3GPP TSG_CN#7 **NP-000089**
ETSI SMG3 Plenary Meeting #7,
Madrid, Spain
13th – 15th March 2000

Agenda item: **5.1.3**

Source: **TSG_N WG1**

Title: **CRs to 3G Work Item ASCI**

Introduction:

This document contains **"21"** CRs on **Work Item ASCI,** that have been agreed by **TSG_N WG1,** and are forwarded to **TSG_N Plenary** meeting #7 for approval.

Tdoc	Spec	CR	Rev	CAT	Rel.	Old Ver	New Ver	Subject
N1-000431	04.08	CRA1001		F	R97	6.7.0	6.9.0	Addition of cause value #25 'Pre-emption'
N1-000473	04.08	CRA1005		A	R98	7.4.0	7.6.0	Addition of cause value #25 'Pre-emption'
N1-000474	24.008	CR177		A	R99	3.2.1	3.3.0	Addition of cause value #25 'Pre-emption'
N1-000429	04.68	CRA021		F	R96	5.4.1	5.5.0	Addition of cause values
N1-000467	04.68	CRA022		A	R97	6.2.0	6.3.0	Addition of cause values
N1-000468	04.68	CRA023		A	R98	7.1.0	7.2.0	Addition of cause values
N1-000469	04.68	CRA024		A	R99	8.0.0	8.1.0	Addition of cause values
N1-000430	04.69	CRA018		F	R96	5.4.0	5.5.0	Addition of cause values
N1-000470	04.69	CRA019		A	R97	6.2.0	6.3.0	Addition of cause values
N1-000471	04.69	CRA020		A	R98	7.1.0	7.2.0	Addition of cause values
N1-000472	04.69	CRA021		A	R99	8.0.0	8.1.0	Addition of cause values
N1-000427	03.68	CRA015		F	R97	6.1.0	6.2.1	Data Flow for Fast Call setup
N1-000463	03.68	CRA018		A	R98	7.0.0	7.1.0	Data Flow for Fast Call setup
N1-000464	03.68	CRA019		A	R99	8.0.0	8.1.0	Data Flow for Fast Call setup
N1-000428	03.69	CRA013		F	R97	6.1.0	6.2.0	Data Flow for Fast Call setup
N1-000465	03.69	CRA014		A	R98	7.0.0	7.1.0	Data Flow for Fast Call setup
N1-000466	03.69	CRA015		A	R99	8.0.0	8.1.0	Data Flow for Fast Call setup
N1-000545	24.008	CR133	1	D	R99	3.2.1	3.3.0	Marking ASCI descriptions
N1-000426	03.68	CRA014		F	R97	6.1.0	6.2.1	VGCS Signalling Flows
N1-000461	03.68	CRA016		A	R98	7.0.0	7.1.0	VGCS Signalling Flows
N1-000462	03.68	CRA017		A	R99	8.0.0	8.1.0	VGCS Signalling Flows

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000426

ETSI SMG3 ASCI
STF139 & ASCI rapporteurs meeting
10 – 14 January 2000

Tdoc U-00-046

CHANGE REQUEST No : **A014**

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

Technical Specification GSM 03.68 Version: 6.1.0

Submitted to SMG CN#7/SMG 3 for approval **X** without presentation ("non-strategic")

list SMG plenary meeting no. here ↑ for information with presentation ("strategic")

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 13.01.00

Subject: VGCS signalling flows

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	X
Release 98	
Release 99	

Reason for change: Errors and inconsistencies in signalling flow overview

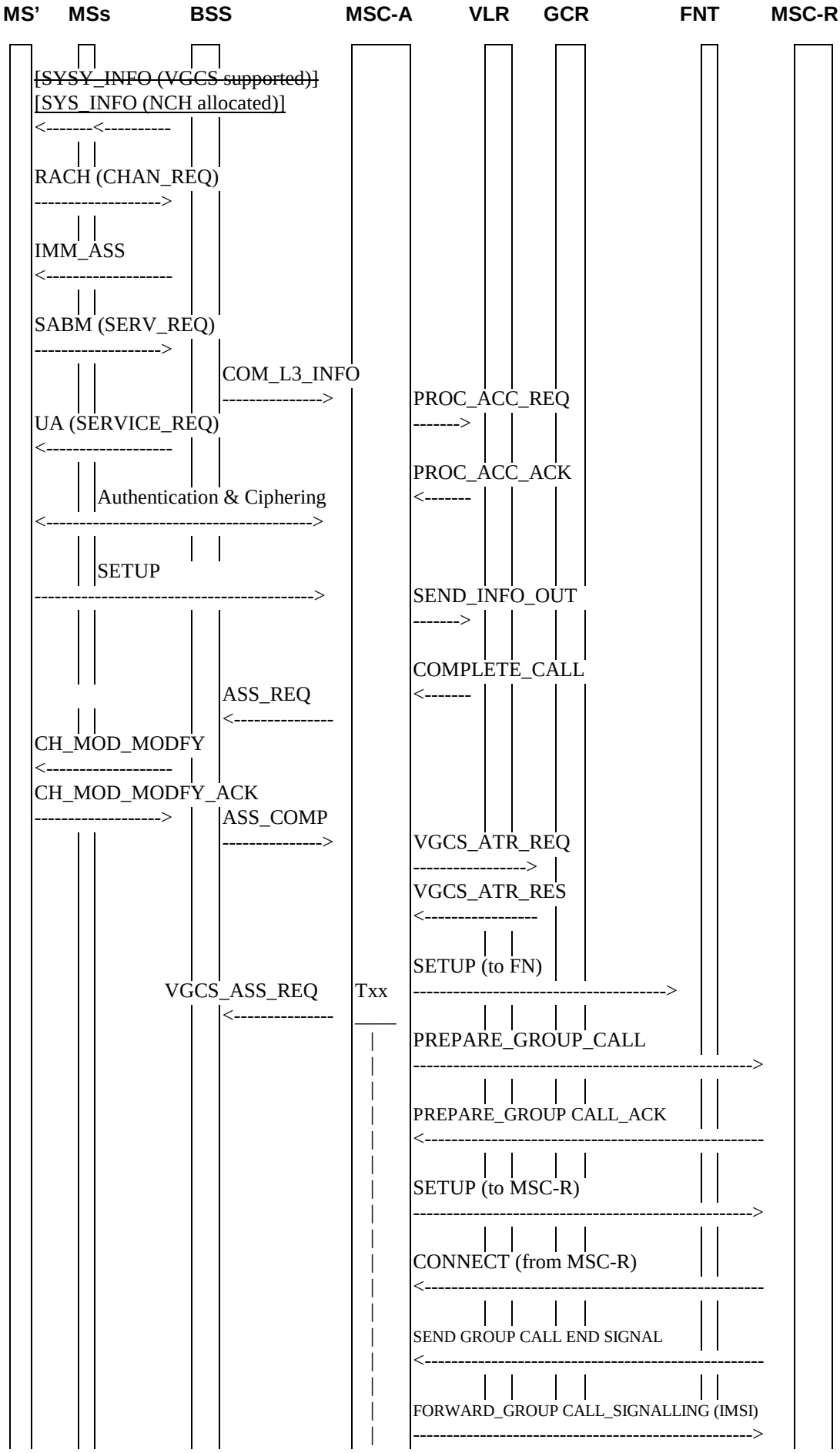
Clauses affected: 11.3.8 Overview of signalling

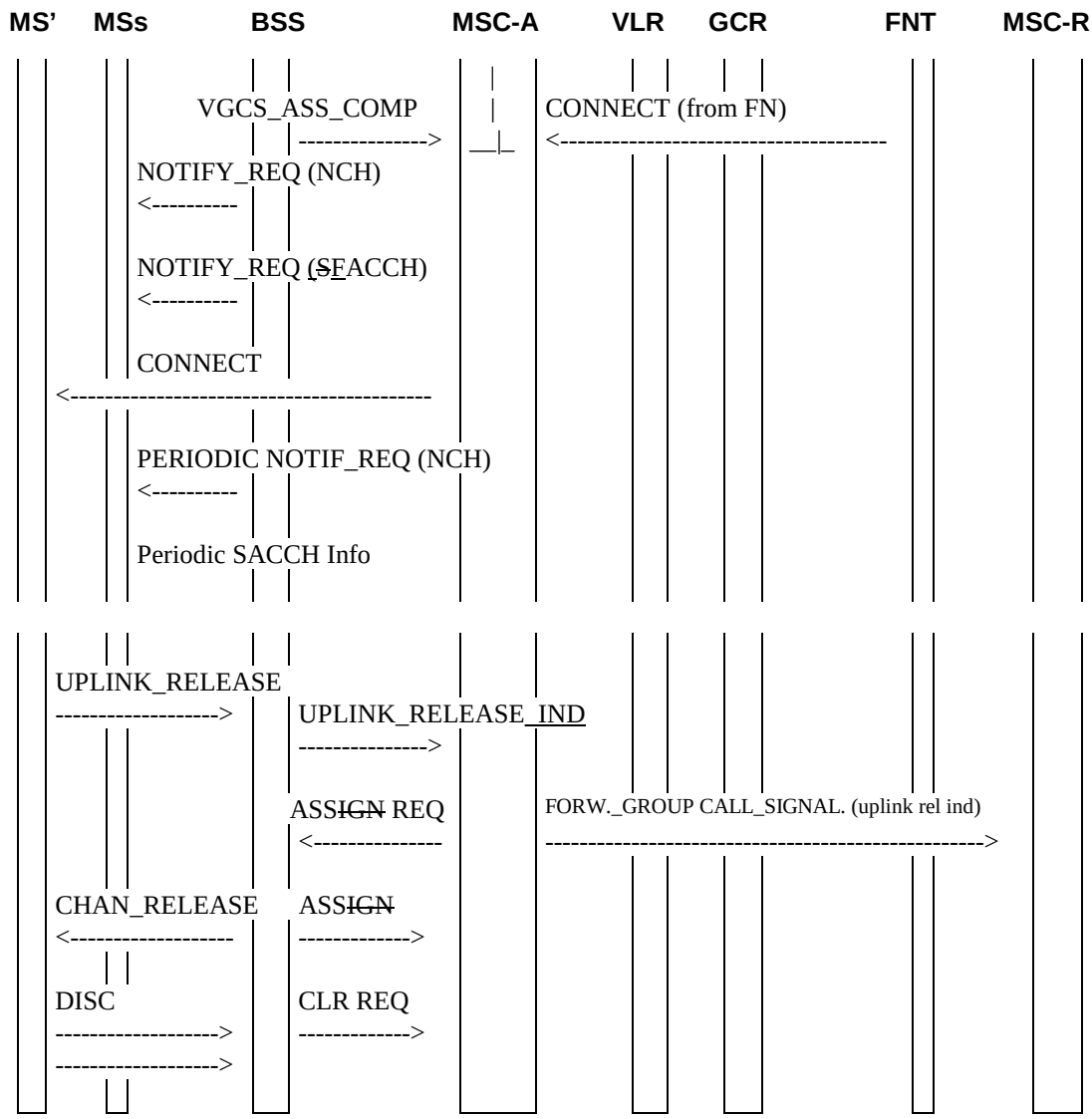
Other specs Affected:

Other releases of same spec		→ List of CRs:
Other core specifications		→ List of CRs:
MS test specifications / TBRs		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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


MS'
MSs
BSS
MSC-A
VLR
GCR
FNT
MSC-R
[SYSY_INFO (VGCS supported)]
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROC_ACC_REQ
UA (SERVICE_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to FN)
VGCS_ASS_REQ
Txx
PREPARE_GROUP_CALL
PREPARE_GROUP CALL_ACK
SETUP (to MSC-R)
CONNECT (from MSC-R)
SEND GROUP CALL END SIGNAL
FORWARD_GROUP CALL_SIGNALLING (IMSI)



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
FNT = fixed network user terminal;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 2: Signalling information required for establishing voice group calls by a service subscriber roaming in the anchor MSC area

SYS_INFO (NCH allocated~~VGCS supported~~): Message used to indicate if the NCH~~VGCS establishment~~ is allocated~~supported~~ on the CCCH in the cell ~~and if voice group call channels and the corresponding notification is supported in the cell~~.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 2: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication and Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 3: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 4: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 2.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information is returned from the GCR.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 5: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

SETUP to fixed network users: Based on the information determined about the users of external networks to be involved in the call, the MSC shall initiate calls to these users in the normal manner, depending on their mode of connection into the MSC, and shall connect them into the conference bridge. Alternatively normal calls to GSM subscribers may be established for dispatchers being GSM subscribers which is not presented in the diagram.

PREPARE_GROUP CALL: The group call attributes are sent to every relay MSC and a Group Call number for call set-up to is requested.

PREPARE_GROUP CALL ACK: The Group Call number for call set-up is returned to the anchor MSC.

SETUP to MSC-R: The ISUP connection is set-up to the relay MSC.

CONNECT from MSC-R: Set-up of the ISUP connection to the relay MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start.

FORWARD_GROUP CALL_SIGNALLING (IMSI): The IMSI of the service subscriber who has established the voice group call and who is allowed to terminate the call is sent to every relay MSC.

Txx: Timer implemented in the MSC which is started with the incoming VGCS SETUP message and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs and the CONNECT messages from the external networks and SEND_GROUP CALL_END_SIGNALs from the relay MSCs, the VGCS shall be established by the MSC to all available parts of the group call area.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (FACCH): Message for notification sent on the FACCH to the mobile stations currently involved in other calls. The notification on the FACCH shall include the group call reference, and the priority level and may also include the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on SACCH. This message may include:

- information of changes of notifications;
- information used for cell re-selection.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): This message is sent to every relay MSC to indicate that the uplink is free.

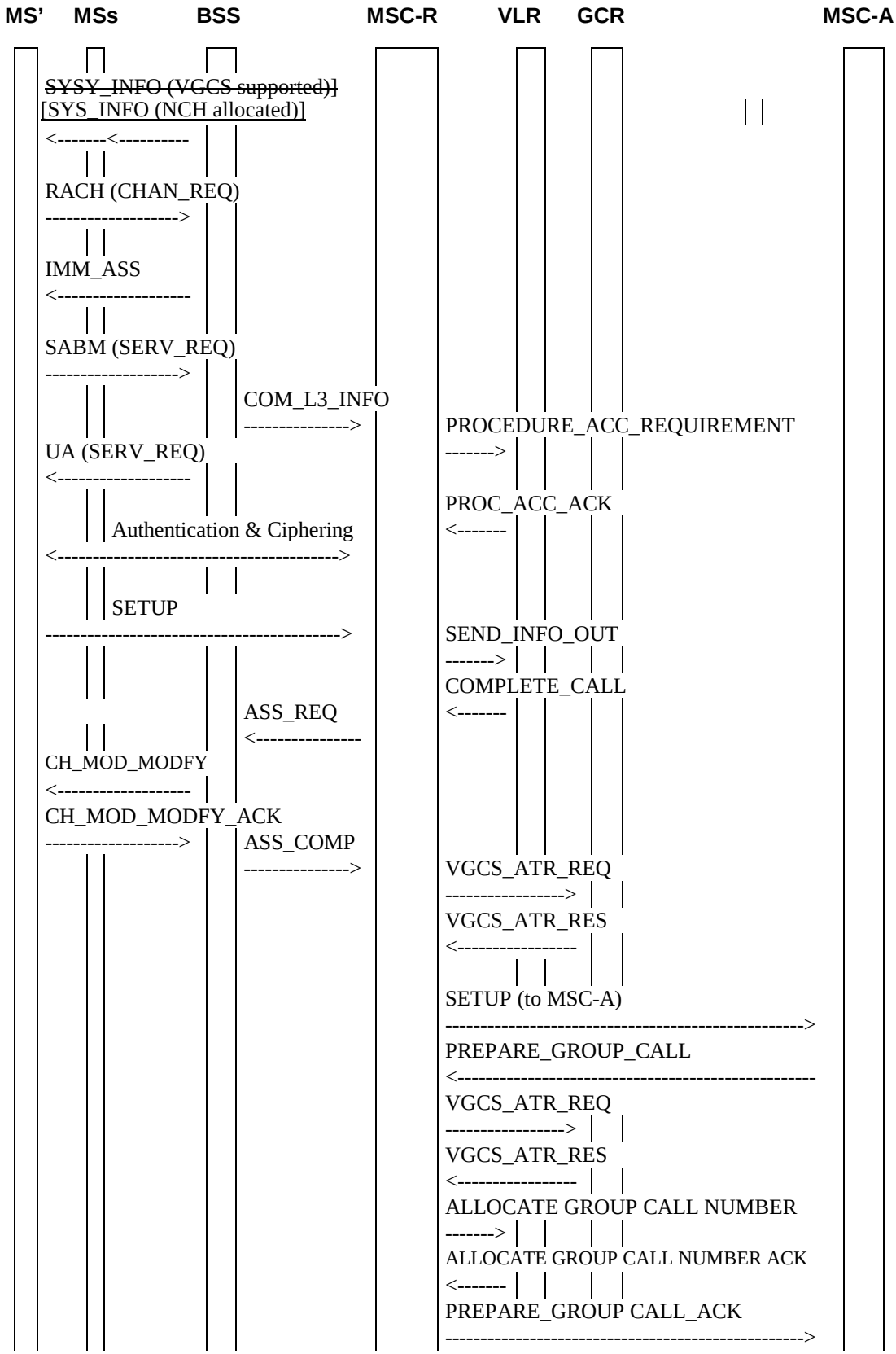
ASSIGNMENT REQUEST: The MSC requests the BSC to assign the mobile to a Group call channel to the calling service subscriber. The ASSIGNMENT REQUEST shall contain the group call reference.

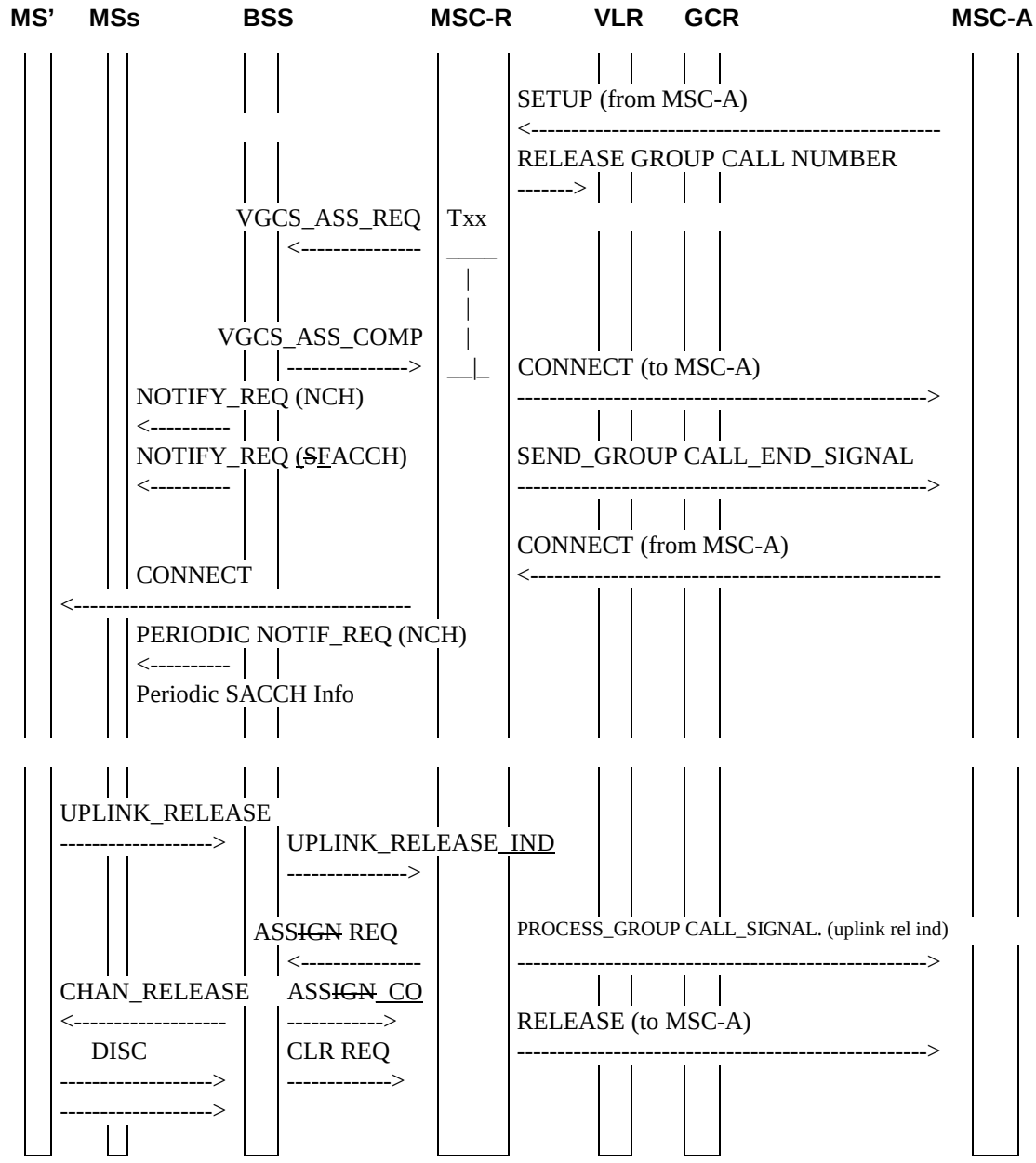
CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT– COMPLETE and CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 6: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.


MS'
MSs
BSS
MSC-R
VLR
GCR
MSC-A
~~SYSY_INFO (VGCS supported)]~~
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROCEDURE_ACC_REQUIREMENT
UA (SERV_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to MSC-A)
PREPARE_GROUP_CALL
VGCS_ATR_REQ
VGCS_ATR_RES
ALLOCATE GROUP CALL NUMBER
ALLOCATE GROUP CALL NUMBER ACK
PREPARE_GROUP CALL_ACK



NOTE: MS' = calling subscriber mobile station;
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MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 3: Signalling information required for establishing voice group calls by a service subscriber roaming in the relay MSC area

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SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 1: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication & Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 2: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 3: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 3.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (MSC-A address) is returned from the GCR.

SETUP to MSC-A: Based on information received from the GCR the relay MSC shall set-up a dedicated connection for the initiating service subscriber to the anchor MSC.

PREPARE_GROUP CALL: The group call attributes (parts) are received from the anchor MSC.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (cell list) is returned from the GCR.

ALLOCATE GROUP CALL NUMBER: The Group Call number is requested from the VLR.

ALLOCATE GROUP CALL NUMBER ACK: The Group Call number is returned from the VLR.

PREPARE_GROUP_CALL_ACK: The Group Call number is sent to MSC-A.

SETUP from MSC-A: The ISUP connection is set-up between MSC-A and MSC-R.

RELEASE GROUP CALL NUMBER: The VLR is requested to release the Group Call number.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [one dedicated message for every requested channel in a cell,] including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 4: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

CONNECT to MSC-A: Set-up of the ISUP connection from the anchor MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start. In addition the IMSI of service subscriber who has established the voice group call and who is allowed to terminate the call is included.

Txx: Timer implemented in the relay MSC which is started with the incoming SETUP message from the anchor MSC and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs, the VGCS shall be established by the relay MSC to all available parts of the group call area and the anchor MSC shall be informed that conversation can start.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (~~S~~FACCH): Message for notification sent on the ~~SACCH or~~ FACCH to the mobile stations currently involved in other calls. The notification on the ~~S~~FACCH shall include ~~only~~ the group call reference, and the priority level~~. The notification on the FACCH~~ and may include also the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on the downlink of the SACCH ~~or on the FACCH~~ informing mobile stations of:

- information of changes of notifications;
- information used for cell re-selection.
- ~~optional details of surrounding cells which may include the channel description of the BCCH and the voice group call channel in each surrounding cell of the group call area or of the group call area inside the same BSC area and other information used for cell re-selection;~~
- ~~whether the group call uplink is free;~~
- ~~notifications or paging information messages on other calls in the cell.~~

CONNECT (from MSC-A): Call set-up of the dedicated connection for the calling service subscriber is confirmed.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): To indicate to the anchor MSC that the uplink is free.

ASSIGNMENT_REQUEST: The MSC requests the BSC to assign a Group call channel to the calling service subscriber. The ASSIGNMENT_REQUEST shall contain the group call reference.

CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT_COMPLETE & CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 5: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.

RELEASE to MSC-A: The dedicated connection for the initiating service subscriber is released.

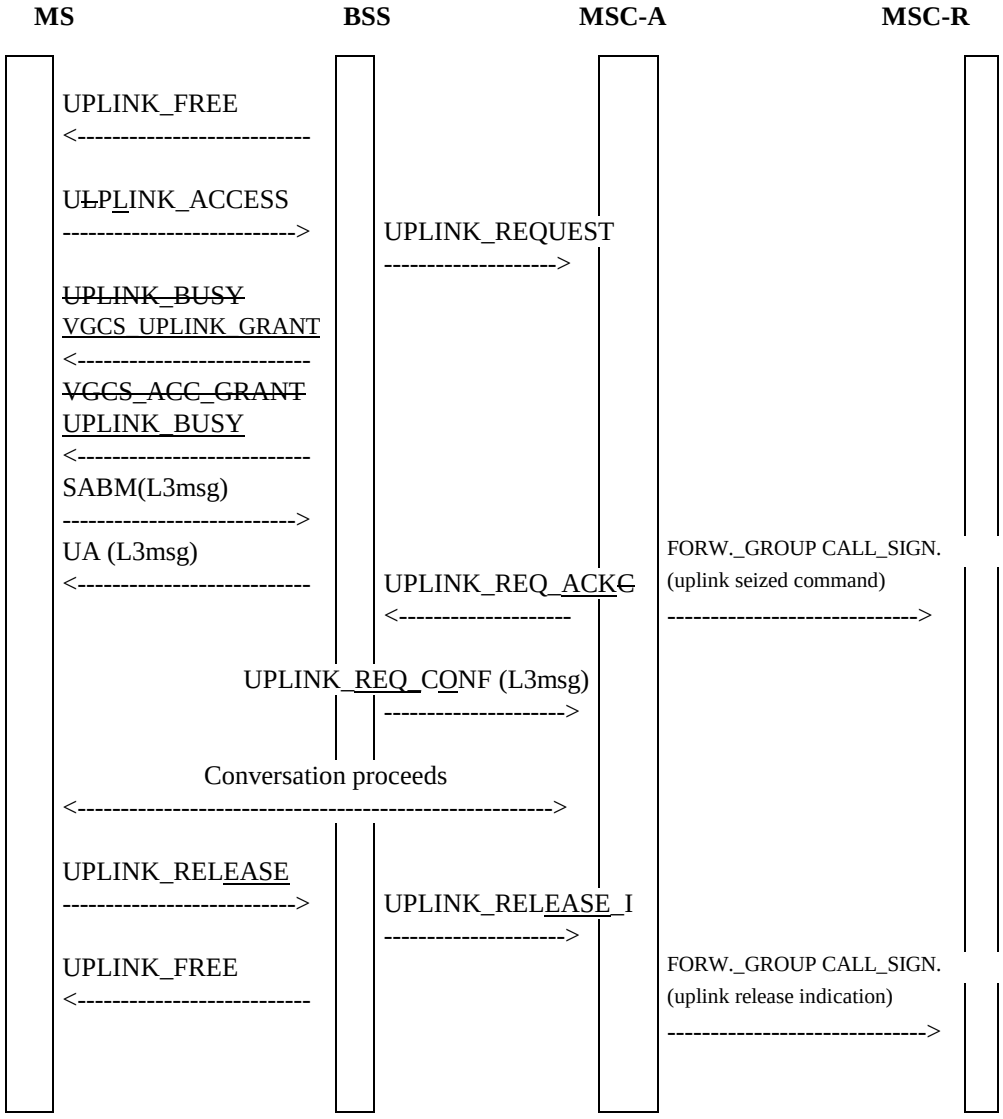

Figure 4: Signalling information required for the voice group call uplink access in the anchor MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

UPLINK_BUSY: This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.

NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM(L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA(L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

UPLINK_REQUEST_~~CONFIRM~~ACKNOWLEDGE: The anchor MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC or MSC-R, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 4. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 4. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

FORWARD_GROUP CALL_SIGNALLING (uplink seized command): This message is sent to all relay MSCs, to inform all mobile stations roaming in parts of the group call area which are controlled by relay MSCs, that the uplink is now busy.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): The anchor MSC indicates to all relay MSCs that the uplink is free. On receipt of the uplink free indication the relay MSC shall send an UPLINK RELEASE message to every BSS of the group call area to indicate that the uplink free.

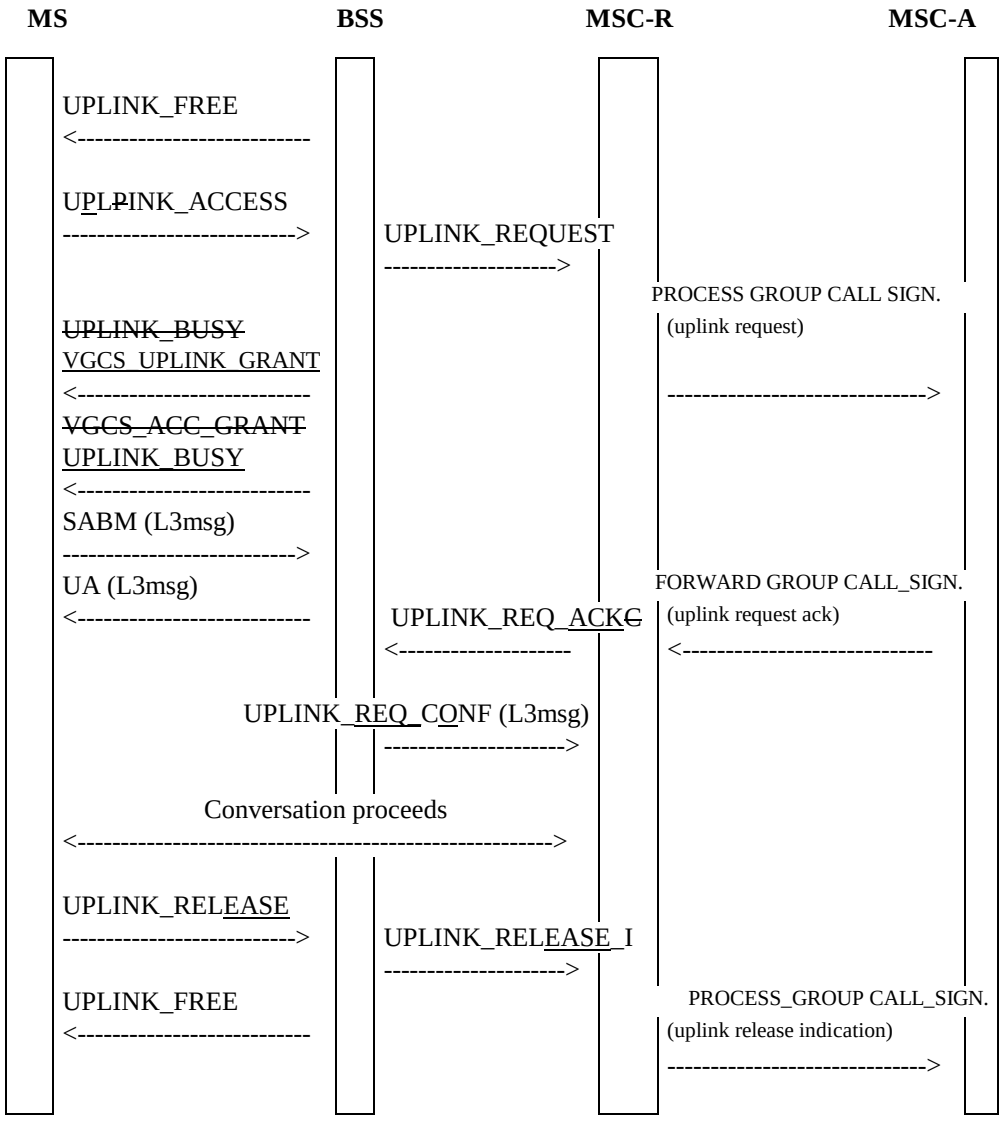

Figure 5: Signalling information required for the voice group call uplink access in the relay MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

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NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM (L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA (L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

PROCESS_GROUP CALL_SIGNALLING (uplink request): This message is sent to the anchor MSC, to indicate that the uplink is requested by a subscriber roaming in the relay MSC area.

FORWARD_GROUP CALL_SIGNALLING (uplink request ack): This message is sent to the relay MSC, to indicate that the uplink is granted to the mobile station roaming in parts of the group call area which are controlled by relay MSC.

UPLINK_REQUEST_ACKNOWLEDGE~~CONFIRM~~: The relay MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 5. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 5. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): The relay MSC indicates to the anchor MSC that the uplink is free.

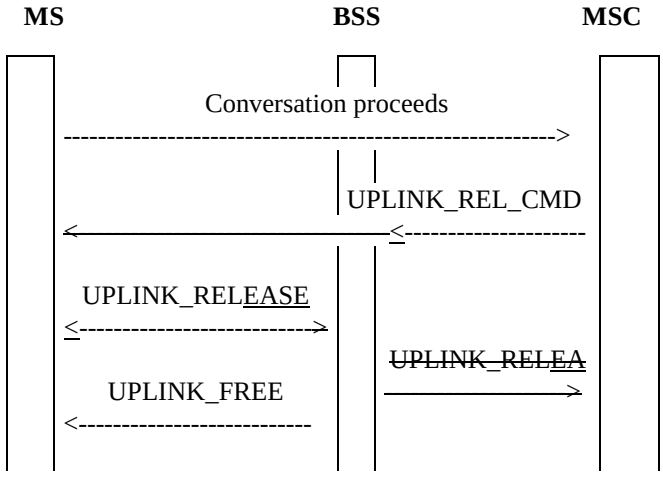

Figure 6: Signalling information required for the voice group call uplink release requested by the network

UPLINK_REL_CMD: When the network wants to release the uplink for any reason then a message requesting release of the uplink is required to be sent from the network to the mobile station on the FACCH.

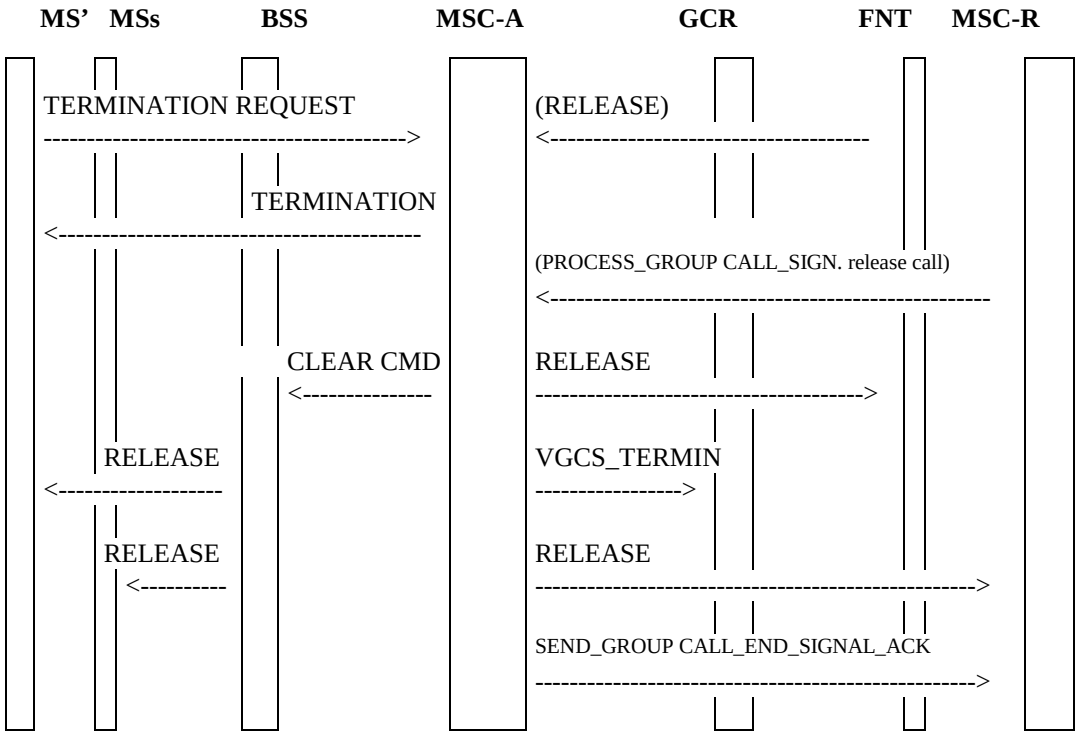

Figure 7: Signalling required to disconnect the group call

TERMINATION REQUEST: An authorized mobile station can send a TERMINATION REQUEST message to clear down the entire voice group call. To do this, the mobile station must have access to the uplink. The network has to check the IMSI to verify the calling subscriber. If the IMSI of the mobile station which has uplink access is presently not known to the network, the network shall send an identity request to the mobile station. Alternatively an authorized dispatcher can terminate the voice group call in which case a RELEASE message is received from the external network. Alternatively an authorized mobile station currently served by a relay MSC can clear down the entire group call in which case a PROCESS_GROUP CALL_SIGNALLING message indicating call release is received from the relay MSC.

CLEAR CMD: This message is sent from the MSC to all related cells to disconnect calls from the conference bridge and stop all periodic notifications for the voice group call to be released.

VGCS_TERMIN: The MSC informs the GCR that the voice group call with the related group call reference is terminated.

RELEASE: RELEASE messages are sent on all downlink FACCH to the service subscribers. The RELEASE messages shall be repeated for a predefined period in order to provide a high probability that the listening mobile stations receive the message.

In addition, RELEASE messages are sent to all related dispatchers and relay MSCs.

SEND_GROUP CALL_END_SIGNAL_ACK: The dialogues to all relay MSCs are closed.

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Tdoc U-00-031

CHANGE REQUEST No :	**A015**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.68	Version:	6.1.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 11.01.00

Subject: Data Flow for Fast Call setup

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

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

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R98 and R99.
Other core specifications	X	→ List of CRs:	24.08 (CR A101 to 04.08)
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 8~~7~~.

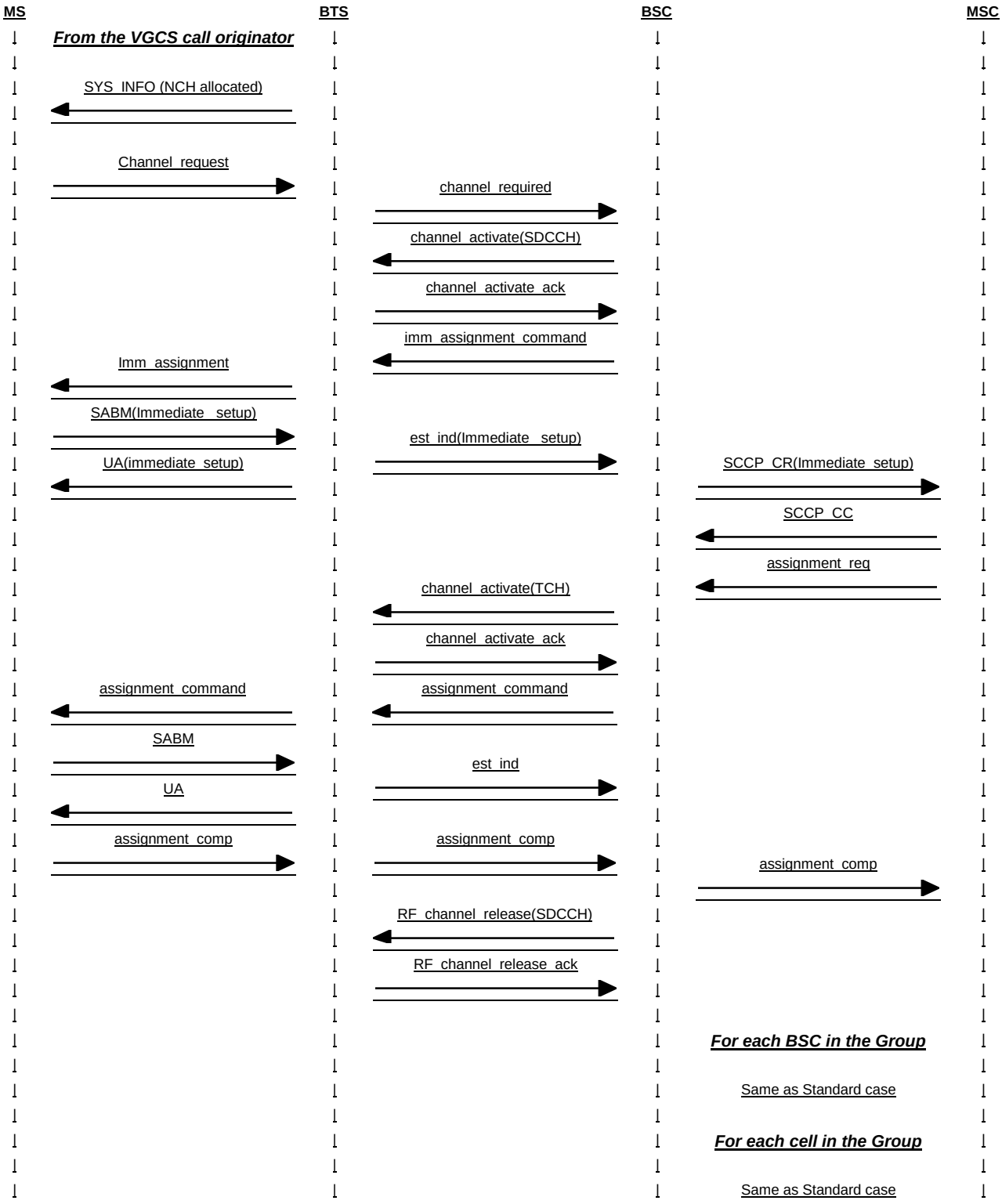

Figure 8: Signalling information required for establishing voice group calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

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IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the voice group call is sent by the MS to the network in order to set-up a group call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

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Tdoc N1-000428

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10. January – 14. January 2000

Tdoc U-00-032

CHANGE REQUEST No : **A013**

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

Technical Specification GSM 03.69 Version: 6.1.0

Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 11.01.00

Subject: Data Flow for Fast Call setup

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	X
Release 98	
Release 99	

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R98 and R99.
Other core specifications	X	→ List of CRs:	24.08 (CR A101 to 04.08)
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 54.

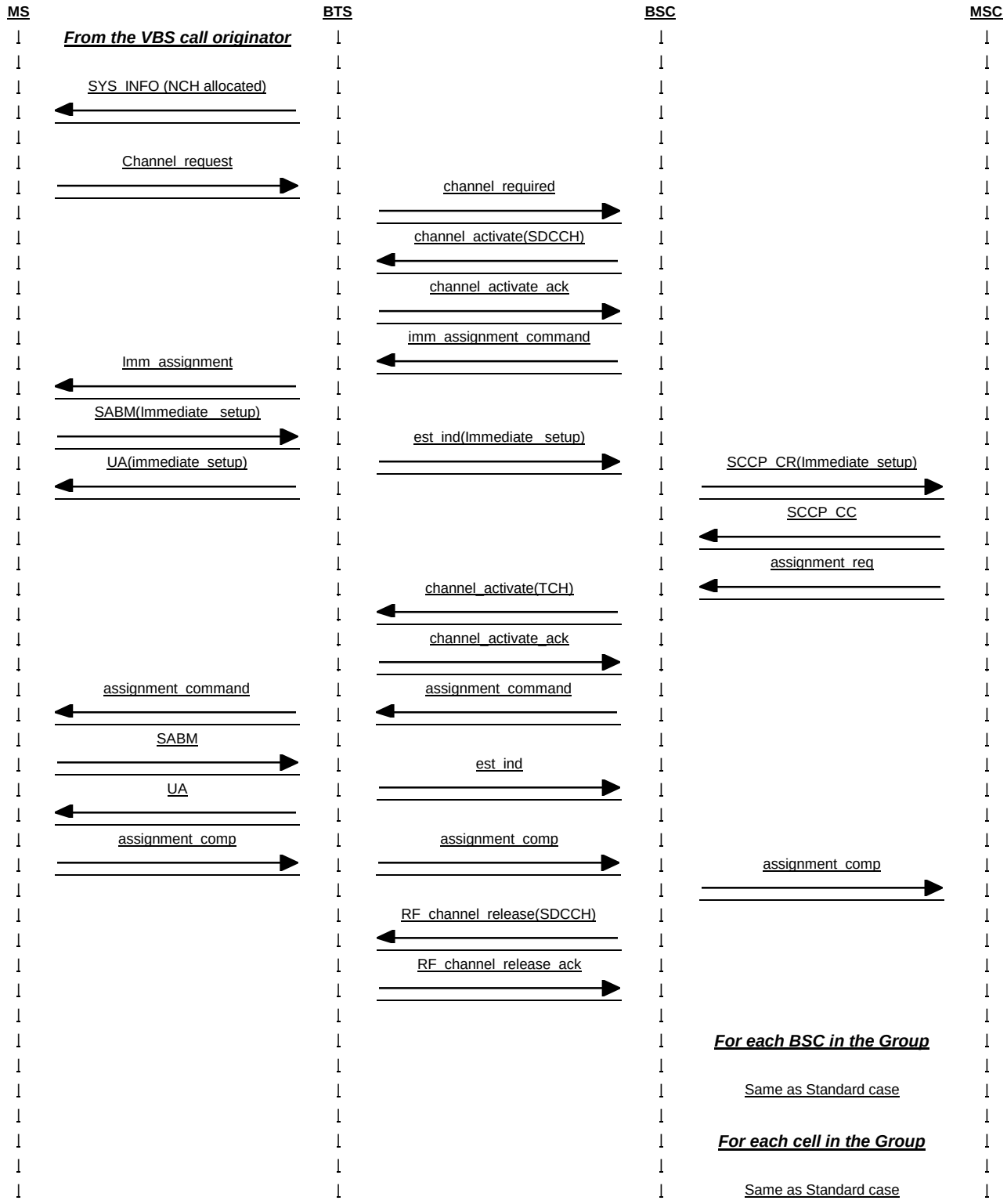

Figure 5: Signalling information required for establishing voice broadcast calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the broadcast call is sent by the MS to the network in order to set-up a broadcast call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE_ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

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Tdoc N1-000429

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Tdoc U-00-006

CHANGE REQUEST No :	**A021**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	04.68	Version:	5.4.0		
Submitted to SMG	CN#7/SMG 3	for approval	**X**	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 05.11.99

Subject: Addition of cause values.

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

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:				
	Other releases of same spec	**X**	→ List of CRs:	R97, R98 and R99.
	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

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

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

This field contains the 7 bit encoding (with leading zeroes) of a non-negative integer which specifies a cause as defined below:

N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

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CHANGE REQUEST No :	**A018**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	04.69	Version:	5.4.0		
Submitted to SMG	CN#7/SMG 3	for approval	**X**	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 05.11.99

Subject: Addition of cause values

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

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:				
	Other releases of same spec	**X**	→ List of CRs:	R97, R98 and R99.
	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

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

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

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8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

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Tdoc U-00-041

CHANGE REQUEST No : **A1001**

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

Technical Specification GSM 04.08 Version: 6.7.0

Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 12.01.00

Subject: Addition of cause value # 25 'Pre-emption'

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

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

Reason for change: GSM 03.67 states that the RELEASE COMPLETE message is sent in the standard way to the called party with a new cause for pre-emption. Thus a new cause value is required for this scenario. The new cause value 25 fits best with cause class and default value 31.

Clauses affected: 10 table 10.5.123 and Annex H

Other specs Affected:

Other releases of same spec	X	→ List of CRs:	R98 and R99
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ 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.

Table 10.5.123/GSM 04.08: Cause information element values

Cause value								Cause num.	Cause	Diagnostic	Remarks
7	6	5	4	3	2	1					
0	0	0	0	0	0	1		1.	Unassigned (unallocated) number	Note 9	
0	0	0	0	0	1	1		3.	No route to destination	Note 9	
0	0	0	0	1	1	0		6.	Channel unacceptable	-	
0	0	0	1	0	0	0		8.	Operator determined barring	-	
0	0	1	0	0	0	0		16.	Normal call clearing	Note 9	
0	0	1	0	0	0	1		17.	User busy	Note 1	
0	0	1	0	0	1	0		18.	No user responding	-	
0	0	1	0	0	1	1		19.	User alerting, no answer	-	
0	0	1	0	1	0	1		21.	Call rejected	Note 9 - user supplied diagnostic (note 4)	
0	0	1	0	1	1	0		22.	Number changed	New destination (note 5)	
0	0	1	1	0	0	1		25	Pre-emption		
0	0	1	1	0	1	0		26.	Non selected user clearing	-	
0	0	1	1	0	1	1		27.	Destination out of order	-	
0	0	1	1	1	0	0		28.	Invalid number format (incomplete number)	-	
0	0	1	1	1	0	1		29.	Facility rejected	Note 1	
0	0	1	1	1	1	0		30.	Response to STATUS ENQUIRY	-	
0	0	1	1	1	1	1		31.	Normal, unspecified	-	
0	1	0	0	0	1	0		34.	No circuit/channel available	Note 1	
0	1	0	0	1	1	0		38.	Network out of order	-	
0	1	0	1	0	0	1		41.	Temporary failure	-	
0	1	0	1	0	1	0		42.	Switching equipment congestion	-	
0	1	0	1	0	1	1		43.	Access information discarded	Discarded information element identifiers (note 6)	
0	1	0	1	1	0	0		44.	requested circuit/channel not available	-	
0	1	0	1	1	1	1		47.	Resources unavailable, unspecified	-	
0	1	1	0	0	0	1		49.	Quality of service unavailable	Note 9	
0	1	1	0	0	1	0		50.	Requested facility not subscribed	Note 1	
0	1	1	0	1	1	1		55.	Incoming calls barred within the CUG	Note 1	
0	1	1	1	0	0	1		57.	Bearer capability not authorized	Note 3	
0	1	1	1	0	1	0		58.	Bearer capability not presently available	Note 3	
0	1	1	1	1	1	1		63.	Service or option not available, unspecified	-	
1	0	0	0	0	0	1		65.	Bearer service not implemented	Note 3	

(continued...)

********* next modified section *****

Annex H (informative): GSM specific cause values for call control

This annex is informative.

H.1 Normal class

H.1.1 Cause No. 1 "unassigned (unallocated) number"

This cause indicates that the destination requested by the mobile station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

H.1.2 Cause No. 3 "no route to destination"

This cause indicates that the called user cannot be reached because the network through which the call has been routed does not serve the destination desired.

H.1.3 Cause No. 6 "channel unacceptable"

This cause indicates the channel most recently identified is not acceptable to the sending entity for use in this call.

H.1.4 Cause No. 8 "operator determined barring"

This cause indicates that the MS has tried to access a service that the MS's network operator or service provider is not prepared to allow.

H.1.5 Cause No.16 "normal call clearing"

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared.

Under normal situations, the source of this cause is not the network.

H.1.6 Cause No.17 "user busy"

This cause is used when the called user has indicated the inability to accept another call.

It is noted that the user equipment is compatible with the call.

H.1.7 Cause No. 18 "no user responding"

This cause is used when a user does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated (defined by the expiry of either timer T303 or T310).

H.1.8 Cause No. 19 "user alerting, no answer"

This cause is used when a user has provided an alerting indication but has not provided a connect indication within a prescribed period of time.

H.1.9 Cause No. 21 "call rejected"

This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible.

H.1.10 Cause No. 22 "number changed"

This cause is returned to a calling mobile station when the called party number indicated by the calling mobile station is no longer assigned. The new called party number may optionally be included in the diagnostic field. If a network does not support this capability, cause No. 1 "unassigned (unallocated) number" shall be used.

H.1.11 Cause No. 25 “pre-emption”

This cause is returned to the network when a mobile station clears an active call which is being pre-empted by another call with higher precedence.

H.1.~~11~~12 Cause No. 26 "non-selected user clearing"

Not supported. Treated as cause no. 31.

H.1.~~12~~13 Cause No. 27 "destination out of order"

This cause indicates that the destination indicated by the mobile station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signalling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.

H.1.~~13~~14 Cause No. 28 "invalid number format (incomplete number)"

This cause indicates that the called user cannot be reached because the called party number is not a valid format or is not complete.

H.1.~~14~~15 Cause No. 29 "facility rejected"

This cause is returned when a facility requested by user can not be provided by the network.

H.1.~~15~~16 Cause No. 30 "response to STATUS ENQUIRY"

This cause is included in STATUS messages if the message is sent in response to a STATUS ENQUIRY message. See also section 5.5.3.

H.1.~~16~~17 Cause No. 31 "normal, unspecified"

This cause is used to report a normal event only when no other cause in the normal class applies.

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CHANGE REQUEST No : **A016** *Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM 03.68 Version: 7.0.0

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [ ] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: VGCS signalling flows

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

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

Reason for change: Errors and inconsistencies in signalling flow overview

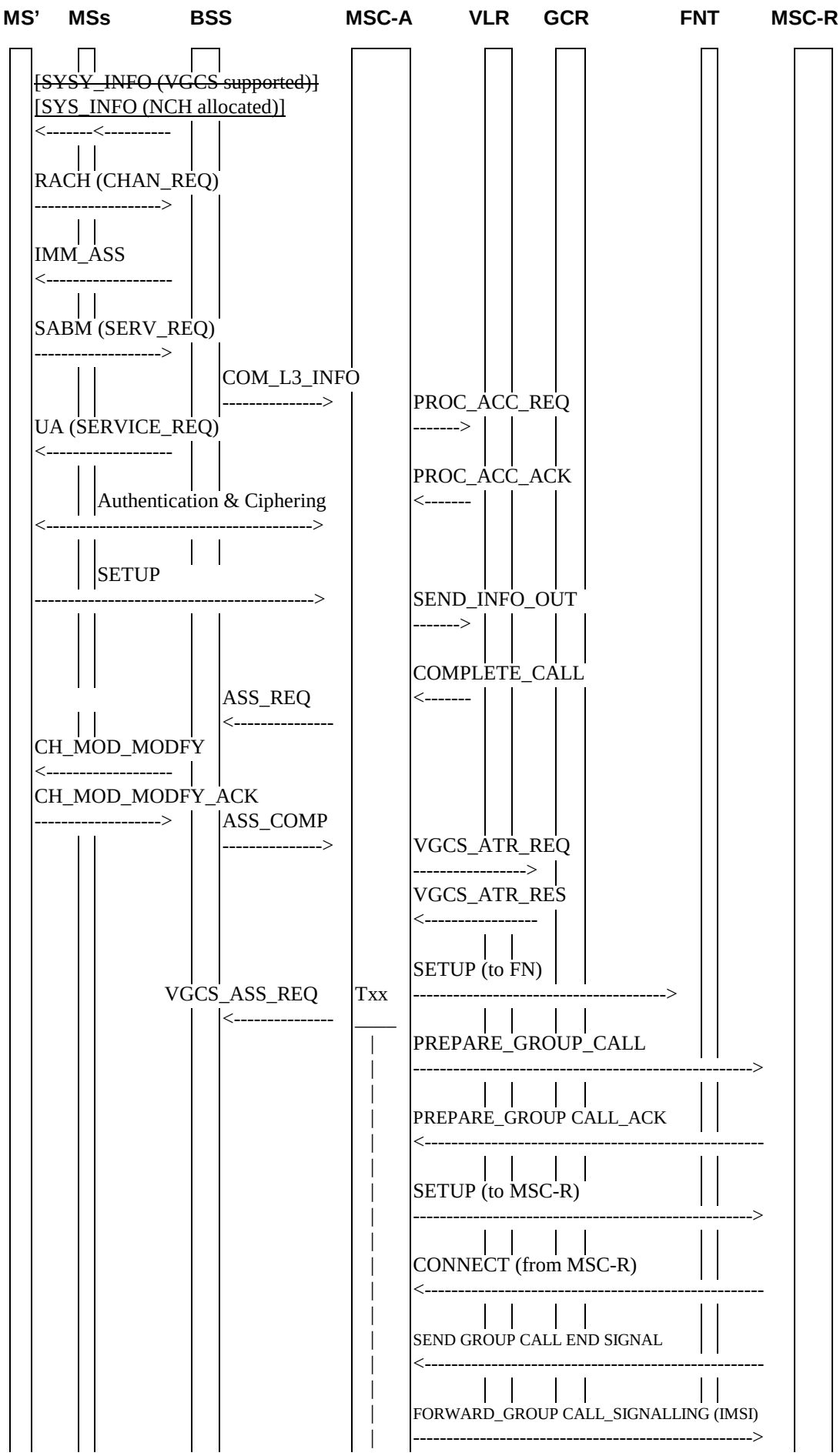
Clauses affected: 11.3.8 Overview of signalling

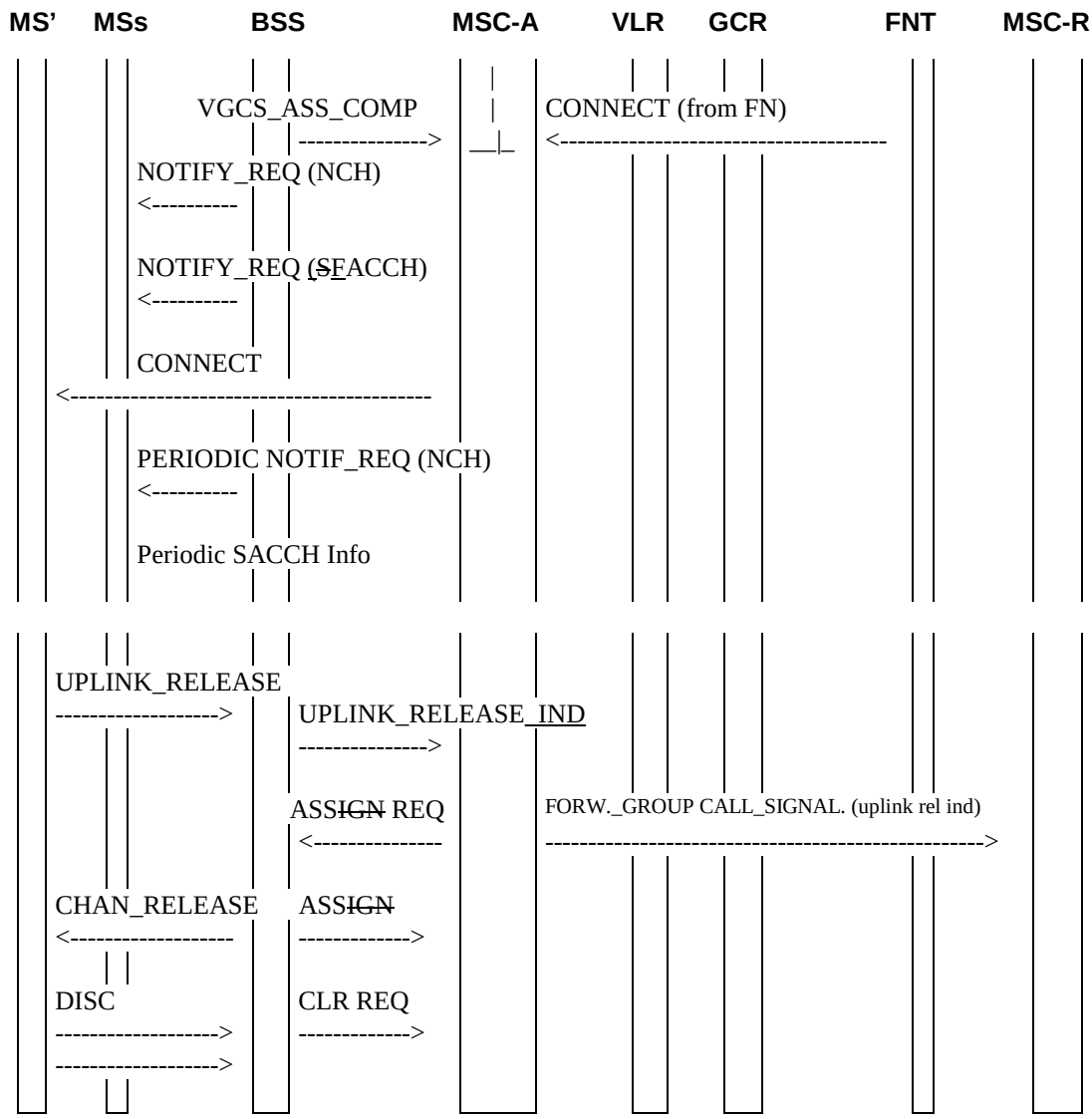
Other specs Affected:

Other releases of same spec	[ ]	→ List of CRs:	R97 A014
Other core specifications	[ ]	→ List of CRs:	
MS test specifications / TBRs	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

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


MS'
MSs
BSS
MSC-A
VLR
GCR
FNT
MSC-R
[SYSY_INFO (VGCS supported)]
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROC_ACC_REQ
UA (SERVICE_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to FN)
VGCS_ASS_REQ
Txx
PREPARE_GROUP_CALL
PREPARE_GROUP CALL_ACK
SETUP (to MSC-R)
CONNECT (from MSC-R)
SEND GROUP CALL END SIGNAL
FORWARD_GROUP CALL_SIGNALLING (IMSI)



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
FNT = fixed network user terminal;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 2: Signalling information required for establishing voice group calls by a service subscriber roaming in the anchor MSC area

SYS_INFO (NCH allocated~~VGCS supported~~): Message used to indicate if the NCH~~VGCS establishment~~ is allocated~~supported~~ on the CCCH in the cell ~~and if voice group call channels and the corresponding notification is supported in the cell~~.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 2: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication and Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 3: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 4: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 2.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information is returned from the GCR.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 5: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

SETUP to fixed network users: Based on the information determined about the users of external networks to be involved in the call, the MSC shall initiate calls to these users in the normal manner, depending on their mode of connection into the MSC, and shall connect them into the conference bridge. Alternatively normal calls to GSM subscribers may be established for dispatchers being GSM subscribers which is not presented in the diagram.

PREPARE_GROUP CALL: The group call attributes are sent to every relay MSC and a Group Call number for call set-up to is requested.

PREPARE_GROUP CALL ACK: The Group Call number for call set-up is returned to the anchor MSC.

SETUP to MSC-R: The ISUP connection is set-up to the relay MSC.

CONNECT from MSC-R: Set-up of the ISUP connection to the relay MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start.

FORWARD_GROUP CALL_SIGNALLING (IMSI): The IMSI of the service subscriber who has established the voice group call and who is allowed to terminate the call is sent to every relay MSC.

Txx: Timer implemented in the MSC which is started with the incoming VGCS SETUP message and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs and the CONNECT messages from the external networks and SEND_GROUP CALL_END_SIGNALs from the relay MSCs, the VGCS shall be established by the MSC to all available parts of the group call area.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (FACCH): Message for notification sent on the FACCH to the mobile stations currently involved in other calls. The notification on the FACCH shall include the group call reference, and the priority level and may also include the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on SACCH. This message may include:

- information of changes of notifications;
- information used for cell re-selection.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): This message is sent to every relay MSC to indicate that the uplink is free.

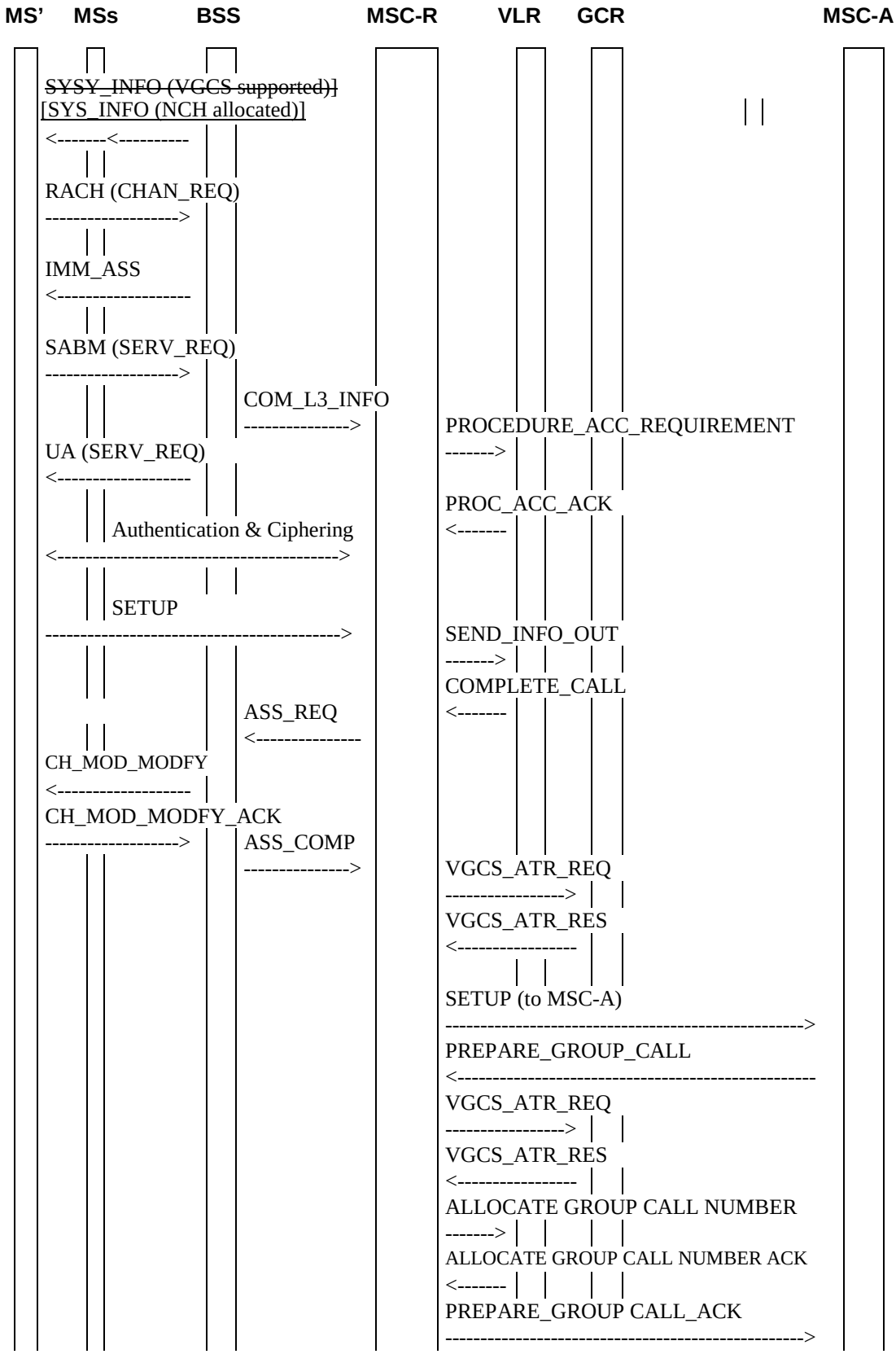
ASSIGNMENT REQUEST: The MSC requests the BSC to assign the mobile to a Group call channel to the calling service subscriber. The ASSIGNMENT REQUEST shall contain the group call reference.

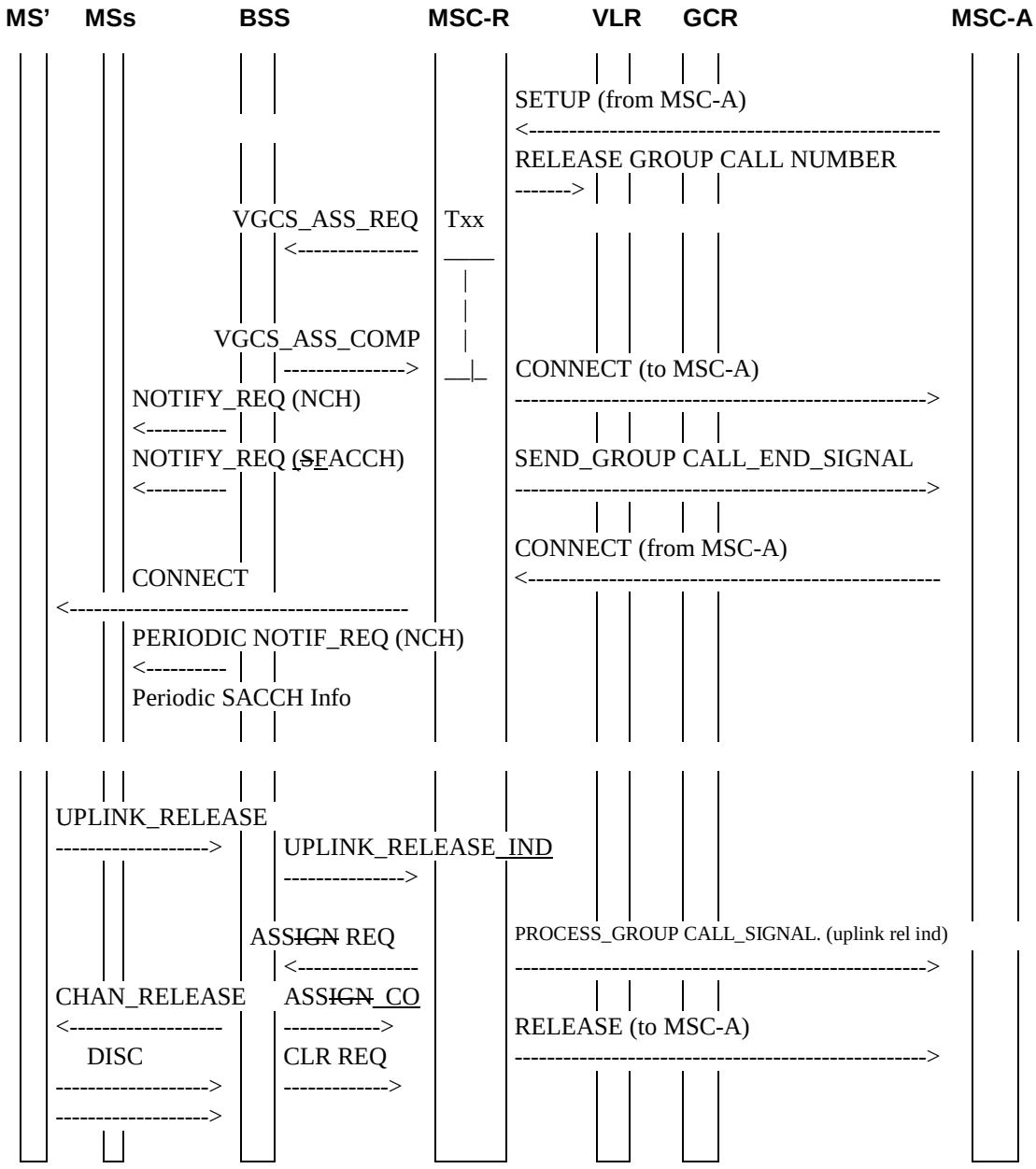
CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT– COMPLETE and CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 6: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.


MS'
MSs
BSS
MSC-R
VLR
GCR
MSC-A
~~SYSY_INFO (VGCS supported)]~~
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROCEDURE_ACC_REQUIREMENT
UA (SERV_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to MSC-A)
PREPARE_GROUP_CALL
VGCS_ATR_REQ
VGCS_ATR_RES
ALLOCATE GROUP CALL NUMBER
ALLOCATE GROUP CALL NUMBER ACK
PREPARE_GROUP CALL_ACK



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 3: Signalling information required for establishing voice group calls by a service subscriber roaming in the relay MSC area

SYS_INFO (NCH allocated~~VGCS supported~~): Message used to indicate if the NCH~~VGCS establishment~~ is allocated~~supported~~ on the CCCH in the cell~~ and if voice group call channels and the corresponding notification is supported in the cell~~.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 1: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication & Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 2: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 3: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 3.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (MSC-A address) is returned from the GCR.

SETUP to MSC-A: Based on information received from the GCR the relay MSC shall set-up a dedicated connection for the initiating service subscriber to the anchor MSC.

PREPARE_GROUP CALL: The group call attributes (parts) are received from the anchor MSC.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (cell list) is returned from the GCR.

ALLOCATE GROUP CALL NUMBER: The Group Call number is requested from the VLR.

ALLOCATE GROUP CALL NUMBER ACK: The Group Call number is returned from the VLR.

PREPARE_GROUP_CALL_ACK: The Group Call number is sent to MSC-A.

SETUP from MSC-A: The ISUP connection is set-up between MSC-A and MSC-R.

RELEASE GROUP CALL NUMBER: The VLR is requested to release the Group Call number.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [one dedicated message for every requested channel in a cell,] including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 4: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

CONNECT to MSC-A: Set-up of the ISUP connection from the anchor MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start. In addition the IMSI of service subscriber who has established the voice group call and who is allowed to terminate the call is included.

Txx: Timer implemented in the relay MSC which is started with the incoming SETUP message from the anchor MSC and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs, the VGCS shall be established by the relay MSC to all available parts of the group call area and the anchor MSC shall be informed that conversation can start.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (~~S~~FACCH): Message for notification sent on the ~~SACCH or~~ FACCH to the mobile stations currently involved in other calls. The notification on the ~~S~~FACCH shall include ~~only~~ the group call reference, and the priority level~~. The notification on the FACCH~~ and may include also the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on the downlink of the SACCH ~~or on the FACCH~~ informing mobile stations of:

- information of changes of notifications;
- information used for cell re-selection.
- ~~optional details of surrounding cells which may include the channel description of the BCCH and the voice group call channel in each surrounding cell of the group call area or of the group call area inside the same BSC area and other information used for cell re-selection;~~
- ~~whether the group call uplink is free;~~
- ~~notifications or paging information messages on other calls in the cell.~~

CONNECT (from MSC-A): Call set-up of the dedicated connection for the calling service subscriber is confirmed.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): To indicate to the anchor MSC that the uplink is free.

ASSIGNMENT_REQUEST: The MSC requests the BSC to assign a Group call channel to the calling service subscriber. The ASSIGNMENT_REQUEST shall contain the group call reference.

CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT_COMPLETE & CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 5: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.

RELEASE to MSC-A: The dedicated connection for the initiating service subscriber is released.

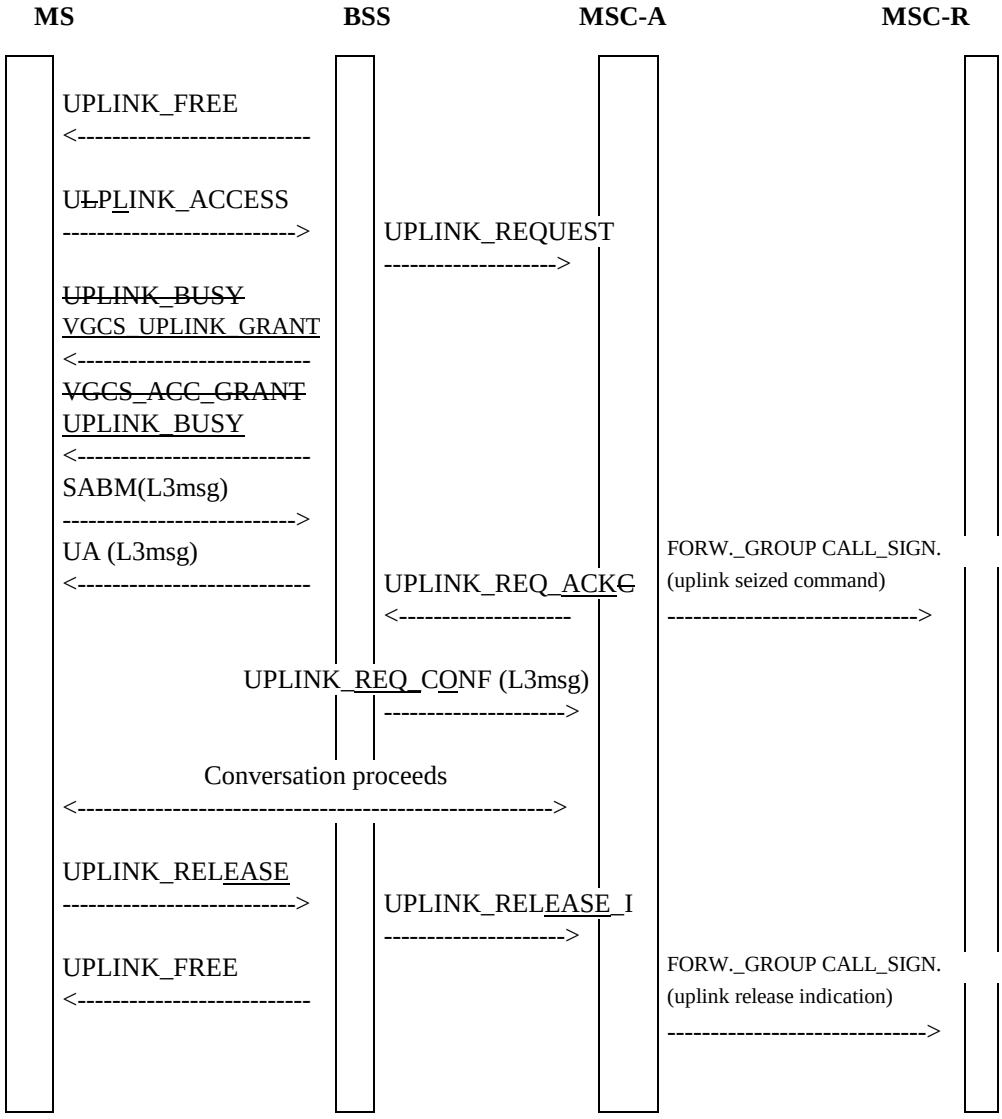


Figure 4: Signalling information required for the voice group call uplink access in the anchor MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

UPLINK_BUSY: This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.

NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM(L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA(L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

UPLINK_REQUEST_~~CONFIRM~~ACKNOWLEDGE: The anchor MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC or MSC-R, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 4. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 4. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

FORWARD_GROUP CALL_SIGNALLING (uplink seized command): This message is sent to all relay MSCs, to inform all mobile stations roaming in parts of the group call area which are controlled by relay MSCs, that the uplink is now busy.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): The anchor MSC indicates to all relay MSCs that the uplink is free. On receipt of the uplink free indication the relay MSC shall send an UPLINK RELEASE message to every BSS of the group call area to indicate that the uplink free.

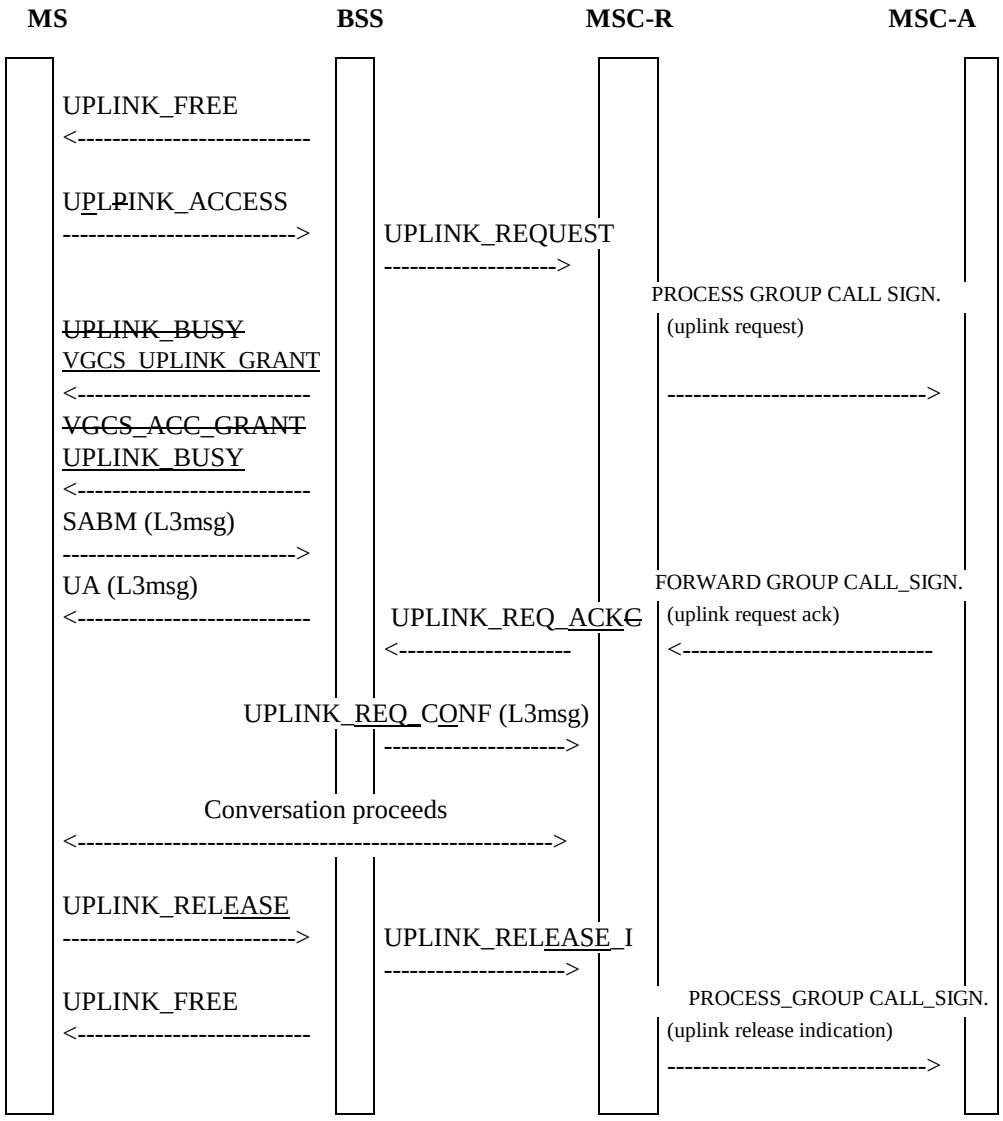


Figure 5: Signalling information required for the voice group call uplink access in the relay MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

UPLINK_BUSY: This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.

NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM (L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA (L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

PROCESS_GROUP CALL_SIGNALLING (uplink request): This message is sent to the anchor MSC, to indicate that the uplink is requested by a subscriber roaming in the relay MSC area.

FORWARD_GROUP CALL_SIGNALLING (uplink request ack): This message is sent to the relay MSC, to indicate that the uplink is granted to the mobile station roaming in parts of the group call area which are controlled by relay MSC.

UPLINK_REQUEST_ACKNOWLEDGE~~CONFIRM~~: The relay MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 5. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 5. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): The relay MSC indicates to the anchor MSC that the uplink is free.

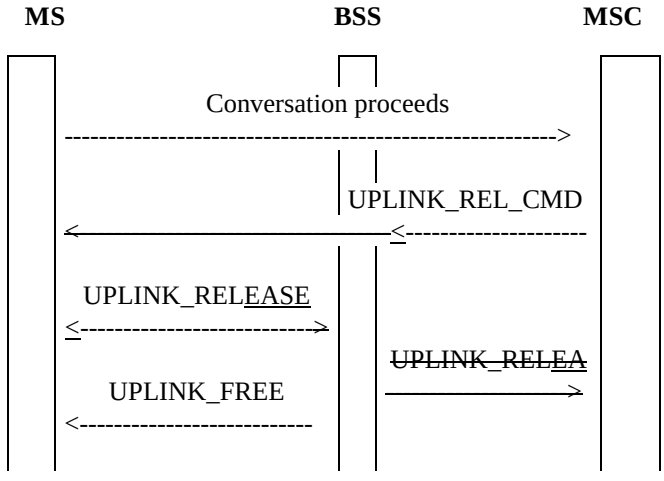


Figure 6: Signalling information required for the voice group call uplink release requested by the network

UPLINK_REL_CMD: When the network wants to release the uplink for any reason then a message requesting release of the uplink is required to be sent from the network to the mobile station on the FACCH.

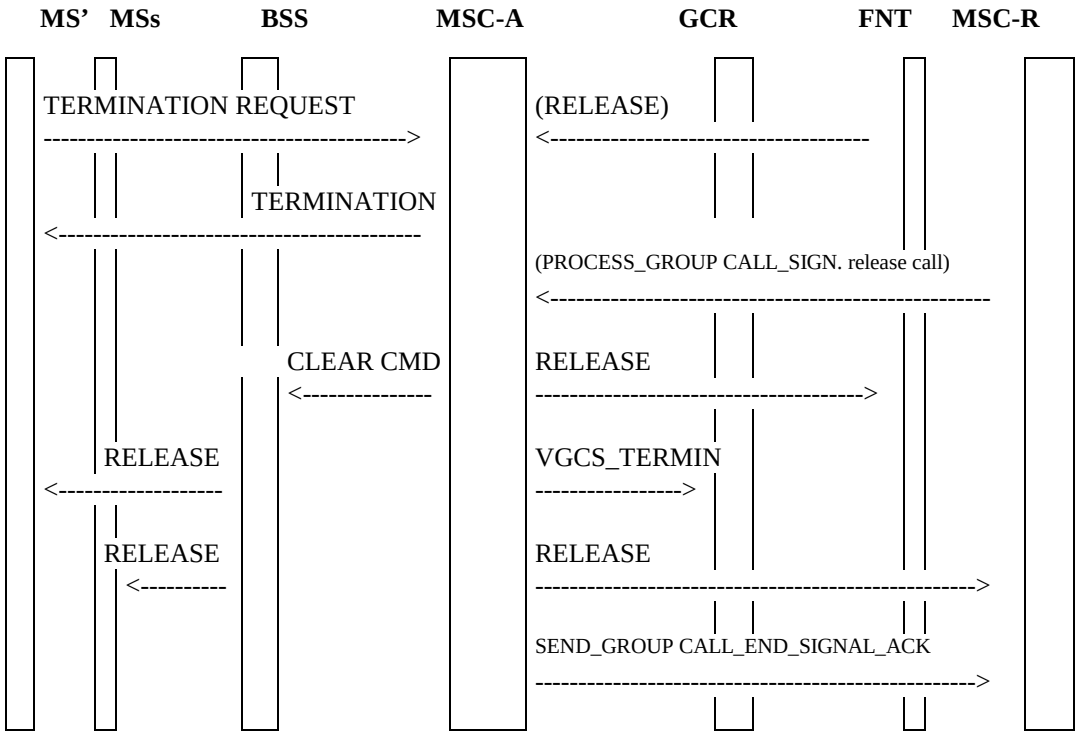


Figure 7: Signalling required to disconnect the group call

TERMINATION REQUEST: An authorized mobile station can send a TERMINATION REQUEST message to clear down the entire voice group call. To do this, the mobile station must have access to the uplink. The network has to check the IMSI to verify the calling subscriber. If the IMSI of the mobile station which has uplink access is presently not known to the network, the network shall send an identity request to the mobile station. Alternatively an authorized dispatcher can terminate the voice group call in which case a RELEASE message is received from the external network. Alternatively an authorized mobile station currently served by a relay MSC can clear down the entire group call in which case a PROCESS_GROUP CALL_SIGNALLING message indicating call release is received from the relay MSC.

CLEAR CMD: This message is sent from the MSC to all related cells to disconnect calls from the conference bridge and stop all periodic notifications for the voice group call to be released.

VGCS_TERMIN: The MSC informs the GCR that the voice group call with the related group call reference is terminated.

RELEASE: RELEASE messages are sent on all downlink FACCH to the service subscribers. The RELEASE messages shall be repeated for a predefined period in order to provide a high probability that the listening mobile stations receive the message.

In addition, RELEASE messages are sent to all related dispatchers and relay MSCs.

SEND_GROUP CALL_END_SIGNAL_ACK: The dialogues to all relay MSCs are closed.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000462

CHANGE REQUEST No :	**A017**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.68	Version:	8.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	**X**	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: VGCS signalling flows

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

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

Reason for change: Errors and inconsistencies in signalling flow overview

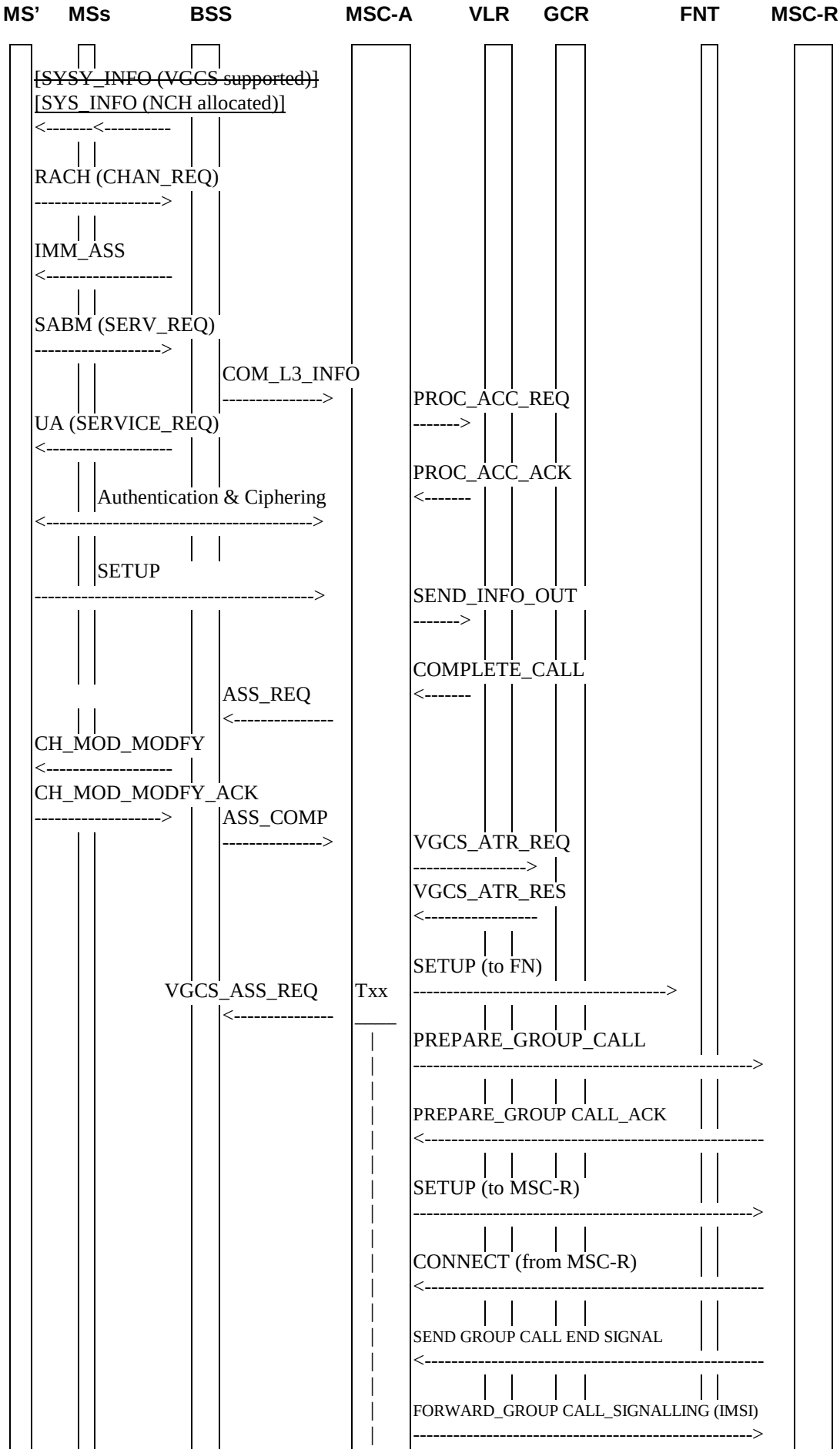
Clauses affected: 11.3.8 Overview of signalling

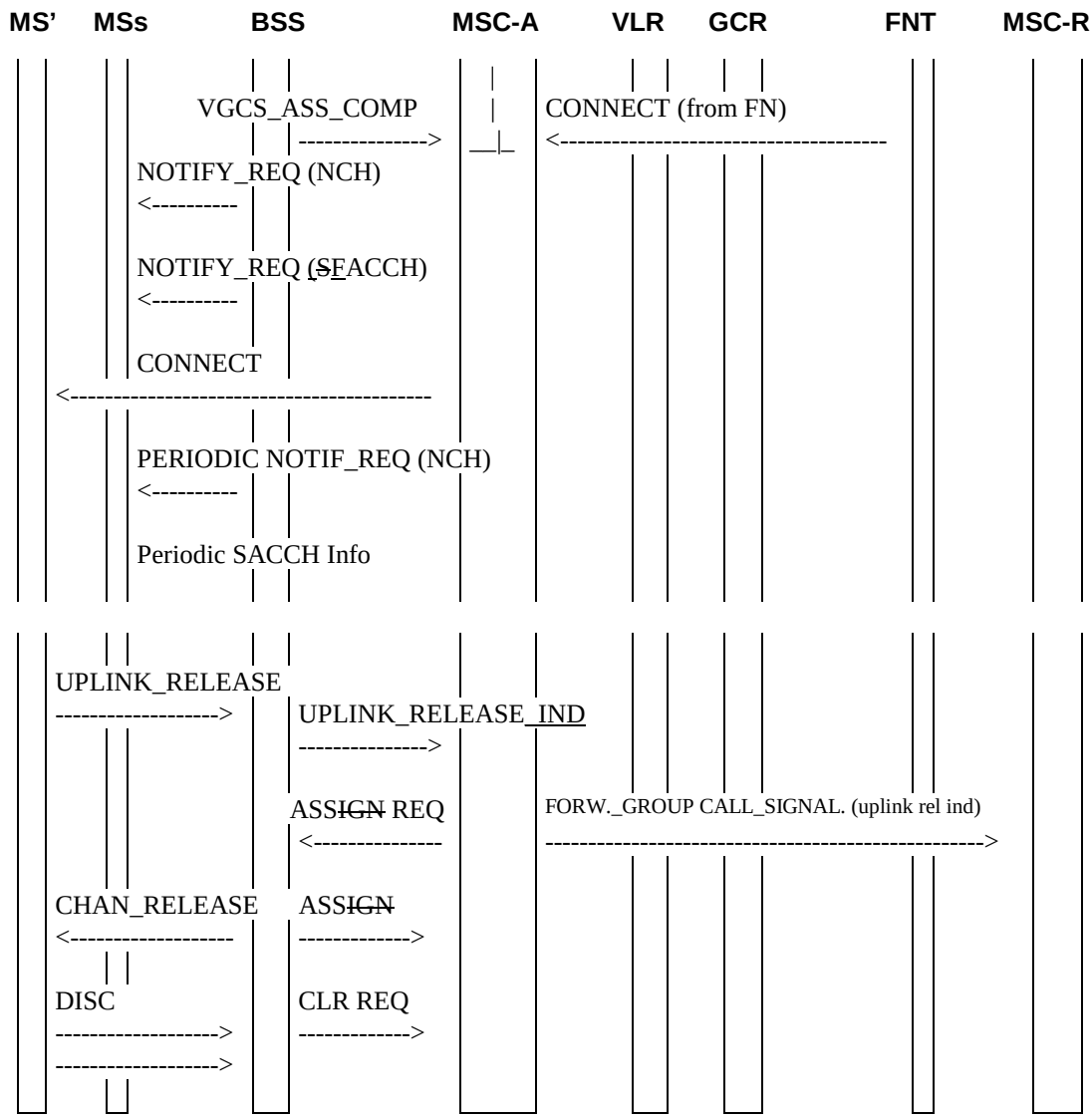
Other specs Affected:

Other releases of same spec		→ List of CRs:	R97 A014 and R98 A016
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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


MS'
MSs
BSS
MSC-A
VLR
GCR
FNT
MSC-R
[SYSY_INFO (VGCS supported)]
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROC_ACC_REQ
UA (SERVICE_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to FN)
VGCS_ASS_REQ
Txx
PREPARE_GROUP_CALL
PREPARE_GROUP CALL_ACK
SETUP (to MSC-R)
CONNECT (from MSC-R)
SEND GROUP CALL END SIGNAL
FORWARD_GROUP CALL_SIGNALLING (IMSI)



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
FNT = fixed network user terminal;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 2: Signalling information required for establishing voice group calls by a service subscriber roaming in the anchor MSC area

SYS_INFO (NCH allocated~~VGCS supported~~): Message used to indicate if the NCH~~VGCS establishment~~ is allocated~~supported~~ on the CCCH in the cell ~~and if voice group call channels and the corresponding notification is supported in the cell~~.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 2: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication and Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 3: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 4: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 2.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information is returned from the GCR.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 5: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

SETUP to fixed network users: Based on the information determined about the users of external networks to be involved in the call, the MSC shall initiate calls to these users in the normal manner, depending on their mode of connection into the MSC, and shall connect them into the conference bridge. Alternatively normal calls to GSM subscribers may be established for dispatchers being GSM subscribers which is not presented in the diagram.

PREPARE_GROUP CALL: The group call attributes are sent to every relay MSC and a Group Call number for call set-up to is requested.

PREPARE_GROUP CALL ACK: The Group Call number for call set-up is returned to the anchor MSC.

SETUP to MSC-R: The ISUP connection is set-up to the relay MSC.

CONNECT from MSC-R: Set-up of the ISUP connection to the relay MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start.

FORWARD_GROUP CALL_SIGNALLING (IMSI): The IMSI of the service subscriber who has established the voice group call and who is allowed to terminate the call is sent to every relay MSC.

Txx: Timer implemented in the MSC which is started with the incoming VGCS SETUP message and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs and the CONNECT messages from the external networks and SEND_GROUP CALL_END_SIGNALs from the relay MSCs, the VGCS shall be established by the MSC to all available parts of the group call area.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (FACCH): Message for notification sent on the FACCH to the mobile stations currently involved in other calls. The notification on the FACCH shall include the group call reference, and the priority level and may also include the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on SACCH. This message may include:

- information of changes of notifications;
- information used for cell re-selection.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): This message is sent to every relay MSC to indicate that the uplink is free.

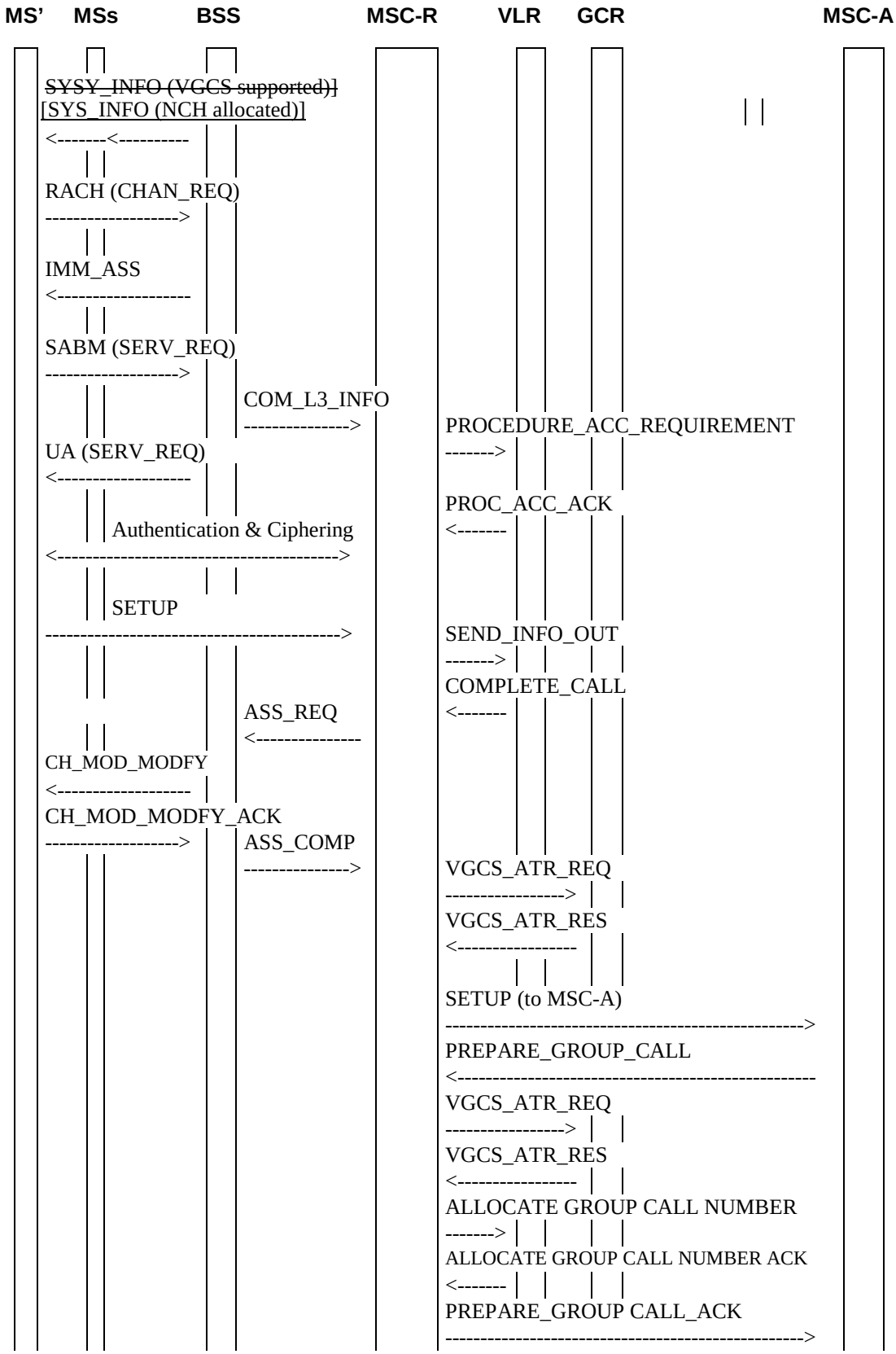
ASSIGNMENT REQUEST: The MSC requests the BSC to assign the mobile to a Group call channel to the calling service subscriber. The ASSIGNMENT REQUEST shall contain the group call reference.

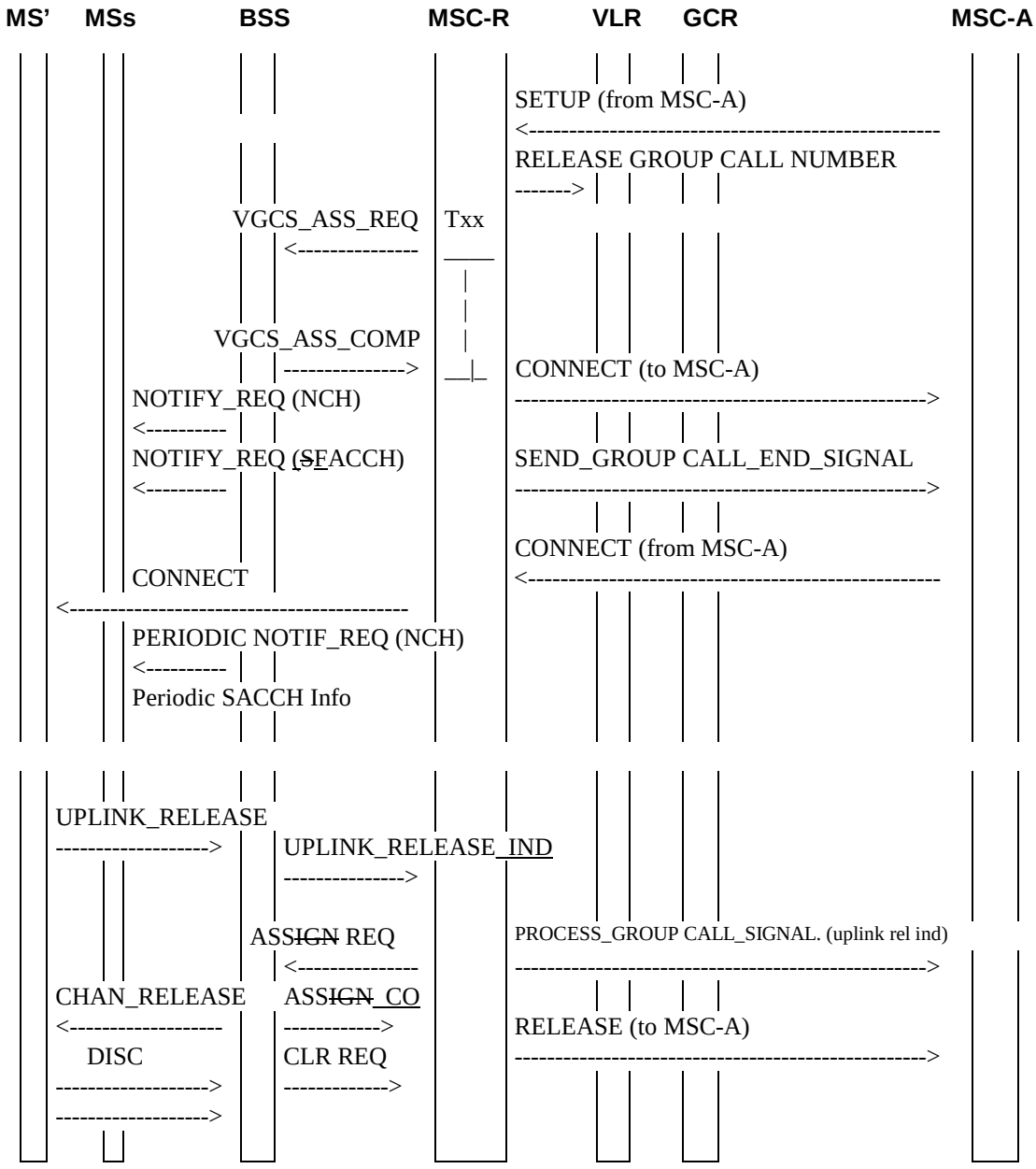
CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT– COMPLETE and CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 6: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.


MS'
MSs
BSS
MSC-R
VLR
GCR
MSC-A
~~SYSY_INFO (VGCS supported)]~~
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROCEDURE_ACC_REQUIREMENT
UA (SERV_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to MSC-A)
PREPARE_GROUP_CALL
VGCS_ATR_REQ
VGCS_ATR_RES
ALLOCATE GROUP CALL NUMBER
ALLOCATE GROUP CALL NUMBER ACK
PREPARE_GROUP CALL_ACK



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 3: Signalling information required for establishing voice group calls by a service subscriber roaming in the relay MSC area

SYS_INFO (NCH allocated~~VGCS supported~~): Message used to indicate if the NCH~~VGCS establishment~~ is allocated~~supported~~ on the CCCH in the cell~~ and if voice group call channels and the corresponding notification is supported in the cell~~.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 1: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication & Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 2: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 3: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 3.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (MSC-A address) is returned from the GCR.

SETUP to MSC-A: Based on information received from the GCR the relay MSC shall set-up a dedicated connection for the initiating service subscriber to the anchor MSC.

PREPARE_GROUP CALL: The group call attributes (parts) are received from the anchor MSC.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (cell list) is returned from the GCR.

ALLOCATE GROUP CALL NUMBER: The Group Call number is requested from the VLR.

ALLOCATE GROUP CALL NUMBER ACK: The Group Call number is returned from the VLR.

PREPARE_GROUP_CALL_ACK: The Group Call number is sent to MSC-A.

SETUP from MSC-A: The ISUP connection is set-up between MSC-A and MSC-R.

RELEASE GROUP CALL NUMBER: The VLR is requested to release the Group Call number.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [one dedicated message for every requested channel in a cell,] including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 4: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT COMPLETE: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

CONNECT to MSC-A: Set-up of the ISUP connection from the anchor MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start. In addition the IMSI of service subscriber who has established the voice group call and who is allowed to terminate the call is included.

Txx: Timer implemented in the relay MSC which is started with the incoming SETUP message from the anchor MSC and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs, the VGCS shall be established by the relay MSC to all available parts of the group call area and the anchor MSC shall be informed that conversation can start.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (~~S~~FACCH): Message for notification sent on the ~~SACCH or~~ FACCH to the mobile stations currently involved in other calls. The notification on the ~~S~~FACCH shall include ~~only~~ the group call reference, and the priority level~~. The notification on the FACCH~~ and may include also the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on the downlink of the SACCH ~~or on the FACCH~~ informing mobile stations of:

- information of changes of notifications;
- information used for cell re-selection.
- ~~optional details of surrounding cells which may include the channel description of the BCCH and the voice group call channel in each surrounding cell of the group call area or of the group call area inside the same BSC area and other information used for cell re-selection;~~
- ~~whether the group call uplink is free;~~
- ~~notifications or paging information messages on other calls in the cell.~~

CONNECT (from MSC-A): Call set-up of the dedicated connection for the calling service subscriber is confirmed.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): To indicate to the anchor MSC that the uplink is free.

ASSIGNMENT_REQUEST: The MSC requests the BSC to assign a Group call channel to the calling service subscriber. The ASSIGNMENT_REQUEST shall contain the group call reference.

CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT_COMPLETE & CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.

NOTE 5: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.

RELEASE to MSC-A: The dedicated connection for the initiating service subscriber is released.

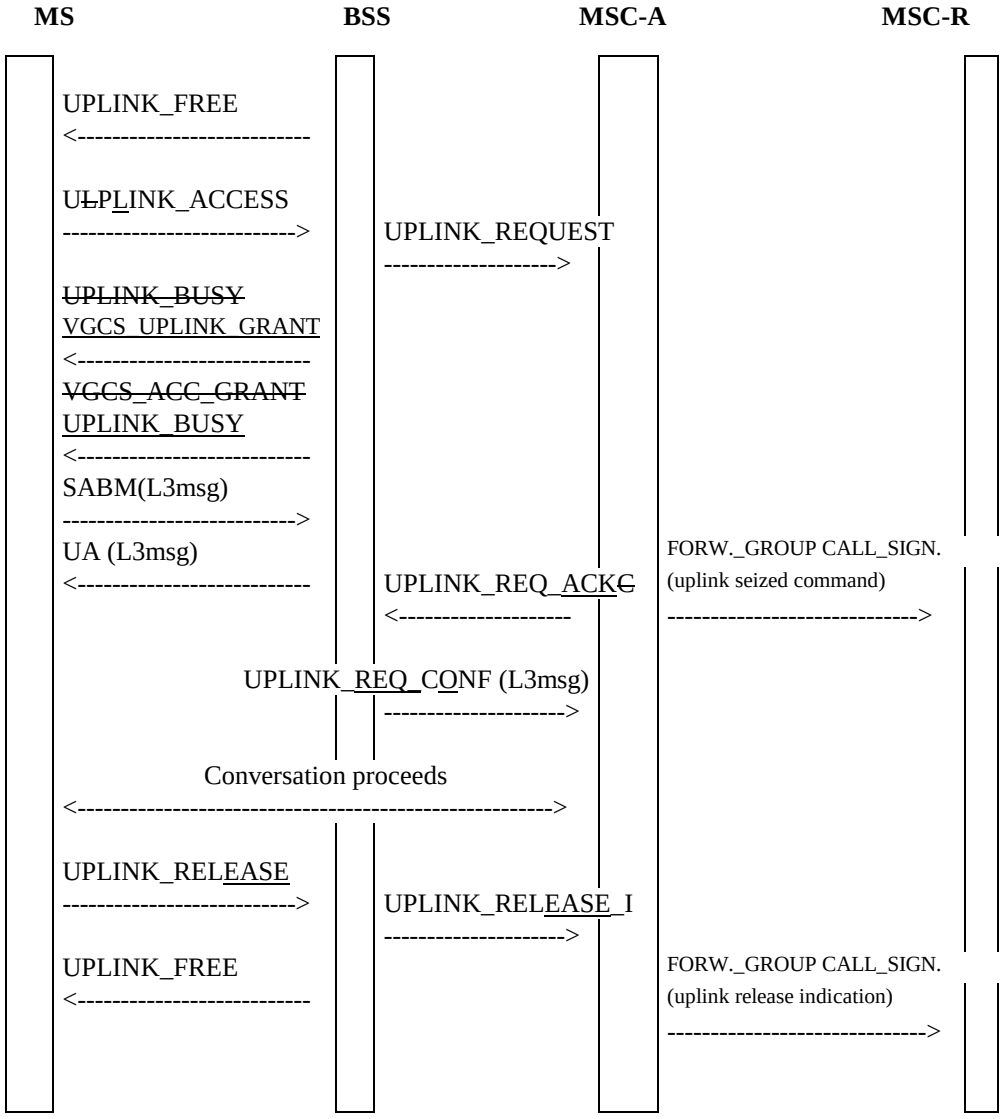


Figure 4: Signalling information required for the voice group call uplink access in the anchor MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

UPLINK_BUSY: This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.

NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM(L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA(L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

UPLINK_REQUEST_~~CONFIRM~~ACKNOWLEDGE: The anchor MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC or MSC-R, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 4. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 4. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

FORWARD_GROUP CALL_SIGNALLING (uplink seized command): This message is sent to all relay MSCs, to inform all mobile stations roaming in parts of the group call area which are controlled by relay MSCs, that the uplink is now busy.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): The anchor MSC indicates to all relay MSCs that the uplink is free. On receipt of the uplink free indication the relay MSC shall send an UPLINK RELEASE message to every BSS of the group call area to indicate that the uplink free.

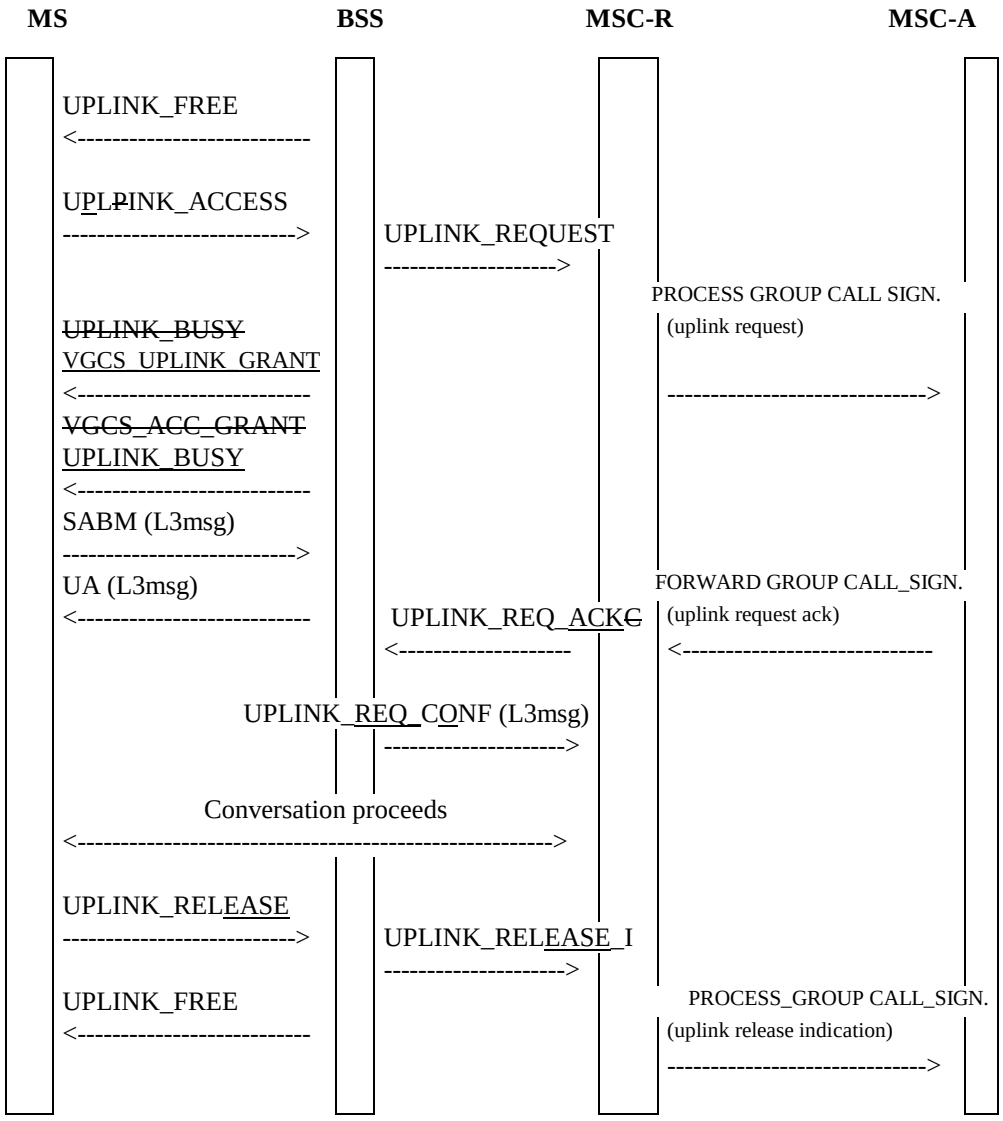


Figure 5: Signalling information required for the voice group call uplink access in the relay MSC (normal case, without contention resolution)

UPLINK_FREE: This connectionless RR message is repeatedly sent by the BSS on the main signalling link (FACCH) to inform all mobile stations of the voice group call members that the uplink is free.

UPLINK_ACCESS: This is sent on the uplink of the voice group call channel using random access procedures. The UPLINK_ACCESS message is similar to a channel request but sent on the group call channel uplink. The establishment cause for subsequent talker uplink request as defined in GSM 04.08 shall be used for this purpose. The mobile station may send repeated UPLINK_ACCESS messages (see GSM 04.08).

UPLINK_REQUEST: The request for the uplink is indicated to the MSC. Only one request per BSC shall be forwarded.

~~**UPLINK_BUSY:** This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.~~

VGCS_UPLINK_GRANT: The reply to the uplink request sent on the voice group channel downlink containing information for synchronisation of the mobile station to the network and uplink access contention resolution. The VGCS_UPLINK_GRANT message shall therefore include a request reference (reflecting the UPLINK_ACCESS) and the physical information required for transmission on the voice group call channel uplink. On receipt of a VGCS_UPLINK_GRANT, the related mobile station can start to send speech directly.

NOTE: UPLINK_FREE messages are stopped immediately.

UPLINK_BUSY: This connectionless RR message is sent on the downlink FACCH to inform all mobile stations that the uplink is now busy.

NOTE: The order of UPLINK_BUSY and SABM message is independent.

SABM (L3msg): The layer 2 link is set up and layer 3 information on classmark and mobile station identity included.

UA (L3msg): The layer 2 link is acknowledged and the layer 3 information reflected for contention resolution.

PROCESS_GROUP CALL_SIGNALLING (uplink request): This message is sent to the anchor MSC, to indicate that the uplink is requested by a subscriber roaming in the relay MSC area.

FORWARD_GROUP CALL_SIGNALLING (uplink request ack): This message is sent to the relay MSC, to indicate that the uplink is granted to the mobile station roaming in parts of the group call area which are controlled by relay MSC.

UPLINK_REQUEST_ACKNOWLEDGE~~CONFIRM~~: The relay MSC acknowledges the uplink to one BSC. If uplink requests have been made by more than one BSC, all remaining uplink requests shall be rejected by an UPLINK_REJ which is not presented in figure 5. On reception of an UPLINK_REJ the BSS shall send an UPLINK_REL to the related mobile station, followed by an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use. The MSC shall send to other BSCs which did not send an uplink request an UPLINK_SEIZED message which is not presented in figure 5. On reception of an UPLINK_SEIZED the BSS shall send an UPLINK_BUSY to indicate to the mobile stations that the uplink is in use.

UPLINK_REQUEST_CONFIRM: The BSS confirms the uplink use to the MSC together with the mobile station identity.

Conversation proceeds: Once the mobile station has control of the uplink, it shall be able to communicate directly. The two-way nature of the conference bridge will ensure that they are already connected to all appropriate downlink channels.

UPLINK_RELEASE: When the service subscriber who has access to the uplink wants to release the channel, then a message indicating release of the uplink is required to be sent from the MS to the BSS on the FACCH.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): The relay MSC indicates to the anchor MSC that the uplink is free.

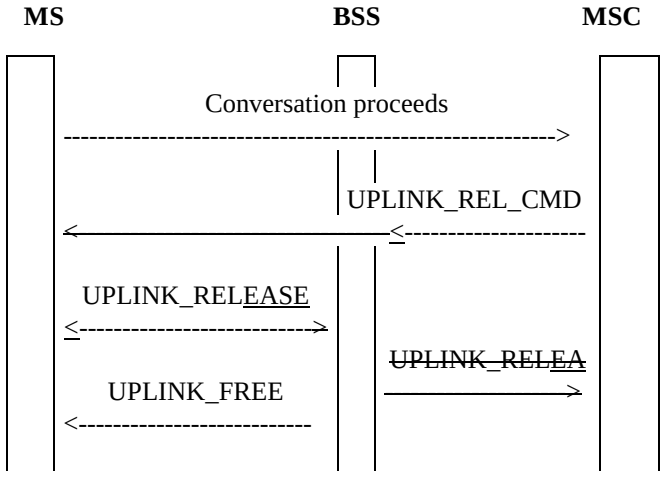


Figure 6: Signalling information required for the voice group call uplink release requested by the network

UPLINK_REL_CMD: When the network wants to release the uplink for any reason then a message requesting release of the uplink is required to be sent from the network to the mobile station on the FACCH.

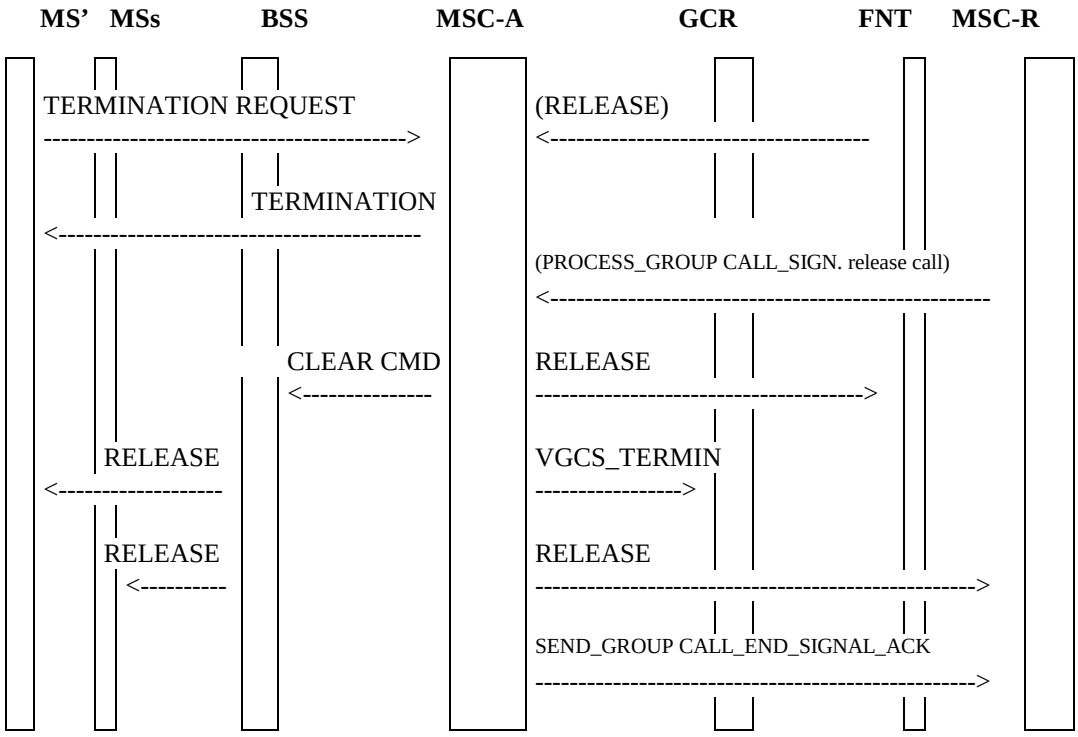


Figure 7: Signalling required to disconnect the group call

TERMINATION REQUEST: An authorized mobile station can send a TERMINATION REQUEST message to clear down the entire voice group call. To do this, the mobile station must have access to the uplink. The network has to check the IMSI to verify the calling subscriber. If the IMSI of the mobile station which has uplink access is presently not known to the network, the network shall send an identity request to the mobile station. Alternatively an authorized dispatcher can terminate the voice group call in which case a RELEASE message is received from the external network. Alternatively an authorized mobile station currently served by a relay MSC can clear down the entire group call in which case a PROCESS_GROUP CALL_SIGNALLING message indicating call release is received from the relay MSC.

CLEAR CMD: This message is sent from the MSC to all related cells to disconnect calls from the conference bridge and stop all periodic notifications for the voice group call to be released.

VGCS_TERMIN: The MSC informs the GCR that the voice group call with the related group call reference is terminated.

RELEASE: RELEASE messages are sent on all downlink FACCH to the service subscribers. The RELEASE messages shall be repeated for a predefined period in order to provide a high probability that the listening mobile stations receive the message.

In addition, RELEASE messages are sent to all related dispatchers and relay MSCs.

SEND_GROUP CALL_END_SIGNAL_ACK: The dialogues to all relay MSCs are closed.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000463

CHANGE REQUEST No :	**A018**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.68	Version:	7.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: Data Flow for Fast Call setup

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

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

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R97 A015
Other core specifications	X	→ List of CRs:	CR A101 to 04.08
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

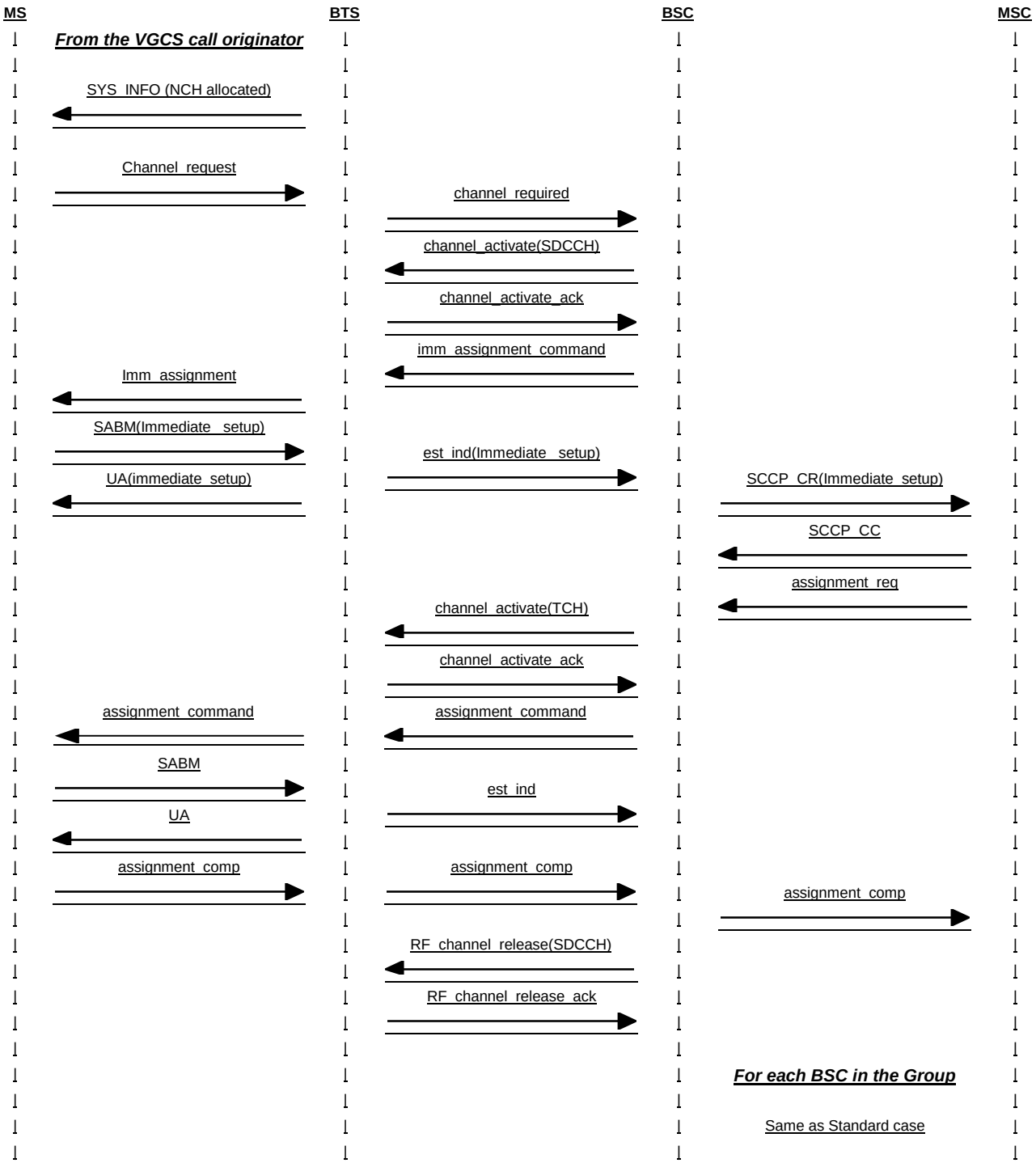
Other comments:

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 8~~7~~.

*** NEXT MODIFIED SECTION ***



↓	↓	↓	***For each cell in the Group*** ↓
↓	↓	↓	↓
↓	↓	↓	Same as Standard case ↓

Figure 8: Signalling information required for establishing voice group calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the voice group call is sent by the MS to the network in order to set-up a group call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000464

CHANGE REQUEST No :	**A019**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.68	Version:	8.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: Data Flow for Fast Call setup

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

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

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R97 A015, R98 A016
Other core specifications	X	→ List of CRs:	CR A101 to 04.08
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

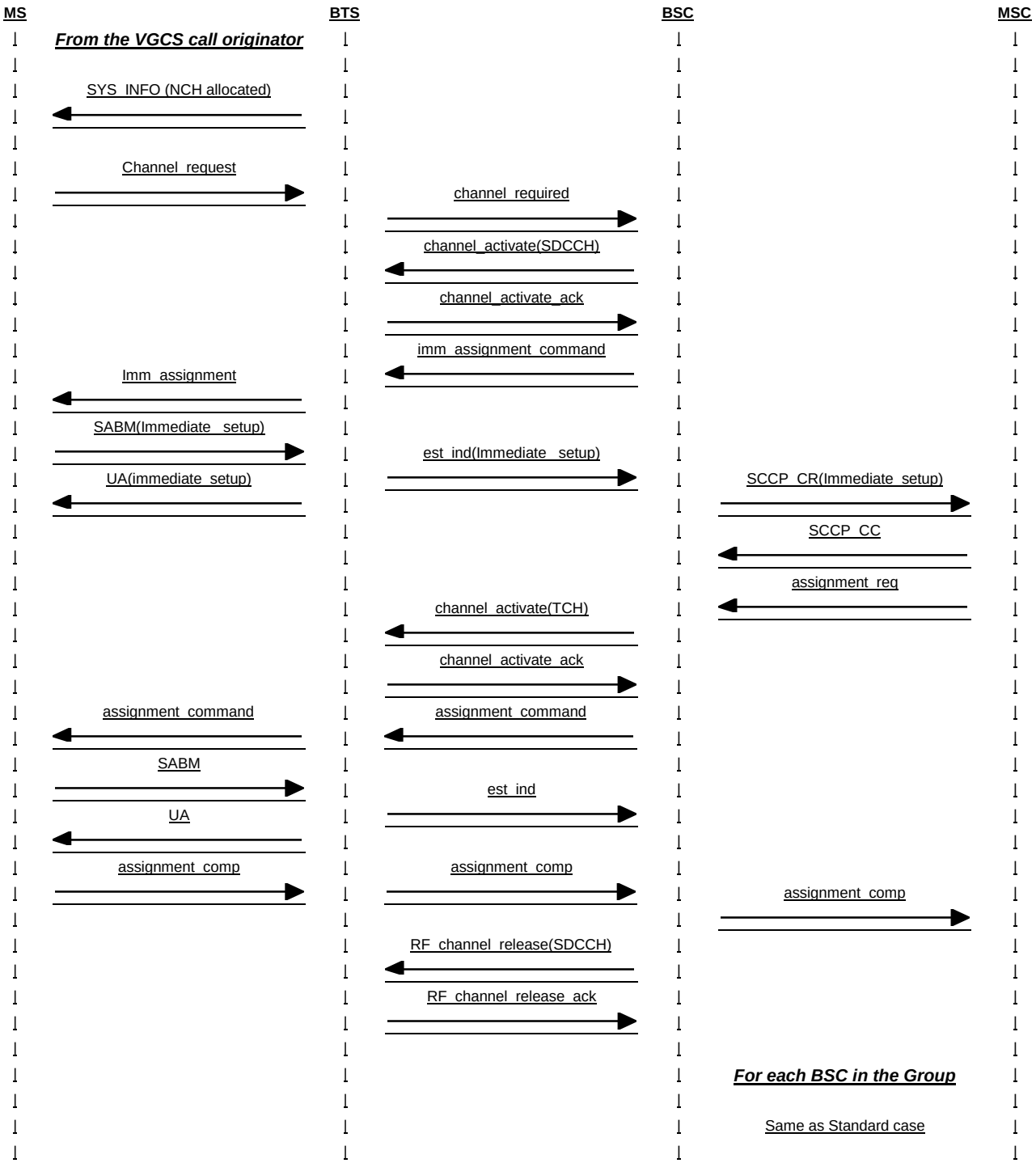
Other comments:

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 8~~7~~.

*** NEXT MODIFIED SECTION ***



↓	↓	↓	***For each cell in the Group*** ↓
↓	↓	↓	↓
↓	↓	↓	Same as Standard case ↓

Figure 8: Signalling information required for establishing voice group calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the voice group call is sent by the MS to the network in order to set-up a group call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

3GPP TSG-CN-WG1, Meeting #11
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Umea, Sweden

Tdoc N1-000465

CHANGE REQUEST No :	**A014**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.69	Version:	7.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: Data Flow for Fast Call setup

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

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

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R97 A013
Other core specifications	X	→ List of CRs:	CR A101 to 04.08
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

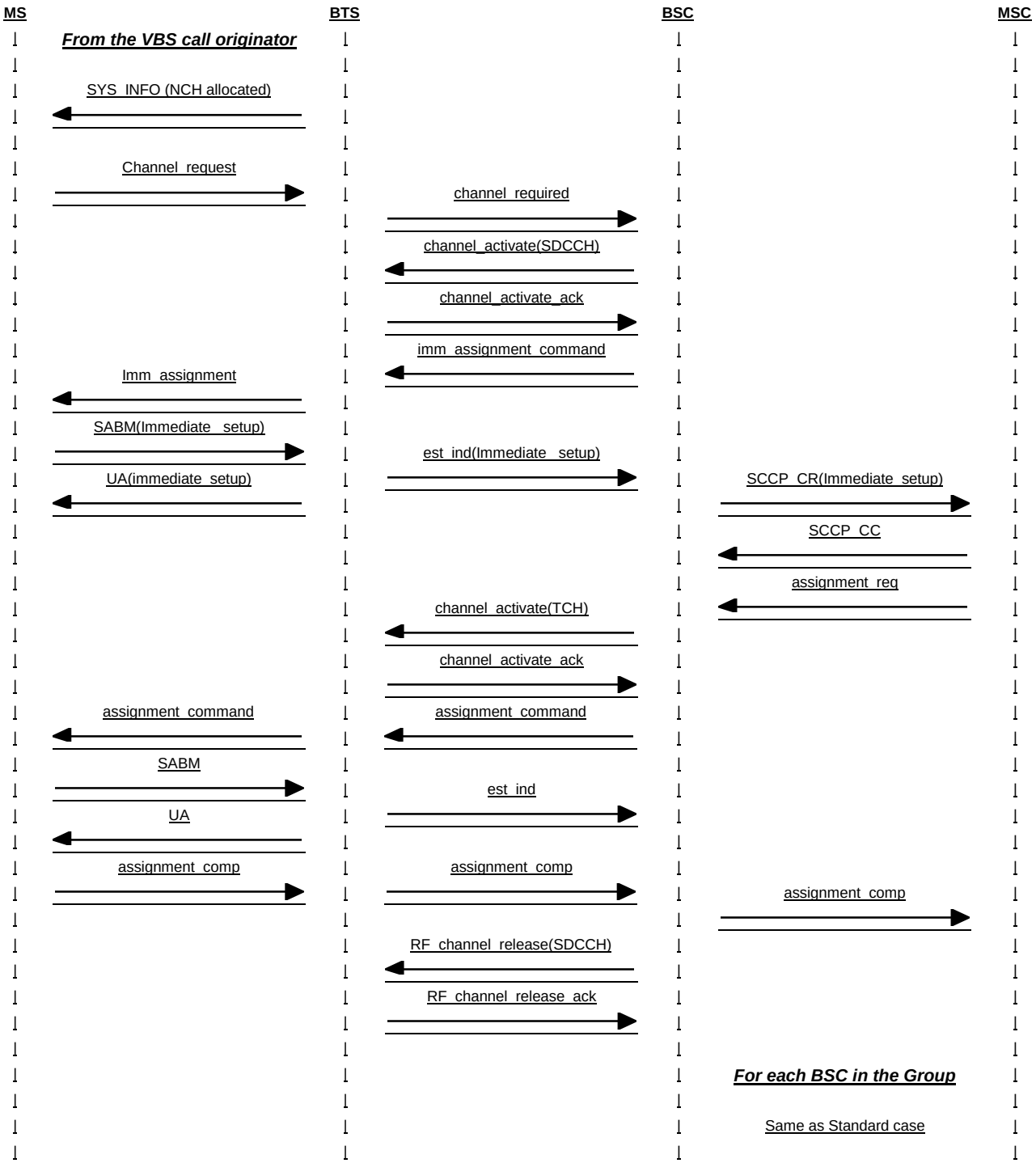
Tdoc N1-000465

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 54.

*** NEXT MODIFIED SECTION ***



↓	↓	↓	***For each cell in the Group*** ↓
↓	↓	↓	↓
↓	↓	↓	Same as Standard case ↓

Figure 5: Signalling information required for establishing voice broadcast calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the broadcast call is sent by the MS to the network in order to set-up a broadcast call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000466

CHANGE REQUEST No :	**A015**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	03.69	Version:	8.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3 **Date:** 28.02.00

Subject: Data Flow for Fast Call setup

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

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

Reason for change: This CR clarifies the optimized use of implicit MM establishment during fast call setup.

Clauses affected: 11.3.8

Other specs affected:

Other releases of same spec	X	→ List of CRs:	R97 A013 and R98 A014.
Other core specifications	X	→ List of CRs:	CR A101 to 04.08
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

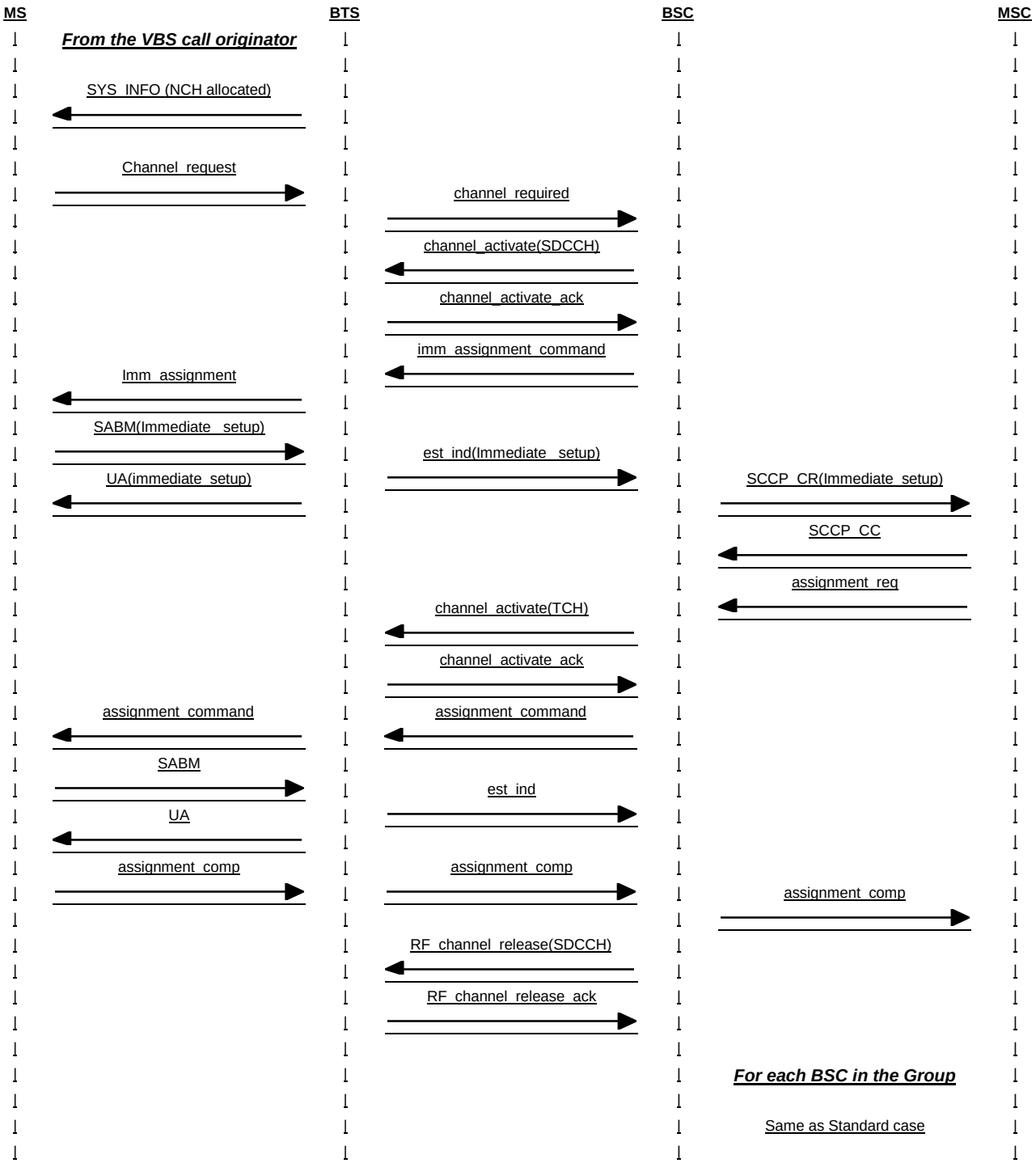
Other comments:

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 54.

*** NEXT MODIFIED SECTION ***



↓	↓	↓	***For each cell in the Group*** ↓
↓	↓	↓	↓
↓	↓	↓	Same as Standard case ↓

Figure 5: Signalling information required for establishing voice broadcast calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP : This message including all details of the broadcast call is sent by the MS to the network in order to set-up a broadcast call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 1: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

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28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000467

CHANGE REQUEST No : **A022**

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

Technical Specification GSM 04.68 Version: 6.2.0

Submitted to SMG: CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3 **Date:** 28.02.00

Subject: Addition of cause values

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[X]
Release 98	[ ]
Release 99	[ ]

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs: R96 A021
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

This field contains the 7 bit encoding (with leading zeroes) of a non-negative integer which specifies a cause as defined below:

N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000468

CHANGE REQUEST No : **A023**

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

Technical Specification GSM 04.68 Version: 7.1.0

Submitted to SMG: CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] | without presentation ("non-strategic") [ ]
for information [ ] | with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: Addition of cause values

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[X]
Release 99	[ ]

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs: R96 A021 and R97 A022
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

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N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

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28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000469

CHANGE REQUEST No :	**A024**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*			
Technical Specification GSM	04.68	Version:	8.0.0		
Submitted to SMG	CN#7/SMG 3	for approval	X	without presentation ("non-strategic")	
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 28.02.00

Subject: Addition of cause values

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

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

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'**.**
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	X	→ List of CRs:	R96 A021, R97 A022, R98 A023
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

This field contains the 7 bit encoding (with leading zeroes) of a non-negative integer which specifies a cause as defined below:

N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

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28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000470

CHANGE REQUEST No : **A019**

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

Technical Specification GSM 04.69 Version: 6.2.0

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 29.02.00

Subject: Addition of cause values

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[X]
Release 98	[ ]
Release 99	[ ]

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs: R96 A018
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

This field contains the 7 bit encoding (with leading zeroes) of a non-negative integer which specifies a cause as defined below:

N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000471

CHANGE REQUEST No : **A020**

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

Technical Specification GSM 04.69 Version: 7.1.0

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 29.02.00

Subject: Addition of cause values

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[X]
Release 99	[ ]

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs:	R96 A018 and R97 A019
Other core specifications	[ ]	→ List of CRs:	
MS test specifications / TBRs	[ ]	→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

cause_part (7 bits)

This field contains the 7 bit encoding (with leading zeroes) of a non-negative integer which specifies a cause as defined below:

N	cause
3	Illegal MS
5	IMEI not accepted
6	Illegal ME
8	Service not authorized
9	Application not supported on the protocol
10	RR connection aborted
16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000472

CHANGE REQUEST No : **A021**

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

Technical Specification GSM 04.69 Version: 8.0.0

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 29.02.00

Subject: Addition of cause values

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[X]

Reason for change: Addition of cause values: #16 for 'Normal clearing', #20 for 'Busy', #23 for 'user not originator of call' and #24 for 'network wants to maintain the call'.
The cause values for a normal call clearing, busy and some termination reject situations (user not originator of call for network wants to maintain the call) were not listed in Table 9.4.

Clauses affected: Table 9.4

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs: R96 A018, R97 A019, R98 A020
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ 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.

9.4.3 Cause

The purpose of the *cause* information element is to describe the reason for generating certain messages and to provide diagnostic information in the event of procedural errors.

The *cause* information element value part has a minimal length of 1 octet. The maximum length is given by the maximum number of octets in a L3 message (see GSM 04.06).

The value part is coded as shown below:

<*cause* > ::= **1 cause_part** [**diagnostics** *]*

| **0 cause_part** <*cause*>

Attributes

The **cause_part** field defines a non-negative integer N. If more than one **cause_part** fields are present in <*cause*>, the information element indicates an unspecific cause; otherwise, it indicates a cause as defined by N.

Field contents

The fields of the information element are coded as shown in table 9.4.

Table 9.4: *cause* information element

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N	cause
3	Illegal MS
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9	Application not supported on the protocol
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16	Normal call clearing
17	Network failure
20	Busy
22	Congestion
23	User not originator of call
24	Network wants to maintain call
30	Response to GET STATUS
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
38	Call cannot be identified
48 - 63	retry upon entry into a new cell
81	Invalid transaction identifier value
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Message type not compatible with the protocol state
112	Protocol error, unspecified

Any other value received shall be treated as an unspecific cause.

Diagnostics

This field contains a message or information element.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000473

CHANGE REQUEST No : **A1005**

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

Technical Specification GSM 04.08 Version: 7.4.0

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]

for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 29.02.00

Subject: Addition of cause value # 25 'Pre-emption'

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[X]
Release 99	[ ]

Reason for change: GSM 03.67 states that the RELEASE COMPLETE message is sent in the standard way to the called party with a new cause for pre-emption. Thus a new cause value is required for this scenario. The new cause value 25 fits best with cause class and default value 31.

Clauses affected: 10 table 10.5.123 and Annex H

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs: R97 A1001
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ 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.

Table 10.5.123/GSM 04.08: Cause information element values

Cause value Class	Value	Cause num.	Cause	Diagnostic	Remarks
7 6 5	4 3 2 1				
0 0 0	0 0 0 1	1.	Unassigned (unallocated) number	Note 9	
0 0 0	0 0 1 1	3.	No route to destination	Note 9	
0 0 0	0 1 1 0	6.	Channel unacceptable	-	
0 0 0	1 0 0 0	8.	Operator determined barring	-	
0 0 1	0 0 0 0	16.	Normal call clearing	Note 9	
0 0 1	0 0 0 1	17.	User busy	Note 1	
0 0 1	0 0 1 0	18.	No user responding	-	
0 0 1	0 0 1 1	19.	User alerting, no answer	-	
0 0 1	0 1 0 1	21.	Call rejected	Note 9 - user supplied diagnostic (note 4)	
0 0 1	0 1 1 0	22.	Number changed	New destination (note 5)	
0 0 1	1 0 0 1	25	Pre-emption		
0 0 1	1 0 1 0	26.	Non selected user clearing	-	
0 0 1	1 0 1 1	27.	Destination out of order	-	
0 0 1	1 1 0 0	28.	Invalid number format (incomplete number)	-	
0 0 1	1 1 0 1	29.	Facility rejected	Note 1	
0 0 1	1 1 1 0	30.	Response to STATUS ENQUIRY	-	
0 0 1	1 1 1 1	31.	Normal, unspecified	-	
0 1 0	0 0 1 0	34.	No circuit/channel available	Note 1	
0 1 0	0 1 1 0	38.	Network out of order	-	
0 1 0	1 0 0 1	41.	Temporary failure	-	
0 1 0	1 0 1 0	42.	Switching equipment congestion	-	
0 1 0	1 0 1 1	43.	Access information discarded	Discarded information element identifiers (note 6)	
0 1 0	1 1 0 0	44.	requested circuit/channel not available	-	
0 1 0	1 1 1 1	47.	Resources unavailable, unspecified	-	
0 1 1	0 0 0 1	49.	Quality of service unavailable	Note 9	
0 1 1	0 0 1 0	50.	Requested facility not subscribed	Note 1	
0 1 1	0 1 1 1	55.	Incoming calls barred within the CUG	Note 1	
0 1 1	1 0 0 1	57.	Bearer capability not authorized	Note 3	
0 1 1	1 0 1 0	58.	Bearer capability not presently available	Note 3	
0 1 1	1 1 1 1	63.	Service or option not available, unspecified	-	
1 0 0	0 0 0 1	65.	Bearer service not implemented	Note 3	

(continued...)

******** next modified section ***

Annex H (informative): GSM specific cause values for call control

This annex is informative.

H.1 Normal class

H.1.1 Cause No. 1 "unassigned (unallocated) number"

This cause indicates that the destination requested by the mobile station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

H.1.2 Cause No. 3 "no route to destination"

This cause indicates that the called user cannot be reached because the network through which the call has been routed does not serve the destination desired.

H.1.3 Cause No. 6 "channel unacceptable"

This cause indicates the channel most recently identified is not acceptable to the sending entity for use in this call.

H.1.4 Cause No. 8 "operator determined barring"

This cause indicates that the MS has tried to access a service that the MS's network operator or service provider is not prepared to allow.

H.1.5 Cause No.16 "normal call clearing"

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared.

Under normal situations, the source of this cause is not the network.

H.1.6 Cause No.17 "user busy"

This cause is used when the called user has indicated the inability to accept another call.

It is noted that the user equipment is compatible with the call.

H.1.7 Cause No. 18 "no user responding"

This cause is used when a user does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated (defined by the expiry of either timer T303 or T310).

H.1.8 Cause No. 19 "user alerting, no answer"

This cause is used when a user has provided an alerting indication but has not provided a connect indication within a prescribed period of time.

H.1.9 Cause No. 21 "call rejected"

This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible.

H.1.10 Cause No. 22 "number changed"

This cause is returned to a calling mobile station when the called party number indicated by the calling mobile station is no longer assigned. The new called party number may optionally be included in the diagnostic field. If a network does not support this capability, cause No. 1 "unassigned (unallocated) number" shall be used.

H.1.11 Cause No. 25 “pre-emption”

This cause is returned to the network when a mobile station clears an active call which is being pre-empted by another call with higher precedence.

H.1.~~11~~12 Cause No. 26 "non-selected user clearing"

Not supported. Treated as cause no. 31.

H.1.~~12~~13 Cause No. 27 "destination out of order"

This cause indicates that the destination indicated by the mobile station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signalling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.

H.1.~~13~~14 Cause No. 28 "invalid number format (incomplete number)"

This cause indicates that the called user cannot be reached because the called party number is not a valid format or is not complete.

H.1.~~14~~15 Cause No. 29 "facility rejected"

This cause is returned when a facility requested by user can not be provided by the network.

H.1.~~15~~16 Cause No. 30 "response to STATUS ENQUIRY"

This cause is included in STATUS messages if the message is sent in response to a STATUS ENQUIRY message. See also section 5.5.3.

H.1.~~16~~17 Cause No. 31 "normal, unspecified"

This cause is used to report a normal event only when no other cause in the normal class applies.

3GPP TSG-CN-WG1, Meeting #11
28 February - 03.March. 2000
Umea, Sweden

Tdoc N1-000474

CHANGE REQUEST No : **177** *Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM 24.008 Version: 3.2.1

Submitted to SMG CN#7/SMG 3 *list SMG plenary meeting no. here ↑*

for approval [X] without presentation ("non-strategic") [ ]
for information [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

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

Work item: ASCI

Source: CN1/SMG3WPA **Date:** 29.02.00

Subject: Addition of cause value # 25 'Pre-emption'

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

F	Correction	[ ]
A	Corresponds to a correction in an earlier release	[X]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[X]

Reason for change: GSM 03.67 states that the RELEASE COMPLETE message is sent in the standard way to the called party with a new cause for pre-emption. Thus a new cause value is required for this scenario. The new cause value 25 fits best with cause class and default value 31.

Clauses affected: 10 table 10.5.123 and Annex H

Other specs Affected:

Other releases of same spec	[X]	→ List of CRs:	R97 A1001 and R98 A1002
Other core specifications	[ ]	→ List of CRs:	
MS test specifications / TBRs	[ ]	→ 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.

Table 10.5.123/GSM 24.008: Cause information element values

Cause value Class	Value	Cause num.	Cause	Diagnostic	Remarks
7 6 5	4 3 2 1				
0 0 0	0 0 0 1	1.	Unassigned (unallocated) number	Note 9	
0 0 0	0 0 1 1	3.	No route to destination	Note 9	
0 0 0	0 1 1 0	6.	Channel unacceptable	-	
0 0 0	1 0 0 0	8.	Operator determined barring	-	
0 0 1	0 0 0 0	16.	Normal call clearing	Note 9	
0 0 1	0 0 0 1	17.	User busy	Note 1	
0 0 1	0 0 1 0	18.	No user responding	-	
0 0 1	0 0 1 1	19.	User alerting, no answer	-	
0 0 1	0 1 0 1	21.	Call rejected	Note 9 - user supplied diagnostic (note 4)	
0 0 1	0 1 1 0	22.	Number changed	New destination (note 5)	
0 0 1	1 0 0 1	25	Pre-emption		
0 0 1	1 0 1 0	26.	Non selected user clearing	-	
0 0 1	1 0 1 1	27.	Destination out of order	-	
0 0 1	1 1 0 0	28.	Invalid number format (incomplete number)	-	
0 0 1	1 1 0 1	29.	Facility rejected	Note 1	
0 0 1	1 1 1 0	30.	Response to STATUS ENQUIRY	-	
0 0 1	1 1 1 1	31.	Normal, unspecified	-	
0 1 0	0 0 1 0	34.	No circuit/channel available	Note 1	
0 1 0	0 1 1 0	38.	Network out of order	-	
0 1 0	1 0 0 1	41.	Temporary failure	-	
0 1 0	1 0 1 0	42.	Switching equipment congestion	-	
0 1 0	1 0 1 1	43.	Access information discarded	Discarded information element identifiers (note 6)	
0 1 0	1 1 0 0	44.	requested circuit/channel not available	-	
0 1 0	1 1 1 1	47.	Resources unavailable, unspecified	-	
0 1 1	0 0 0 1	49.	Quality of service unavailable	Note 9	
0 1 1	0 0 1 0	50.	Requested facility not subscribed	Note 1	
0 1 1	0 1 1 1	55.	Incoming calls barred within the CUG	Note 1	
0 1 1	1 0 0 1	57.	Bearer capability not authorized	Note 3	
0 1 1	1 0 1 0	58.	Bearer capability not presently available	Note 3	
0 1 1	1 1 1 1	63.	Service or option not available, unspecified	-	
1 0 0	0 0 0 1	65.	Bearer service not implemented	Note 3	

(continued...)

******** next modified section ***

Annex H (informative): GSM specific cause values for call control

This annex is informative.

H.1 Normal class

H.1.1 Cause No. 1 "unassigned (unallocated) number"

This cause indicates that the destination requested by the mobile station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

H.1.2 Cause No. 3 "no route to destination"

This cause indicates that the called user cannot be reached because the network through which the call has been routed does not serve the destination desired.

H.1.3 Cause No. 6 "channel unacceptable"

This cause indicates the channel most recently identified is not acceptable to the sending entity for use in this call.

H.1.4 Cause No. 8 "operator determined barring"

This cause indicates that the MS has tried to access a service that the MS's network operator or service provider is not prepared to allow.

H.1.5 Cause No.16 "normal call clearing"

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared.

Under normal situations, the source of this cause is not the network.

H.1.6 Cause No.17 "user busy"

This cause is used when the called user has indicated the inability to accept another call.

It is noted that the user equipment is compatible with the call.

H.1.7 Cause No. 18 "no user responding"

This cause is used when a user does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated (defined by the expiry of either timer T303 or T310).

H.1.8 Cause No. 19 "user alerting, no answer"

This cause is used when a user has provided an alerting indication but has not provided a connect indication within a prescribed period of time.

H.1.9 Cause No. 21 "call rejected"

This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible.

H.1.10 Cause No. 22 "number changed"

This cause is returned to a calling mobile station when the called party number indicated by the calling mobile station is no longer assigned. The new called party number may optionally be included in the diagnostic field. If a network does not support this capability, cause No. 1 "unassigned (unallocated) number" shall be used.

H.1.11 Cause No. 25 “pre-emption”

This cause is returned to the network when a mobile station clears an active call which is being pre-empted by another call with higher precedence.

H.1.~~11~~12 Cause No. 26 "non-selected user clearing"

Not supported. Treated as cause no. 31.

H.1.~~12~~13 Cause No. 27 "destination out of order"

This cause indicates that the destination indicated by the mobile station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signalling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.

H.1.~~13~~14 Cause No. 28 "invalid number format (incomplete number)"

This cause indicates that the called user cannot be reached because the called party number is not a valid format or is not complete.

H.1.~~14~~15 Cause No. 29 "facility rejected"

This cause is returned when a facility requested by user can not be provided by the network.

H.1.~~15~~16 Cause No. 30 "response to STATUS ENQUIRY"

This cause is included in STATUS messages if the message is sent in response to a STATUS ENQUIRY message. See also section 5.5.3.

H.1.~~16~~17 Cause No. 31 "normal, unspecified"

This cause is used to report a normal event only when no other cause in the normal class applies.

3GPP/TSG-CN-WG1, Meeting #11
Umea, Sweden, 28.2. – 2.3.2000

N1-000545
Document rev of N1-000296
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.

24.008	CR	133r1	Current Version:	3.2.1

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

For submission to:	CN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: CN1 **Date:** 28-Feb-00

Subject: Marking of ASCI descriptions

Work item: ASCI

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

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

Reason for change: Voice Group Call Service and Voice Broadcast Service are applicable in GSM only.

Clauses affected: 1.7.1

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.

1.7 Applicability of implementations

The applicability of procedures of this technical specification for the mobile station is dependent on the services and functions which are to be supported by a mobile station.

1.7.1 Voice Group Call Service (VGCS) and Voice Broadcast Service (VBS)

Voice Group Call Service and Voice Broadcast Service are applicable in GSM only.

For mobile stations supporting the Voice Group Call Service or the Voice Broadcast Service, it is explicitly mentioned throughout this technical specification if a certain procedure is applicable only for such a service and, if necessary, how mobile stations not supporting such a service shall behave.
For VGCS and VBS, the following possible mobile station implementations exist:

- support of listening to voice broadcast calls (VBS listening)
- support of originating a voice broadcast call (VBS originating)
- support of listening to voice group calls (VGCS listening)
- support of talking in voice group calls (VGCS talking. This always includes the implementation for VGCS listening)
- support of originating a voice group call (VGCS originating. This always includes the implementation for VGCS talking)

Apart from the explicitly mentioned combinations, all possible combinations are optional and supported by this technical specification.
The related terms are used in this technical specification, if information on these implementation options is required.