Technical Specification Group Services and System Aspects   **TSGS#6(99)523**
Meeting #6, Nice, France, 15-17 December 1999

Source: **TSG SA1**

Title: **CRs to 22.129 and 22.135 on handover of multiple connections**

Document for: **Approval**

Agenda Item: **5.1.4**

Status	Spec	CR	Rev	Phase	Subject	CAT	Vers	New Vers	TSG Meeting	TSG Doc.No.	Pres
	22.129	009		R99	3G/2G handover in the PS Domain	D	3.1.0	3.2.0	S1#06	S1-991019	No
	22.135	001		R99	Transfer of Handover chapter to 22.129	D	3.0.0	3.1.0	S1#06	S1-991020	No
	22.135	002		R99	Clarification on handling of multiple bearers	D	3.0.0	3.1.0	S1#06	S1-991065	No
	22.129	010		R99	Handover of a Multicall	B	3.1.0	3.2.0	S1#06	S1-991066	No

CHANGE REQUEST

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22.129	CR	009	Current Version:	3.1.0

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

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

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

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

Source:	TSG SA1	**Date:**	02/12/1999

Subject:	3G/2G handover in the PS Domain

Work item:	6.9

Category:

				Release:		
	F	Correction			Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification	**X**		Release 99	**X**
					Release 00	

Reason for change:	• Introduce guidance for handover between 3G and 2G systems in the PS domain.
	• Incorporate handover text from multicall specification.

Clauses affected:	5.4 (New), 6.4, 7.4

Other specs affected:

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

Other comments:

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5   Requirements for Handover from UMTS to UMTS

5.1   Handover due to UE Movement

It should be possible to provide a technical implementation of handover such that there is no measurable impact on the quality of any service when handover due to UE movement occurs. This does not imply that all UMTS handovers will achieve this ideal. However, the standards shall define at least one UTRA radio access mode in which this is possible given the following:

- UE speed stays within limits for given service;

- UE stays constantly within UMTS coverage of a single UTRAN.

5.2   Handover Between UTRA Radio Access Modes

The standards shall permit a technical implementation of handover between radio access modes, although there may be a temporary degradation of QoS on bearer services at the time of handover.

5.34   UMTS cell capacity

Consideration must be given services such as multimedia which may involve use of multiple bearers. Due for example to cell loading, it may happen that a target cell cannot support the combination of bearer services provided by the current serving cell. Means shall be provided for the application(s) to indicate minimum acceptable QoS for services continuation after handover. Although all UMTS bearer services may not be handed over, the handover to another UMTS cell should not be precluded.

5.4 Handover of a Multicall

The handover event can trigger changes to individual calls in any multicall scenario.

Priority setting of CS Calls and PS Sessions shall influence the handover process. It shall be possible to handover all calls and sessions. If the target cell is not able to accommodate all calls/sessions, then the calls/sessions that are handed over shall be selected in following order and the calls/sessions that cannot be handed over will be released.
The selection criteria shall be based on the following order:
    i.   The call of teleservice emergency call
    ii.   If the user has set the priority, the call or session of highest priority marking. If there is more than one call or session of highest priority marking, then the call of teleservice telephony shall be chosen in preference to those of equal highest priority. If there are multiple calls where priority is the same, how to treat the calls depends on the operator.
    iii.   The call of teleservice telephony
    iv.   The call of any other type
If no single call can be selected according to the above criteria, handover shall be rejected.
A change in the availability of suitable radio resources may also occur for other reasons in addition to handover.

6   Requirements for Handover from UMTS to GSM

6.1   Operational Requirements

6.1.2   GSM bands

The standard shall support handover to any combination of GSM bands supported by the GSM standards.

6.2   Performance Requirements

The following service principles apply to performance requirements:
- when the UE performs handover to GSM then the service requirements of GSM that relate to handover between different cells in different location areas is taken as the benchmark. It is not the intention to setmore stringent service requirements for UMTS to GSM handover than are already commonly accepted for handover within GSM.

6.2.1 Detection Time of Potential GSM Handover Candidates

Means shall be defined which allow the UE to achieve as good detection time performance as the GSM benchmark: ie to behave in such a way as to detect potential GSM handover candidates as quickly as a GSM mobile performing an intra GSM handover is required to do so.

6.2.2 Number of GSM handover candidates to detect

Means shall be available which allow UE to detect an equal number of GSM handover candidates relative to the GSM benchmark, ie to behave in such a way as to detect as many potential GSM handover candidates as a GSM mobile performing an intra GSM handover is required to do so.

6.2.3 Probability of Connection Loss

The service requirement is that it should be possible to hand over to GSM from UMTS with a probability of connection loss that fulfils the corresponding service requirement for intra GSM handover.

6.2.4 Temporary degradation of service caused by handover

The service requirement is that means should be defined so that it is possible to construct networks comprising GSM and UTRA radio resources in such a way that the duration and extent of any degradation of service during handover from UMTS to GSM is no worse than during intra GSM handover.

6.3 Specific Requirements for Individual Services from UMTS to GSM

6.3.1 Speech

Handover of a UMTS Speech channel to GSM shall result in a GSM speech teleservice connection. This requirement also applies to emergency calls:
- any call based on the default UMTS speech codec shall be mapped to the FR GSM speech codec. In the case the terminal and the GSM network support AMR and /or EFR and/or HR, it shall be the operators choice to define the appropriate mapping.

Means shall be defined which make it possible to limit any temporary degradation on handover so it meets the performance specified by GSM service requirements for speech handover.

6.3.2 Short Message Service

There are no requirements related to handover for short message service.

6.3.3 Cell Broadcast

There are no requirements related to handover for cell broadcast.

6.3.4 USSD

The technical standards shall provide means to ensure that any handover that occurs during a USSD interaction need no more affect the service than intra-GSM handover.

6.3.5 Facsimile

It is not required that a facsimile transmission that is active between UE and network at the time of handover from UMTS to GSM completes successfully.

6.3.6 Data Bearer Services

Standards shall be defined to permit the possibility of handover of a UMTS connection oriented data bearer service to GSM which shall result in an appropriate GSM/GPRS bearer service. The mapping between UMTS data bearer services and appropriate GSM/GPRS data bearer services will depend upon many factors such as data rate, delay constraints, error rate etc. Means shall be provided for the application to indicate minimum acceptable QoS for service continuation after handover.

Means shall be defined (eg existing GSM flow control mechanisms) which make it possible to limit any temporary degradation on handover so it meets the performance specified by GSM service requirements for connection oriented data bearer service handover.

It is required to handover a user context between GPRS and UMTS . Independently of the used air interface, the user shall stay connected to an external network (internet, intranet).

6.3.7 Supplementary Services

Control and *use* of Supplementary Services to be according to GSM or UMTS standard as applicable at the time, although close synergy between these should be encouraged to ensure that handover has no effect on their correct operation or continuity of service.

Where a GSM supplementary services is supported in UMTS then the technical standards should allow handover to GSM to have no effect, at least where the GSM and UMTS networks have the same network operator.

6.4 Requirements on multiple bearer services handover from UMTS to GSM

Consideration must be given to ~~multimedia~~ services which may involve multiple bearer services. The mapping between UMTS data bearer services and GSM/GPRS bearer services will depend upon many factors such as data rate, delay constraints, error rate etc.. Means shall be provided for the application(s) to indicate minimum acceptable QoS for services continuation after handover. In the event certain UMTS bearer services cannot be handed over to GSM/GPRS, the handover of some of the bearers to maintain the service should not be precluded.

In the case where user equipped with a dual mode terminal is in 3G coverage and has multiple PDP contexts activated (for instance to support multimedia) then it is preferable to handover one PDP context, rather than dropping all of them. As a first priority only the PDP contexts which have an associated QoS that can be supported by the 2G networks should be candidates for handover.

If there are still multiple PDP contexts as "handover candidates" then it shall be an operator choice which PDP context will be maintained. When roaming this decision shall be taken by the serving network. The operator may choose to either;

a)   Drop all of the PDP contexts.

b)   Choose one based upon criteria such as duration, amount of traffic transferred, etc.

In case of UMTS to GSM handover of a **Multicall** only one call can be handed over.

7 Requirements for Handover from GSM to UMTS

7.1 Operational Requirements

7.1.2 GSM bands

The standard shall support handover from any combination of GSM bands supported by the GSM standards.

7.2 Performance Requirements

The technical standards should ensure that it is possible to handover from GSM to UMTS in such a way that temporary degradations are no worse than GSM to GSM handovers.

7.3 Specific Requirements for Individual Service Handover from GSM to UMTS

7.3.1 Speech

AMR, EFR, FR and HR calls shall be mapped to the default UMTS speech codec.

7.3.32 Short Message Service

There are no requirements related to handover for short message service.

7.3.3   Cell Broadcast

There are no requirements related to handover for cell broadcast.

7.3.4   USSD

In GSM, USSD is a connection mode teleservice according to the definition above: in USSD the association between endpoints is called a 'transaction' (see GSM 03.90). In GSM, USSD transaction from the UE can terminate at the local MSC, the VLR or the HLR. It is not required to standardise means to handover into UMTS of transactions with the local MSC. The need to standardise handover of transactions with the VLR and HLR is for further study.

7.3.5   Facsimile

It is not required that a facsimile transmission that is active between UE and network at the time of handover from GSM to UMTS completes successfully.

7.3.6   GSM Data Bearer Services

7.3.6.1 Circuit Switched Data

> Note: The requirements in this section should not delay the release 99 standardisation process and may need review.

Standards shall be defined to permit the possibility of handover of a GSM circuit switched data bearer to UMTS which shall result in a UMTS connection oriented data bearer service . Means shall be provided for the application to indicate minimum acceptable QoS for service continuation after handover. If this cannot be provided by theUMTS network handover will not take place (which may result in call loss once the UE moves outside GSM coverage).
Means shall be defined which make it possible to limit any temporary degradation on handover so it meets the performance specified by GSM service requirements for circuit switched data handover.

7.3.6.2   Packet Switched Data

It is required to handover a user context between GPRS and UMTS . Independently of the used radio interface, the user shall stay connected to an external network (internet, intranet). Any change in the QoS shall be seen at the service access points as a network initiated renegotiation of QoS. If the supported QoS is not acceptable, the MS may terminate the connection/context.
Means shall be defined which make it possible to limit any temporary degradation on handover so it meets the performance specified by GSM service requirements for packet switched data handover.

7.3.7   Supplementary services

Where a GSM supplementary services is supported in the target UMTS network then the technical standards should allow handover from GSM to UMTS to have no effect on that service, at least where the GSM and UMTS networks have the same network operator.

7.4   Requirements on multiple bearer services handover from GSM to UMTS

Consideration must be given to ~~multimedia~~ services which may involve the use of multiple bearer services. For example Class A GPRS terminals will be capable of simultaneously supporting more than one data bearer services. The mapping between GSM/GPRS bearer services and UMTS bearer services will depend upon many factors such as data rate, delay constraints, error rate etc. Means shall be defined to allow handover of several data bearer services from GSM to UMTS. Means shall be defined for the application(s) to indicate minimum acceptable QoS for services continuation after handover.

TSG-SA Working Group 1 meeting #6

San Diego, 29 Nov – 03 Dec 1999

TSG S1   (99)1020

Agenda: 6.8

3G CHANGE REQUEST

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22.135 CR **001**   Current Version: 3.0.0

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

For submision to TSG   SA#6   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

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

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

Source: SA WG1   **Date:**

Subject: Transfer of Handover chapter to 22.129

3G Work item:

Category: F   Correction   ☐
           A   Corresponds to a correction in a 2G specification   ☐
(only one category   B   Addition of feature   ☐
Shall be marked   C   Functional modification of feature   ☐
With an X)   D   Editorial modification   **X**

Reason for change: Multicall HO requirements has been moved to 22.129

Clauses affected: 5.6

Other specs affected: Other 3G core specifications   ☐ → List of CRs:
            Other 2G core specifications   ☐ → List of CRs:
            MS test specifications   ☐ → List of CRs:
            BSS test specifications   ☐ → List of CRs:
            O&M specifications   ☐ → List of CRs:

Other comments:

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~~5.6~~ ~~Handover~~

~~The handover event can trigger changes to individual calls in any multicall scenario.~~

~~Priority setting of CS Calls and PS Sessions shall influence the handover process. It shall be possible to handover all calls and sessions. If the target cell is not able to accommodate all calls/sessions, then the calls/sessions that are handed over shall be selected in following order and the calls/sessions that cannot be handed over will be released.~~
~~The selection criteria shall be based on the following order:~~
> ~~i. The call of teleservice emergency call~~
> ~~ii. If the user has set the priority, the call or session of highest priority marking. If there is more than one call or session of highest priority marking, then the call of teleservice telephony shall be chosen in preference to those of equal highest priority. If there are multiple calls where priority is the same, how to treat the calls depends on the operator.~~
> ~~iii. The call of teleservice telephony~~
> ~~iv. The call of any other type~~

~~If no single call can be selected according to the above criteria, handover shall be rejected.~~
> ~~Note: Requirements shall be considered in an intra and inter system (e.g. UMTS to GSM) handover situations. In case of intra UMTS handover it shall be possible handover all calls when resources permit. In case of UMTS to GSM handover only one call can be handed over. A change in the availability of suitable radio resources may also occur for other reasons in addition to handover.~~

~~For further handover requirements please refer to TS 22.129.~~
> ~~NOTE This section may be later transferred to TS 22.129.~~

TSG-SA Working Group 1 (Services) meeting#6
San Diego, USA, 29th November – 3rd December 1999

TSG S1   (99)1065

Agenda:

3G CHANGE REQUEST

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22.135 CR **002**   Current Version: 3.0.0

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

For submision to TSG SA#6   for approval **X** *(only one box should*
list TSG meeting no. here ↑   for information   *be marked with an X)*

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

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

Source:	TSG SA WG1	**Date:**	1999-12-03

Subject:	Clarification on handling of multiple bearers

3G Work item:	

Category: F Correction ☐
A Corresponds to a correction in a 2G specification ☐
(only one category   B Addition of feature ☐
shall be marked   C Functional modification of feature ☐
with an X)   D Editorial modification **X**

Reason for change:	The current Stage 1 contains a mixture the use of "bearer" and "call". The handling of multiple voice calls in handover for future releases is clarified.

Clauses affected:	4.2.1, 5.1.1, 5.4, 5.7, 7.2.2

Other specs affected:	Other 3G core specifications	☐ → List of CRs:	
	Other 2G core specifications	☐ → List of CRs:	
	MS test specifications	☐ → List of CRs:	
	BSS test specifications	☐ → List of CRs:	
	O&M specifications	☐ → List of CRs:	

Other comments:	

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3GPP

Note: The protocol architecture in GSM allows several parallel CS calls, the limitation being that there is only one traffic channel, which the different CS calls share. This is facilitated by e.g. the Call Waiting, Call Hold, Call Transfer and Multiparty SSs. Call configurations related to GSM supplementary services are not considered as Multicall. See section 6 for interworking.

It shall be possible for each CS call / PS session to have independent traffic and performance characteristics. It shall be possible that each active CS call and PS session shall be terminated individually.
It shall be also possible that each of the CS calls and PS sessions have different priorities.
Note: Priority mechanism for CS calls and PS sessions at release 1999 is for further study.

The basic idea with CS multicall is that each CS call may have one dedicated bearer, i.e. it is possible that each new call (MO and MT) generate a new bearer.
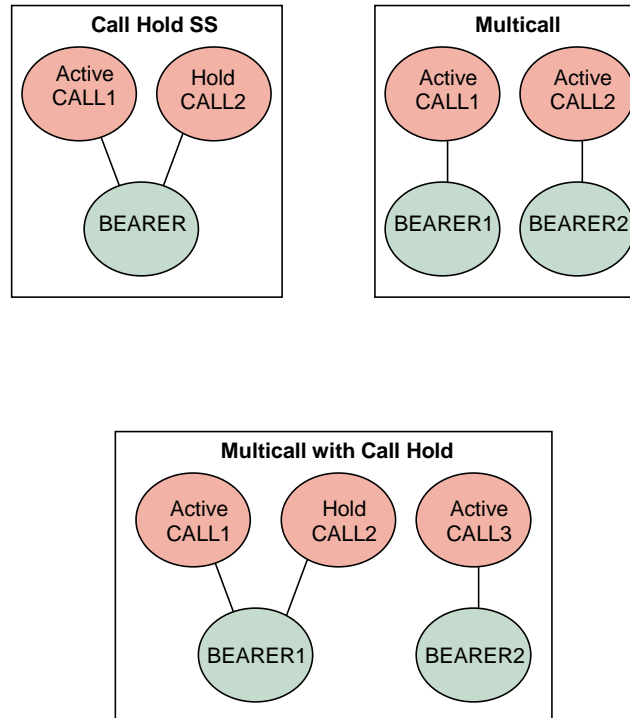

Figure 1: Multicall concept

It is a requirement, that the current GSM supplementary services are preserved when suitable. Support of UMTS-GSM interworking and handovers, GSM evolution, GSM user conventions etc. are reasons for this requirement.

4.2   Multicall service scenarios

4.2.1   Terminating CS call

The indication of terminating CS call to mobile terminal will be done until the maximum number of total CS calls (N_{cs}) has been reached.
If the maximum number to total CS call has been reached an additional terminating call (N_{cs}+1) will be only indicated to the user if the user have the SS Call Waiting active. (N_{cs} is specified in chapter 5.2.) See chapter 6.4.2 for interworking with Call Waiting SS. The maximum value for Ncs=7 and no more calls may be supported, irrespective of whether the SS Call Waiting is active or not, once this has been reached.
If the N_{cs} is not been reached and a terminating call is indicated to the user she may reacted in the following way:
   a) accepting the terminating call

      -   the user/user applications shall have the possibility to allocate a new bearer for the terminating call

      -   the user/user applications shall have the possibility to reuse/share an already established bearer (e.g. release existing calls or put an speech on hold and accept the terminating call.

   b) rejecting the terminating call

If the user/user application rejects the terminating call the call shall be released in a normal way

c) ignoring the incoming call

If the user/user application ignores the indication of the terminating call (i.e. not accepts nor rejects) the terminating call the normal call handling shall apply, e.g.. after the Alerting Timer expires the call will be released.

4.2.2 Originating CS call

If the N_{cs} is not reached already and the user/user application wants to establish a new originating CS call she may act in the following way:

a) allocate a new bearer for the originating call

b) reuse/share an already established bearer (e.g. to put an speech on hold and set-up a new call.

4.2.3 PS sessions

It shall be possible to have several PS sessions active simultaneously. See TS22.060 for further details.
PS sessions shall be handled independently of any CS calls.

Note: There are no new PS related requirements from TS 22.060 point of view but there might be issues related to stage 2 and stage 3 that need to be considered.

4.2.4 Connectionless traffic

Multicall shall not impact the usage of SMS-PP, SMS-CB and USSD.

4.4 Charging aspects

It shall be possible to charge each call / session independently.
5 Functional requirements

5.1 Provision and withdrawal

5.1.1 Provision

The provision of multicall is provided by prior arrangement with home environment. If the multicall service is provisioned the limits for N_{cs} and N_{ps} shall be set as subscription options. Ncs is equal to the number of bearers that a user is allowed when Call Hold or Call Waiting are not invoked.

5.1.2 Withdrawal

The multicall service subscription will be withdrawn on subscribers request or at administrative reasons.

5.2 Registration

User shall be able to modify the maximum number of CS calls and number of PS sessions within the limitations set at provision of the service.

5.3 Interrogation

User shall be able to interrogate the maximum number of CS calls and number of PS sessions set by user.
User shall be able to interrogate the maximum number of CS calls and number of PS sessions supported by serving network.

5.4 Limiting the number of multicalls

It should be possible for the number of active calls or sessions supported simultaneously to be restricted and selected by network operator, by the capabilities of the used terminal, by user subscription and/or user setting. The maximum

number of CS calls and PS sessions should be set respectively. It shall be possible to have one or more CS calls simultaneously with one or more parallel PS sessions.

Standard shall be able to support up to 7 simultaneous CS Calls (N_{cs}). This is equal to the number of bearers when the Call Hold or Call Waiting are not invoked.

Standard shall be able to support up to 7 PS Sessions (N_{ps}).

Terminals and networks may support any number of CS calls and PS Sessions within these limits.

It shall be possible to limit the maximum number of simultaneous bearers for CS calls to one, at this case GSM rel'98 functionality shall be shall provided.

The value of the maximum number of active speech calls is 1. Network shall not allow more than bearers allocated for speech.

5.6 Handover

The handover event can trigger changes to individual calls in any multicall scenario.

Priority setting of CS Calls and PS Sessions shall influence the handover process. It shall be possible to handover all calls and sessions. If the target cell is not able to accommodate all calls/sessions, then the calls/sessions that are handed over shall be selected in following order and the calls/sessions that cannot be handed over will be released.

The selection criteria shall be based on the following order:
- v. The call of teleservice emergency call
- vi. If the user has set the priority, the call or session of highest priority marking. If there is more than one call or session of highest priority marking, then the call of teleservice telephony shall be chosen in preference to those of equal highest priority. If there are multiple calls where priority is the same, how to treat the calls depends on the operator.
- vii. The call of teleservice telephony
- viii. The call of any other type

If no single call can be selected according to the above criteria, handover shall be rejected.

Note: Requirements shall be considered in an intra and inter system (e.g. UMTS to GSM) handover situations. In case of intra UMTS handover it shall be possible handover all calls when resources permit. In case of UMTS to GSM handover only one call can be handed over. A change in the availability of suitable radio resources may also occur for other reasons in addition to handover.

For further handover requirements please refer to TS 22.129.

NOTE This section may be later transferred to TS 22.129.

5.7 Busy Definition

~~The NDUB (Network Determined User Busy) occurs, when a call is about to be offered and the maximum number of total CS calls has been reached. The maximum number of CS calls depends on the setting of the N_{cs}.~~

NDUB (**Network Determined User Busy**) occurs when:
1. The maximum number of calls has been reached. In the case where Call Waiting or Call Hold are not subscribed to, this is equal to maximum number of bearers. In the case with Multiparty this can occur even if bearers are still available.
2. In the case where Call Waiting or Call Hold are subscribed to, the maximum number of bearers is reached, and the maximum number of both waiting and held calls has been reached.

NOTE: This implies that CFB according to NDUB will only be invoked if the maximum number of CS calls is reached.

For User Determined User Busy (UDUB) condition see GSM 02.01 Annex C.

5.8 Exceptional procedures or unsuccessful outcome

If the subscriber requests to set the limits of N_{cs} and/or N_{ps} to higher values as allowed according to the provision (subscription option), this request shall be rejected and the subscriber shall be informed on the unsuccessful outcome of the request.

Roaming into networks not supporting multicall shall be possible and at this case GSM rel'98 functionality shall apply .

In case there is a difference between the maximum numbers (N_{cs}, N_{ps}) , supported by the serving network, by the capabilities of the used terminal and/or by the user setting (according to the user

subscription options), the smallest value should be applied as the maximum number.

6 Interaction with other services

6.1 General on Supplementary Services

Relation between multicall and supplementary services are considered only for CS calls. .

6.2 Line Identification

6.2.1 Calling Line Identification Presentation (CLIP)

No impact, i.e. CLIP shall be provided with all calls.

6.2.2 Calling Line Identification Restriction (CLIR)

No impact, i.e. CLIR shall be provided with all calls.

6.2.3 Connected Line Identification Presentation (COLP)

No impact, i.e. COLP shall be provided with all calls.

6.2.4 Connected Line Identification Restriction (COLR)

No impact, i.e. COLR shall be provided with all calls.

6.3 Call Forwarding

6.3.1 Call Forwarding Unconditional (CFU)

No impact.

6.3.2 Call Forwarding on Busy (CFB)

No impact.

6.3.3 Call Forwarding on No Reply (CFNRy)

No impact.

6.3.4 Call Forwarding on Not Reachable (CFNRc)

No impact.

6.4 Call Completion

6.4.1 Call Hold (CH)

No impact, i.e. it shall be possible to put an established speech call on hold.

6.4.2 Call Waiting (CW)

The indication of a terminating CS call within the maximum number of calls is done by multicall feature; whereas the indication of a terminating call to the user / terminal by Call Waiting function is done when multicall limit (N_{cs}) has been reached and the subscriber has CW active. When the supplementary service "Call Waiting" is applicable the maximum number of calls is M+ N_{cs} , where M is maximum number of waiting calls, which is specified in 22.083.

NOTE: Due to that there is no change to the maximum number of waiting calls required from the multicall service the maximum number of waiting calls is still 1.

6.5 Multi Party (MPTY)

No Impact.
The number of MPTY member may be limited because of number of existing CS calls.

6.6 Closed User Group (CUG)

No impact.

6.7 Advice of Charge (AoC)

It shall be possible for network to indicate the AoC parameters for each CS call.
 It shall be possible for mobile terminal to count each CS Call charges respectively and to have overall ACM (Accumulated Call Meter as defined in 22.024) for all the calls.

6.8 Call Barring

No impact.

6.8.1 Barring of all outgoing calls

No impact.

6.8.2 Barring of outgoing international calls

No impact.

6.8.3 Barring of outgoing international calls except those directed to the HPLMN country

No impact.

6.8.4 Barring of all incoming calls

No impact.

6.8.5 Barring of incoming calls when roaming

No impact.

6.9 Explicit Call Transfer (ECT)

No impact.

6.10 Completion of Call to Busy Subscriber (CCBS)

No impact.

6.11 Multiple Subscriber Profile (MSP)

No impact.

6.12 Calling Name Presentation (CNAP)

No impact.

6.13 User-to-User Signalling (UUS)

No Impact

6.14 enhanced Multi-Level Precedence and Pre-emption service (eMLPP)

No impact.

6.15 Call Deflection (CD)

No impact.

6.16 CAMEL

No impact.

6.17 IST

No impact.

7 Cross Phase Compatibility for R99

This section details the cross phase compatibility requirements relating to the service requirements in this document.
Note: when a change is introduced which affects the 3GPP specifications, it is said to be 'backward compatible' if existing equipment can continue to operate and perform correctly with equipment that conforms to the new implementation.

7.1 Compatibility With Existing Standards

Where the service and operational requirements in this document relate to a core network functionality, compatibility is required.
Multicall mechanisms is not applicable for GSM BSS.

7.2 Compatibility With Future Releases

It is envisaged that 3GPP standards will evolve beyond R99, for example with the addition of new service requirements. The standards which define the technical implementation of R99 should be developed in such a way that it is practical to add the requirements in this section in a backward compatible manner.
Following chapters include requirements that are foreseen for future release.

7.2.1 Multicall configuration

When having one active CS call and one held call on the same bearer. It shall be possible to create a new CS bearer and to move one of the calls to the new bearer, resulting both calls being active within the limits set by the operator/user and within the capability of the terminal. See figure 2: Split of bearer.
When having two calls (multicall) on the separate bearers. It shall be possible to join both calls to one of the two bearers, put the one of the calls to hold and to release unused CS bearer. It shall be possible to select which call to put on hold. See figure 2: Combination of bearers. *(Note: there is no clear end-user service requirement for this feature at time being.)*
NOTE: Due to that only speech calls can be put on hold, so one of the two active Cs calls has to be a speech call
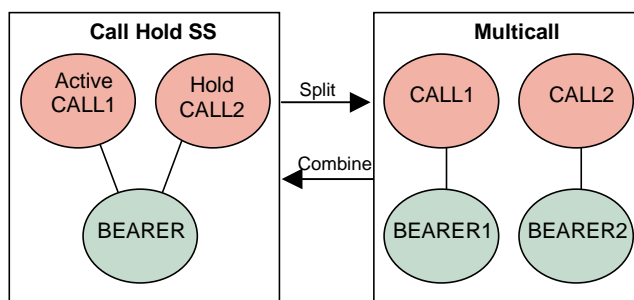

Figure2: Illustration for split of bearer and combination of bearers.

7.2.2 Several simultaneous speech calls / bearers

Key requirements for multicall is to allow several simultaneous CS call. The most important usage scenario is to allow several CS data bearers to be bind at application level resulting to higher than 64kbits/s data rates. Other important feature is just general flexibility allowing e.g. simultaneous speech and data call. It's been also required to have several simultaneous active speech calls.

It's been proposed that the multicall feature could be introduced in a phased manner, meaning that in the first phase, i.e. UMTS phase 1, release 99 only one active speech call would be supported. However, Call control should not prohibit a complete set of multiple speech bearer services in future releases and UTRAN shall be designed in a flexible way to support multiple speech bearers. In Release 99, GSM SS Call Wait, Multiparty and Call Hold are used to offer simultaneous speech calls to user.

If multiple simultaneous voice calls are supported then the Call Hold service shall be used to reconfigure the number of bearers supporting voice calls if required during handover. e.g. in the case of handover to GSM where only one voice call can be active at a time. This requirement is dependent on the user subscribing to Call Hold.

7.2.3 CCBS

At release 1999 CCBS no enhancements for CCBS is required.

In the future releases the definition of IDLE state of subscriber A and destination B should be modified in away that the IDLE state is reach even if there are active CS calls but the maximum limit of CS calls is not reached.

3GPP SA1 # 6
San Diego CA., USA, 29th Nov. to 3rd Dec. 1999

Document **TP-991066**

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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

22.129 CR **010** Current Version: **3.1.0**

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

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

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

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

Source: TSG SA WG1   **Date:** 03/12/1999

Subject: Handover of a Multicall

Work item:

Category:

	F	Correction		**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature	**X**		Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	
					Release 00	**X**

Reason for change: Addition of use of Call Hold to handle handover of Multicall

Clauses affected: 8.3 (New)

Other specs affected:

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

Other comments:

help.doc

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

To From	Terrestrial Cellular	Fixed/Cordless	Satellite
Terrestrial Cellular	Yes (R99)	Yes	Yes
Fixed/Cordless	Yes	Yes	Yes
Satellite	Yes	Yes	No

8.3 Support of Muticall with Simultaneous Voice Calls

In the case where Multicall is used to support multiple voice calls a handover must be attempted for each bearer that is in use. In the case where not all bearers can be supported by the destination network the related voice calls shall be automatically put on hold. After the handover is completed, the subscriber shall be able to retrieve any held voice call by invoking the Call Hold service.

This requirement is dependent on the user subscribing to Call Hold.

This is only required if there is more than one simultaneous speech call and this is therefore not required for Release 99.