN BC parameters, shall be set to:

fixed network user rate:	56 kbit/s
connection element:	non-transparent
Synchronous/Asynchronous	asynchronous

all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

23) When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an ITC = RDI.
An ISDN BC-IE, as specified in ETR 018 and shown below, shall be taken to indicate that interworking with an indirectly connected restricted 64 kbit/s network is required:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110/X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 56 kbit/s

In this case the PLMN BC parameter Information Transfer Capability is set to „Other ITC" and Other ITC parameter is set to „restricted digital".If ISDN LLC exists, all the corresponding fields in the PLMN BC shall be derived from the ISDN LLC. Otherwise, the corresponding fields in the UMTS BC shall be derived from the ISDN BC. In the above both case, Connection element is set as follows.

Connection element: transparent
bothNT or bothT (If IWF supports FTM and LLC does not indicate User information layer 1 protocol = "X.31 flag stuffing")
non-transparent (if IWF supports FTM and LLC indicates User information layer 1 protocol = "X.31 flag stuffing")

24) V.120 interworking is required if the ISDN LLC parameter User Information Layer 1 Protocol is set to „V.120". In this case the PLMN BC parameter Rate Adaptation is set to „Other rate adaptation" and Other Rate Adaptation parameter is set to „V.120". All the corresponding fields in the GSM BC shall be derived from the ISDN LLC.

25) This parameter is only included in case of non-transparent multislot connections.

26) This value was used by services defined for former GSM releases and does not need to be supported.

27) Following BC parameters in SETUP message shall be set to:

Fixed network user rate 32 kbit/s
Connection element transparent (for multimedia)
bothNT or bothT (If IWF supports PIAFS, UMTS only)

28) UIL1P is set to "H.221 & H.242" or "H.223 & H.245" by H.324/I. In the case where UIL1P is set to "H.221 and H.242", this should be mapped to "H.223 & H.245".

29) In UMTS, if the User Rate of the ISDN BC is less than 9,6 kbit/s and the Connection Element is mapped to "NT", then FNUR is fixed to 9,6 kbit/s.

CR-Form-v5

CHANGE REQUEST

⌘ **29.007** CR **051** ⌘rev **1** ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Signalling of FTM calls	
Source: ⌘	TSG CN WG3	
Work item code: ⌘	TEI [CS Data]	***Date:*** ⌘ 2002-04-10

Category: ⌘ **A**

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Release: ⌘ REL-4

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘	FTM service is mapped to an ambiguous ISDN BC and thus not recognized at the terminating side.
Summary of change: ⌘	LLC shall be used to signal FTM.
Consequences if not approved: ⌘	Problems to set up FTM calls on the terminating side.

Clauses affected: ⌘	10.2.2.6
Other specs affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments: ⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.2.2.6 Mapping Functions

The following tables (7A + 7B) show that only the ISDN BC is used for mapping (exceptions are indicated).

NOTE: The ISDN/ PLMN BC-IE mapping shall be performed as specified in tables 7A and 7B. This shall be done to allow setup of a compatible end-to-end connection between two MSs or one MS and an ISDN terminal.

In the following tables 7A and 7B the comparison is drawn between parameters in the PLMN call set up request message and that of the ISDN call set up request message. In some cases no comparable values are available and these will be marked as such. In these cases reference will need to be made to the table of network interworking in 3GPP TS 29.007 to identify the appropriate choice. In some cases it is not necessary to support a particular option, and in this case those parameters will be annotated appropriately.

The PLMN parameters and values are as in 3GPP TS 24.008 in combination as in 3GPP TS 27.001. The ISDN parameters and values are as in Q.931 (05/98).

Table 7A: Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
3 #7..6	**Radio channel requirement** half rate channel full rate channel dual, full, rate preferred dual, half rate preferred		No comparable field
3 #5	**Coding Standard** GSM standard coding	3 #7..6	**Coding Standard** CCITT standardized coding
3 #4	**Transfer mode** circuit mode packet mode (note7)	4 #7..6	Transfer mode circuit mode packet mode
3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN facsimile group 3 (note 1) other ITC (see octet 5a)	3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio 3,1 kHz audio no comparable value
5a #7..6	**Other ITC** restricted digital		(note 18)
4 #7	**Compression** (note 14) data compression allowed data compression not allowed		No comparable field
4 #6..5	**Structure** SDU integrity unstructured	4a #7..5	**Structure** (note 4)
4 #4	**Duplex mode** half duplex full duplex	5d #7	**Duplex mode** half duplex full duplex
4 #3	**Configuration** point to point	4a #4..3	**Configuration** (note 4)
4 #1	**Establishment** demand	4a #2..1	**Establishment** (note 4)
4	**NIRR** (note 12) no meaning Data ≤ 4.8kbit/s, FR nt, 6kbit/s radio interface is requested		No comparable field
5 #5..4	**Rate adaptation** no rate adaptation (note 2) V.110, I.460/X.30 rate adaptation CCITT X.31 flag stuffing (note 25) No comparable value(note 11) No comparable value(note 11) No comparable value(note 11) other rate adaptation (see octet 5a)	5 #5..1	**User information layer 1 protocol** no comparable value CCITT standardized rate adaption V.110, I.460/X.30 (note 25) Recommendation G.711 µ-law Recommendation G.711 A-law (note 3) Recommendation G.721 32 kbit/s ADPCM and I.460 No comparable value
5a #5..4	**Other rate adaptation** V.120 (note 17) PIAFS (note 27) H.223 & H.245		No comparable value H.223 & H.245 (note 26)
5 #3..1	**Signalling access protocol** I.440/I.450 X.21 (note 24) X.28, ded.PAD, indiv.NUI (note 24) X.28, ded PAD, univ.NUI (note 24) X.28, non-ded PAD (note 24) X.32 (note 24)		No comparable field
6 #1	**Synchronous/asynchronous** synchronous asynchronous	5a #7	**Synchronous/asynchronous** synchronous asynchronous (note 25)
6	**User info. layer 1 protocol**	5	**User info. layer 1 protocol**

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
#5..2	default layer 1 protocol	#5..1	see section under rate adaptation for 3GPP TS 24.008 above
6a #7	**Number of stop bits** 1 bit 2 bits	5c #7..6	**Number of stop bits** 1 bit 2 bits
6a #6	**Negotiation** In band neg. not possible no comparable value	5a #6	**Negotiation** In band neg. not possible In band neg. possible (note 10)
6a #5	**Number of data bits** 7 bits 8 bits	5c #5..4	**Number of data bits excluding parity if present** 7 bits 8 bits
6a #4..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s (note 7) 1.2 kbit/s / 75 bit/s (note 24) any value no comparable value	5a #5..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s 75 bit/s / 1.2 kbit/s 19.2 kbit/s (note 14) Ebits or inband negotiation (note 10)
6b #7..6	**Intermediate rate** 8 kbit/s 16 kbit/s any value	5b #7..6	**Intermediate rate** (note 13) 8 kbit/s or not used 16 kbit/s or not used 32 kbit/s or not used (note 14)
6b #5	**NIC on Tx** does not require requires (note7)	5b #5b	**NIC on Tx** does not require requires (note 8)
6b #4	**NIC on Rx** cannot accept can accept (note 7)	5b #4	**NIC on Rx** cannot accept can accept (note 8)
6b #3..1	**Parity information** odd even none forced to 0 forced to 1	5c #3..1	**Parity information** odd even none forced to 0 forced to 1
6c #7..6	**Connection element** transparent non-transparent (RLP) both, transp. preferred both, non-transp. preferred		No comparable field
6c #5..1	**Modem type** none V.21 V.22 V.22bis V.23 (note 24) V.26ter V.32 modem for undef. interface autobauding type 1	5d #6..1	**Modem type** no comparable value (note 5) V.21 V.22 V.22bis V.23 V.26ter V.32 No comparable value (note 5) No comparable value (note 5, note 10)
7 #5..1	**User info. layer 2 protocol** X.25 link level (note 24) ISO 6429, codeset 0 COPnoFICt videotex profile 1 (note 7) X.75 layer 2 modified (CAPI) (note 24)	6	**User info.layer 2 prot.** (note 6) X.25 link level no comparable value no comparable value no comparable value X.25 link level
6d #5..1	**Fixed network user rate** (note 15) FNUR not applicable (note 7) 9,6 kbit/s 12 kbit/s (note 7) 14,4 kbit/s	5a #5..1	**User rate** no comparable value 9,6 kbit/s 12 kbit/s 14,4 kbit/s

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
	19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 33.6 kbit/s 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s		19,2 kbit/s 28,8 kbit/s 32.0 kbit/s no comparable value 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s no comparable value (note 16)
6e #3..1	**Maximum number of traffic channels** 1 TCH 2 TCH 3 TCH 4 TCH 5 TCH 6 TCH 7 TCH (note 7) 8 TCH (note 7)		No comparable field
6f #4..1	**Wanted air interface user rate (note 23)** air interface user rate not applicable (note 7) 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 38,4 kbit/s 43,2 kbit/s 57,6 kbit/s interpreted by the network as 38.4 kbit/s (note 7)		No comparable field
6d #7..6	**Other modem type** (note 15) No other modem type V.34	5d #6..1	**Modem type** no comparable value V.34
6e #7..4	**Acceptable channel coding(s)** TCH/F4.8 acceptable (note 19) TCH/F9.6 acceptable TCH/F14.4 acceptable		No comparable field
6f #7..5	**User initiated modification indicator (note 23)** User initiated modification not required User initiated modification upto 1 TCH/F may be requested User initiated modification upto 2 TCH/F may be requested User initiated modification upto 3 TCH/F may be requested User initiated modification upto 4 TCH/F may be requested		No comparable field
6g #7..5	**Acceptable channel coding(s) (note 20)** TCH/F28.8 acceptable TCH/F32.0 acceptable TCH/F43.2 acceptable (note 22)		No comparable field
6g #4..3	**Asymmetry preference indication (Note 23)** no preference up link biased asymmetry preference down link biased asymmetry preference		No comparable field

General Notes

The application rules for coding the information elements ISDN-BC/LLC/HLC as set out in ETR 018 and Q.931 (05/98) shall apply.

Other field values in the ISDN BC-IE not supported in 3GPP TS 24.008 are:

Information transfer rate: In this case default 64 kbit/s is selected.

Flow control on transmission:

Flow control on reception: This shall be selected if outband flow control applies. Outband flow control is indicated by the absence of the UIL2P parameter for non-transparent connections.

User information layer 3 protocol: Octet 7 shall not be sent unless specific application rules are given for particular cases (to be defined by PLMN). End-to-end significant User Information layer 3 protocol shall be sent by LLC.

Notes regarding particular entries in table 7A:

NOTE 1: In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and only a single PLMN BC is contained in the call set-up request then this shall be mapped to an ISDN BC with:

- coding standard: CCITT;

- information transfer capability: 3,1 kHz audio;

- transfer mode: circuit;

- information transfer rate: 64 kbit/s;

- user layer 1 protocol: G711 A-law or μ-law (PCS-1900); and

- if an HLC is not present, the network will insert a "Facsimile group 2/3" HLC;

- if an HLC element is present, the network will pass it through unmodified.

In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and two PLMN BCs are contained in the call set-up request, then the same ISDN BC as mentioned above is created. If the first PLMN BC indicates "facsimile group 3" an HLC "facsimile group 2/3" will be inserted by the network (if not received from the MS). However if the first PLMN BC indicates "speech", the network will not send a HLC, irrespective where a HLC was received from the MS or not.

NOTE 2: This value is present in combination with information transfer capability parameter value "3,1 kHz audio Ex PLMN" or "facsimile group 3" and will therefore be mapped to the value "Recommendation G.711 A-law" or Recommendation G.711 μ-law" (PCS-1900) of the Q.931 (05/98) parameter user layer 1 protocol (see note 3).

NOTE 3: The value "Recommendation G.711 A-law" or "Recommendation G.711 μ-law" (PCS-1900) applies only when the Q.931 (05/98) parameter information transfer capability indicates "3,1 kHz audio" or "speech".

NOTE 4: When interworking with an ISDN according to ETS 300 102-1 octets 4a and 4b shall not be included because default values apply. In an ISDN according to Q.931 (05/98) these octets no more exist.

NOTE 5: In this case octet 5d shall not be included.

NOTE 6: Octet 6 shall not be sent unless specific application rules are given for a particular case (PLMN specified). End-to-end significant user information layer 2 protocol shall be sent by LLC.

NOTE 7: Not used for currently defined Bearer Services and Teleservices.

NOTE 8: These values will only be set if the "Information Transfer Capability" indicates "3,1 kHz audio", synchronous data transmission is used and octet 5b of the ISDN BC is present.

NOTE 9: (VOID).

NOTE 10: The PLMN BC-IE parameter value "autobauding modem type 1" will be mapped to the ISDN BC-IE parameter values "inband negotiation possible" and "user rate indicated by E-bits specified in ITU-T Recommendation I.460 or may be negotiated inband" (octet 5a of ISDN BC-IE). In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

NOTE 11: The ITC value of the PLMN BC-IE "speech", "3,1 kHz audio Ex PLMN" will indicate these requirements.

NOTE 12: For the use of NIRR see 3GPP TS 27.001.

NOTE 13: The value of the Intermediate Rate field of the ISDN Bearer Capability information element shall only depend on the values of the User Rate and the Information Transfer Capability in the same information element. The correspondence is:

Intermediate Rate = not used if User Rate > than 19.2 kbit/s.
Intermediate Rate = 32 kbit/s if User Rate = 19,2 kbit/s or 14.4 kbit/s.
Intermediate Rate = 16 kbit/s if User Rate = 9,6 kbit/s.
Intermediate Rate = 8 kbit/s otherwise.

In case of Audio calls the value of the Intermediate Rate may be set to "not used".

NOTE 14: If compression is supported by the MSC and "data compression allowed" is indicated, then the ISDN user rate for UDI calls shall be set as follows. If the parameter "FNUR" is present the ISDN user rate shall be set to this value. Otherwise the PLMN user rate shall be mapped to an equal or any higher ISDN user rate value (in case of V.110 the highest ISDN user rate shall be 19,2 kbit/s). The Intermediate Rate shall be set to an appropriate value.(see subclause 10.2.4.11).

In case of "3,1 kHz audio" the modem shall try to negotiate data compression and flow control (see subclause 9.2.4.11). In case of "autobauding type 1" high speed modems may be used (see note 10).

NOTE 15: User rate of the PLMN -BC is overridden by the fixed network user rate of the PLMN BC-IE if available. When the MT indicates „autobauding", „modem for undefined interface" or „none", the other modem type shall be set to „no other modem type"; any other value of the modem type is overridden by the other modem type value (see 3GPP TS 27.001). In UMTS, if octet 6d is not present in the PLMN BC, the MSC shall reject the call. The support of user rates lower than 9.6 kbit/s in UMTS are only possible in the scope of autobauding (see note 10).

NOTE 16: The ISDN-BC will consist of the octets 1 to 4 only, coded:

Coding standard: CCITT
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s

NOTE 17: V.120 interworking is selected.

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters. The LLC parameter Rate Adaptation will be set to "V.120".

When interworking with unrestricted 64 kbit/s networks the ISDN BC shall be coded according to note 16.

NOTE 18: When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an ITC = RDI.
When indirectly interworking with a restricted 64 kbit/s network the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard: CCITT
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110/X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 56 kbit/s

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital"

NOTE 19: In case the MS signals an ACC containing TCH/F4.8 only and the network does not support TCH/F4.8 channel coding, then the MSC may act as if TCH/F9.6 were included in the ACC.

NOTE 20: Extension of the 'Acceptable channel codings' field in octet 6e in case EDGE channel codings are supported.

NOTE 21: Void

NOTE 22: Only applicable for non-transparent services.

NOTE 23: This parameter shall be included if EDGE channel codings are indicated in ACC. In cases where this parameter would not otherwise be included, the value is set to 'Air interface user rate not applicable' or 'User initiated modification not requested' or 'No preference'.

NOTE 24: This value was used by services defined for former GSM releases and does not need to be supported.

NOTE 25: The case of FTM is identified by Rate adaptation in the PLMN BC-IE set to "CCITT X.31 flag stuffing", Connection element set to "non-transparent", and Synchronous/asynchronous set to "asynchronous". The MSC applies one of the following alternatives: ~~The parameter values shall be set according to Note 16 in case FNUR is 64 kbit/s and according to Note 18 if Other ITC is RDI.~~

1) In the case FNUR=64 kbit/s
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded according to ETR 018 as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	(CCITT standardized rate adaptation X.31 HDLC flag stuffing) (note: the absence of octet 5 indicates that HDLC flag stuffing applies)
User information layer 2 protocol:	Recommendation X.25, link layer
User information layer 3 protocol:	Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

2) In the case FNUR=56 kbit/s and the MSC is directly connected to a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	RDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: RDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: (CCITT standardized rate adaptation
X.31 HDLC flag stuffing) (note: the
absence of octet 5 indicates that HDLC flag
stuffing applies)
User information layer 2 protocol: Recommendation X.25, link layer
User information layer 3 protocol: Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

3) In the case FNUR=56 kbit/s and the MSC is indirectly interworking with a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110/X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 56 kbit/s

- If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital" and the LLC parameter User information layer 1 protocol will be set to "X.31 flag stuffing".

NOTE 26: In the case FNUR=64 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: H.223 and H.245

In the case FNUR=56 kbit/s the ISDN BC-IE shall be coded as in note 18.

In the case FNUR=32 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110, I.460 & X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 32 kbit/s

In the case FNUR=28.8 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	3,1 kHz Audio
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	G.711 A-law or µ-law
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
Modem type:	V.34
User rate:	28.8 kbit/s

In the case FNUR=33.6 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	3,1 kHz Audio
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	G.711 A-law or µ-law

NOTE 27: In the case the FNUR=32 kbit/s the ISDN BC-IE shall be coded for PIAFS as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	V.110, I.460 and X.30
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
User rate:	32 kbit/s

In the case of a FNUR=64 kbit/s the ISDN BC-IE shall be coded for PIAFS as in note 16.

Table 7B: Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
	no comparable field	3 #7..6	**Radio channel requirement** full rate channel (these bits are spare in the network to MS direction)
3 #7..6	**Coding standard** CCITT standardized coding	3 #5	**Coding standard** GSM standardized coding
3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio no comparable value no comparable value 7 kHz audio video (note 23)	3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN (note2) facsimile group 3 (note 3) other ITC (see octet 5a) not supported not supported
		5a #7..6	**Other ITC** restricted digital
4 #7..6	**Transfer mode** circuit mode packet mode	3 #4	**Transfer mode** circuit mode not supported
4 #5..1	**Information transfer rate** 64 kbit/s		 no comparable field
	No comparable field	4 #7	**Compression** (note 18) data compression possible data compression not possible
	No comparable field (note 4)	(4) 4 #6..5	**Structure** (note 9) SDU integrity unstructured
4a #4..3	No comparable field (note 4)	4 #3	**Configuration** point-to-point (note 5)
	No comparable field	4 #2	**NIRR** (note 17) No meaning Data ≤ 4.8 kbit/s, FR nt, 6 kbit/s radio interface requested
4a #2..1	No comparable field (note 4)	4 #1	**Establishment** demand (note 5)
4b #7..6			
4b #5..1			
5 #5..1	**User information layer 1 protocol** no comparable value CCITT V.110, I.460 / X.30 G.711 A-law CCITT X.31 flag stuffing no comparable value	5 #5..4	**Rate adaption** no rate adaption (note 11) V.110, I.460/X.30 rate adaption no comparable value not supported other rate adaption (see octet 5a)
	No comparable value H.221 & H.242(note 28) H.223 & H.245	5a #5..4	**Other rate adaptation** V.120 (note 24) PIAFS H.223 & H.245 H.223 & H.245
	no comparable field	5 #3..1	**Signalling access protocol** I.440/I.450 X.21 (note 26) X.28, ded.PAD, indiv.NUI (note 26) X.28, ded.PAD, univ.NUI (note 26) X.28, non-ded.PAD (note 26) X.32 (note 26)
	any of the above values	6 #5..2	**User information layer 1 protocol** default layer 1 protocol
5a #7	**Synchronous / asynchronous** synchronous asynchronous	6 #1	**Synchronous/asynchronous** synchronous asynchronous
5a	**Negotiation**	6a	**Negotiation**

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
#6	not possible inband neg, possible (note 16)	#6	not possible no comparable value
5a #5..1	**User rate** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s rate is indicated by Ebit as specified in rec. I.460 0,6 kbit/s 3,6 kbit/s 7,2 kbit/s 8 kbit/s 14,4 kbit/s 16 kbit/s 19.2 kbit/s 28.8 kbit/s 32 kbit/s 38.4 kbit/s 48 kbit/s 56 kbit/s 57.6 kbit/s 0,1345 kbit/s 0,1 kbit/s 75 bit/s / 1,2 kbit/s 1,2 kbit/s / 75 bit/s 0,110 kbit/s 0,2 kbit/s	6a #4..1	**User rate (note 18 and 29)** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s (note 13) **(**note 16) not supported not supported not supported not supported (note 20) not supported (note 20) (note 20) (note 20) (note 20) (note 20) (note 20) not supported not supported not supported not supported not supported not supported not supported
5b #7..6	**Intermediate rate** not used (note 19) 8 kbit/s 16 kbit/s 32 kbit/s	6b #7..6	**Intermediate rate** (note 6) (note 18) 8 or 16 kbit/s 8 kbit/s 16 kbit/s
5b #5	**NIC on Tx** (note 14) does not require requires	6b #5	**NIC on Tx** does not require requires (note 13)
5b #4	**NIC on Rx** (note 14) cannot accept can accept	6b #4	**NIC on Rx** cannot accept can accept (note 13)
5b #3	**Flow control on Tx** (note 15) Not Required Required		no comparable field
5b #2	**Flow control on Rx** (note 15) Cannot Accept Accept		no comparable field
5c #7..6	**Number of stop bits** 1 bit 2 bits not used 1.5 bits	6a #7	**Number of stop bits** 1 bit 2 bits no comparable value not supported
5c #5..4	**Number of data bits** 7 bits 8 bits not used 5 bits	6a #5	**Number of data bits** 7 bits 8 bits no comparable value not supported
5c #3..1	**Parity information** odd even none forced to 0 forced to 1	6b #3..1	**Parity information** odd even none forced to 0 forced to 1
	no comparable field	6c #7..6	**Connection element** (note 1) transparent non-transparent (RLP) both, transp. preferred

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
			both, non-transp preferred
5d #7	**Duplex mode** half duplex full duplex	4 #4	**Duplex mode** half duplex (note 13) full duplex (note 5)
5d #6..1	**Modem type** reserved V.21 V.22 V.22bis V.23 V.26ter V.32 V.26 V.26bis V.27 V.27bis V.29 no comparable value	6c #5..1	**Modem type** (note 12) none (note 7) V.21 V.22 V.22bis not supported V.26ter V.32 not supported not supported not supported not supported not supported autobauding type 1 (note 16)
5a #5..1	**User rate** no comparable value 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 38,4 kbit/s 48 kbit/s 56 kbit/s no comparable value	6d #5..1	**Fixed network user rate** (note 20) FNUR not applicable 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s (note 27) 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s (note 22)
	Modem type no comparable value (note 21) V.34	6d #7..6	**Other modem type** No other modem type V.34
	No comparable field	6f #7..5	**User initiated modification indicator (note 1) (note 25)** User initiated modification not required User initiated modification upto 1 TCH/F may be requested User initiated modification upto 2 TCH/F may be requested User initiated modification upto 3 TCH/F may be requested User initiated modification upto 4 TCH/F may be requested
6 #5..1	**User information layer 2 protocol (note 10)** Q.921 (I.441) X.25, link level no comparable value	7	**User information layer 2 protocol (note 8)** no comparable value not supported ISO 6429, codeset 0
7	**User information layer 3 protocol (note 10)** Q.931 (I.451) X.25, packet level		 not supported not supported

General notes:

1) Other ISDN BC parameter values than those listed in the table, if indicated in the BC-IE, will be rejected by clearing the call, exception see mapping note 4.

2) Only the PLMN BC parameter values listed in the table may be generated (comparable values) during a mobile-terminated call by mapping the ISDN BC parameter values, exception see (10).

3) According to Q.931 (05/98) and 3GPP TS 24.008, respectively, the octets are counted from 1 to n onwards; the bit position in a particular octet is indicated by #x..y, with {x,y} = 1..8 (bit 1 is the least and bit 8 the most significant bit).

4) If octets 5 to 5d of the ISDN BC are absent but present in the LLC, the LLC octets should apply for the mapping as indicated above. In the case of V.120 interworking (see note 24) these LLC octets shall apply.

5) If within the ISDN BC the parameters information transfer capability indicates "3,1 kHz audio" and user layer 1 protocol indicates "G711 A-law" or "G.711 µ-law" (PCS-1900) but no modem type is available and the HLC does not indicate "facsimile group 3", octets 5 to 5d of the LLC, if available, apply for the above mapping procedure.

6) The number of octets which shall be encoded for the PLMN BC-IE must comply to encoding rules in 3GPP TS 24.008 and the combination of the different parameter values shall be in accordance to 3GPP TS 27.001.

Notes regarding particular entries in table 7B:

1) This PLMN parameter value is inserted according to user rate requirements and network capabilities / preferences.

2) This PLMN parameter value is inserted, if the information transfer capability in ISDN BC is "3,1kHz audio" and a comparable modem type is specified.

3) This PLMN parameter value is inserted, if the information transfer capability is "3,1 kHz audio" and the content of the HLC-IE, if any, indicates "facsimile group 2/3", (for details refer to subclause 10.2.2 case 3 for HLR action and case 5 for VMSC action). Note that via MAP the value "alternate speech/facsimile group 3 - starting with speech" shall be used, when TS 61 applies.

4) When interworking with an ISDN according to ETS 300 102-1, octets 4a and 4b may be present. The values are ignored and PLMN values are set according to notes 5 and 9.

5) This PLMN parameter value is inserted if the comparable ISDN parameter value is missing.

6) The value of the Intermediate Rate field of the GSM Bearer Capability information element shall only depend on the value of the user rate in the same information element. If the connection element is "transparent", the value is 16 kbit/s, if the user rate is 9.6 or 12 kbit/s, and 8 kbit/s otherwise. For any other connection element setting the value is 16 kbit/s.

7) This PLMN BC parameter value is inserted, if the PLMN BC parameter "Information Transfer Capability" indicates "Unrestricted digital information", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech".

8) Where the network indicates "asynchronous" and connection elements "non-transparent", "both, transparent preferred" or "both, non-transparent preferred" , then the GSM BC should be forwarded without parameter user information layer 2 protocol, see also (10).

9) The PLMN parameter value shall be set to "unstructured" where the network indicates connection element "transparent". Where the network indicates connection elements "non transparent" "both, transparent preferred" or "both, non transparent preferred" the value of the parameter structure shall be set to "SDU Integrity".

10) Mapping of parameter values of this octet to PLMN BC parameters and values are subject to specific application rules, i.e. unless otherwise explicitly stated in an appropriate TS mapping to PLMN BC parameters shall not take place.

11) This value shall be used when the value of the PLMN BC parameter "Information Transfer Capability" indicates the value "3,1 kHz audio ex PLMN", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech" which is reserved for MAP operations.

12) The modem encoding of both Q.931 (05/98) and ETS 300 102-1 version 1 shall be accepted and mapped according to 3GPP TS 24.008.

13) Value not used for currently defined bearer services and Teleservices.

14) NIC is only supported in GSM for "3,1 kHz Ex PLMN audio" interworking with synchronous data transmission.

15) Because the required flow control mechanism can not be indicated to the MS (refer to 3GPP TS 27.001), the network shall check if the flow control mechanism selected by the MS and indicated in the CALL CONFIRMED message suits to the requirements requested by the ISDN terminal adaptor. In case of a mismatch the call shall be released in the IWF.

Because an asymmetric flow control mechanism (with respect to transmitting and receiving side) is not supported in the PLMN, the different values of the ISDN BC-IE parameters "flow control on Tx" and "flow control on Rx" shall be interpreted in the following way:

- "Flow control on Rx" set to "accepted" matches with "outband flow control", irrespective of the value of the parameter "flow control on Tx".

- "Flow control on Rx" set to "not accepted" and "flow control on Tx" set to "not required" matches with "inband flow control" and "no flow control".

- where "Flow control on Rx" is set to "not accepted" and "flow control on Tx" to "required" the call shall be released by the IWF.

16) If in case of 3,1 kHz audio interworking "inband negotiation possible" is indicated and the parameter user rate is set to "rate is indicated by E bits specified in Recommendation I.460 or may be negotiated inband" the user rate in the PLMN BC-IE shall be set according to a network preferred value. If ISDN-BC parameter modem type is present, its value shall be ignored. The PLMN-BC parameter modem type shall be set according to the user rate in case of connection element "transparent" and to "autobauding type 1" in case of connection element "non transparent", "both, transparent preferred" or "both, non transparent preferred". In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

For unrestricted digital interworking the call shall be rejected if these values are indicated.
If the PLMN-BC parameter modem type indicates "autobauding type 1" or "none", then the PLMN-BC parameter other modem type shall be set to "no other modem type".

17) For the use of NIRR see 3GPP TS 27.001. The VMSC shall set this parameter dependent upon its capabilities and preferences.

18) If compression is supported by the MSC, the value "data compression possible" may be set. Depending on the capabilities of the MSC, the user rate value and the intermediate rate value is set to an appropriate value.

19) Only applicable if the parameter ISDN-BC ITC indicates "3,1 kHz audio" and for "UDI" calls if User Rate > "19,2 kbit/s".

20) The user rate of the PLMN BC is set to the value for the fall-back bearer service. In case the mobile station does not support the fixed network user rate (i.e. the call confirmation message does not contain the fixed network user rate parameter), the network may release the call for a transparent connection element.

21) The modem type parameter of the PLMN -BC is taken into account, only.

22) In the case no LLC is received and the ISDN-BC received consists of octets 1 to 4 only, coded:

Coding standard:	CCITT
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64kbit/s

the following PLMN -BC parameters, shall be set to:

fixed network user rate:	64 kbit/s
connection element:	transparent
	bothNT or bothT (If IWF supports ~~FTM or~~ PIAFS)

The other parameters of the PLMN -BC shall be set to values indicating a fall-back service.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the ISDN-BC received consists of 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	UDI

    Transfer mode: circuit
    Information transfer rate: 64kbit/s

the following PLMN BC parameters, shall be set to:

    fixed network user rate: 64 kbit/s
    connection element: non-transparent
    Synchronous/Asynchronous   asynchronous
all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the
    ISDN-BC received consists of 1 to 4 only, coded:

    Coding standard: ITU-T
    Information Transfer capability: RDI
    Transfer mode: circuit
    Information transfer rate: 64kbit/s

the following PLMN BC parameters, shall be set to:

    fixed network user rate: 56 kbit/s
    connection element: non-transparent
    Synchronous/Asynchronous   asynchronous
all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

23) When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an
    ITC = RDI.
    An ISDN BC-IE, as specified in ETR 018 and shown below, shall be taken to indicate that interworking with an
    indirectly connected restricted 64 kbit/s network is required:

        Coding standard: CCITT
        Information Transfer capability: UDI
        Transfer mode: circuit
        Information transfer rate: 64 kbit/s
        User information layer 1 protocol: V.110/X.30
        Synchronous/Asynchronous: synchronous
        Negotiation: In-band negotiation not possible
        User rate: 56 kbit/s

    In this case the PLMN BC parameter Information Transfer Capability is set to „Other ITC" and Other ITC
    parameter is set to „restricted digital".If ISDN LLC exists, all the corresponding fields in the PLMN BC shall be
    derived from the ISDN LLC. Otherwise, the corresponding fields in the UMTS BC shall be derived from the
    ISDN BC. In the above both case, Connection element is set as follows.

        Connection element: transparent
                                                           bothNT or bothT (If IWF supports FTM and LLC does not indicate
                                                           User information layer 1 protocol = "X.31 flag stuffing")
                                                           non-transparent (if IWF supports FTM and LLC indicates
                                                           User information layer 1 protocol = "X.31 flag stuffing")

24) V.120 interworking is required if the ISDN LLC parameter User Information Layer 1 Protocol is set to „V.120".
    In this case the PLMN BC parameter Rate Adaptation is set to „Other rate adaptation" and Other Rate
    Adaptation parameter is set to „V.120". All the corresponding fields in the GSM BC shall be derived from the
    ISDN LLC.

25) This parameter is only included in case of non-transparent multislot connections.

26) This value was used by services defined for former GSM releases and does not need to be supported.

27) Following BC parameters in SETUP message shall be set to:

Fixed network user rate	32 kbit/s
Connection element	transparent (for multimedia)
	bothNT or bothT (If IWF supports PIAFS, UMTS only)

28) UIL1P is set to "H.221 & H.242" or "H.223 & H.245" by H.324/I. In the case where UIL1P is set to "H.221 and H.242", this should be mapped to "H.223 & H.245".

29) In UMTS, if the User Rate of the ISDN BC is less than 9,6 kbit/s and the Connection Element is mapped to "NT", then FNUR is fixed to 9,6 kbit/s.

CR-Form-v5

CHANGE REQUEST

⌘ **29.007** CR **052** ⌘**rev** **1** ⌘ Current version: **5.1.0** ⌘

For **HELP** *on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network ☐   Core Network **X**

Title: ⌘	Signalling of FTM calls	
Source: ⌘	TSG CN WG3	
Work item code: ⌘	TEI [CS Data]	***Date:*** ⌘ 2002-04-10

Category: ⌘ **A**	***Release:*** ⌘ REL-5

Use <u>one</u> *of the following categories:*
  F *(correction)*
  A *(corresponds to a correction in an earlier release)*
  B *(addition of feature),*
  C *(functional modification of feature)*
  D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use <u>one</u> *of the following releases:*
  2   *(GSM Phase 2)*
  R96   *(Release 1996)*
  R97   *(Release 1997)*
  R98   *(Release 1998)*
  R99   *(Release 1999)*
  REL-4 *(Release 4)*
  REL-5 *(Release 5)*

Reason for change: ⌘	FTM service is mapped to an ambiguous ISDN BC and thus not recognized at the terminating side.
Summary of change: ⌘	LLC shall be used to signal FTM.
Consequences if not approved: ⌘	Problems to set up FTM calls on the terminating side.

Clauses affected: ⌘	10.2.2.6

Other specs affected: ⌘	☐ Other core specifications ⌘		
	☐ Test specifications		
	☐ O&M Specifications		

Other comments: ⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.2.2.6　Mapping Functions

The following tables (7A + 7B) show that only the ISDN BC is used for mapping (exceptions are indicated).

　　NOTE:　The ISDN/ PLMN BC-IE mapping shall be performed as specified in tables 7A and 7B. This shall be done to allow setup of a compatible end-to-end connection between two UEs or one UE and an ISDN terminal.

In the following tables 7A and 7B the comparison is drawn between parameters in the PLMN call set up request message and that of the ISDN call set up request message. In some cases no comparable values are available and these will be marked as such. In these cases reference will need to be made to the table of network interworking in 3GPP TS 29.007 to identify the appropriate choice. In some cases it is not necessary to support a particular option, and in this case those parameters will be annotated appropriately.

The PLMN parameters and values are as in 3GPP TS 24.008 in combination as in 3GPP TS 27.001. The ISDN parameters and values are as in Q.931 (05/98).

Table 7A: Comparable setting of parameters in PLMN and ISDN: Mobile Originated

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
3 #7..6	**Radio channel requirement** half rate channel full rate channel dual, full, rate preferred dual, half rate preferred		No comparable field
3 #5	**Coding Standard** GSM standard coding	3 #7..6	**Coding Standard** CCITT standardized coding
3 #4	**Transfer mode** circuit mode packet mode (note7)	4 #7..6	Transfer mode circuit mode packet mode
3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN facsimile group 3 (note 1) other ITC (see octet 5a)	3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio 3,1 kHz audio no comparable value
5a #7..6	**Other ITC** restricted digital		(note 18)
4 #7	**Compression** (note 14) data compression allowed data compression not allowed		No comparable field
4 #6..5	**Structure** SDU integrity unstructured	4a #7..5	**Structure** (note 4)
4 #4	**Duplex mode** half duplex full duplex	5d #7	**Duplex mode** half duplex full duplex
4 #3	**Configuration** point to point	4a #4..3	**Configuration** (note 4)
4 #1	**Establishment** demand	4a #2..1	**Establishment** (note 4)
4	**NIRR** (note 12) no meaning Data ≤ 4.8kbit/s, FR nt, 6kbit/s radio interface is requested		No comparable field
5 #5..4	**Rate adaptation** no rate adaptation (note 2) V.110, I.460/X.30 rate adaptation CCITT X.31 flag stuffing (note 25) No comparable value(note 11) No comparable value(note 11) No comparable value(note 11) other rate adaptation (see octet 5a)	5 #5..1	**User information layer 1 protocol** no comparable value CCITT standardized rate adaption V.110, I.460/X.30 (note 25) Recommendation G.711 μ-law Recommendation G.711 A-law (note 3) Recommendation G.721 32 kbit/s ADPCM and I.460 No comparable value
5a #5..4	**Other rate adaptation** V.120 (note 17) PIAFS (note 27) H.223 & H.245		No comparable value H.223 & H.245 (note 26)
5 #3..1	**Signalling access protocol** I.440/I.450 X.21 (note 24) X.28, ded.PAD, indiv.NUI (note 24) X.28, ded PAD, univ.NUI (note 24) X.28, non-ded PAD (note 24) X.32 (note 24)		No comparable field
6 #1	**Synchronous/asynchronous** synchronous asynchronous	5a #7	**Synchronous/asynchronous** synchronous asynchronous (note 25)
6	**User info. layer 1 protocol**	5	**User info. layer 1 protocol**

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
#5..2	default layer 1 protocol	#5..1	see section under rate adaptation for 3GPP TS 24.008 above
6a #7	**Number of stop bits** 1 bit 2 bits	5c #7..6	**Number of stop bits** 1 bit 2 bits
6a #6	**Negotiation** In band neg. not possible no comparable value	5a #6	**Negotiation** In band neg. not possible In band neg. possible (note 10)
6a #5	**Number of data bits** 7 bits 8 bits	5c #5..4	**Number of data bits excluding parity if present** 7 bits 8 bits
6a #4..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s (note 7) 1.2 kbit/s / 75 bit/s (note 24) any value no comparable value	5a #5..1	**User rate** 0.3 kbit/s 1.2 kbit/s 2.4 kbit/s 4.8 kbit/s 9.6 kbit/s 12 kbit/s 75 bit/s / 1.2 kbit/s 19.2 kbit/s (note 14) Ebits or inband negotiation (note 10)
6b #7..6	**Intermediate rate** 8 kbit/s 16 kbit/s any value	5b #7..6	**Intermediate rate** (note 13) 8 kbit/s or not used 16 kbit/s or not used 32 kbit/s or not used (note 14)
6b #5	**NIC on Tx** does not require requires (note7)	5b #5b	**NIC on Tx** does not require requires (note 8)
6b #4	**NIC on Rx** cannot accept can accept (note 7)	5b #4	**NIC on Rx** cannot accept can accept (note 8)
6b #3..1	**Parity information** odd even none forced to 0 forced to 1	5c #3..1	**Parity information** odd even none forced to 0 forced to 1
6c #7..6	**Connection element** transparent non-transparent (RLP) both, transp. preferred both, non-transp. preferred		No comparable field
6c #5..1	**Modem type** none V.21 V.22 V.22bis V.23 (note 24) V.26ter V.32 modem for undef. interface autobauding type 1	5d #6..1	**Modem type** no comparable value (note 5) V.21 V.22 V.22bis V.23 V.26ter V.32 No comparable value (note 5) No comparable value (note 5, note 10)
7 #5..1	**User info. layer 2 protocol** X.25 link level (note 24) ISO 6429, codeset 0 COPnoFICt videotex profile 1 (note 7) X.75 layer 2 modified (CAPI) (note 24)	6	**User info.layer 2 prot.** (note 6) X.25 link level no comparable value no comparable value no comparable value X.25 link level
6d #5..1	**Fixed network user rate** (note 15) FNUR not applicable (note 7) 9,6 kbit/s 12 kbit/s (note 7) 14,4 kbit/s	5a #5..1	**User rate** no comparable value 9,6 kbit/s 12 kbit/s 14,4 kbit/s

Octet	PLMN BC parameter value	Octet	ISDN BC parameter value
	19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 33.6 kbit/s 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s		19,2 kbit/s 28,8 kbit/s 32.0 kbit/s no comparable value 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s no comparable value (note 16)
6e #3..1	**Maximum number of traffic channels** 1 TCH 2 TCH 3 TCH 4 TCH 5 TCH 6 TCH 7 TCH (note 7) 8 TCH (note 7)		No comparable field
6f #4..1	**Wanted air interface user rate (note 23)** air interface user rate not applicable (note 7) 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 38,4 kbit/s 43,2 kbit/s 57,6 kbit/s interpreted by the network as 38.4 kbit/s (note 7)		No comparable field
6d #7..6	**Other modem type** (note 15) No other modem type V.34	5d #6..1	**Modem type** no comparable value V.34
6e #7..4	**Acceptable channel coding(s)** TCH/F4.8 acceptable (note 19) TCH/F9.6 acceptable TCH/F14.4 acceptable		No comparable field

6f
#7..5
	User initiated modification indicator (note 23)
	User initiated modification not
	   required
	User initiated modification upto 1
	   TCH/F may be requested
	User initiated modification upto 2
	   TCH/F may be requested
	User initiated modification upto 3
	   TCH/F may be requested
	User initiated modification upto 4
	   TCH/F may be requested
			No comparable field

6g #7..5	**Acceptable channel coding(s) (note 20)** TCH/F28.8 acceptable TCH/F32.0 acceptable TCH/F43.2 acceptable (note 22)		No comparable field
6g #4..3	**Asymmetry preference indication (Note 23)** no preference up link biased asymmetry preference down link biased asymmetry preference		No comparable field

General Notes

The application rules for coding the information elements ISDN-BC/LLC/HLC as set out in ETR 018 and Q.931 (05/98) shall apply.

Other field values in the ISDN BC-IE not supported in 3GPP TS 24.008 are:

    Information transfer rate: In this case default 64 kbit/s is selected.

Flow control on transmission:

Flow control on reception: This shall be selected if outband flow control applies. Outband flow control is indicated by the absence of the UIL2P parameter for non-transparent connections.

User information layer 3 protocol: Octet 7 shall not be sent unless specific application rules are given for particular cases (to be defined by PLMN). End-to-end significant User Information layer 3 protocol shall be sent by LLC.

Notes regarding particular entries in table 7A:

NOTE 1: In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and only a single PLMN BC is contained in the call set-up request then this shall be mapped to an ISDN BC with:

- coding standard: CCITT;

- information transfer capability: 3,1 kHz audio;

- transfer mode: circuit;

- information transfer rate: 64 kbit/s;

- user layer 1 protocol: G711 A-law or µ-law (PCS-1900); and

- if an HLC is not present, the network will insert a "Facsimile group 2/3" HLC;

- if an HLC element is present, the network will pass it through unmodified.

In the case where PLMN BC "Information Transfer Capability" indicates "Facsimile group 3" and two PLMN BCs are contained in the call set-up request, then the same ISDN BC as mentioned above is created. If the first PLMN BC indicates "facsimile group 3" an HLC "facsimile group 2/3" will be inserted by the network (if not received from the UE). However if the first PLMN BC indicates "speech", the network will not send a HLC, irrespective where a HLC was received from the UE or not.

NOTE 2: This value is present in combination with information transfer capability parameter value "3,1 kHz audio Ex PLMN" or "facsimile group 3" and will therefore be mapped to the value "Recommendation G.711 A-law" or Recommendation G.711 µ-law" (PCS-1900) of the Q.931 (05/98) parameter user layer 1 protocol (see note 3).

NOTE 3: The value "Recommendation G.711 A-law" or "Recommendation G.711 µ-law" (PCS-1900) applies only when the Q.931 (05/98) parameter information transfer capability indicates "3,1 kHz audio" or "speech".

NOTE 4: When interworking with an ISDN according to ETS 300 102-1 octets 4a and 4b shall not be included because default values apply. In an ISDN according to Q.931 (05/98) these octets no more exist.

NOTE 5: In this case octet 5d shall not be included.

NOTE 6: Octet 6 shall not be sent unless specific application rules are given for a particular case (PLMN specified). End-to-end significant user information layer 2 protocol shall be sent by LLC.

NOTE 7: Not used for currently defined Bearer Services and Teleservices.

NOTE 8: These values will only be set if the "Information Transfer Capability" indicates "3,1 kHz audio", synchronous data transmission is used and octet 5b of the ISDN BC is present.

NOTE 9: (VOID).

NOTE 10: The PLMN BC-IE parameter value "autobauding modem type 1" will be mapped to the ISDN BC-IE parameter values "inband negotiation possible" and "user rate indicated by E-bits specified in ITU-T Recommendation I.460 or may be negotiated inband" (octet 5a of ISDN BC-IE). In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

NOTE 11: The ITC value of the PLMN BC-IE "speech", "3,1 kHz audio Ex PLMN" will indicate these requirements.

NOTE 12: For the use of NIRR see 3GPP TS 27.001.

NOTE 13: The value of the Intermediate Rate field of the ISDN Bearer Capability information element shall only depend on the values of the User Rate and the Information Transfer Capability in the same information element. The correspondence is:

Intermediate Rate = not used if User Rate > than 19.2 kbit/s.
Intermediate Rate = 32 kbit/s if User Rate = 19,2 kbit/s or 14.4 kbit/s.
Intermediate Rate = 16 kbit/s if User Rate = 9,6 kbit/s.
Intermediate Rate = 8 kbit/s otherwise.

In case of Audio calls the value of the Intermediate Rate may be set to "not used".

NOTE 14: If compression is supported by the MSC and "data compression allowed" is indicated, then the ISDN user rate for UDI calls shall be set as follows. If the parameter "FNUR" is present the ISDN user rate shall be set to this value. Otherwise the PLMN user rate shall be mapped to an equal or any higher ISDN user rate value (in case of V.110 the highest ISDN user rate shall be 19,2 kbit/s). The Intermediate Rate shall be set to an appropriate value.(see subclause 10.2.4.11).

In case of "3,1 kHz audio" the modem shall try to negotiate data compression and flow control (see subclause 9.2.4.11). In case of "autobauding type 1" high speed modems may be used (see note 10).

NOTE 15: User rate of the PLMN -BC is overridden by the fixed network user rate of the PLMN BC-IE if available. When the MT indicates „autobauding", „modem for undefined interface" or „none", the other modem type shall be set to „no other modem type"; any other value of the modem type is overridden by the other modem type value (see 3GPP TS 27.001). In Iu mode, if octet 6d is not present in the PLMN BC, the MSC shall reject the call. The support of user rates lower than 9.6 kbit/s in Iu mode are only possible in the scope of autobauding (see note 10).

NOTE 16: The ISDN-BC will consist of the octets 1 to 4 only, coded:

Coding standard:	CCITT
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

NOTE 17: V.120 interworking is selected.

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the UE shall be mapped to the LLC parameters. The LLC parameter Rate Adaptation will be set to "V.120".

When interworking with unrestricted 64 kbit/s networks the ISDN BC shall be coded according to note 16.

NOTE 18: When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an ITC = RDI.
When indirectly interworking with a restricted 64 kbit/s network the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard:	CCITT
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	V.110/X.30
Synchronous/Asynchronous:	synchronous
Negotiation:	In-band negotiation not possible
User rate:	56 kbit/s

If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the UE shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital"

NOTE 19: In case the UE signals an ACC containing TCH/F4.8 only and the network does not support TCH/F4.8 channel coding, then the MSC may act as if TCH/F9.6 were included in the ACC.

NOTE 20: Extension of the 'Acceptable channel codings' field in octet 6e in case EDGE channel codings are supported.

NOTE 21: Void

NOTE 22: Only applicable for non-transparent services.

NOTE 23: This parameter shall be included if EDGE channel codings are indicated in ACC. In cases where this parameter would not otherwise be included, the value is set to 'Air interface user rate not applicable' or 'User initiated modification not requested' or 'No preference'.

NOTE 24: This value was used by services defined for former PLMN releases and does not need to be supported.

NOTE 25: The case of FTM is identified by Rate adaptation in the PLMN BC-IE set to "CCITT X.31 flag stuffing", Connection element set to "non-transparent", and Synchronous/asynchronous set to "asynchronous". The MSC applies one of the following alternatives: ~~The parameter values shall be set according to Note 16 in case FNUR is 64 kbit/s and according to Note 18 if Other ITC is RDI.~~

1) In the case FNUR=64 kbit/s
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded according to ETR 018 as follows:

Coding standard:	ITU-T
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s
User information layer 1 protocol:	(CCITT standardized rate adaptation X.31 HDLC flag stuffing) (note: the absence of octet 5 indicates that HDLC flag stuffing applies)
User information layer 2 protocol:	Recommendation X.25, link layer
User information layer 3 protocol:	Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

2) In the case FNUR=56 kbit/s and the MSC is directly connected to a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded as follows:

Coding standard:	ITU-T
Information Transfer capability:	RDI
Transfer mode:	circuit
Information transfer rate:	64 kbit/s

- the LLC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: RDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: (CCITT standardized rate adaptation X.31 HDLC flag stuffing) (note: the absence of octet 5 indicates that HDLC flag stuffing applies)
User information layer 2 protocol: Recommendation X.25, link layer
User information layer 3 protocol: Recommendation X.25, packet layer

If user information layer 1 protocol is indicated by absence of octet 5 user information layer 2/3 protocol are also absent.

3) In the case FNUR=56 kbit/s and the MSC is indirectly interworking with a restricted 64 kbit/s network,
- the ISDN BC-IE shall be coded according to ETR 018, as shown below:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110/X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 56 kbit/s

- If an LLC element is not present, the network will insert an LLC. If an LLC is present it may be modified. The PLMN -BC parameters negotiated with the MS shall be mapped to the LLC parameters according to the rules in this table. The LLC parameter Information Transfer Capability will be set to „restricted digital" and the LLC parameter User information layer 1 protocol will be set to "X.31 flag stuffing".

NOTE 26: In the case FNUR=64 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: H.223 and H.245

In the case FNUR=56 kbit/s the ISDN BC-IE shall be coded as in note 18.

In the case FNUR=32 kbit/s the ISDN BC-IE shall be coded as follows:

Coding standard: ITU-T
Information Transfer capability: UDI
Transfer mode: circuit
Information transfer rate: 64 kbit/s
User information layer 1 protocol: V.110, I.460 & X.30
Synchronous/Asynchronous: synchronous
Negotiation: In-band negotiation not possible
User rate: 32 kbit/s

In the case FNUR=28.8 kbit/s the ISDN BC-IE shall be coded as follows:

```
                        Coding standard:                        ITU-T
                        Information Transfer capability:         3,1 kHz Audio
                        Transfer mode:                           circuit
                        Information transfer rate:               64 kbit/s
                        User information layer 1 protocol:       G.711 A-law or µ-law
                        Synchronous/Asynchronous:                synchronous
                        Negotiation:                             In-band negotiation not possible
                        Modem type:                              V.34
                        User rate:                               28.8 kbit/s
```

In the case FNUR=33.6 kbit/s the ISDN BC-IE shall be coded as follows:

```
                        Coding standard:                        ITU-T
                        Information Transfer capability:         3,1 kHz Audio
                        Transfer mode:                           circuit
                        Information transfer rate:               64 kbit/s
                        User information layer 1 protocol:       G.711 A-law or µ-law
```

NOTE 27: In the case the FNUR=32 kbit/s the ISDN BC-IE shall be coded for PIAFS as follows:

```
                        Coding standard:                        ITU-T
                        Information Transfer capability:         UDI
                        Transfer mode:                           circuit
                        Information transfer rate:               64 kbit/s
                        User information layer 1 protocol:       V.110, I.460 and X.30
                        Synchronous/Asynchronous:                synchronous
                        Negotiation:                             In-band negotiation not possible
                        User rate:                               32 kbit/s
```

In the case of a FNUR=64 kbit/s the ISDN BC-IE shall be coded for PIAFS as in note 16.

Table 7B: Comparable setting of parameters in PLMN and ISDN: Mobile Terminated

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
1	**Bearer Capability IEI**	1	**Bearer Capability IEI**
2	**Length of BC contents**	2	**Length of BC contents**
	no comparable field	3 #7..6	**Radio channel requirement** full rate channel (these bits are spare in the network to UE direction)
3 #7..6	**Coding standard** CCITT standardized coding	3 #5	**Coding standard** GSM standardized coding
3 #5..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio no comparable value no comparable value 7 kHz audio video (note 23)	3 #3..1	**Information transfer capability** speech unrestricted digital 3,1 kHz audio ex PLMN (note2) facsimile group 3 (note 3) other ITC (see octet 5a) not supported not supported
		5a #7..6	**Other ITC** restricted digital
4 #7..6	**Transfer mode** circuit mode packet mode	3 #4	**Transfer mode** circuit mode not supported
4 #5..1	**Information transfer rate** 64 kbit/s		no comparable field
	No comparable field	4 #7	**Compression** (note 18) data compression possible data compression not possible
	No comparable field (note 4)	(4) 4 #6..5	**Structure** (note 9) SDU integrity unstructured
4a #4..3	No comparable field (note 4)	4 #3	**Configuration** point-to-point (note 5)
	No comparable field	4 #2	**NIRR** (note 17) No meaning Data $\leq$ 4.8 kbit/s, FR nt, 6 kbit/s radio interface requested
4a #2..1	No comparable field (note 4)	4 #1	**Establishment** demand (note 5)
4b #7..6			
4b #5..1			
5 #5..1	**User information layer 1 protocol** no comparable value CCITT V.110, I.460 / X.30 G.711 A-law CCITT X.31 flag stuffing no comparable value No comparable value H.221 & H.242(note 28) H.223 & H.245	5 #5..4	**Rate adaption** no rate adaption (note 11) V.110, I.460/X.30 rate adaption no comparable value not supported other rate adaption (see octet 5a)
		5a #5..4	**Other rate adaptation** V.120 (note 24) PIAFS H.223 & H.245 H.223 & H.245
	no comparable field	5 #3..1	**Signalling access protocol** I.440/I.450 X.21 (note 26) X.28, ded.PAD, indiv.NUI (note 26) X.28, ded.PAD, univ.NUI (note 26) X.28, non-ded.PAD (note 26) X.32 (note 26)
	any of the above values	6 #5..2	**User information layer 1 protocol** default layer 1 protocol
5a #7	**Synchronous / asynchronous** synchronous asynchronous	6 #1	**Synchronous/asynchronous** synchronous asynchronous
5a	**Negotiation**	6a	**Negotiation**

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
#6	not possible inband neg, possible (note 16)	#6	not possible no comparable value
5a #5..1	**User rate** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s rate is indicated by Ebit as specified in rec. I.460 0,6 kbit/s 3,6 kbit/s 7,2 kbit/s 8 kbit/s 14,4 kbit/s 16 kbit/s 19.2 kbit/s 28.8 kbit/s 32 kbit/s 38.4 kbit/s 48 kbit/s 56 kbit/s 57.6 kbit/s 0,1345 kbit/s 0,1 kbit/s 75 bit/s / 1,2 kbit/s 1,2 kbit/s / 75 bit/s 0,110 kbit/s 0,2 kbit/s	6a #4..1	**User rate (note 18 and 29)** 0,3 kbit/s 1,2 kbit/s 2,4 kbit/s 4,8 kbit/s 9,6 kbit/s 12 kbit/s (note 13) **(**note 16) not supported not supported not supported not supported (note 20) not supported (note 20) (note 20) (note 20) (note 20) (note 20) (note 20) not supported not supported not supported not supported not supported not supported not supported
5b #7..6	**Intermediate rate** not used (note 19) 8 kbit/s 16 kbit/s 32 kbit/s	6b #7..6	**Intermediate rate** (note 6) (note 18) 8 or 16 kbit/s 8 kbit/s 16 kbit/s
5b #5	**NIC on Tx** (note 14) does not require requires	6b #5	**NIC on Tx** does not require requires (note 13)
5b #4	**NIC on Rx** (note 14) cannot accept can accept	6b #4	**NIC on Rx** cannot accept can accept (note 13)
5b #3	**Flow control on Tx** (note 15) Not Required Required		no comparable field
5b #2	**Flow control on Rx** (note 15) Cannot Accept Accept		no comparable field
5c #7..6	**Number of stop bits** 1 bit 2 bits not used 1.5 bits	6a #7	**Number of stop bits** 1 bit 2 bits no comparable value not supported
5c #5..4	**Number of data bits** 7 bits 8 bits not used 5 bits	6a #5	**Number of data bits** 7 bits 8 bits no comparable value not supported
5c #3..1	**Parity information** odd even none forced to 0 forced to 1	6b #3..1	**Parity information** odd even none forced to 0 forced to 1
	no comparable field	6c #7..6	**Connection element** (note 1) transparent non-transparent (RLP) both, transp. preferred

Octet	ISDN BC parameter value	Octet	PLMN BC parameter value
			both, non-transp preferred
5d #7	**Duplex mode** half duplex full duplex	4 #4	**Duplex mode** half duplex　　(note 13) full duplex (note 5)
5d #6..1	**Modem type** reserved V.21 V.22 V.22bis V.23 V.26ter V.32 V.26 V.26bis V.27 V.27bis V.29 no comparable value	6c #5..1	**Modem type** (note 12) none　(note 7) V.21 V.22 V.22bis not supported V.26ter V.32 not supported not supported not supported not supported not supported autobauding type 1　(note 16)
5a #5..1	**User rate** no comparable value 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s 38,4 kbit/s 48 kbit/s 56 kbit/s no comparable value	6d #5..1	**Fixed network user rate**　(note 20) FNUR not applicable 9,6 kbit/s 14,4 kbit/s 19,2 kbit/s 28,8 kbit/s 32.0 kbit/s (note 27) 38,4 kbit/s 48,0 kbit/s 56,0 kbit/s 64,0 kbit/s (note 22)
	Modem type no comparable value (note 21) V.34	6d #7..6	**Other modem type** No other modem type V.34
	No comparable field	6f #7..5	**User initiated modification indicator (note 1) (note 25)** User initiated modification not 　　required User initiated modification upto 1 　　TCH/F may be requested User initiated modification upto 2 　　TCH/F may be requested User initiated modification upto 3 　　TCH/F may be requested User initiated modification upto 4 　　TCH/F may be requested
6 #5..1	**User information layer 2 protocol (note 10)** Q.921 (I.441) X.25, link level no comparable value	7	**User information layer 2 protocol (note 8)** no comparable value not supported ISO 6429, codeset 0
7	**User information layer 3 protocol (note 10)** Q.931 (I.451) X.25, packet level		 not supported not supported

General notes:

1) Other ISDN BC parameter values than those listed in the table, if indicated in the BC-IE, will be rejected by clearing the call, exception see mapping note 4.

2) Only the PLMN BC parameter values listed in the table may be generated (comparable values) during a mobile-terminated call by mapping the ISDN BC parameter values, exception see (10).

3) According to Q.931 (05/98) and 3GPP TS 24.008, respectively, the octets are counted from 1 to n onwards; the bit position in a particular octet is indicated by #x..y, with {x,y} = 1..8 (bit 1 is the least and bit 8 the most significant bit).

4) If octets 5 to 5d of the ISDN BC are absent but present in the LLC, the LLC octets should apply for the mapping as indicated above. In the case of V.120 interworking (see note 24) these LLC octets shall apply.

5) If within the ISDN BC the parameters information transfer capability indicates "3,1 kHz audio" and user layer 1 protocol indicates "G711 A-law" or "G.711 µ-law" (PCS-1900) but no modem type is available and the HLC does not indicate "facsimile group 3", octets 5 to 5d of the LLC, if available, apply for the above mapping procedure.

6) The number of octets which shall be encoded for the PLMN BC-IE must comply to encoding rules in 3GPP TS 24.008 and the combination of the different parameter values shall be in accordance to 3GPP TS 27.001.

Notes regarding particular entries in table 7B:

1) This PLMN parameter value is inserted according to user rate requirements and network capabilities / preferences.

2) This PLMN parameter value is inserted, if the information transfer capability in ISDN BC is "3,1kHz audio" and a comparable modem type is specified.

3) This PLMN parameter value is inserted, if the information transfer capability is "3,1 kHz audio" and the content of the HLC-IE, if any, indicates "facsimile group 2/3", (for details refer to subclause 10.2.2 case 3 for HLR action and case 5 for VMSC action). Note that via MAP the value "alternate speech/facsimile group 3 - starting with speech" shall be used, when TS 61 applies.

4) When interworking with an ISDN according to ETS 300 102-1, octets 4a and 4b may be present. The values are ignored and PLMN values are set according to notes 5 and 9.

5) This PLMN parameter value is inserted if the comparable ISDN parameter value is missing.

6) The value of the Intermediate Rate field of the PLMN Bearer Capability information element shall only depend on the value of the user rate in the same information element. If the connection element is "transparent", the value is 16 kbit/s, if the user rate is 9.6 or 12 kbit/s, and 8 kbit/s otherwise. For any other connection element setting the value is 16 kbit/s.

7) This PLMN BC parameter value is inserted, if the PLMN BC parameter "Information Transfer Capability" indicates "Unrestricted digital information", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech".

8) Where the network indicates "asynchronous" and connection elements "non-transparent", "both, transparent preferred" or "both, non-transparent preferred" , then the PLMN BC should be forwarded without parameter user information layer 2 protocol, see also (10).

9) The PLMN parameter value shall be set to "unstructured" where the network indicates connection element "transparent". Where the network indicates connection elements "non transparent" "both, transparent preferred" or "both, non transparent preferred" the value of the parameter structure shall be set to "SDU Integrity".

10) Mapping of parameter values of this octet to PLMN BC parameters and values are subject to specific application rules, i.e. unless otherwise explicitly stated in an appropriate TS mapping to PLMN BC parameters shall not take place.

11) This value shall be used when the value of the PLMN BC parameter "Information Transfer Capability" indicates the value "3,1 kHz audio ex PLMN", "facsimile group 3" or "alternate speech/facsimile group 3, starting with speech" which is reserved for MAP operations.

12) The modem encoding of both Q.931 (05/98) and ETS 300 102-1 version 1 shall be accepted and mapped according to 3GPP TS 24.008.

13) Value not used for currently defined bearer services and Teleservices.

14) NIC is only supported in A/Gb mode for "3,1 kHz Ex PLMN audio" interworking with synchronous data transmission.

15) Because the required flow control mechanism can not be indicated to the UE (refer to 3GPP TS 27.001), the network shall check if the flow control mechanism selected by the UE and indicated in the CALL CONFIRMED message suits to the requirements requested by the ISDN terminal adaptor. In case of a mismatch the call shall be released in the IWF.

Because an asymmetric flow control mechanism (with respect to transmitting and receiving side) is not supported in the PLMN, the different values of the ISDN BC-IE parameters "flow control on Tx" and "flow control on Rx" shall be interpreted in the following way:

- "Flow control on Rx" set to "accepted" matches with "outband flow control", irrespective of the value of the parameter "flow control on Tx".

- "Flow control on Rx" set to "not accepted" and "flow control on Tx" set to "not required" matches with "inband flow control" and "no flow control".

- where "Flow control on Rx" is set to "not accepted" and "flow control on Tx" to "required" the call shall be released by the IWF.

16) If in case of 3,1 kHz audio interworking "inband negotiation possible" is indicated and the parameter user rate is set to "rate is indicated by E bits specified in Recommendation I.460 or may be negotiated inband" the user rate in the PLMN BC-IE shall be set according to a network preferred value. If ISDN-BC parameter modem type is present, its value shall be ignored. The PLMN-BC parameter modem type shall be set according to the user rate in case of connection element "transparent" and to "autobauding type 1" in case of connection element "non transparent", "both, transparent preferred" or "both, non transparent preferred". In case of data compression high speed modems, like V.32bis, V.34 and/or V.90 may be used in the IWF. Autobauding may also be used to support user rates less than 9.6 kbit/s towards the PSTN.

For unrestricted digital interworking the call shall be rejected if these values are indicated.
If the PLMN-BC parameter modem type indicates "autobauding type 1" or "none", then the PLMN-BC parameter other modem type shall be set to "no other modem type".

17) For the use of NIRR see 3GPP TS 27.001. The VMSC shall set this parameter dependent upon its capabilities and preferences.

18) If compression is supported by the MSC, the value "data compression possible" may be set. Depending on the capabilities of the MSC, the user rate value and the intermediate rate value is set to an appropriate value.

19) Only applicable if the parameter ISDN-BC ITC indicates "3,1 kHz audio" and for "UDI" calls if User Rate > "19,2 kbit/s".

20) The user rate of the PLMN BC is set to the value for the fall-back bearer service. In case the user equipment does not support the fixed network user rate (i.e. the call confirmation message does not contain the fixed network user rate parameter), the network may release the call for a transparent connection element.

21) The modem type parameter of the PLMN -BC is taken into account, only.

22) In the case no LLC is received and the ISDN-BC received consists of octets 1 to 4 only, coded:

Coding standard:	CCITT
Information Transfer capability:	UDI
Transfer mode:	circuit
Information transfer rate:	64kbit/s

the following PLMN -BC parameters, shall be set to:

fixed network user rate:	64 kbit/s
connection element:	transparent
	bothNT or bothT (If IWF supports ~~FTM or~~ PIAFS)

The other parameters of the PLMN -BC shall be set to values indicating a fall-back service.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the ISDN-BC received consists of 1 to 4 only, coded:

Coding standard:	ITU-T
Information Transfer capability:	UDI

    Transfer mode: circuit
    Information transfer rate: 64kbit/s

the following PLMN BC parameters, shall be set to:

    fixed network user rate: 64 kbit/s
    connection element: non-transparent
    Synchronous/Asynchronous   asynchronous
all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

In the case an LLC indicating UIL1P=X.31 (either explicitly or implicitly by octet 5 missing) is received and the
    ISDN-BC received consists of 1 to 4 only, coded:

    Coding standard: ITU-T
    Information Transfer capability: RDI
    Transfer mode: circuit
    Information transfer rate: 64kbit/s

the following PLMN BC parameters, shall be set to:

    fixed network user rate: 56 kbit/s
    connection element: non-transparent
    Synchronous/Asynchronous   asynchronous
all other parameters shall be set according to 3GPP TS 27.001 to indicate FTM.

23) When the MSC is directly connected to a restricted 64 kbit/s network, the ISDN BC-IE is coded with an
ITC = RDI.
An ISDN BC-IE, as specified in ETR 018 and shown below, shall be taken to indicate that interworking with an
indirectly connected restricted 64 kbit/s network is required:

    Coding standard: CCITT
    Information Transfer capability: UDI
    Transfer mode: circuit
    Information transfer rate: 64 kbit/s
    User information layer 1 protocol: V.110/X.30
    Synchronous/Asynchronous: synchronous
    Negotiation: In-band negotiation not possible
    User rate: 56 kbit/s

In this case the PLMN BC parameter Information Transfer Capability is set to „Other ITC" and Other ITC
parameter is set to „restricted digital".If ISDN LLC exists, all the corresponding fields in the PLMN BC shall be
derived from the ISDN LLC. Otherwise, the corresponding fields in the PLMN BC shall be derived from the
ISDN BC. In the above both case, Connection element is set as follows.

    Connection element: transparent
                                     bothNT or bothT (If IWF supports FTM and LLC does not indicate
                                           User information layer 1 protocol = "X.31 flag stuffing")
                                           non-transparent (if IWF supports FTM and LLC indicates
                                           User information layer 1 protocol = "X.31 flag stuffing")

24) V.120 interworking is required if the ISDN LLC parameter User Information Layer 1 Protocol is set to „V.120".
In this case the PLMN BC parameter Rate Adaptation is set to „Other rate adaptation" and Other Rate
Adaptation parameter is set to „V.120". All the corresponding fields in the PLMN BC shall be derived from the
ISDN LLC.

25) This parameter is only included in case of non-transparent multislot connections.

26) This value was used by services defined for former PLMN releases and does not need to be supported.

27) Following BC parameters in SETUP message shall be set to:

Fixed network user rate	32 kbit/s
Connection element	transparent (for multimedia)
	bothNT or bothT (If IWF supports PIAFS, UTRAN Iu mode only)

28) UIL1P is set to "H.221 & H.242" or "H.223 & H.245" by H.324/I. In the case where UIL1P is set to "H.221 and H.242", this should be mapped to "H.223 & H.245".

29) In Iu mode, if the User Rate of the ISDN BC is less than 9,6 kbit/s and the Connection Element is mapped to "NT", then FNUR is fixed to 9,6 kbit/s.