3GPP TSG CN Plenary Meeting #21 **NP-030328**
17th - 19th September 2003. Frankfurt, Germany.

Source: TSG CN WG3

Title: CRs on Rel-4 and previous Work Item TEI.

Agenda item: 7.11

Document for: APPROVAL

Introduction:

This document contains **7** CRs on **Rel-4 and previous Work Item TEI,** including the corresponding mirror CRs (as required).

These CRs have been agreed by TSG CN WG3 and are forwarded to TSG CN Plenary meeting for approval.

WG_tdoc	Title	Spec	CR	Rev	Cat	Rel	C_Ver
N3-030649	Interpretation of "no BC-IE in CALL PROC/CONF messages"	29.007	087		F	R99	3.12.0
N3-030650	Interpretation of "no BC-IE in CALL PROC/CONF messages"	29.007	088		A	Rel-4	4.8.0
N3-030651	Interpretation of "no BC-IE in CALL PROC/CONF messages"	29.007	080	2	A	Rel-5	5.6.0
N3-030656	Interpretation of "no BC-IE in CALL PROC/CONF messages"	27.001	102	1	F	R99	3.12.0
N3-030657	Interpretation of "no BC-IE in CALL PROC/CONF messages"	27.001	103	1	A	Rel-4	4.10.0
N3-030658	Interpretation of "no BC-IE in CALL PROC/CONF messages"	27.001	100	3	A	Rel-5	5.6.0
N3-030652	Interpretation of "no BC-IE in CALL PROC/CONF messages"	23.172	018	1	F	Rel-5	5.1.0

3GPP TSG-CN WG3 Meeting #29 **N3-030649**
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **29.007** **CR** **087** ⌘ **rev** **-** ⌘ Current version: **3.12.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/2003
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)
Rel-6 (Release 6)

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached pages
Consequences if not approved:	⌘	Inconsistent and confusing rules in this specification.

Clauses affected:	⌘	Clauses 9.2.1, 9.2.2, 9.4.1, 9.4.2, 10.4.1 and 10.4.2

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		27.001, 23.172
			X	Test specifications		
			X	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/specs/CR.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.

First section modified

9.2.1 Network interworking mobile originated

9.2.1.1 Selection of interworking function

The interworking function will need to negotiate with the user to establish the appropriate modem selection e.g. data rate, modulation scheme, etc. In addition, it will also be required to convert the signalling format, from a combination of out of band and in band, to that suitable for controlling the modem and the autocalling line procedure function where applicable. ~~In the following modem selection procedures it~~ It is assumed that the interworking function and modems will be associated with each MSC.

For a data call originated by a circuit mode data terminal on the PLMN, the modem selection is done by using the elements "modem type" and "other modem type" in the bearer capability (PLMN-BC) of the call set-up message ~~(bearer capability)~~.

In addition, other elements of the call setup will indicate the user rate, etc. to be used via that modem. The use of this information however means that the network is only able to select a modem from the modem pool which conforms to the speed which the terminal is utilizing at the DTE/DCE interface at the MS (e.g. V.22 for 1 200 bps). The exception to this is where the user has selected the non transparent service in which case either an autobauding or multi self selecting speed modem (e.g. V.32) may be used.

~~In case~~If in GSM the PLMN-BC(s) received with the set-up message indicated a multislot, 14.4kbit/s, ~~and~~ or EDGE-operation (refer to 3GPP TS 27.001) and the network does not support any of the required such services, the PLMN-BC(s) sent with the call proceeding message shall not contain the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters - the MSC shall discard the multislot, ~~or~~ 14.4kbit/s ~~and/~~or EDGE-related parameters and use the fall-back bearer service indicated by the remaining parameters of the PLMN-BS(s) on a singleslot configuration (refer to 3GPP TS 08.20 and 3GPP TS 04.21) on the MSC/IWF-BSS link. The MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

If the MSC supports in GSM the multislot, 14.4kbit/s ~~and/~~or EDGE-operation or if the MSC supports UMTS, the PLMN-BC(s) shall include the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters of the call proceeding message if these parameters were present in the call set-up message received from the UE. In GSM the ~~. The~~ MSC shall apply on the MSC/IWF-BSS link a singleslot or multislot configuration according to the rules defined in 3GPP TS 04.21, 3GPP TS 08.20 and 3GPP TS 24.022. 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.

~~In case~~If in GSM, the PLMN-BC(s) received with the set-up message did not indicate a multislot, 14.4kbit/s or EDGE-operation, the MSC shall not include the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters in the PLMN-BC(s) of the call proceeding message - the MSC shall use a singleslot configuration on the MSC/IWF-BSS link.

The MSC may negotiate parameters with the MS according to the rules defined in 3GPP TS 27.001. For multislot, 14.4 kbit/s, EDGE and Iu Mode operations the MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

9.2.1.2 Modem Selection

In general terms the indication of the bearer capability parameter "Information Transfer Capability" will be utilized in the call set-up message to determine when the modem should be selected in the call.

In case of single calls, the modem function shall operate in the calling mode in case of mobile originated calls and in the answering mode in case of mobile terminated calls.

In case of dual data calls (alternate speech/facsimile group 3) the operation mode of the modem (working in calling or answering mode) depend on the initial call setup direction and on the optional parameter "Reverse Call Setup Direction" information element of the MODIFY message. If this information element is omitted the direction is derived from the initial call setup direction, i.e. the mode is the same as in case of single calls.

For the attribute value "3,1 kHz audio Ex PLMN" and "facsimile group 3", the modem will be selected immediately. The line procedure according to V.25 will then be carried out using the appropriate modem functions.

For the Teleservice 61 "Alternate speech/facsimile group 3", (if speech is selected as the first service), the modem is made available but not selected until the subscriber indicates the change of service request (see subclause 9.3).

For "alternate speech/facsimile group 3" calls refer to 3GPP TS 03.45 and 03.46 (GSM).

9.2.1.3 Mapping of BC-IE from PLMN to ISUP (or other)

As it cannot be determined from the called address whether the distant network is a PSTN or an ISDN the same mapping takes place as for ISDN calls (see table 7A), if ISDN signalling is used between different MSCs (e.g. on the link VMSC - GMSC).

9.2.2 Network Interworking Mobile terminated PSTN Originated

This subclause describes the interworking of calls where the calling subscriber cannot generate or communicate Compatibility Information exhaustive for deducing a PLMN Basic Service to a PLMN (gateway MSC/interrogating node) because of lack of ISDN signalling capability. Thus the HLR is relieved from any compatibility checking for such calls.

Two methods of allocating MS International ISDN Numbers (MSISDNs) are allowed: Firstly, a separate MSISDN may be allocated for each service, or service option, which a subscriber uses for incoming calls; or, alternatively, a single number, applicable for all incoming calls is used.

It should be noted that it is possible for both schemes to co-exist within the PLMN and that they are not mutually exclusive.

a) Multiple MSISDNs are used ("The Multi-numbering Scheme"). See figure 2.

b) A single MSISDN is used ("The Single-numbering Scheme"). See figure 3.

9.2.2.1 Multi-numbering Scheme

In this scheme, the HPLMN will allocate a number of MSISDNs to a subscriber and associate with each of these numbers a Bearer Capability to identify a Bearer or a Teleservice. This Bearer Capability comprises a complete PLMN Bearer Capability (PLMN BC) information element with contents according to 3GPP TS 27.001 and coded as per 3GPP TS 24.008. In either case, when the HLR receives an interrogation relating to an incoming call (i.e. the MAP "Send Routing Information" procedure), it requests a roaming number (MSRN) from the VLR. This request will contain the PLMN BC reflecting the service associated with the called MSISDN, i.e. the PLMN BC is passed to the VLR within the MAP parameter "GSM Bearer Capability" of the message "Provide Roaming Number".

At the VMSC, when the incoming call arrives, the PLMN BC associated with the MSRN are retrieved from the VLR and sent to the MS at call set-up.

Where the PLMN specific parameters "connection element" and "radio channel" requirements contained in the retrieved PLMN BC-IE, indicate dual capabilities then the VMSC shall set them according to its capabilities/preferences. Additionally the parameters correlated to those mentioned above shall be modified in accordance with 3GPP TS 27.001.

The same applies to the parameter modem type if "autobauding type 1" is indicated but the IWF does not support this feature. The parameter "data compression" may also be modified according to the capabilities of the IWF.

Where single capabilities are indicated then the VMSC shall use the requested values if it is able to support the service requested. If it is unable to support the requested service then it shall set them according to its capabilities/preferences.

Where the Compatibility Information is provided in a degree exhaustive to deduce a PLMN Basic Service (see application rules in subclause 10.2.2), then the VMSC in providing the PLMN BC IE in the setup message shall set the PLMN specific parameters to its capabilities/preferences.

On receipt of a Set-up message containing the compatibility information, the MS will analyse the contents to decide whether the service can be supported (with or without modification, see 3GPP TS 27.001) and the call will be accepted or rejected as appropriate.

These negotiable parameters in the PLMN BC-IE are: Connection Element (Transparent\non-transparent), Data Compression, number of data bits, number of stop bits and parity as well as the correlated parameters Structure, Intermediate Rate, Modem Type and User Information Layer 2 Protocol. Additionally, for multislot, 14.4 kbit/s and EDGE operations in GSM the parameters Fixed Network User Rate, Other Modem Type and User Initiated Modification Indicator, and for ~~Iu Mode operations~~UMTS the parameters Fixed Network User Rate and Other Modem Type, can be negotiated. For FTM, PIAFS and Multimedia, Rate adaption/Other rate adaption can be negotiated. For FTM and PIAFS, Synchronous/asynchronous can be negotiated, see 3GPP TS 27.001.

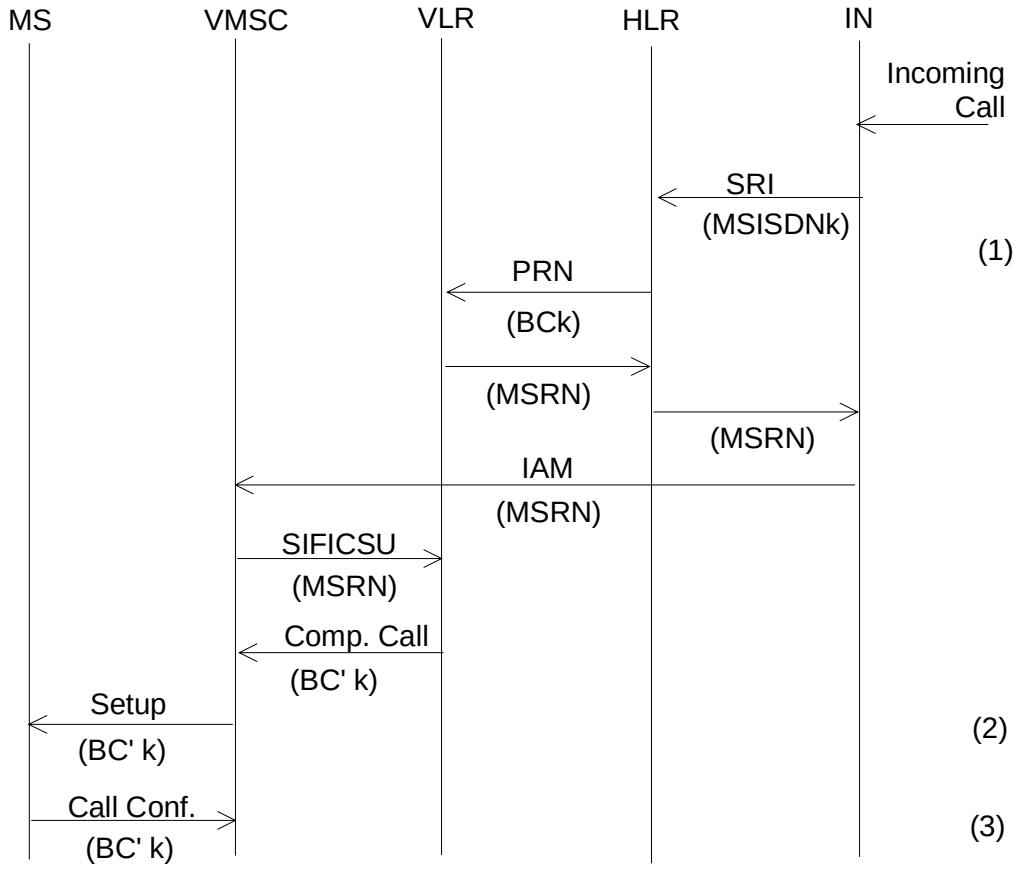
This negotiation takes place by means of the MS reflecting back to the MSC a complete bearer capability information element in the call confirmed message, with the relevant parameters changed. If this does not take place (i.e. if there is no PLMN BC present in the call confirmed message), than the MSC will assume that the values originally transmitted to the MS are accepted with the following exceptions:~~-~~

- ~~In case~~If in GSM, the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification ~~parameter~~indicator" parameters and no multislot, 14.4 kbit/s, and/or EDGE related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall discard the "fixed network user rate", "other modem type" and "user initiated modification ~~parameter~~indicator" parameters - the MSC shall use the fall-back bearer service indicated by the remaining parameters of the PLMN-BC on a singleslot configuration (refer to 3GPP TS 08.20 and 3GPP TS 04.21) on the MSC/IWF-BSS link.

- On the other hand, if in GSM, the PLMN-BC received with the call confirmed message contain(s) multislot, 14.4kbit/s or EDGE-related parameters the MSC shall apply on the MSC/IWF-BSS link a singleslot or multislot configuration according to the rules defined in 3GPP TS 04.21, 3GPP TS 08.20 and 3GPP TS 24.022. 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.

- If in UMTS, the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters, but no related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall release the call.

In addition the MS may propose to the network to modify the User Rate as well as the correlated parameters Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call. For multislot, 14.4kbit/s, EDGE and Iu Mode operations, the MS may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001).



NOTES: (1) The HLR translates the received MSISDN_ called address (MSISDNk) into the relevant bearer capability information (BCk).
(2) Some parameters of BCk may be provided/modified according to the MSC's capabilities/preferences. See subclause 9.2.2.
(3) In the "Call Confirmed" message, the MS may modify some parameters of the BC. See subclause 9.2.2.

Abbr.:
SRI - Send Routing Information.
PRN - Provide Roaming Number.
MSRN - Mobile Station Roaming Number.
IAM - Initial Address Message.
SIFICSU - Send Information For Incoming Call Set Up.

Figure 2: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses multiple MSISDN numbers with corresponding BCs

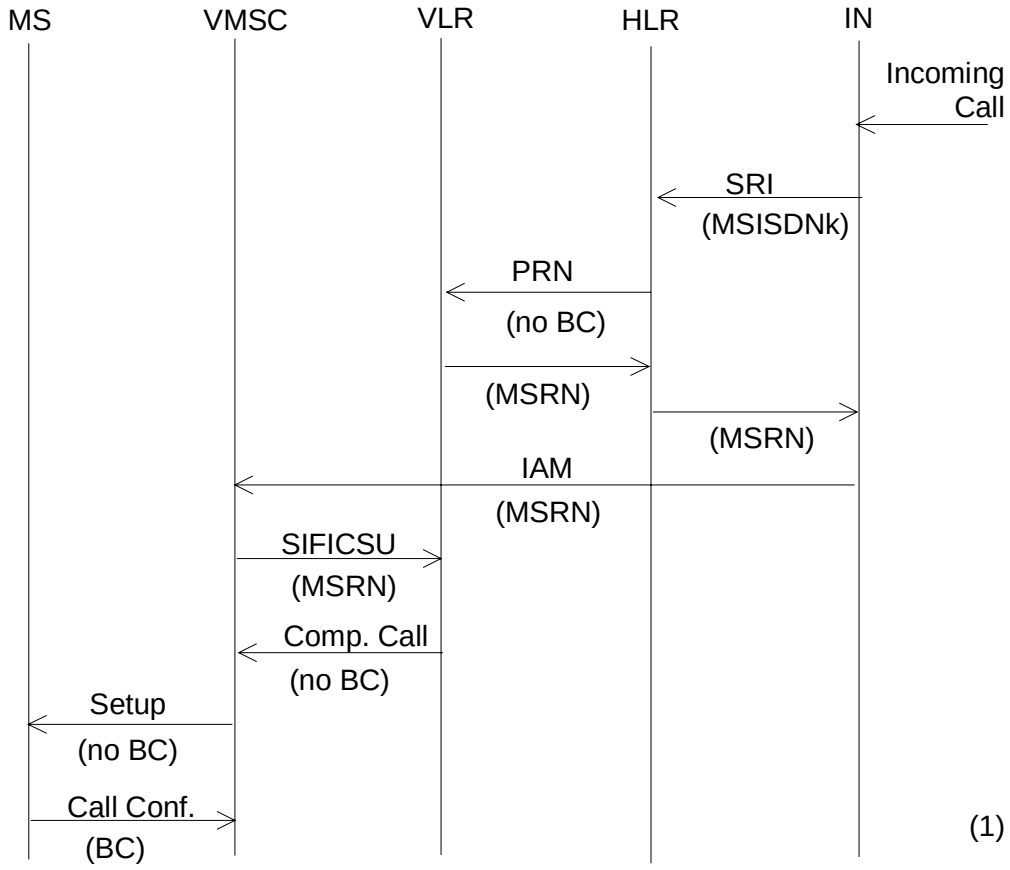
9.2.2.2 Single-numbering Scheme

In the single-numbering scheme, the HPLMN will allocate one MSISDN to a subscriber, applicable to all services.

In this case, when the HLR receives an interrogation relating to an incoming call without compatibility information exhaustive for deducing a PLMN Basic Service (i.e. the MAP "Send Routing Information" procedure), the request to the VLR for a roaming number will not contain compatibility information i.e. a PLMN BC.

At the VLR, when the incoming call arrives, there is no PLMN BC associated with the MSRN and so the call set-up to the ~~mobile~~ UE will not contain the PLMN BC information element.

In this case, the MS will return a complete single or dual PLMN BC in the Call Confirmed message, indicating the service required by the mobile subscriber. The VMSC will analyse this PLMN BC and optionally perform subscription checking (see 3GPP TS 02.01). If the requested PLMN BC can be supported the call is established, otherwise the call will be released.



NOTE: (1) This BC is derived from information stored in the MS, according to its configuration.
(2) Abbreviations: see figure 2.

Figure 3: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses single MSISDN numbers (no corresponding BC stored). Per call MSRN allocation

Next section modified

9.4 3G-H.324/M calls over 3,1kHz audio

In case of 3G-H.324/M calls over 3.1kHz audio, the IWF shall provide the V.34 modem modulation and the V.8 procedure with the indication of H.324 support in the call function category of the V.8 handshaking. H.223 & H.245 flow is not terminated in the modem function.

The performance of V.8bis by the modem function is FFS.

9.4.1 Mobile originated multimedia call

9.4.1.1 Call setup

The setup message sent by the MS contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a speech BC-IE and a 3.1kHz multimedia BC-IE to indicate the support of a fallback to speech (ref. to TS 27.001 and TS 24.008).

The MSC shall not accept a requested service to which the user has no subscription. On the condition the user has the required subscriptions (i.e. to multimedia and/or speech) the following applies:

- in case of a multimedia only BC-IE the MSC may accept the setup as such or with modifications sent to the MS in the call proceeding message (ref. to TS 27.001);

- in case of both a speech BC-IE and a 3.1kHz multimedia BC-IE the MSC may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call ~~confirm~~ proceeding message or turn the call to a multimedia only call by sending only a multimedia BC-IE in the call ~~confirm~~ proceeding message (Ref. to TS 27.001).

The IWF V.34 modem shall initiate the ITU-T V.8 handshaking and indicate the support of H.324/M in the call function category of the V.8 handshaking. If the called party's modem does not indicate a H.324 support in its V.8 inband signalling response, the IWF may clear the call. If the called party responds with a modem answering tone but there is no V.8 response at all, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 or 28.8 kbit/s, the MSC shall initiate a MODIFY message (ref. to TS 24.008) to indicate the new data rate to the MS. HDLC flag stuffing or the stuffing mode defined in ITU-T recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the MS and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (ref. to ITU-T recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the MS. If the MS responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.1.2 Fallback to speech after setup

If the MSC has accepted the possibility of a fallback to speech and the IWF modem does not recognize the answering tone of the called modem within the expiration of a timer started at the reception of the answer message, the MSC IWF shall initiate an In Call Modification procedure (ref. to TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the calling MS and the fixed network. If the fallback fails e.g. due to a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum value for the timer is 3 seconds (ref. to the ITU-T V.25 recommendation).

9.4.2 Mobile terminated multimedia call

9.4.2.1 Call setup

If the user has a subscription to both the multimedia bearer service and the speech teleservice and if the network supports both services and the fallback functionality, the MSC shall send both a multimedia BC-IE and a speech BC-IE in the setup message to the mobile station. If the user has a subscription only to the multimedia bearer service the MSC shall send only a multimedia BC-IE.

In case of both a speech BC-IE and a 3,1 kHz multimedia BC-IE in the setup the mobile station may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message or to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE in the call confirmed message. In case of a multimedia only BC-IE in the setup the MS may accept the setup as such or with modifications sent to the MSC in the call confirmed message.

If no service definition is available in the network, the MSC shall send no BC-IE(s) to the mobile station in the call setup. The MSC shall analyse the received BC-IE(s) and optionally perform a subscription check to the multimedia and/or speech service(s) requested by the mobile station in the call confirmed message and shall not accept a requested service rejected by the subscription check.

The IWF V.34 modem shall await the ITU-T V.8 handshaking to be initiated by the calling party's modem and shall recognize the support of H.324 in the call function category of the incoming V.8 handshaking. If the calling party's modem does not indicate a H.324 support in its V.8 inband signalling, the IWF may clear the call. If the calling modem tries to handshake another than V.34 modem scheme, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 or 28.8 kbit/s, the MSC shall initiate a MODIFY message (ref. to TS 24.008) to indicate the new data rate to the MS. HDLC

flag stuffing or the stuffing mode defined in ITU-T recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the MS and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (ref. to ITU-T recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the MS. If the MS responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.2.2 Fallback to speech after setup

If the MSC supports a fallback to speech and the user has a subscription to the speech service and the mobile station accepts the possibility of a fallback to speech in the call confirmed message and the IWF modem does not recognize a call tone nor a V.8 Call Indication nor a V.8 Call Menu within the expiration of a timer started at the sending of the ANSam answer tone (i.e. the calling party is not a V.34 modem), the IWF shall initiate an In Call Modification procedure (ref. to TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the called MS and the fixed network. If the fallback fails e.g. due to a missing subscription to speech or a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum timer value is 3 seconds (ref. to the ITU-T V.8 recommendation).

Next section for information

10 Interworking to the ISDN

The interworking to the ISDN is specified on the principle of the network supporting standardized associated signalling protocol as outlined in clause 6, i.e. DSS1 and ISUP. An ISDN not complying with this definition differs - for the purpose of the present document - in that it does not support the compatibility information to that degree necessary for deducing a PLMN Basic Service. These networks will find their reflection in the following where those implications are to be set out.

The calling address sent in a mobile originated call to the ISDN is always the basic MSISDN even if the ISDN user shall use a different MSISDN (multi numbering scheme, see 9.2.2 case a) for a mobile terminated call (call back) as only the basic MSISDN is available at the VLR (see 3GPP TS 29.002).

The scope of this clause is to describe the handling of the content of the Information Elements where "content" is understood to be the value of the parameter fields of the Information Elements, namely BC-IE, HLC and LLC, after the length indicator. For the transport of these Information Elements within the PLMN refer to 3GPP TS 29.002.

The handling of multislot, 14.4kbit/s, EDGE and Iu Mode related parameter of the call control signalling and the applicability of single- or multislot configurations (refer to 3GPP TS 08.20 and 3GPP TS 04.21) is the same as for the PSTN interworking cases. For multislot, 14.4kbit/s, EDGE and Iu Mode operations, the MS may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001). In case a transparent service is used, the call shall be released. For a non-transparent service with flow control, the MSC/IWF shall use towards the fixed network the unmodified "fixed network user rate" and shall use the "wanted air interface user rate" towards the mobile station.

Next section modified

10.4 3G-H.324/M calls over UDI/RDI

3G-H.324/M calls provide UDI/RDI(e.g. 32 kbit/s transparent data, 56 kbit/s transparent data or 64 kbit/s transparent data). H.223 and H.245 flow is not terminated in the MSC.

3G-H.324 calls over 64 kbit/s transparent data and 56kbit/s transparent data can be connected to H.324/I calls over UDI/RDI. H.223 protocol is transparent to IWF.

In case of 3G-H.324M calls over 32 kbit/s, IWF which performs rate adaptation between 64kbit/s and 32kbit/s is used. Rate adaptation is based on ITU-T I.460.

The support of IWF which transcodes the multiplexes and the content of control, audio, video and data in MSC is FFS.

3GPP TSG-CN WG3 Meeting #29 ***N3-030650***
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **29.007** **CR** **088** ⌘ **rev** **-** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

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Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached pages
Consequences if not approved:	⌘	Inconsistent and confusing rules in this specification.

Clauses affected:	⌘	Clauses 9.2.1, 9.2.2, 9.4.1, 9.4.2, 10.4.1 and 10.4.2				
Other specs affected:	⌘	**Y**	**N**	Other core specifications	⌘	27.001, 23.172
		[X]	[ ]			
		[ ]	[X]	Test specifications		
		[ ]	[X]	O&M Specifications		
Other comments:	⌘					

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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.

First section modified

9.2.1 Network interworking mobile originated

9.2.1.1 Selection of interworking function

The interworking function will need to negotiate with the user to establish the appropriate modem selection e.g. data rate, modulation scheme, etc. In addition, it will also be required to convert the signalling format, from a combination of out of band and in band, to that suitable for controlling the modem and the autocalling line procedure function where applicable. ~~In the following modem selection procedures it~~ It is assumed that the interworking function and modems will be associated with each MSC.

For a data call originated by a circuit mode data terminal on the PLMN, the modem selection is done by using the elements "modem type" and "other modem type" in the bearer capability (PLMN-BC) of the call set-up message ~~(bearer capability)~~.

In addition, other elements of the call setup will indicate the user rate, etc. to be used via that modem. The use of this information however means that the network is only able to select a modem from the modem pool which conforms to the speed which the terminal is utilizing at the DTE/DCE interface at the MS (e.g. V.22 for 1 200 bps). The exception to this is where the user has selected the non transparent service in which case either an autobauding or multi self selecting speed modem (e.g. V.32) may be used.

~~In case~~If in GSM the PLMN-BC(s) received with the set-up message indicated a multislot, 14.4kbit/s, ~~and~~ or EDGE-operation (refer to 3GPP TS 27.001) and the network does not support any of the required such services, the PLMN-BC(s) sent with the call proceeding message shall not contain the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters - the MSC shall discard the multislot, ~~or~~ 14.4kbit/s ~~and/~~or EDGE-related parameters and use the fall-back bearer service indicated by the remaining parameters of the PLMN-BS(s) on a singleslot configuration (refer to 3GPP TS 48.020 and 3GPP TS 44.021) on the MSC/IWF-BSS link. The MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

If the MSC supports in GSM the multislot, 14.4kbit/s ~~and/~~or EDGE-operation or if the MSC supports UMTS, the PLMN-BC(s) shall include the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters of the call proceeding message if these parameters were present in the call set-up message received from the UE. In GSM the ~~. The~~ MSC shall apply on the MSC/IWF-BSS link a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022. 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.

~~In case~~If in GSM, the PLMN-BC(s) received with the set-up message did not indicate a multislot, 14.4kbit/s or EDGE-operation, the MSC shall not include the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters in the PLMN-BC(s) of the call proceeding message - the MSC shall use a singleslot configuration on the MSC/IWF-BSS link.

The MSC may negotiate parameters with the MS according to the rules defined in 3GPP TS 27.001. For multislot, 14.4 kbit/s, EDGE and Iu Mode operations the MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

9.2.1.2 Modem Selection

In general terms the indication of the bearer capability parameter "Information Transfer Capability" will be utilized in the call set-up message to determine when the modem should be selected in the call.

In case of single calls, the modem function shall operate in the calling mode in case of mobile originated calls and in the answering mode in case of mobile terminated calls.

In case of dual data calls (alternate speech/facsimile group 3) the operation mode of the modem (working in calling or answering mode) depend on the initial call setup direction and on the optional parameter "Reverse Call Setup Direction" information element of the MODIFY message. If this information element is omitted the direction is derived from the initial call setup direction, i.e. the mode is the same as in case of single calls.

For the attribute value "3,1 kHz audio Ex PLMN" and "facsimile group 3", the modem will be selected immediately. The line procedure according to V.25 will then be carried out using the appropriate modem functions.

For the Teleservice 61 "Alternate speech/facsimile group 3", (if speech is selected as the first service), the modem is made available but not selected until the subscriber indicates the change of service request (see subclause 9.3).

For "alternate speech/facsimile group 3" calls refer to 3GPP TS 43.045 (GSM) and 3GPP TS 23.146 (UMTS).

9.2.1.3 Mapping of BC-IE from PLMN to ISUP (or other)

As it cannot be determined from the called address whether the distant network is a PSTN or an ISDN the same mapping takes place as for ISDN calls (see table 7A), if ISDN signalling is used between different MSCs (e.g. on the link VMSC - GMSC).

9.2.2 Network Interworking Mobile terminated PSTN Originated

This subclause describes the interworking of calls where the calling subscriber cannot generate or communicate Compatibility Information exhaustive for deducing a PLMN Basic Service to a PLMN (gateway MSC/interrogating node) because of lack of ISDN signalling capability. Thus the HLR is relieved from any compatibility checking for such calls.

Two methods of allocating MS International ISDN Numbers (MSISDNs) are allowed: Firstly, a separate MSISDN may be allocated for each service, or service option, which a subscriber uses for incoming calls; or, alternatively, a single number, applicable for all incoming calls is used.

It should be noted that it is possible for both schemes to co-exist within the PLMN and that they are not mutually exclusive.

a) Multiple MSISDNs are used ("The Multi-numbering Scheme"). See figure 2.

b) A single MSISDN is used ("The Single-numbering Scheme"). See figure 3.

9.2.2.1 Multi-numbering Scheme

In this scheme, the HPLMN will allocate a number of MSISDNs to a subscriber and associate with each of these numbers a Bearer Capability to identify a Bearer or a Teleservice. This Bearer Capability comprises a complete PLMN Bearer Capability (PLMN BC) information element with contents according to 3GPP TS 27.001 and coded as per 3GPP TS 24.008. In either case, when the HLR receives an interrogation relating to an incoming call (i.e. the MAP "Send Routing Information" procedure), it requests a roaming number (MSRN) from the VLR. This request will contain the PLMN BC reflecting the service associated with the called MSISDN, i.e. the PLMN BC is passed to the VLR within the MAP parameter "GSM Bearer Capability" of the message "Provide Roaming Number".

At the VMSC, when the incoming call arrives, the PLMN BC associated with the MSRN are retrieved from the VLR and sent to the MS at call set-up.

Where the PLMN specific parameter "connection element" contained in the retrieved PLMN BC-IE, indicates dual capabilities then the VMSC shall set it according to its capabilities/preferences. Additionally the parameters correlated to "connection element" shall be modified in accordance with 3GPP TS 27.001.

The same applies to the parameter modem type if "autobauding type 1" is indicated but the IWF does not support this feature. The parameter "data compression" may also be modified according to the capabilities of the IWF.

Where single capabilities are indicated then the VMSC shall use the requested values if it is able to support the service requested. If it is unable to support the requested service then it shall set them according to its capabilities/preferences.

Where the Compatibility Information is provided in a degree exhaustive to deduce a PLMN Basic Service (see application rules in subclause 10.2.2), then the VMSC in providing the PLMN BC IE in the setup message shall set the PLMN specific parameters to its capabilities/preferences.

On receipt of a Set-up message containing the compatibility information, the MS will analyse the contents to decide whether the service can be supported (with or without modification, see 3GPP TS 27.001) and the call will be accepted or rejected as appropriate.

These negotiable parameters in the PLMN BC-IE are: Connection Element (Transparent\non-transparent), Data Compression, number of data bits, number of stop bits and parity as well as the correlated parameters Structure, Intermediate Rate, Modem Type and User Information Layer 2 Protocol. Additionally, for multislot, 14.4 kbit/s and EDGE operations in GSM the parameters Fixed Network User Rate, Other Modem Type and User Initiated Modification Indicator, and for ~~Iu Mode operations~~UMTS the parameters Fixed Network User Rate and Other Modem Type, can be negotiated. For FTM, PIAFS and Multimedia, Rate adaption/Other rate adaption can be negotiated. For FTM and PIAFS, Synchronous/asynchronous can be negotiated, see 3GPP TS 27.001.

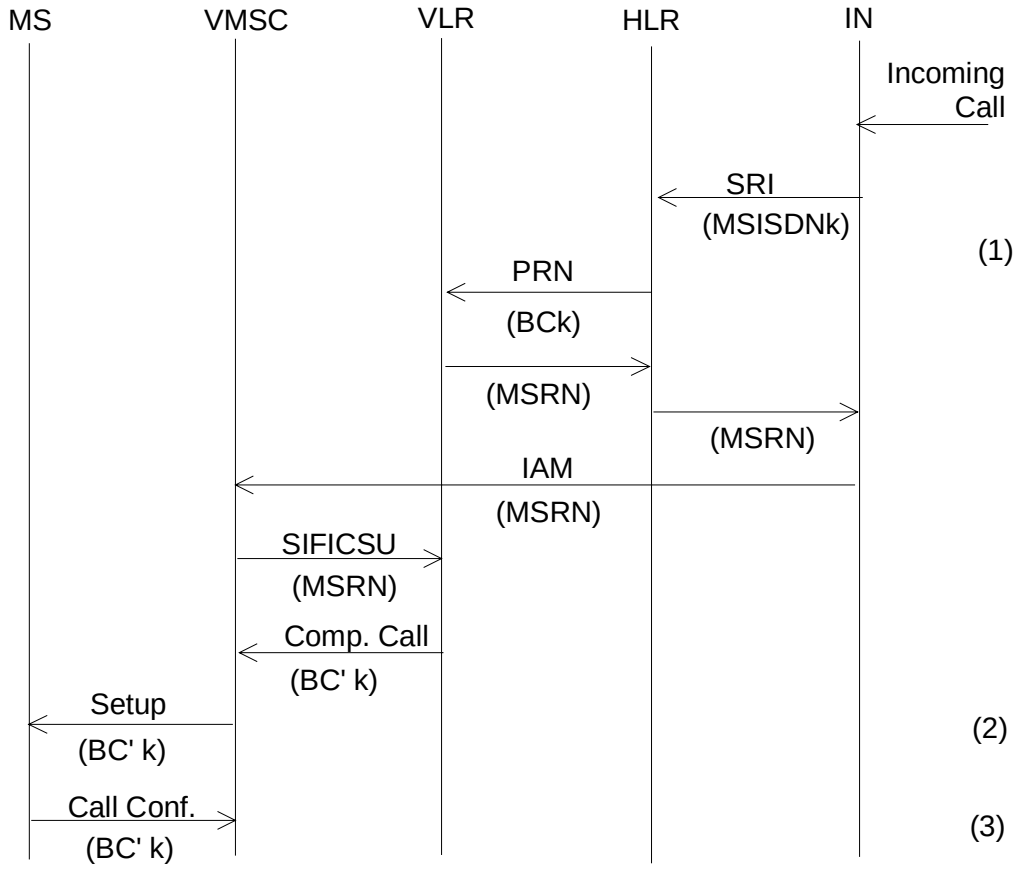
This negotiation takes place by means of the MS reflecting back to the MSC a complete bearer capability information element in the call confirmed message, with the relevant parameters changed. If this does not take place (i.e. if there is no PLMN BC present in the call confirmed message), than the MSC will assume that the values originally transmitted to the MS are accepted with the following exceptions:~~.~~

- ~~In case~~If in GSM, the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification ~~parameter~~indicator" parameters and no multislot, 14.4 kbit/s, and/or EDGE related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall discard the "fixed network user rate", "other modem type" and "user initiated modification ~~parameter~~indicator" parameters - the MSC shall use the fall-back bearer service indicated by the remaining parameters of the PLMN-BC on a singleslot configuration (refer to 3GPP TS 48.020 and 3GPP TS 44.021) on the MSC/IWF-BSS link.

- On the other hand, if in GSM, the PLMN-BC received with the call confirmed message contain(s) multislot, 14.4kbit/s or EDGE-related parameters the MSC shall apply on the MSC/IWF-BSS link a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022. 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.

- If in UMTS, the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters, but no related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall release the call.

In addition the MS may propose to the network to modify the User Rate as well as the correlated parameters Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call. For multislot, 14.4kbit/s, EDGE –and Iu Mode operations, the MS may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001).



NOTES: (1) The HLR translates the received MSISDN_ called address (MSISDNk) into the relevant bearer capability information (BCk).
(2) Some parameters of BCk may be provided/modified according to the MSC's capabilities/preferences. See subclause 9.2.2.
(3) In the "Call Confirmed" message, the MS may modify some parameters of the BC. See subclause 9.2.2.

Abbr.:
SRI - Send Routing Information.
PRN - Provide Roaming Number.
MSRN - Mobile Station Roaming Number.
IAM - Initial Address Message.
SIFICSU - Send Information For Incoming Call Set Up.

Figure 2: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses multiple MSISDN numbers with corresponding BCs

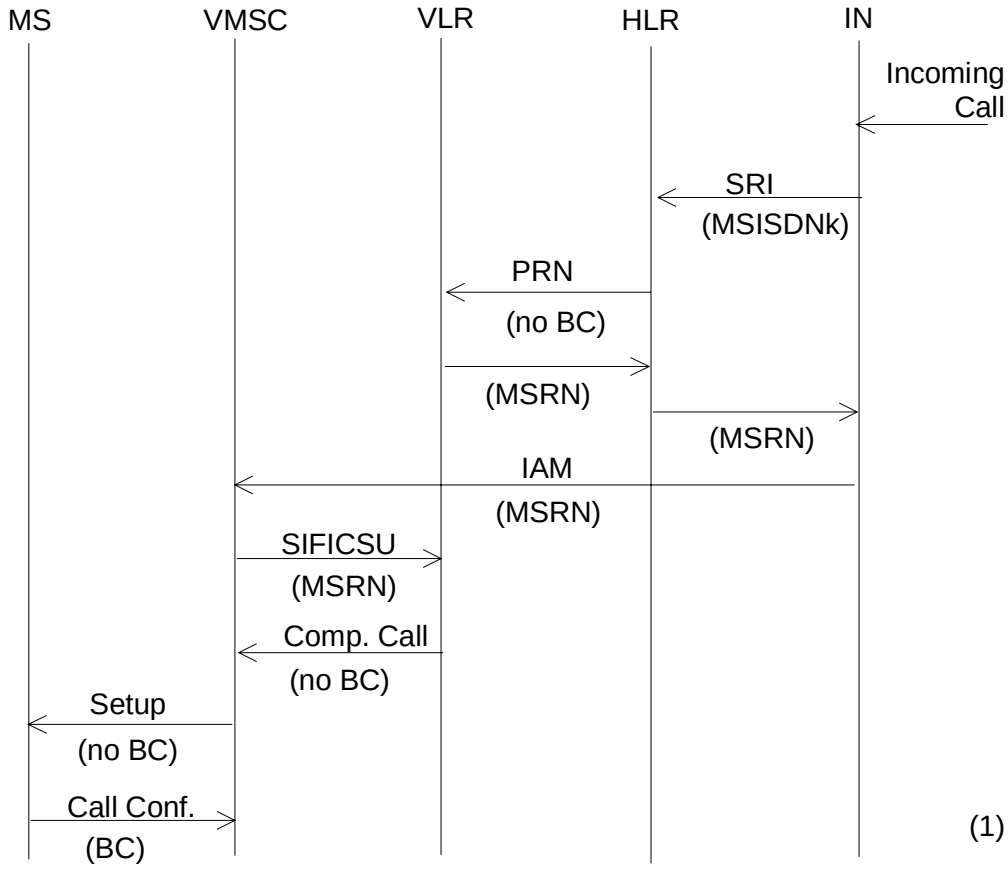
9.2.2.2 Single-numbering Scheme

In the single-numbering scheme, the HPLMN will allocate one MSISDN to a subscriber, applicable to all services.

In this case, when the HLR receives an interrogation relating to an incoming call without compatibility information exhaustive for deducing a PLMN Basic Service (i.e. the MAP "Send Routing Information" procedure), the request to the VLR for a roaming number will not contain compatibility information i.e. a PLMN BC.

At the VLR, when the incoming call arrives, there is no PLMN BC associated with the MSRN and so the call set-up to the ~~mobile~~ UE will not contain the PLMN BC information element.

In this case, the MS will return a complete single or dual PLMN BC in the Call Confirmed message, indicating the service required by the mobile subscriber. The VMSC will analyse this PLMN BC and optionally perform subscription checking (see 3GPP TS 42.001). If the requested PLMN BC can be supported the call is established, otherwise the call will be released.



NOTE: (1) This BC is derived from information stored in the MS, according to its configuration.
(2) Abbreviations: see figure 2.

Figure 3: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses single MSISDN numbers (no corresponding BC stored). Per call MSRN allocation

Next section modified

9.4 3G-H.324/M calls over 3,1kHz audio

In case of 3G-H.324/M calls over 3.1kHz audio, the IWF shall provide the V.34 modem modulation and the V.8 procedure with the indication of H.324 support in the call function category of the V.8 handshaking. H.223 & H.245 flow is not terminated in the modem function.

The performance of V.8bis by the modem function is FFS.

9.4.1 Mobile originated multimedia call

9.4.1.1 Call setup

The setup message sent by the MS contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a speech BC-IE and a 3.1kHz multimedia BC-IE to indicate the support of a fallback to speech (see 3GPP TS 27.001 and 3GPP TS 24.008).

The MSC shall not accept a requested service to which the user has no subscription. On the condition the user has the required subscriptions (i.e. to multimedia and/or speech) the following applies:

- in case of a multimedia only BC-IE the MSC may accept the setup as such or with modifications sent to the MS in the call proceeding message (see 3GPP TS 27.001);

- in case of both a speech BC-IE and a 3.1kHz multimedia BC-IE the MSC may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call ~~confirm~~ proceedingmessage or turn the call to a multimedia only call by sending only a multimedia BC-IE in the call ~~confirm~~ proceeding message (see 3GPP TS 27.001).

The IWF V.34 modem shall initiate the ITU-T Recommendation V.8 handshaking and indicate the support of H.324/M in the call function category of the V.8 handshaking. If the called party's modem does not indicate a H.324 support in its V.8 inband signalling response, the IWF may clear the call. If the called party responds with a modem answering tone but there is no V.8 response at all, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 or 28.8 kbit/s, the MSC shall initiate a MODIFY message (see 3GPP TS 24.008) to indicate the new data rate to the MS. HDLC flag stuffing or the stuffing mode defined in ITU-T Recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the MS and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (see ITU-T Recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the MS. If the MS responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.1.2 Fallback to speech after setup

If the MSC has accepted the possibility of a fallback to speech and the IWF modem does not recognize the answering tone of the called modem within the expiration of a timer started at the reception of the answer message, the MSC IWF shall initiate an In Call Modification procedure (see 3GPP TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the calling MS and the fixed network. If the fallback fails e.g. due to a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum value for the timer is 3 seconds (see ITU-T Recommendation V.25).

9.4.2 Mobile terminated multimedia call

9.4.2.1 Call setup

If the user has a subscription to both the multimedia bearer service and the speech teleservice and if the network supports both services and the fallback functionality, the MSC shall send both a multimedia BC-IE and a speech BC-IE in the setup message to the mobile station. If the user has a subscription only to the multimedia bearer service the MSC shall send only a multimedia BC-IE.

In case of both a speech BC-IE and a 3,1 kHz multimedia BC-IE in the setup the mobile station may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message or to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE in the call confirmed message. In case of a multimedia only BC-IE in the setup the MS may accept the setup as such or with modifications sent to the MSC in the call confirmed message.

If no service definition is available in the network, the MSC shall send no BC-IE(s) to the mobile station in the call setup. The MSC shall analyse the received BC-IE(s) and optionally perform a subscription check to the multimedia and/or speech service(s) requested by the mobile station in the call confirmed message and shall not accept a requested service rejected by the subscription check.

The IWF V.34 modem shall await the ITU-T Recommendation V.8 handshaking to be initiated by the calling party's modem and shall recognize the support of H.324 in the call function category of the incoming V.8 handshaking. If the calling party's modem does not indicate a H.324 support in its V.8 inband signalling, the IWF may clear the call. If the calling modem tries to handshake another than V.34 modem scheme, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 kbit/s or 28.8 kbit/s, the MSC shall initiate a MODIFY message (see 3GPP TS 24.008) to indicate the new data rate to the MS.

HDLC flag stuffing or the stuffing mode defined in ITU-T Recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 kbit/s or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the MS and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (see ITU-T Recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the MS. If the MS responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.2.2 Fallback to speech after setup

If the MSC supports a fallback to speech and the user has a subscription to the speech service and the mobile station accepts the possibility of a fallback to speech in the call confirmed message and the IWF modem does not recognize a call tone nor a V.8 Call Indication nor a V.8 Call Menu within the expiration of a timer started at the sending of the ANSam answer tone (i.e. the calling party is not a V.34 modem), the IWF shall initiate an In Call Modification procedure (see 3GPP TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the called MS and the fixed network. If the fallback fails e.g. due to a missing subscription to speech or a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum timer value is 3 seconds (see ITU-T Recommendation V.8).

Next section for information

10 Interworking to the ISDN

The interworking to the ISDN is specified on the principle of the network supporting standardized associated signalling protocol as outlined in clause 6, i.e. DSS1 and ISUP. An ISDN not complying with this definition differs - for the purpose of the present document - in that it does not support the compatibility information to that degree necessary for deducing a PLMN Basic Service. These networks will find their reflection in the following where those implications are to be set out.

The calling address sent in a mobile originated call to the ISDN is always the basic MSISDN even if the ISDN user shall use a different MSISDN (multi numbering scheme, see subclause 9.2.2 case a) for a mobile terminated call (call back) as only the basic MSISDN is available at the VLR (see 3GPP TS 29.002).

The scope of this clause is to describe the handling of the content of the Information Elements where "content" is understood to be the value of the parameter fields of the Information Elements, namely BC-IE, HLC and LLC, after the length indicator. For the transport of these Information Elements within the PLMN refer to 3GPP TS 29.002.

The handling of multislot, 14.4kbit/s, EDGE and Iu Mode related parameter of the call control signalling and the applicability of single- or multislot configurations (see 3GPP TS 48.020 and 3GPP TS 44.021) is the same as for the PSTN interworking cases. For multislot, 14.4kbit/s, EDGE and Iu Mode operations, the MS may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001). In case a transparent service is used, the call shall be released. For a non-transparent service with flow control, the MSC/IWF shall use towards the fixed network the unmodified "fixed network user rate" and shall use the "wanted air interface user rate" towards the mobile station.

Next section modified

10.4 3G-H.324/M calls over UDI/RDI

3G-H.324/M calls provide UDI/RDI(e.g. 32 kbit/s transparent data, 56 kbit/s transparent data or 64 kbit/s transparent data). H.223 and H.245 flow is not terminated in the MSC.

3G-H.324 calls over 64 kbit/s transparent data and 56kbit/s transparent data can be connected to H.324/I calls over UDI/RDI. H.223 protocol is transparent to IWF.

In case of 3G-H.324M calls over 32 kbit/s, IWF which performs rate adaptation between 64kbit/s and 32kbit/s is used. Rate adaptation is based on ITU-T Recommendation I.460.

The support of IWF which transcodes the multiplexes and the content of control, audio, video and data in MSC is FFS.

3GPP TSG-CN WG3 Meeting #29 **N3-030651**
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **29.007** **CR** **080** ⌘ **rev** **2** ⌘ Current version: **5.6.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/2003
Category:	⌘	**A**
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)*
Rel-6 *(Release 6)*

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached pages
Consequences if not approved:	⌘	Inconsistent and confusing rules in this specification.

Clauses affected:	⌘	Clauses 9.2.1, 9.2.2, 9.4.1, 9.4.2, 10.4.1 and 10.4.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	27.001, 23.172
		X /	Other core specifications		
		/ X	Test specifications		
		/ X	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.

First section modified

9.2.1 Network interworking mobile originated

9.2.1.1 Selection of interworking function

The interworking function will need to negotiate with the user to establish the appropriate modem selection e.g. data rate, modulation scheme, etc. In addition, it will also be required to convert the signalling format, from a combination of out of band and in band, to that suitable for controlling the modem and the autocalling line procedure function where applicable. ~~In the following modem selection procedures it~~ It is assumed that the interworking function and modems will be associated with each MSC.

For a data call originated by a circuit mode data terminal on the PLMN, the modem selection is done by using the elements "modem type" and "other modem type" in the bearer capability (PLMN-BC) of the call set-up message ~~(bearer capability)~~.

In addition, other elements of the call setup will indicate the user rate, etc. to be used via that modem. The use of this information however means that the network is only able to select a modem from the modem pool which conforms to the speed which the terminal is utilizing at the DTE/DCE interface at the UE (e.g. V.22 for 1 200 bps). The exception to this is where the user has selected the non transparent service in which case either an autobauding or multi self selecting speed modem (e.g. V.32) may be used.

~~In case~~ If in A/Gb or GERAN Iu mode the PLMN-BC(s) received with the set-up message indicated a multislot, 14.4 kbit/s, ~~and~~ or EDGE-operation (refer to 3GPP TS 27.001) and the network does not support any of the required such services, the PLMN-BC(s) sent with the call proceeding message shall not contain the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters - the MSC shall discard the multislot, ~~or~~ 14.4 kbit/s and~~/or~~ EDGE-related parameters and use the fall-back bearer service indicated by the remaining parameters of the PLMN-BS(s) on a singleslot configuration (refer to 3GPP TS 48.020 and 3GPP TS 44.021) on the MSC/IWF-RAN link. The MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

If the MSC supports in A/Gb or GERAN Iu mode the multislot, 14.4 kbit/s, ~~and/~~or EDGE-operation or if the MSC supports UTRAN Iu mode, the PLMN-BC(s) shall include the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters of the call proceeding message if these parameters were present in the call set-up message received from the UE. In A/Gb or GERAN Iu mode the ~~The~~ MSC shall apply on the MSC/IWF-RAN link a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022. 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.

~~In case~~ If in A/Gb or GERAN Iu mode, the PLMN-BC(s) received with the set-up message did not indicate a multislot, 14.4 kbit/s or EDGE-operation, the MSC shall not include the "fixed network user rate", "other modem type" and "user initiated modification indicator" parameters in the PLMN-BC(s) of the call proceeding message - the MSC shall use a singleslot configuration on the MSC/IWF-RAN link.

The MSC may negotiate parameters with the UE according to the rules defined in 3GPP TS 27.001. For multislot, 14.4 kbit/s, EDGE and Iu Mode operations the MSC/IWF shall modify the relevant parameters in a possibly present LLC accordingly.

9.2.1.2 Modem Selection

In general terms the indication of the bearer capability parameter "Information Transfer Capability" will be utilized in the call set-up message to determine when the modem should be selected in the call.

In case of single calls, the modem function shall operate in the calling mode in case of mobile originated calls and in the answering mode in case of mobile terminated calls.

In case of dual data calls (alternate speech/facsimile group 3) the operation mode of the modem (working in calling or answering mode) depend on the initial call setup direction and on the optional parameter "Reverse Call Setup Direction" information element of the MODIFY message. If this information element is omitted the direction is derived from the initial call setup direction, i.e. the mode is the same as in case of single calls.

For the attribute value "3,1 kHz audio Ex PLMN" and "facsimile group 3", the modem will be selected immediately. The line procedure according to ITU-T Recommendation V.25 will then be carried out using the appropriate modem functions.

For the Teleservice 61 "Alternate speech/facsimile group 3", (if speech is selected as the first service), the modem is made available but not selected until the subscriber indicates the change of service request (see subclause 9.3).

For "alternate speech/facsimile group 3" calls refer to 3GPP TS 43.045 (A/Gb mode) and 3GPP TS 23.146 (UTRAN Iu mode).

9.2.1.3 Mapping of BC-IE from PLMN to ISUP (or other)

As it cannot be determined from the called address whether the distant network is a PSTN or an ISDN the same mapping takes place as for ISDN calls (see table 7A), if ISDN signalling is used between different MSCs (e.g. on the link VMSC - GMSC).

9.2.2 Network Interworking Mobile terminated PSTN Originated

This subclause describes the interworking of calls where the calling subscriber cannot generate or communicate Compatibility Information exhaustive for deducing a PLMN Basic Service to a PLMN (gateway MSC/interrogating node) because of lack of ISDN signalling capability. Thus the HLR is relieved from any compatibility checking for such calls.

Two methods of allocating UE International ISDN Numbers (MSISDNs) are allowed: Firstly, a separate MSISDN may be allocated for each service, or service option, which a subscriber uses for incoming calls; or, alternatively, a single number, applicable for all incoming calls is used.

It should be noted that it is possible for both schemes to co-exist within the PLMN and that they are not mutually exclusive.

a) Multiple MSISDNs are used ("The Multi-numbering Scheme"). See figure 2.

b) A single MSISDN is used ("The Single-numbering Scheme"). See figure 3.

9.2.2.1 Multi-numbering Scheme

In this scheme, the HPLMN will allocate a number of MSISDNs to a subscriber and associate with each of these numbers a Bearer Capability to identify a Bearer or a Teleservice. This Bearer Capability comprises a complete PLMN Bearer Capability (PLMN BC) information element with contents according to 3GPP TS 27.001 and coded as per 3GPP TS 24.008. In either case, when the HLR receives an interrogation relating to an incoming call (i.e. the MAP "Send Routing Information" procedure), it requests a roaming number (MSRN) from the VLR. This request will contain the PLMN BC reflecting the service associated with the called MSISDN, i.e. the PLMN BC is passed to the VLR within the MAP parameter "GSM Bearer Capability" of the message "Provide Roaming Number".

At the VMSC, when the incoming call arrives, the PLMN BC associated with the MSRN are retrieved from the VLR and sent to the UE at call set-up.

Where the PLMN specific parameter "connection element" contained in the retrieved PLMN BC-IE, indicates dual capabilities then the VMSC shall set it according to its capabilities/preferences. Additionally the parameters correlated to "connection element" shall be modified in accordance with 3GPP TS 27.001.

The same applies to the parameter modem type if "autobauding type 1" is indicated but the IWF does not support this feature. The parameter "data compression" may also be modified according to the capabilities of the IWF.

Where single capabilities are indicated then the VMSC shall use the requested values if it is able to support the service requested. If it is unable to support the requested service then it shall set them according to its capabilities/preferences.

Where the Compatibility Information is provided in a degree exhaustive to deduce a PLMN Basic Service (see application rules in subclause 10.2.2), then the VMSC in providing the PLMN BC IE in the setup message shall set the PLMN specific parameters to its capabilities/preferences.

On receipt of a Set-up message containing the compatibility information, the UE will analyse the contents to decide whether the service can be supported (with or without modification, see 3GPP TS 27.001) and the call will be accepted or rejected as appropriate.

These negotiable parameters in the PLMN BC-IE are: Connection Element (Transparent\non-transparent), Data Compression, number of data bits, number of stop bits and parity as well as the correlated parameters Structure, Intermediate Rate, Modem Type and User Information Layer 2 Protocol. Additionally, for multislot, 14.4 kbit/s and EDGE operations in A/Gb or GERAN Iu mode the parameters Fixed Network User Rate, Other Modem Type and User Initiated Modification Indicator, and for UTRAN Iu Mode operations the parameters Fixed Network User Rate and Other Modem Type, can be negotiated. For FTM, PIAFS and Multimedia, Rate adaption/Other rate adaption can be negotiated. For FTM and PIAFS, Synchronous/asynchronous can be negotiated, see 3GPP TS 27.001.

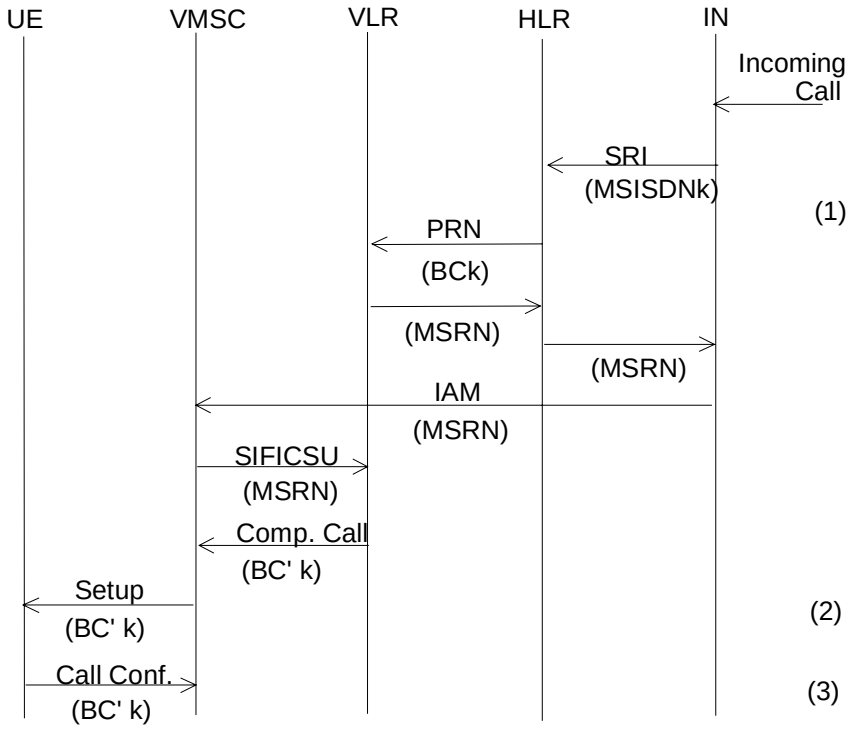
This negotiation takes place by means of the UE reflecting back to the MSC a complete bearer capability information element in the call confirmed message, with the relevant parameters changed. If this does not take place (i.e. if there is no PLMN BC present in the call confirmed message), than the MSC will assume that the values originally transmitted to the UE are accepted with the following exceptions:~~.~~

- ~~In case~~If in A/Gb or GERAN Iu mode, the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification ~~parameter~~indicator" parameters and no multislot, 14.4 kbit/s, and/or EDGE related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall discard the "fixed network user rate", "other modem type" and "user initiated modification ~~parameter~~indicator" parameters - the MSC shall use the fall-back bearer service indicated by the remaining parameters of the PLMN-BC on a singleslot configuration (refer to 3GPP TS 48.020 and 3GPP TS 44.021) on the MSC/IWF-RAN link.

- On the other hand, if in A/Gb or GERAN Iu mode the PLMN-BC received with the call confirmed message contain(s) multislot, 14.4kbit/s or EDGE-related parameters the MSC shall apply on the MSC/IWF-RAN link a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022. 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.

- If in UTRAN Iu mode the PLMN-BC sent with the set-up message contained the "fixed network user rate", "other modem type" and if applicable the "user initiated modification indicator" parameters, but no related parameters (refer to 3GPP TS 27.001 and 24.008) are received in the PLMN-BC of the call confirmed message or no PLMN-BC is received, the MSC shall release the call.

In addition the UE may propose to the network to modify the User Rate as well as the correlated parameters Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call. For multislot, 14.4kbit/s, EDGE and Iu Mode operations, the UE may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001).



NOTES: (1) The HLR translates the received MSISDN_ called address (MSISDNk) into the relevant bearer capability information (BCk).
(2) Some parameters of BCk may be provided/modified according to the MSC's capabilities/preferences. See subclause 9.2.2.
(3) In the "Call Confirmed" message, the UE may modify some parameters of the BC. See subclause 9.2.2.

Abbr.:
SRI - Send Routing Information.
PRN - Provide Roaming Number.
MSRN - Mobile Station Roaming Number.
IAM - Initial Address Message.
SIFICSU - Send Information For Incoming Call Set Up.

Figure 2: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses multiple MSISDN numbers with corresponding BCs

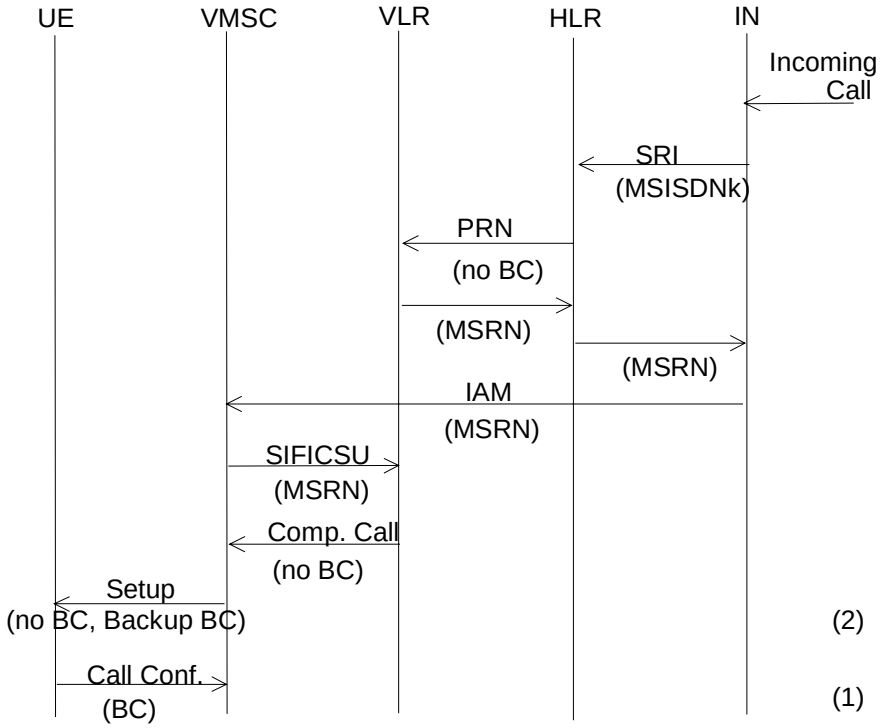
9.2.2.2 Single-numbering Scheme

In the single-numbering scheme, the HPLMN will allocate one MSISDN to a subscriber, applicable to all services.

In this case, when the HLR receives an interrogation relating to an incoming call without compatibility information exhaustive for deducing a PLMN Basic Service (i.e. the MAP "Send Routing Information" procedure), the request to the VLR for a roaming number will not contain compatibility information i.e. a PLMN BC.

At the VLR, when the incoming call arrives, there is no PLMN BC associated with the MSRN and so the call set-up to the ~~mobile~~ UE will not contain the PLMN BC information element. However, the VMSC may include all available information in the BACKUP BC information element of the call set-up message, see subclause 10.2.2.7.

In the case the PLMN was not able to provide a PLMN BC, the UE will return a complete single or dual PLMN BC in the Call Confirmed message, indicating the service required by the mobile subscriber. The VMSC will analyse this PLMN BC and optionally perform subscription checking (see 3GPP TS 22.001). If the requested PLMN BC can be supported the call is established, otherwise the call will be released.



NOTE: (1) This BC is derived from information stored in the UE, according to its configuration. The UE may also use the information provided in the Backup BC.
(2) The Backup BC may be included if the BC is missing.
(3) Abbreviations: see figure 2.

Figure 3: Call Flow for a mobile terminated, PSTN originated call where the compatibility information provided are not exhaustive for deducing a PLMN Bearer Service; HLR uses single MSISDN numbers (no corresponding BC stored). Per call MSRN allocation

Next section modified

9.4 3G-H.324/M calls over 3,1kHz audio

In case of 3G-H.324/M calls over 3.1kHz audio, the IWF shall provide the V.34 modem modulation and the V.8 procedure with the indication of H.324 support in the call function category of the V.8 handshaking. H.223 and H.245 flow is not terminated in the modem function.

The performance of V.8bis by the modem function is FFS.

9.4.1 Mobile originated multimedia call

9.4.1.1 Call setup

The setup message sent by the UE contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a speech BC-IE and a 3.1kHz multimedia BC-IE to indicate the support of a fallback to speech (see 3GPP TS 27.001 and 3GPP TS 24.008).

The MSC shall not accept a requested service to which the user has no subscription. On the condition the user has the required subscriptions (i.e. to multimedia and/or speech) the following applies:

- in case of a multimedia only BC-IE the MSC may accept the setup as such or with modifications sent to the UE in the call proceeding message (see 3GPP TS 27.001);

- in case of both a speech BC-IE and a 3.1kHz multimedia BC-IE the MSC may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call ~~confirm~~ proceeding message or turn the call to a multimedia only call by sending only a multimedia BC-IE in the call ~~confirm~~ proceeding message (See 3GPP TS 27.001).

The IWF V.34 modem shall initiate the ITU-T Recommendation V.8 handshaking and indicate the support of H.324/M in the call function category of the V.8 handshaking. If the called party's modem does not indicate a H.324 support in its V.8 inband signalling response, the IWF may clear the call. If the called party responds with a modem answering tone but there is no V.8 response at all, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 kbit/s or 28.8 kbit/s, the MSC shall initiate a MODIFY message (see 3GPP TS 24.008) to indicate the new data rate to the UE. HDLC flag stuffing or the stuffing mode defined in ITU-T Recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 kbit/s or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the UE and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (see ITU-T Recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the UE. If the UE responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.1.2 Fallback to speech after setup

If the MSC has accepted the possibility of a fallback to speech and the IWF modem does not recognize the answering tone of the called modem within the expiration of a timer started at the reception of the answer message, the MSC IWF shall initiate an In Call Modification procedure (see 3GPP TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the calling UE and the fixed network. If the fallback fails e.g. due to a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum value for the timer is 3 seconds (see ITU-T Recommendation V.25).

9.4.2 Mobile terminated multimedia call

9.4.2.1 Call setup

If the user has a subscription to both the multimedia bearer service and the speech teleservice and if the network supports both services and the fallback functionality, the MSC shall send both a multimedia BC-IE and a speech BC-IE in the setup message to the user equipment. If the user has a subscription only to the multimedia bearer service the MSC shall send only a multimedia BC-IE.

In case of both a speech BC-IE and a 3,1 kHz multimedia BC-IE in the setup the user equipment may either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message or to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE in the call confirmed message. In case of a multimedia only BC-IE in the setup the UE may accept the setup as such or with modifications sent to the MSC in the call confirmed message.

If no service definition is available in the network, the MSC shall send no BC-IE(s) to the user equipment in the call setup. The MSC shall analyse the received BC-IE(s) and optionally perform a subscription check to the multimedia and/or speech service(s) requested by the user equipment in the call confirmed message and shall not accept a requested service rejected by the subscription check.

The IWF V.34 modem shall await the ITU-T Recommendation V.8 handshaking to be initiated by the calling party's modem and shall recognize the support of H.324 in the call function category of the incoming V.8 handshaking. If the calling party's modem does not indicate a H.324 support in its V.8 inband signalling, the IWF may clear the call. If the calling modem tries to handshake another than V.34 modem scheme, the IWF shall clear the call.

If FNUR = 33.6 kbit/s is agreed on in the setup, the IWF shall configure its V.34 modem to operate in automode with an upper data rate limit of 33.6 kbit/s and a lower data rate limit of 28.8 kbit/s. If the modems handshake to 31.2 or 28.8 kbit/s, the MSC shall initiate a MODIFY message (see 3GPP TS 24.008) to indicate the new data rate to the UE. HDLC flag stuffing or the stuffing mode defined in ITU-T Recommendation H.223 (Annexes A, B and C) shall be used to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the UE and the IWF. In order to be able to use the correct stuffing pattern, the IWF shall detect the stuffing mode patterns exchanged between the multimedia terminals after the traffic channel setup (see ITU-T Recommendation H.324). The IWF may start the stuffing immediately after the detection of the used method. In downlink stuffing the IWF inserts stuffing patterns between the H.223 frames. In uplink stuffing the IWF removes stuffing patterns from between the H.223 frames received from the UE. If the UE responds with a MODIFY REJECT message, the MSC shall clear the call.

9.4.2.2 Fallback to speech after setup

If the MSC supports a fallback to speech and the user has a subscription to the speech service and the user equipment accepts the possibility of a fallback to speech in the call confirmed message and the IWF modem does not recognize a call tone nor a V.8 Call Indication nor a V.8 Call Menu within the expiration of a timer started at the sending of the ANSam answer tone (i.e. the calling party is not a V.34 modem), the IWF shall initiate an In Call Modification procedure (see 3GPP TS 24.008) in order to fall back to a speech mode. As a result of the procedure the IWF resource shall be released and a speech channel shall be set up between the called UE and the fixed network. If the fallback fails e.g. due to a missing subscription to speech or a failing In Call Modification procedure, the IWF shall clear the call.

A recommended minimum timer value is 3 seconds (see ITU-T Recommendation V.8).

Next section for information

10 Interworking to the ISDN

The interworking to the ISDN is specified on the principle of the network supporting standardized associated signalling protocol as outlined in clause 6, i.e. DSS1 and ISUP. An ISDN not complying with this definition differs - for the purpose of the present document - in that it does not support the compatibility information to that degree necessary for deducing a PLMN Basic Service. These networks will find their reflection in the following where those implications are to be set out.

The calling address sent in a mobile originated call to the ISDN is always the basic MSISDN even if the ISDN user shall use a different MSISDN (multi numbering scheme, see 9.2.2 case a) for a mobile terminated call (call back) as only the basic MSISDN is available at the VLR (see 3GPP TS 29.002).

The scope of this clause is to describe the handling of the content of the Information Elements where "content" is understood to be the value of the parameter fields of the Information Elements, namely BC-IE, HLC and LLC, after the length indicator. For the transport of these Information Elements within the PLMN refer to 3GPP TS 29.002.

The handling of multislot, 14.4kbit/s, EDGE and Iu Mode related parameters of the call control signalling and the applicability of single- or multislot configurations (refer to 3GPP TS 48.020 and 3GPP TS 44.021) is the same as for the PSTN interworking cases. For multislot, 14.4kbit/s, EDGE and Iu Mode operations, the UE may also propose to the network to modify the Fixed Network User Rate and Other Modem Type parameters (see 3GPP TS 27.001). In case a transparent service is used, the call shall be released. For a non-transparent service with flow control, the MSC/IWF shall use towards the fixed network the unmodified "fixed network user rate" and shall use the "wanted air interface user rate" towards the user equipment.

Next section modified

10.4 3G-H.324/M calls over UDI/RDI

3G-H.324/M calls provide UDI/RDI (e.g. 32 kbit/s transparent data, 56 kbit/s transparent data or 64 kbit/s transparent data). H.223 and H.245 flow is not terminated in the MSC.

3G-H.324 calls over 64 kbit/s transparent data and 56kbit/s transparent data can be connected to H.324/I calls over UDI/RDI. H.223 protocol is transparent to IWF.

In case of 3G-H.324M calls over 32 kbit/s, IWF which performs rate adaptation between 64kbit/s and 32kbit/s is used. Rate adaptation is based on ITU-T Recommendation I.460.

The Service Change and Fallback functionality for UDI/RDI multimedia calls is described in 3GPP TS 23.172 [83].

The support of IWF which transcodes the multiplexes and the content of control, audio, video and data in MSC is FFS.

10.4.1 Mobile originated multimedia call

10.4.1.1 Call setup

The setup message sent by the ~~MS~~ UE contains either a multimedia BC-IE indicating a multimedia only call request (*i.e.* no fallback / service change allowed) or both a speech BC-IE and a multimedia BC-IE to indicate the support of fallback and service change (see 3GPP TS 27.001 [43] and 3GPP TS 24.008 [40]).

The MSC shall not accept a requested service to which the user is not provisioned for. Provided that the user is provisioned for the BS30 bearer service – and/or speech the following applies :

- in case of a multimedia only BC-IE, the MSC shall either accept the setup as such or with modifications sent to the ~~MS~~ UE in the call proceeding message (see 3GPP TS 27.001 [43]) ;
- in case of both a speech BC-IE and a multimedia BC-IE in either order, the MSC shall either accept the possibility of fallback or service change by responding with the two BC-IEs in the same order as received, in the reverse order (relayed from terminating user), ~~or no BC-IEs,~~ or turn the call to a speech call by sending only a speech BC-IE in the call proceeding message, or turn the call to a multimedia only call by sending only the multimedia BC-IE in the call proceeding message (see 3GPP TS 27.001 [43]).
- in case of a multimedia BC-IE with FNUR = 32 kbit/s and a speech BC-IE, the MSC shall reply with only a multimedia BC-IE in the call proceeding message (see 3GPP TS 23.172 [83]).

10.4.1.2 Fallback after setup

If the MSC has accepted the possibility of a fallback and service change, and the transit network or the terminating side does not allow one of the bearers, the MSC shall initiate an In-Call Modification procedure (see 3GPP TS 24.008 [40]) in order to fallback to the allowed mode. As a result of the procedure, the radio and network resources are modified and the relevant channel is set up between the calling ~~MS~~ UE and the fixed network. If the fallback fails, *e.g.* due to an unsuccessful In-Call Modification procedure, the MSC shall clear the call.

10.4.1.3 User initiated service change after setup

If the MSC has accepted the possibility of a service change and the user initiates an In-Call Modification procedure (see 3GPP TS 24.008 [40]) in order to change the service either from speech to multimedia or vice-versa, the MSC shall invoke the service change as an In-Call Modification procedure. As a result of the procedure, the radio and core network resources are modified in order to comply with the requested service change.

10.4.2 Mobile terminated multimedia call

10.4.2.1 Call setup

If the user is provisioned to use both the transparent bearer service (for multimedia) and the speech teleservice, and if the network supports both services and the service change functionality, the MSC shall send both a multimedia BC-IE

and a speech BC-IE in the setup message to the mobile station. In case the MSC receives a multimedia call, the multimedia BC-IE is prioritised (first BC). In case the MSC receives a speech call, the speech BC is prioritised.

If the user is provisioned to use only the transparent bearer service and if the network supports the multimedia service, the MSC shall only send a multimedia BC-IE, which results in a fallback to multimedia if the call was a speech call.

If the user is provisioned to use only the speech teleservice, the MSC shall only send a speech BC-IE, which results in a fallback to speech if the call was a multimedia call.

In case both a speech BC-IE and a multimedia BC-IE are included in the setup message, the mobile station shall either accept the service change capability by responding with two BC-IEs in the same or reversed order, ~~or with no BC-IEs,~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message, or to a multimedia only call (*i.e.* no service change allowed) by sending only a multimedia BC-IE in the call confirmed message.

In case of a multimedia only BC-IE in the setup, the ~~MS~~ UE may accept the setup as such or with modifications sent to the MSC in the call confirmed message.

10.4.2.2 User initiated service change after setup

If the MSC supports the possibility of a service change and the user initiates an In-Call Modification procedure (see 3GPP TS 24.008 [40]) in order to change the service either from speech to multimedia or vice-versa, the MSC shall invoke the service change as an In-Call Modification procedure. As a result of the procedure, the radio and core network resources are modified in order to comply with the requested service change.

3GPP TSG-CN WG3 Meeting #29 **Tdoc ⌘N3-030652**
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **23.172** **CR** **018** ⌘**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: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/2003
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)
Rel-6 (Release 6)

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached pages
Consequences if not approved:	⌘	Inconsistent and confusing rules. Contradiction to 27.001 and 29.007.

Clauses affected:	⌘	Clauses 4.2.2, 4.2.3 and 4.3.3			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	27.001, 29.007
		X /	Other core specifications		
		/ X	Test specifications		
		/ X	O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:
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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.

First section modified

4.2.1 Mobile originating side - initiation of call setup

By sending a SETUP message with a Repeat Indicator set to "support of service change and fallback", a multimedia BC-IE, and a speech BC-IE (see figure 4.1), a terminal may request a call to be set with the capability to fallback to either a speech only, a multimedia only call or to use service change later during the active state of the call (the first BC-IE indicates the preferred service).

After checking the provisioning, and verifying that the functionality is supported, the MSC replies in the CALL PROCEEDING message with either the two BCs in the same order (~~or no BC~~ to indicate that it accepts the proposed settings - see figure 4.2), or with a single BC (multimedia or speech - see figure 4.3) unless the CALL PROCEEDING is delayed until the response from the terminating user and then it may also be sent with the BCs in reverse order (see clause 4.2.3).

In the case the MSC ignores the SETUP message if the presence of a reserved value for the Repeat Indicator is set, it sends a STATUS message back to the UE (see figure 4.4), with the Cause Value set to #100, "Conditional IE error" (see 3GPP TS 24.008 [3], clause 8.7.2). The UE then reacts as described in 3GPP TS 24.008 [3], clause 5.5.3.2.2, and may resend a new SETUP message with a single BC, or perform any appropriate action according to its implementation. This also applies in case the MSC returns instead a RELEASE COMPLETE message.

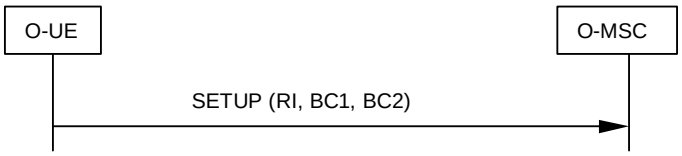
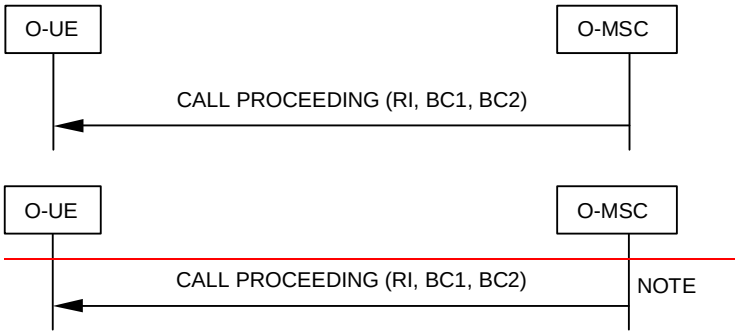


Figure 4.1: SETUP message towards the originating MSC



~~NOTE: The MSC may send CALL PROCEEDING without RI and BCs to indicate that it accepts the proposed settings sent in the SETUP message.~~

Figure 4.2: Normal case

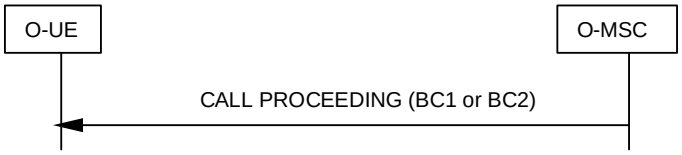
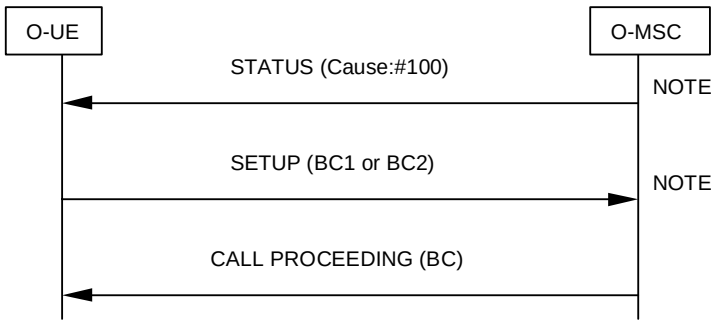


Figure 4.3: Fallback case



NOTE: The sending of the STATUS message from the MSC and the second SETUP message from the UE are implementation dependent.

Figure 4.4: MSC not supporting the RI value

4.2.2 Mobile terminating side

When the terminating MSC receives a request for a multimedia call, it shall check if the called user is provisioned for the service.

The terminating MSC shall include in the SETUP message towards the UE both BC-IEs in the same order as indicated by the incoming request together with the Repeat Indicator set to "service change and fallback in order to invoke the SCUDIF functionality in the called terminal (see figure 4.5).

The terminating UE, based on its capabilities and internal settings, may return the two BC-IEs in the same order (~~or no BC~~ to indicate that it accepts the proposed settings - see figure 4.6), reversed order (see figure 4.7), or just one BC-IE (either speech or multimedia - see figure 4.8) to the terminating MSC in the CALL CONFIRMED message.

In the case the UE ignores the SETUP message due to the presence of a reserved value for the Repeat Indicator, it sends a STATUS message back to the terminating MSC (see figure 4.9), with the Cause Value set to #100, "Conditional IE error" (see 3GPP TS 24.008 [3], clause 8.7.2). The terminating MSC shall then react according to 3GPP TS 24.008 [3], clause 5.5.3.2.2 and it shall send a new SETUP message with a single BC, either the preferred service BC-IE or the speech BC-IE (fallback to speech), depending on configuration. The call setup then proceeds accordingly.

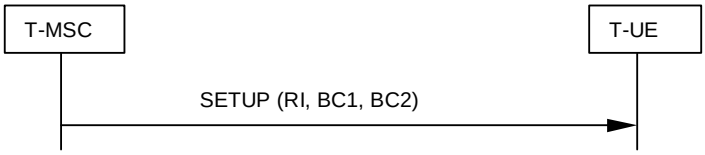
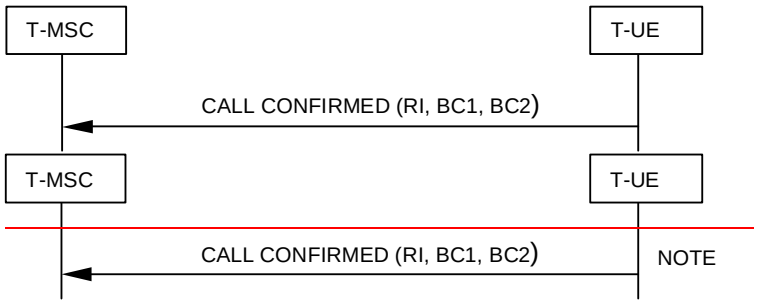


Figure 4.5: SETUP message towards the terminating UE

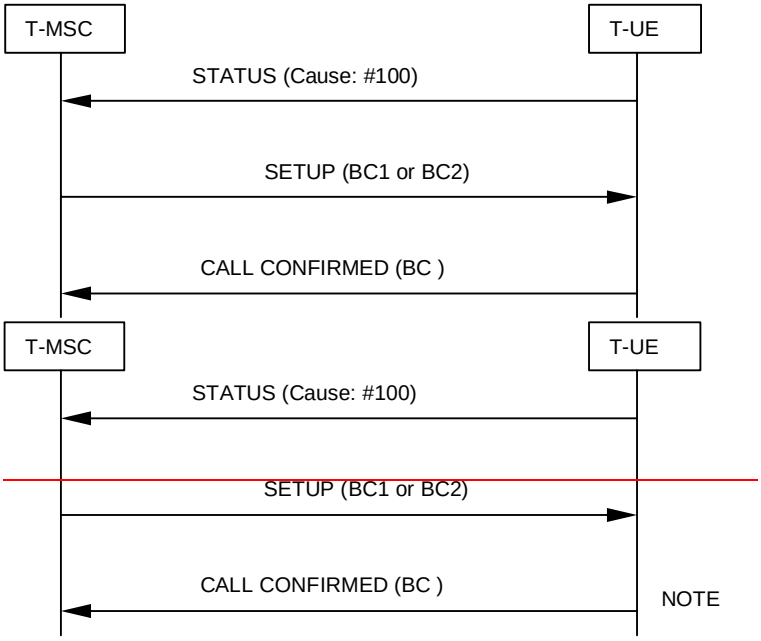


~~NOTE: The UE may send the CALL CONFIRMED message without RI and BCs to indicate that it accepts the proposed settings sent in the SETUP message.~~

Figure 4.6: Normal case

Figure 4.7: Reversed call setup

Figure 4.8: Fallback case



~~NOTE: The UE may send the CALL CONFIRMED message without BC to indicate that it accepts the proposed settings sent in the SETUP message.~~

Figure 4.9: UE not supporting the RI value

Next section modified

4.3.3 Terminating side

The terminating MSC receives the list of supported codec types, including the 3G-324.M codec. It shall then send a SETUP message towards the terminating UE including a Repeat Indicator with the value "service change and fallback" and two BC-IEs, according to the following rule:

- if the 3G-324.M codec is the first (preferred) codec in the list of supported codecs, then the first BC-IE in the SETUP message is the multimedia BC-IE, and the second BC-IE is the speech BC-IE (see figure 4.17);

- if the 3G-324.M codec is in the list of supported codec types, but not in the first position, then the first BC-IE in the SETUP message is the speech BC-IE, and the second BC-IE is the multimedia BC-IE (see figure 4.18).

The terminating UE answers according to its capabilities in the CALL CONFIRMED message. The terminating MSC shall determine the Selected Codec and construct the list of available codecs according to the following rules:

- if no Repeat Indicator is included, and only a speech BC-IE is received, the MSC shall choose a speech codec as the Selected Codec according to the normal mechanism, and no 3G-324.M codec shall be inserted in the list of available codecs (see figure 4.19);

- if no Repeat Indicator is included, and only a multimedia BC-IE is received, the MSC shall choose the 3G-324.M codec as the Selected Codec, and only the 3G-324.M codec shall be inserted in the list of available codecs (see figure 4.20);

- if the Repeat Indicator is included, and the speech BC_IE is the first BC-IE and the multimedia BC-IE is the second BC-IE, the MSC shall choose a speech codec as the Selected Codec according to the normal mechanism, and both the 3G-324.M codec and speech codecs shall be inserted in the list of available codecs (see figure 4.21);

- if the Repeat Indicator is included, and the multimedia BC-IE is the first BC-IE and the speech BC-IE is the second BC-IE, the Selected Codec shall be the 3G-324.M codec, and both the 3G-324.M codec and speech codecs shall be inserted in the list of available codecs (see figure 4.22).

~~NOTE: If the UE sends a CALL CONFIRMED message without Repeat Indicator and BCs, it indicates that it accepts the proposed settings sent in the SETUP message, which are then used by the MSC to select the relevant case.~~

The Selected Codec and the list of available codecs shall be sent back to the originating MSC according to the normal codec negotiation procedure.

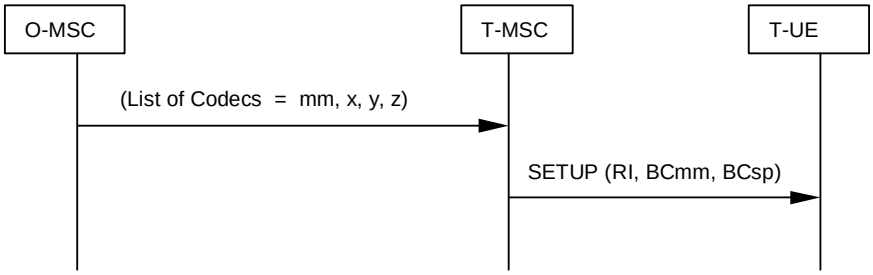


Figure 4.17: 3G-324M codec first

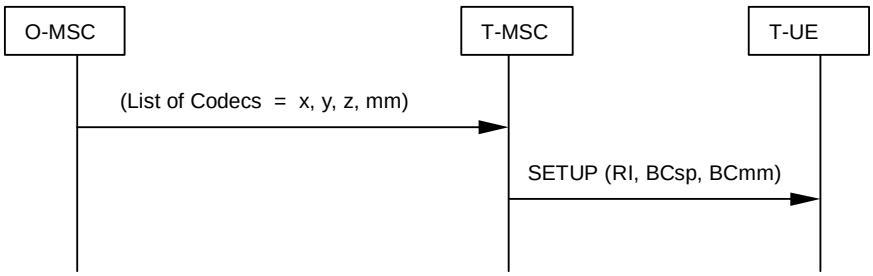
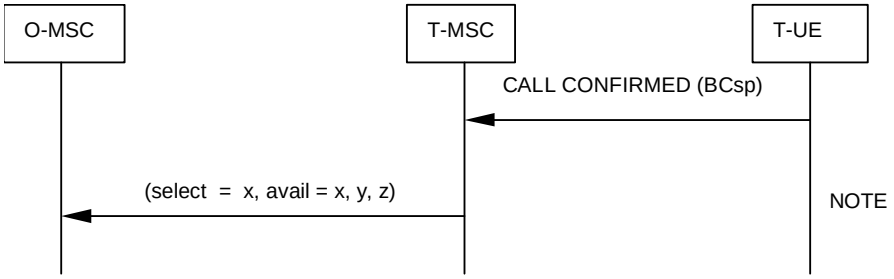


Figure 4.18: Speech codec first



NOTE: The actual speech codec is selected according to OoBTC procedures.

Figure 4.19: Speech only

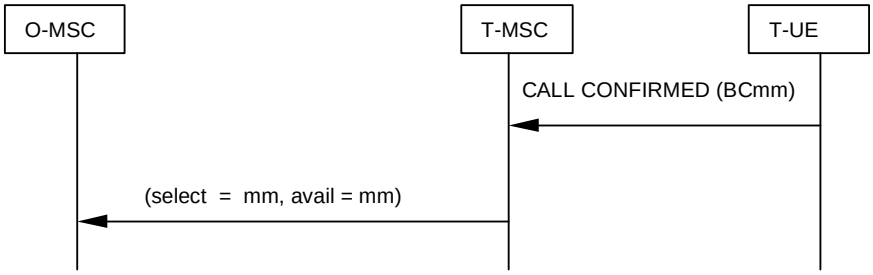
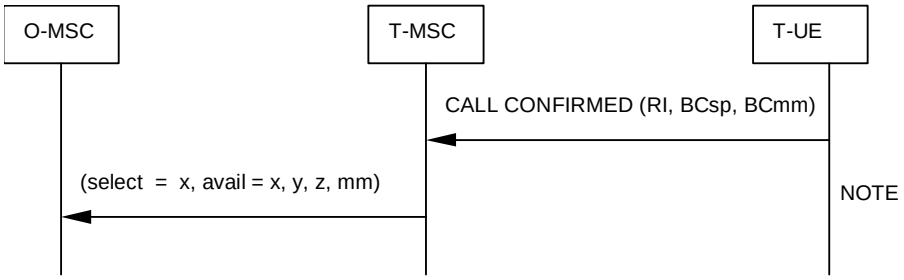
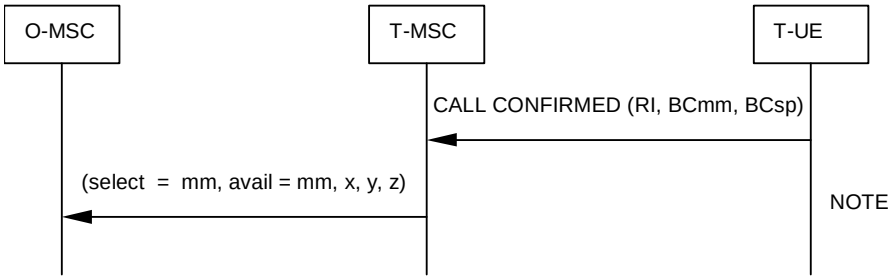


Figure 4.20: Multimedia only



NOTE: The actual speech codec is selected according to OoBTC procedures.

Figure 4.21: Speech preferred



NOTE: The actual list of speech codecs is built according to OoBTC procedures.

Figure 4.22: Multimedia preferred

3GPP TSG-CN WG3 Meeting #29 ***N3-030656***
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **27.001** **CR** **102** ⌘ **rev** **1** ⌘ Current version: **3.12.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/03
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)
Rel-6 (Release 6)

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached page
Consequences if not approved:	⌘	Different, incompatible implementations are possible

Clauses affected:	⌘	Clauses 8.3.3.1, 8.3.3.2

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		29.007, 23.172
			X	Test specifications		
			X	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.

First section modified

8.3.3 Indication of Compatibility Requirements to the PLMN

8.3.3.1 Indication in case of Mobile terminating calls

In support of:

- PSTN originated calls; and
- ISDN originated calls using 3,1 kHz audio Bearer Capability (BC); as well as
- ISDN originated calls using unrestricted digital Bearer Capability but not specifying all parameters for deducing a Bearer Service.

Mobile specific requirements to be dealt with in the Bearer Capability information element the call confirmed message has been introduced in the call control protocol (3GPP TS 24.008). This also allows for re-negotiation of specific parameters at the beginning of the connection set-up process. The specific parameters are:

a) mobile specific requirements:

- Connection element (transparent/non transparent);
- Structure (note 1);
- Synchronous/Asynchronous (note 8);
- Rate adaptation/other rate adaptation (note 9);
- User information layer 2 protocol (note 1);
- Intermediate rate (note 2), (note 3);
- Modem Type (note 1), (note 3);
- User Rate (note 3);
- Compression ,
- Fixed network user rate, (note 3) (note 4);
- Other modem type, (note 3) (note 4);
- User initiated modification indication (note 4).

The following parameters are indicated by the MS to the network, only:

- Acceptable channel codings (note 5);
- Maximum number of traffic channels, (note 5);
- Wanted air interface user rate (note 6) (note 7);
- Asymmetry preference indication (note 7).

NOTE 1: This parameter is correlated with the value of the parameter connection element.

NOTE 2: For non-transparent services this parameter is correlated with the value of the parameter negotiation of intermediate rate requested.

NOTE 3: Modification of these parameters may be proposed by the MS. The Network may accept it or not.

NOTE 4: This parameter shall be included by the MS only ~~in case~~if it was received from the network.

NOTE 5: This parameter shall be included only ~~in case~~if the parameter 'fixed network user rate' is included.

NOTE 6: This parameter shall be included only for non-transparent services and ~~in case~~if the parameter 'fixed network user rate' is included.

NOTE 7: This parameter has to be included if EDGE channel coding(s) are included in Acceptable channel codings. 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 8: For FTM and PIAFS, this parameter may be negotiated as in table B.4e. How the subscription for BS20 is assured, is an operator matter.

NOTE 9: For FTM, PIAFS or Multimedia, this parameter may be negotiated as in table B.4f.

b) requirements with effects at the partner terminal:

- Number of data bits;
- Number of stop bits;
- Parity.

The MS indicates the radio channel requirement in the call confirmed message. If the MS indicates the support of "dual" (HR and FR channels) the final decision, which radio channel is chosen, is done by the network in an RR message. The radio channel requirement is ignored in UMTS, see Table B.5a in Annex B.

If the network proposes optional support of both transparent and non transparent connection elements but does not indicate a user information layer 2 protocol, the MS shall set the appropriate value, if choosing non transparent in the call confirmed message and out-band flow control is not requested, see B.1.1.2.

Additionally the values of the parameters structure, modem type and intermediate rate have to be set in conformance with the values of the parameters radio channel requirements, negotiation of intermediate rate requested and connection element.

Subclause B.1.1.2 and table B.1 in the annex B describe the negotiation procedure. Annex B table B.4 describes the selection of the modem type and the dependence on the value of the parameter connection element. Annex B table B.4 describes the selection of the intermediate rate and user rate and their dependence upon the value of the NIRR parameter and the equipment capabilities.

The following MT cases can be deduced from the individual call set-up request conditions:

a) If the set-up does not contain a BC information element, the MS in the call confirmed message shall include any BC information (single or multiple BC-IE). ~~In case of~~If multiple BC-IEs are present, one BC-IE ~~must~~ shall indicate the information transfer capability "speech". A speech BC-IE together with a 3,1kHz multimedia BC-IE indicates the support of a fallback to speech (ref. to 3GPP TS 29.007 and 3GPP TS 24.008).

b) If the set-up message contains a single BC-IE, the MS in the call confirmed message shall use either a single BC-IE, if it wants to negotiate mobile specific parameter values, or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

c) If the set-up contains a multiple BC-IE, the MS in the call confirmed message shall use either a multiple BC-IE, if it wants to negotiate mobile specific parameter values, or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

- ~~In case of~~For a 3,1kHz multimedia setup the MS can either accept the possibility of a fallback to speech by responding with two BC-IEs ~~or with no BC-IEs~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message or turn the call to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE in the call confirmed message.

- ~~Alternatively~~ For facsimile, a single BC-IE, containing fax group 3 only, shall be used if a multiple BC-IE requesting speech alternate fax group 3 is received and the MS is not able to support the speech capability. Annex B, table B.7, describes the negotiation rules.

If the BC-IE contains 3,1 kHz ex PLMN, the MS is allowed to negotiate all mobile specific parameter values listed above. If the BC-IE contains facsimile group 3, the MS is allowed to negotiate the connection element (transparent/non

transparent) only. In any case, if the set-up message requests a "single service", the MS ~~must~~ shall not answer in the call confirmed message requesting a "dual service"~~ and vice versa~~.

However, for dual services with repeat indicator set to circular (alternate) the MS may change the sequence of dual BC-IEs within the call confirmed message (preceded by the same value of the repeat indicator), if it wants to start with a different Bearer Capability than proposed by the network as the initial one.

In addition, the MS may propose to the network to modify User Rate, Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call.

If the BC-IE received from the network contains the parameters 'fixed network user rate', 'other modem type' and possibly the 'user initiated modification', the MS ~~can~~ shall either:

a) ~~if in GSM,~~ include no BC-IE or a BC-IE without these parameters in the call confirmed message, i.e. the MS discards these parameters (only allowed in A/Gb mode); or

b) include the possibly modified values for the 'fixed network user rate' and 'other modem type' in the BC-IE of the call confirmed message. The network might accept or reject the modified values. In this case the MS shall also include the parameters 'maximum number of traffic channels' and 'acceptable channel codings'. Additionally for non-transparent services, the MS shall also include the parameters 'wanted air interface user rate' and the 'user initiated modification indication'. The parameters 'acceptable channel codings extended' and 'asymmetry indication' may also be included.

In case a), the MS shall use the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 04.21).

In ~~GSM~~ case b), the MS shall use in GSM a singleslot or multislot configuration according to the rules defined in 3GPP TS 04.21, 3GPP TS 08.20 and 3GPP TS 24.022.

~~In case~~ If the 'acceptable channel codings' is indicated by the MS, the decision which channel coding is used is done by the network and indicated to the mobile station with an RR message. This RR message may also assign an asymmetric channel coding. The 'acceptable channel codings' parameter takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. Also the intermediate rate and user rate per traffic channel in a multislot configuration are not indicated by the 'intermediate rate' and 'user rate' parameters of the BC-IE, but depend on the chosen channel coding only.

~~If the MS receives a BC-IE in the SETUP message containing the parameters 'fixed network user rate', 'other modem type', the MS may include these parameters in the BC-IE of the CALL CONFIRMED message (i.e. octets 6d, 6e, 6f, and 6g ref. to 3GPP TS 24.008), with parameter values negotiated according to Annex B.~~ If no BC-IE is received in the SETUP message, the MS may include the~~se~~ parameters 'fixed network user rate', 'other modem type' etc. (i.e. octets 6d, 6e, 6f, and 6g, see 3GPP TS 24.008) in the BC-IE of the CALL CONFIRMED message. However, in this case, the network may release the call if it does not support these parameters.

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3,1 kHz multimedia call, the modems may handshake to 31.2 or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (ref. to 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.2 Indication in case of Mobile originating calls

In support of mobile originating calls the values of BC-IE parameters are requested in the set-up message from the MS. If the MS indicates the support of both transparent and non transparent connection elements the network shall return its choice in the call proceeding message. The MS is not allowed to indicate support of both transparent and non transparent, if the MS also requests out-band flow control, i.e. it does not indicate a layer 2 protocol.

Additionally the value of the parameter modem type has to be set depending on the value of the parameter connection element as described in annex B, table B.4a.

The set-up message contains a single or multiple BC-IE. ~~In case of~~If multiple BC-IEs are present, one BC-IE ~~must~~ shall indicate the information transfer capability "speech".

~~In case of~~For a multimedia call the setup message contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a speech BC-IE and a 3,1kHz multimedia BC-IE to indicate the support/request of a fallback to speech (ref. to 3GPP TS 29.007 and 3GPP TS 24.008).

If the set-up message requests a "single service", the network ~~must~~ shall not answer in the call proceeding message requesting a "dual service"~~ and vice versa~~. Alternatively the network shall answer with a single BC-IE containing fax group 3 if a multiple BC-IE requesting speech alternate fax group 3 is received but the network does not allow the use of this alternate service. Annex B, table B.7, describes the negotiation rules. If the MS requests a "dual service" the network is not allowed to change the sequence of the service.

If the setup message requests a 3.1 kHz multimedia service with fallback, the network may return both BC-IEs in the same order to accept the request, or a single BC-IE if fallback or one of the requested services are not allowed.

If the set-up message is indicates that negotiation of intermediate rate is requested then the network shall behave as described in annex B, table B.4b.

Unless otherwise specified~~ in annex B~~, if no BC-IE parameter needs negotiation it is up to the network if it sends a CALL PROCEEDING message (with or without a BC-IE) towards the MS or not.

For MS to network direction, octet 6e shall be included whenever octet 6d is included (see 3GPP TS 24.008).

For multislot, TCH/F14.4, and EDGE operations and in UMTS the MS shall include an appropriate set of the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH' and 'acceptable channel codings' in the BC-IE of the SETUP message. If EDGE channel coding(s) are included in ACC ~~in case of~~for transparent calls, the 'Wanted air interface user rate'-parameter shall be set to 'Air interface user rate not applicable' and the 'User initiated modification indication'-parameter to 'User initiated modification not requested'. In a non-transparent multislot operation, the MS shall also include the parameters 'wanted air interface user rate' and 'user initiated modification indication' in the BC-IE of the SETUP message. In a non-transparent TCH/F14.4 or EDGE operation or in UMTS the MS shall also include the parameter 'wanted air interface user rate'. In non-transparent EDGE operation the MS shall also include the parameter 'asymmetry preference indication'. It shall also set the other parameters of the BC-IE (i.e. 'user rate') to values identifying fall-back values. Depending on the network two situations can be distinguished:

a) The network supports the requested operation:

- in this case the network ~~must~~ shall include the parameter 'fixed network user rate', 'other modem type' and possibly 'user initiated modification' in the BC-IE(s) of the CALL PROCEEDING message, irrespective whether or not they contain modified values or just a copy of the received ones;

- the 'acceptable channel codings' indicated by the MS in the SETUP message takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. The intermediate rate per traffic channel and the user rate per traffic channel is dependent on the chosen channel coding only. The chosen channel coding is indicated to the mobile station by the network with an RR message.

b) The network does not support the requested operation :

- in this case, in GSM, the BC-IE of the CALL PROCEEDING message will not contain the parameters fixed network user rate' and 'other modem type' or no BC-IE will be included in the CALL PROCEEDING message at all. The mobile station shall then discard the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH', 'acceptable channel codings' 'wanted air interface user rate' and 'user initiated modification indication' sent with the SETUP message and apply the fall-back bearer service;

- in Iu mode the network shall release the call.

In case a), the MS shall use in GSM a singleslot or multislot configuration according to the rules defined in 3GPP TS 04.21, 3GPP TS 08.20 and 3GPP TS 24.022.

In case b), the MS shall use in GSM the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 04.21).

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3,1 kHz multimedia call, the modems may handshake to 31.2 or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (ref. to 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.3 Differences in validity of BC parameter values in GSM and UMTS

The validity of a BC parameter value, either in the SETUP or CALL CONFIRMED message, may differ from GSM to UMTS. Certain parameters are irrelevant in UMTS and any value given is valid and ignored. These parameters may be available in the BC IE. For those parameters that are relevant in UMTS and GSM, certain values may be invalid in one of the systems. Invalid parameter values may cause rejection of the BC and subsequent release of the call.

Parameters that are ignored in UMTS may be set to default values, or to specific values in view of an eventual handover to GSM. Parameter values that are invalid in one system may result in unsuccessful handover from the other system.

Table B.5a in Annex B, lists parameters that are ignored in UMTS and parameter values which validity is different in GSM and UMTS.

3GPP TSG-CN WG3 Meeting #29 ***N3-030657***
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **27.001** **CR** **103** ⌘ **rev** **1** ⌘ Current version: **4.10.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/03
Category:	⌘	**A**
Release:	⌘	Rel-4

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached page
Consequences if not approved:	⌘	Different, incompatible implementations are possible

Clauses affected:	⌘	Clauses 8.3.3.1, 8.3.3.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	29.007, 23.172
		X /	Test specifications		
		/ X	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/specs/CR.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.

First section modified

8.3.3 Indication of Compatibility Requirements to the PLMN

8.3.3.1 Indication in case of Mobile terminating calls

In support of:

- PSTN originated calls; and
- ISDN originated calls using 3,1 kHz audio Bearer Capability (BC); as well as
- ISDN originated calls using unrestricted digital Bearer Capability but not specifying all parameters for deducing a Bearer Service.

Mobile specific requirements to be dealt with in the Bearer Capability information element the call confirmed message has been introduced in the call control protocol (3GPP TS 24.008). This also allows for re-negotiation of specific parameters at the beginning of the connection set-up process. The specific parameters are:

a) mobile specific requirements:

- Connection element (transparent/non transparent);
- Structure (note 1);
- Synchronous/Asynchronous (note 8);
- Rate adaptation/other rate adaptation (note 9);
- User information layer 2 protocol (note 1);
- Intermediate rate (note 2), (note 3);
- Modem Type (note 1), (note 3);
- User Rate (note 3);
- Compression ,
- Fixed network user rate, (note 3) (note 4);
- Other modem type, (note 3) (note 4);
- User initiated modification indication (note 4).

The following parameters are indicated by the MS to the network, only:

- Radio Channel Requirement;
- Acceptable channel codings (note 5);
- Maximum number of traffic channels, (note 5);
- Wanted air interface user rate (note 6) (note 7);
- Asymmetry preference indication (note 7).

NOTE 1: This parameter is correlated with the value of the parameter connection element.

NOTE 2: For non-transparent services this parameter is correlated with the value of the parameter negotiation of intermediate rate requested.

NOTE 3: Modification of these parameters may be proposed by the MS. The Network may accept it or not.

NOTE 4: This parameter shall be included by the MS only ~~in case~~if it was received from the network.

NOTE 5: This parameter shall be included only ~~in case~~if the parameter 'fixed network user rate' is included.

NOTE 6: This parameter shall be included only for non-transparent services and ~~in case~~if the parameter 'fixed network user rate' is included.

NOTE 7: This parameter has to be included if EDGE channel coding(s) are included in Acceptable channel codings. 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 8: For FTM and PIAFS, this parameter may be negotiated as in table B.4e. How the subscription for BS20 is assured, is an operator matter.

NOTE 9: For FTM, PIAFS or Multimedia, this parameter may be negotiated as in table B.4f.

b) requirements with effects at the partner terminal:

- Number of data bits;
- Number of stop bits;
- Parity.

The MS indicates the radio channel requirement in the call confirmed message. If the MS indicates the support of "dual" (HR and FR channels) the final decision, which radio channel is chosen, is done by the network in an RR message. The radio channel requirement is ignored in UMTS, see table B.5a in Annex B.

If the network proposes optional support of both transparent and non transparent connection elements, but does not indicate a user information layer 2 protocol, the MS shall set the appropriate value, if choosing non transparent in the call confirmed message and out-band flow control is not requested, see B.1.1.2.

Additionally the values of the parameters structure, modem type and intermediate rate have to be set in conformance with the values of the parameters radio channel requirements, negotiation of intermediate rate requested and connection element.

Subclause B.1.1.2 and table B.1 in the annex B describe the negotiation procedure. Annex B table B.4 describes the selection of the modem type and the dependence on the value of the parameter connection element. Annex B table B.4 describes the selection of the intermediate rate and user rate and their dependence upon the value of the NIRR parameter and the equipment capabilities.

The following MT cases can be deduced from the individual call set-up request conditions:

a) If the set-up does not contain a BC information element, the MS in the call confirmed message shall include any BC information (single or multiple BC-IE). ~~In case of~~If multiple BC-IEs are present, one BC-IE shall indicate the information transfer capability "speech". A speech BC-IE together with a 3,1kHz multimedia BC-IE indicates the support of a fallback to speech (see 3GPP TS 29.007 and 3GPP TS 24.008).

b) If the set-up message contains a single BC-IE, the MS in the call confirmed message shall use either a single BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

c) If the set-up contains a multiple BC-IE, the MS in the call confirmed message shall use either a multiple BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

- ~~In case of~~For a 3,1kHz multimedia setup the MS may either accept the possibility of a fallback to speech by responding with two BC-IEs, ~~or with no BC-IEs,~~ or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message or turn the call to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE, in the call confirmed message.

- ~~In case of~~For facsimile, a single BC-IE, containing fax group 3 only, shall be used if a multiple BC-IE requesting speech alternate fax group 3 is received and the MS is not able to support the speech capability. Annex B, table B.7, describes the negotiation rules.

If the BC-IE contains 3,1 kHz ex PLMN, the MS is allowed to negotiate all mobile specific parameter values listed above. If the BC-IE contains facsimile group 3, the MS is not allowed to negotiate any mobile specific parameter. In any case, if the set-up message requests a "single service", the MS shall not answer in the call confirmed message requesting a "dual service".

However, for dual services with repeat indicator set to circular (alternate) the MS may change the sequence of dual BC-IEs within the call confirmed message (preceded by the same value of the repeat indicator), if it wants to start with a different Bearer Capability than proposed by the network as the initial one.

In addition, the MS may propose to the network to modify User Rate, Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call.

If the BC-IE received from the network contains the parameters 'fixed network user rate', 'other modem type' and possibly the 'user initiated modification', the MS ~~may~~ shall either:

a) ~~if in GSM,~~ include no BC-IE or a BC-IE without these parameters in the call confirmed message, i.e. the MS discards these parameters (only allowed in A/Gb mode); or

b) include the possibly modified values for the 'fixed network user rate' and 'other modem type' in the BC-IE of the call confirmed message. The network might accept or reject the modified values. In this case the MS shall also include the parameters 'maximum number of traffic channels' and 'acceptable channel codings'. Additionally for non-transparent services, the MS shall also include the parameters 'wanted air interface user rate' and the 'user initiated modification indication'. The parameters 'acceptable channel codings extended' and 'asymmetry indication' may also be included.

In case a), the MS shall use the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

In ~~GSM~~ case b), the MS shall use in GSM a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022.

~~In case~~ If the 'acceptable channel codings' is indicated by the MS, the decision which channel coding is used is done by the network and indicated to the mobile station with a RR message. This RR message may also assign an asymmetric channel coding. The 'acceptable channel codings' parameter takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. Also the intermediate rate and user rate per traffic channel in a multislot configuration are not indicated by the 'intermediate rate' and 'user rate' parameters of the BC-IE, but depend on the chosen channel coding only.

~~If the MS receives a BC-IE in the SETUP message containing the parameters 'fixed network user rate', 'other modem type', the MS may include these parameters in the BC-IE of the CALL CONFIRMED message (i.e. octets 6d, 6e, 6f, and 6g see 3GPP TS 24.008), with parameter values negotiated according to Annex B.~~ If no BC-IE is received in the SETUP message, the MS may include the~~se~~ parameters 'fixed network user rate', 'other modem type' etc. (i.e. octets 6d, 6e, 6f, and 6g, see 3GPP TS 24.008) in the BC-IE of the CALL CONFIRMED message. However, in this case, the network may release the call if it does not support these parameters.

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 kbit/s or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (see 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T Recommendation V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 kbit/s or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.2 Indication in case of Mobile originating calls

In support of mobile originating calls the values of BC-IE parameters are requested in the set-up message from the MS. If the MS indicates the support of both transparent and non transparent connection elements the network shall return its choice in the call proceeding message. The MS is not allowed to indicate support of both transparent and non transparent, if the MS also requests out-band flow control, i.e. it does not indicate a layer 2 protocol.

Additionally the value of the parameter modem type has to be set depending on the value of the parameter connection element as described in annex B, table B.4a.

The set-up message contains a single or multiple BC-IE. ~~In case of~~If multiple BC-IEs are present, one BC-IE shall indicate the information transfer capability "speech".

~~In case of~~For a multimedia call the setup message contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a speech BC-IE and a 3,1kHz multimedia BC-IE to indicate the support/request of a fallback to speech (see 3GPP TS 29.007 and 3GPP TS 24.008).

If the set-up message requests a "single service", the network shall not answer in the call proceeding message requesting a "dual service". Alternatively the network shall answer with a single BC-IE containing fax group 3 if a multiple BC-IE requesting speech alternate fax group 3 is received but the network does not allow the use of this alternate service. Annex B, table B.7, describes the negotiation rules. If the MS requests a "dual service" the network is not allowed to change the sequence of the service.

If the setup message requests a 3.1 kHz multimedia service with fallback, the network may return both BC-IEs in the same order to accept the request, or a single BC-IE if fallback or one of the requested services are not allowed.

If the set-up message indicates that negotiation of intermediate rate is requested then the network shall behave as described in annex B, table B.4b.

Unless otherwise specified ~~in annex B~~, if no BC-IE parameter needs negotiation it is up to the network if it sends a CALL PROCEEDING message (with or without a BC-IE) towards the MS or not.

For MS to network direction, octet 6e shall be included whenever octet 6d is included (see 3GPP TS 24.008).

For multislot, TCH/F14.4, and EDGE operations and in UMTS the MS shall include an appropriate set of the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH' and 'acceptable channel codings' in the BC-IE of the SETUP message. If EDGE channel coding(s) are included in ACC ~~in case of~~for transparent calls, the 'Wanted air interface user rate'-parameter shall be set to 'Air interface user rate not applicable' and the 'User initiated modification indication'-parameter to 'User initiated modification not requested'. In a non-transparent multislot operation, the MS shall also include the parameters 'wanted air interface user rate' and 'user initiated modification indication' in the BC-IE of the SETUP message. In a non-transparent TCH/F14.4 or EDGE operation or in UMTS the MS shall also include the parameter 'wanted air interface user rate'. In non-transparent EDGE operation the MS shall also include the parameter 'asymmetry preference indication'. It shall also set the other parameters of the BC-IE (i.e. 'user rate') to values identifying fall-back values. Depending on the network two situations can be distinguished:

a) The network supports the requested operation:

   - in this case the network shall include the parameter 'fixed network user rate', 'other modem type' and possibly 'user initiated modification' in the BC-IE(s) of the CALL PROCEEDING message, irrespective whether or not they contain modified values or just a copy of the received ones;

   - the 'acceptable channel codings' indicated by the MS in the SETUP message takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. The intermediate rate per traffic channel and the user rate per traffic channel is dependent on the chosen channel coding only. The chosen channel coding is indicated to the mobile station by the network with an RR message.

b) The network does not support the requested operation:

   - in this case, in GSM, the BC-IE of the CALL PROCEEDING message does not contain the parameters fixed network user rate' and 'other modem type' or no BC-IE is included in the CALL PROCEEDING message at all. The mobile station shall then discard the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH', 'acceptable channel codings' 'wanted air interface user rate' and 'user initiated modification indication' sent with the SETUP message and apply the fall-back bearer service;

   - in Iu mode the network shall release the call.

In case a), the MS shall use in GSM a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022.

In case b), the MS shall use in GSM the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 kbit/s or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (see 3GPP TS 24.008), if it supports the requested modification. If the

MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T Recommendation V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 kbit/s or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.3 Differences in validity of BC parameter values in GSM and UMTS

The validity of a BC parameter value, either in the SETUP or CALL CONFIRMED message, may differ from GSM to UMTS. Certain parameters are irrelevant in UMTS and any value given is valid and ignored. These parameters may be available in the BC IE. For those parameters that are relevant in UMTS and GSM, certain values may be invalid in one of the systems. Invalid parameter values may cause rejection of the BC and subsequent release of the call.

Parameters that are ignored in UMTS may be set to default values, or to specific values in view of an eventual handover to GSM. Parameter values that are invalid in one system may result in unsuccessful handover from the other system.

Table B.5a in annex B lists parameters that are ignored in UMTS and parameter values which validity is different in GSM and UMTS.

3GPP TSG-CN WG3 Meeting #29 **N3-030658**
Sophia Antipolis, France. 25th - 29th August 2003.

CR-Form-v7

CHANGE REQUEST

⌘ **27.001** **CR** **100** ⌘ **rev** **3** ⌘ Current version: **5.6.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Interpretation of "no BC-IE in CALL PROC/CONF messages"
Source:	⌘	TSG_CN WG3 [Siemens AG]
Work item code:	⌘	TEI
Date:	⌘	29/08/03
Category:	⌘	**A**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The BC-IE for CS multimedia calls carries also the parameter FNUR. The rules regarding the interpretation of a missing BC-IE in the CALL PROC or CALL CONF messages, respectively, are different for CS multimedia calls and for calls carrying the FNUR, but are not consistently described. This CR removes these inconsistencies by removing the "no BC-IE option" to confirm a requested service for CS multimedia services.
Summary of change:	⌘	See attached page
Consequences if not approved:	⌘	Different, incompatible implementations are possible

Clauses affected:	⌘	Clauses 8.3.3.1, 8.3.3.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	29.007, 23.172
		X /	Test specifications		
		/ X	O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:
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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.

First section modified

8.3.3 Indication of Compatibility Requirements to the PLMN

8.3.3.1 Indication in case of Mobile terminating calls

In support of:

- PSTN originated calls; and
- ISDN originated calls using 3,1 kHz audio Bearer Capability (BC); as well as
- ISDN originated calls using unrestricted digital Bearer Capability but not specifying all parameters for deducing a Bearer Service.

Mobile specific requirements to be dealt with in the Bearer Capability information element the call confirmed message has been introduced in the call control protocol (3GPP TS 24.008). This also allows for re-negotiation of specific parameters at the beginning of the connection set-up process. The specific parameters are:

a) mobile specific requirements:

- Connection element (transparent/non transparent);
- Structure (note 1);
- Synchronous/Asynchronous (note 8);
- Rate adaptation/other rate adaptation (note 9);
- User information layer 2 protocol (note 1);
- Intermediate rate (note 2), (note 3);
- Modem Type (note 1), (note 3);
- User Rate (note 3);
- Compression ,
- Fixed network user rate, (note 3) (note 4);
- Other modem type, (note 3) (note 4);
- User initiated modification indication (note 4).

The following parameters are indicated by the MS to the network, only:

- Radio Channel Requirement;
- Acceptable channel codings (note 5);
- Maximum number of traffic channels, (note 5);
- Wanted air interface user rate (note 6) (note 7);
- Asymmetry preference indication (note 7).

NOTE 1: This parameter is correlated with the value of the parameter connection element.

NOTE 2: For non-transparent services this parameter is correlated with the value of the parameter negotiation of intermediate rate requested.

NOTE 3: Modification of these parameters may be proposed by the MS. The Network may accept it or not.

NOTE 4: This parameter shall be included by the MS only ~~in case~~if it was received from the network.

NOTE 5: This parameter shall be included only ~~in case~~if the parameter 'fixed network user rate' is included.

NOTE 6: This parameter shall be included only for non-transparent services and ~~in case~~ if the parameter 'fixed network user rate' is included.

NOTE 7: This parameter has to be included if EDGE channel coding(s) are included in Acceptable channel codings. 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 8: For FTM and PIAFS, this parameter may be negotiated as in table B.4e. How the subscription for BS20 is assured, is an operator matter.

NOTE 9: For FTM, PIAFS or Multimedia, this parameter may be negotiated as in table B.4f.

b) requirements with effects at the partner terminal:

- Number of data bits;
- Number of stop bits;
- Parity.

The MS indicates the radio channel requirement in the call confirmed message. If the MS indicates the support of "dual" (HR and FR channels) the final decision, which radio channel is chosen, is done by the network in an RR message. The radio channel requirement is ignored in UTRAN Iu mode, see table B.5a in Annex B.

If the network proposes optional support of both transparent and non transparent connection elements, but does not indicate a user information layer 2 protocol, the MS shall set the appropriate value, if choosing non transparent in the call confirmed message and out-band flow control is not requested, see B.1.1.2.

Additionally the values of the parameters structure, modem type and intermediate rate have to be set in conformance with the values of the parameters radio channel requirements, negotiation of intermediate rate requested and connection element.

Subclause B.1.1.2 and table B.1 in the annex B describe the negotiation procedure. Annex B table B.4 describes the selection of the modem type and the dependence on the value of the parameter connection element. Annex B table B.4 describes the selection of the intermediate rate and user rate and their dependence upon the value of the NIRR parameter and the equipment capabilities.

The following MT cases can be deduced from the individual call set-up request conditions:

a) If the set-up does not contain a BC information element, the MS in the call confirmed message shall include any BC information (single or multiple BC-IE). The MS may use the information provided in the BACKUP BC information element (see 3GPP TS 29.007 and 3GPP TS 24.008) to deduce the requested service. Note, that the presence of the BACKUP BC-IE does not change the condition of "no BC-IE received", that means in particular that the MS shall include any BC-IE (as mentioned before) and shall not negotiate parameter values where the MSC has to offer a value in the BC-IE first, as e.g., for the parameter "compression". ~~In case of~~If multiple BC-IEs are present, one BC-IE shall indicate the information transfer capability "speech". A 3,1 kHz multimedia BC-IE together with a speech BC-IE indicates the support of a fallback to speech. A UDI/RDI multimedia BC-IE together with a speech BC-IE indicates the support of service change and fallback (see 3GPP TS 29.007 and 3GPP TS 24.008).

b) If the set-up message contains a single BC-IE, the MS in the call confirmed message shall use either a single BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

c) If the set-up contains a multiple BC-IE, the MS in the call confirmed message shall use either a multiple BC-IE, if it wants to negotiate mobile specific parameter values or, unless otherwise specified ~~in annex B~~, no BC-IE, if it agrees with the requested ones.

- ~~In case of~~For a 3,1kHz multimedia setup the MS may either accept the possibility of a fallback to speech by responding with two BC-IEs, ~~or with no BC-IEs,~~ or turn the call to a speech call by sending only a speech

BC-IE in the call confirmed message or turn the call to a multimedia only call (i.e. no fallback to speech allowed) by sending only a multimedia BC-IE, in the call confirmed message.

- ~~In case of~~For a UDI/RDI multimedia setup, the MS may either accept the possibility of service change by responding with two BC-IEs ~~or with no BC-IEs~~, or turn the call to a speech call by sending only a speech BC-IE in the call confirmed message, or turn the call to a multimedia call by sending only a multimedia BC-IE in the call confirmed message.

- ~~In case of~~For facsimile, a single BC-IE, containing fax group 3 only, shall be used if a multiple BC-IE requesting speech alternate fax group 3 is received and the MS is not able to support the speech capability. Annex B, table B.7, describes the negotiation rules.

If the BC-IE contains 3,1 kHz ex PLMN, the MS is allowed to negotiate all mobile specific parameter values listed above. If the BC-IE contains facsimile group 3, the MS is not allowed to negotiate any mobile specific parameter value. In any case, if the set-up message requests a "single service", the MS shall not answer in the call confirmed message requesting a "dual service".

However, for dual services with repeat indicator set to "circular (alternate)" or to "service change and fallback" the MS may change the sequence of dual BC-IEs within the call confirmed message (preceded by the same value of the repeat indicator), if it wants to start with a different Bearer Capability than proposed by the network as the initial one.

In addition, the MS may propose to the network to modify User Rate, Modem Type and Intermediate Rate in the CALL CONFIRMED message. The network may accept or release the call.

If the BC-IE received from the network contains the parameters 'fixed network user rate', 'other modem type' and possibly the 'user initiated modification', the MS ~~may~~ shall either:

a) ~~if in A/Gb mode,~~ include no BC-IE or a BC-IE without these parameters in the call confirmed message, i.e. the MS discards these parameters (only allowed in A/Gb mode); or

b) include the possibly modified values for the 'fixed network user rate' and 'other modem type' in the BC-IE of the call confirmed message. The network might accept or reject the modified values. In this case the MS shall also include the parameters 'maximum number of traffic channels' and 'acceptable channel codings'. Additionally for non-transparent services, the MS shall also include the parameters 'wanted air interface user rate' and the 'user initiated modification indication'. The parameters 'acceptable channel codings extended' and 'asymmetry indication' may also be included.

In case a), the MS shall use the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

In ~~A/Gb or GERAN Iu mode~~ case b), the MS shall use in A/Gb or GERAN Iu mode a ~~singleshot~~ singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022.

~~In case~~If the 'acceptable channel codings' is indicated by the MS, the decision which channel coding is used is done by the network and indicated to the mobile station with a RR message. This RR message may also assign an asymmetric channel coding. The 'acceptable channel codings' parameter takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. Also the intermediate rate and user rate per traffic channel in a multislot configuration are not indicated by the 'intermediate rate' and 'user rate' parameters of the BC-IE, but depend on the chosen channel coding only.

~~If the MS receives a BC-IE in the SETUP message containing the parameters 'fixed network user rate', 'other modem type', the MS may include these parameters in the BC-IE of the CALL CONFIRMED message (i.e. octets 6d, 6e, 6f, and 6g see 3GPP TS 24.008), with parameter values negotiated according to Annex B.~~ If no BC-IE is received in the SETUP message, the MS may include the~~se~~ parameters 'fixed network user rate', 'other modem type' etc. (i.e. octets 6d, 6e, 6f, and 6g, see 3GPP TS 24.008) in the BC-IE of the CALL CONFIRMED message. However, in this case, the network may release the call if it does not support these parameters.

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 kbit/s or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (see 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T Recommendation V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.2 Indication in case of Mobile originating calls

In support of mobile originating calls the values of BC-IE parameters are requested in the set-up message from the MS. If the MS indicates the support of both transparent and non transparent connection elements the network shall return its choice in the call proceeding message. The MS is not allowed to indicate support of both transparent and non transparent, if the MS also requests out-band flow control, i.e. it does not indicate a layer 2 protocol.

Additionally the value of the parameter modem type has to be set depending on the value of the parameter connection element as described in annex B, table B.4a.

The set-up message contains a single or multiple BC-IE. ~~In case~~If of multiple BC-IEs are present, one BC-IE shall indicate the information transfer capability "speech".

~~In case of~~For a 3,1 kHz multimedia call, the setup message contains either a multimedia BC-IE indicating a multimedia only call request (i.e. no fallback to speech allowed) or both a 3,1 kHz multimedia BC-IE and a speech BC-IE to indicate the support of a fallback to speech (see 3GPP TS 29.007 and 3GPP TS 24.008).

~~In case of~~ For a UDI/RDI multimedia call, the setup message contains either a multimedia BC-IE indicating a multimedia only call request, or both a multimedia BC-IE and a speech BC-IE (in any order) to indicate the support of service change and fallback (see 3GPP TS 29.007 and 3GPP TS 24.008). The latter is not applicable to multimedia calls with FNUR=32.0 kbit/s.

If the set-up message requests a "single service", the network shall not answer in the call proceeding message requesting a "dual service". Alternatively the network shall answer with a single BC-IE containing fax group 3 if a multiple BC-IE requesting speech alternate fax group 3 is received but the network does not allow the use of this alternate service. Annex B, table B.7, describes the negotiation rules.

If the MS requests a "dual service" the network is not allowed to change the sequence of the service, a change may however occur due to the called user and this may then be relayed back to the originating MS by the network.

If the setup message requests a 3.1 kHz multimedia service with fallback, the network may return both BC-IEs in the same order ~~or no BC-IE~~ to accept the request, ~~both BC-IEs in the reverse order (relayed from terminating User),~~ or a single BC-IE if fallback~~, service change~~ or one of the requested services are not allowed.

If the setup message requests a UDI/RDI multimedia service with fallback, the network may return both BC-IEs in the same order to accept the request, both BC-IEs in the reverse order (relayed from terminating User), or a single BC-IE if fallback, service change or one of the requested services are not allowed.

If the set-up message indicates that negotiation of intermediate rate is requested then the network shall behave as described in annex B, table B.4b.

Unless otherwise specified ~~in annex B~~, if no BC-IE parameter needs negotiation it is up to the network if it sends a CALL PROCEEDING message (with or without a BC-IE) towards the MS or not.

For MS to network direction, octet 6e shall be included whenever octet 6d is included (see 3GPP TS 24.008).

For multislot, TCH/F14.4, and EDGE operations and in ~~UTRAN~~ Iu mode the MS shall include an appropriate set of the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH' and 'acceptable channel codings' in the BC-IE of the SETUP message. If EDGE channel coding(s) are included in ACC ~~in case of~~for transparent calls, the 'Wanted air interface user rate'-parameter shall be set to 'Air interface user rate not applicable' and the 'User initiated modification indication'-parameter to 'User initiated modification not requested'. In a non-transparent multislot operation, the MS shall also include the parameters 'wanted air interface user rate' and 'user initiated modification indication' in the BC-IE of the SETUP message. In a non-transparent TCH/F14.4 or EDGE operation or in ~~UTRAN~~ Iu mode the MS shall also include the parameter 'wanted air interface user rate'. In non-transparent EDGE operation the MS shall also include the parameter 'asymmetry preference indication'. It shall also set the other parameters of the BC-IE (i.e. 'user rate') to values identifying fall-back values. Depending on the network two situations can be distinguished:

a) The network supports the requested operation:

- in this case the network shall include the parameter 'fixed network user rate', 'other modem type' and possibly 'user initiated modification' in the BC-IE(s) of the CALL PROCEEDING message, irrespective whether or not they contain modified values or just a copy of the received ones;

- the 'acceptable channel codings' indicated by the MS in the SETUP message takes precedence over the 'negotiation of intermediate rate requested' parameter for non-transparent services. The intermediate rate per

traffic channel and the user rate per traffic channel is dependent on the chosen channel coding only. The chosen channel coding is indicated to the mobile station by the network with an RR message.

b) The network does not support the requested operation:

- in this case, in A/Gb mode, the BC-IE of the CALL PROCEEDING message does not contain the parameters fixed network user rate' and 'other modem type' or no BC-IE is included in the CALL PROCEEDING message at all. The mobile station shall then discard the parameters 'fixed network user rate', 'other modem type', 'maximum number of TCH', 'acceptable channel codings' 'wanted air interface user rate' and 'user initiated modification indication' sent with the SETUP message and apply the fall-back bearer service;

- in Iu mode the network shall release the call.

In case a), the MS shall use in A/Gb and GERAN Iu mode a singleslot or multislot configuration according to the rules defined in 3GPP TS 44.021, 3GPP TS 48.020 and 3GPP TS 24.022.

In case b), the MS shall use in A/Gb mode the fall-back bearer service indicated by the remaining parameters of the BC-IE on a single slot configuration (reference 3GPP TS 44.021).

If FNUR = 33.6 kbit/s is agreed on in the setup of a 3.1 kHz multimedia call, the modems may handshake to 31.2 kbit/s or 28.8 kbit/s. In this case the MS receives a MODIFY message from the MSC to indicate the new data rate, and shall respond with a MODIFY COMPLETE message (see 3GPP TS 24.008), if it supports the requested modification. If the MS does not support the requested modification, it shall respond with a MODIFY REJECT message. The MT shall indicate the new data rate to the TE (e.g. using the ITU-T Recommendation V.80 inband signalling) in order to cause the TE to use stuffing to adapt the 31.2 kbit/s or 28.8 kbit/s data rate to the 33.6 kbit/s traffic channel between the TE and IWF.

8.3.3.3 Differences in validity of BC parameter values in A/Gb mode, GERAN Iu mode and UTRAN Iu mode

The validity of a BC parameter value, either in the SETUP or CALL CONFIRMED message, may differ from A/Gb mode to GERAN Iu mode and to UTRAN Iu mode. Certain parameters are irrelevant in UTRAN or GERAN Iu mode and any value given is valid and ignored. These parameters may be available in the BC IE. For those parameters that are relevant in UTRAN Iu mode, GERAN Iu mode and A/Gb mode, certain values may be invalid in one of the systems. Invalid parameter values may cause rejection of the BC and subsequent release of the call.

Parameters that are ignored in UTRAN or GERAN Iu mode may be set to default values, or to specific values in view of an eventual handover to A/Gb mode. Parameter values that are invalid in one system may result in unsuccessful handover from the other system.

Table B.5a in annex B lists parameters that are ignored in UTRAN or GERAN Iu mode and parameter values which validity is different in A/Gb mode, GERAN Iu mode and UTRAN Iu mode.