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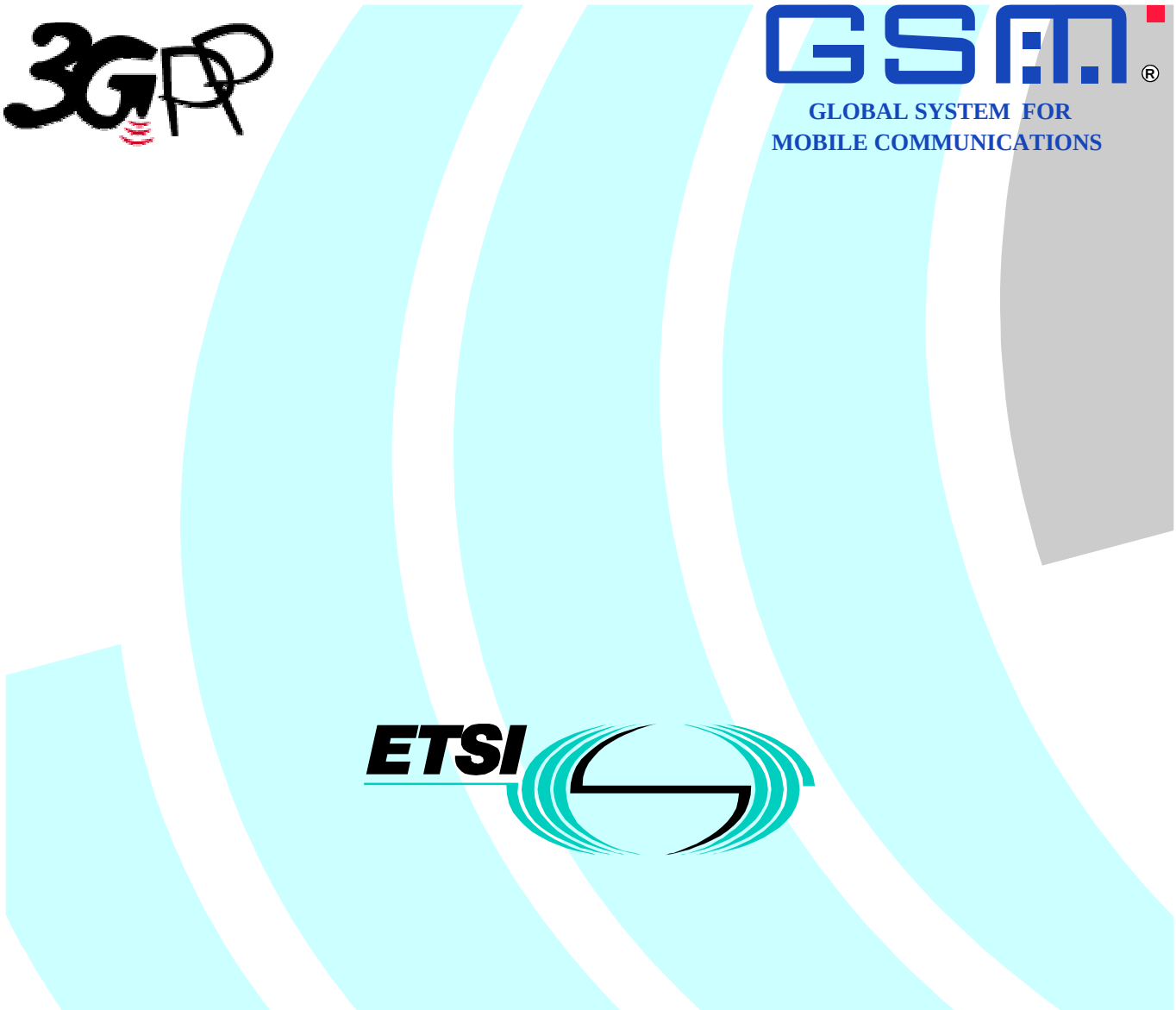
Technical Specification

Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
Multicall;
Stage 3
(3G TS 24.135 version 3.0.0 Release 1999)



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Foreword

This Technical Specification (TS) has been produced by the ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under www.etsi.org/key .

Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The present document gives the stage 3 description of the Multicall (MC) supplementary service within the 3GPP system.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document gives the stage 3 description of the Multicall (MC) supplementary service. The present document specifies the procedures used by the radio interface for normal operation, registration and interrogation of the Multicall supplementary service. Provision, withdrawal, erasure, activation and deactivation of supplementary services is an administrative matter between the mobile subscriber and the service provider and causes no signalling on the radio interface.

3G TS 24.010 describes the general aspects of the specification of supplementary services at the layer 3 radio interface.

3G TS 24.080 specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in 3G TS 22.004, 3G TS 22.072, 3G TS 22.08x, 3G TS 22.09x-series and 3G TS 22.135. 3G TS 22.135 is related specifically to the Multicall supplementary service.

The technical realization of supplementary services are described in 3G TS 23.011, 3G TS 23.072, 3G TS 23.08x, 23.09x-series and 3G TS 23.135. 3G TS 23.135 is related specifically to the Multicall supplementary service.

The procedures for Call Control and Mobility Management at the layer 3 radio interface are defined in 3G TS 24.007 and 3G TS 24.008.

The following supplementary services are described in the present document:

- Multicall (MC) (see clause 4).

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3G TR 21.905: "3GPP Vocabulary".

[2] 3G TS 22.004: "General on supplementary services".

[3] 3G TS 22.030: "Man-Machine Interface (MMI) of the Mobile Station (MS)".

[4] 3G TS 22.135: "Multicall Stage1".

[5] 3G TS 23.011: "Technical realization of supplementary services".

[6] 3G TS 23.135: "Multicall supplementary service – stage 2".

[7] 3G TS 24.007: "Mobile radio interface signalling layer 3 General aspects".

[8] 3G TS 24.008: "Mobile radio interface layer 3 specification Core Network Protocol – Stage 3".

[9] 3G TS 24.010: "Mobile radio interface layer 3 Supplementary services specification General aspects".

[10] 3G TS 24.080: "Mobile radio interface layer 3 Supplementary services specification Formats and coding".

[11] 3G TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

3 Definitions and abbreviations

3.1 Abbreviations

For the purposes of the present document, the terms and definitions given in 3G TS 22.135 apply.

Further related abbreviations are given in 3G TR 21.905.

4 Multicall (MC)

4.1 Normal operation

All of the radio signalling specific to Multicall is at the served mobile subscriber side. The radio signalling on the other side uses basic call signalling procedures only.

The mobile subscriber supporting Multicall shall include the stream identifier (SI) information element to indicate whether a new traffic channel is requested for the call. Refer to TS 24.008 for the rules on allocating stream identifiers.

4.1.1 Mobile originating call (request a new traffic channel)

If the served mobile subscriber initiates an outgoing call (A-B), the mobile subscriber shall include the stream identifier (SI) information element in the SETUP message. For the first call, i.e. when there are no other ongoing calls, the following rules apply:

- The stream identifier value shall be equal to 1.
- CC capabilities that indicate N_{br}_UE shall be included in the SETUP message.
- NW CC capabilities that indicate the network supports Multicall shall be included in the CALL PROCEEDING message.

If the NW CC capabilities is not sent from the network, the mobile subscriber shall assume that the network doesn't support Multicall, and shall not initiate an additional mobile originating call via a new bearer.

If the network receives the SETUP message with a stream identifier value other than 1 for the first call, the network shall initiate call clearing with cause #95 "semantically incorrect message".

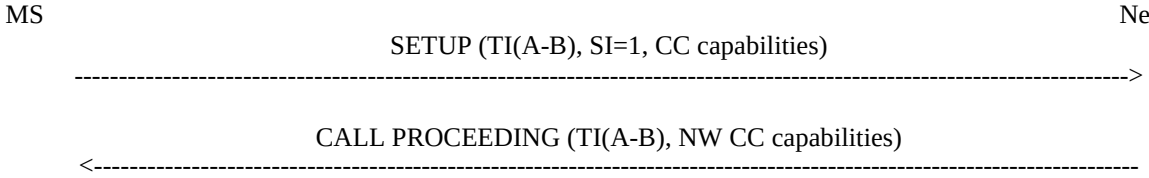

Figure 1: The first mobile originating call

If there is one active call (A-B) and the served mobile subscriber B wants to initiate another call (B-C) via a new bearer, the mobile subscriber B shall include a stream identifier (B-C) in the SETUP message. If there are several active calls and the mobile subscriber B wants to initiate another call via a new bearer, the mobile subscriber B shall include a stream identifier that is not used for the active calls.

If the network receives a SETUP message with a stream identifier including an invalid content, the network shall initiate call clearing with cause #95 "semantically incorrect message".

If the network can not permit the call because the mobile subscriber is not provisioned with the Multicall supplementary service, the network shall initiate call clearing with cause #50 "requested facility not subscribed".

If the network can not permit the call because the Multicall limit (N_{br}_SN or N_{br}_User) is exceeded, the network shall initiate call clearing with cause #63 "service or option not available". In this case, a NotifySS operation containing the Multicall-indicator that indicates the number of active bearers in use would exceed the maximum value will be sent to the served mobile subscriber B in a clearing message. Multicall-indicator includes:

- N_{br}_SN exceeded.
- N_{br}_User exceeded.

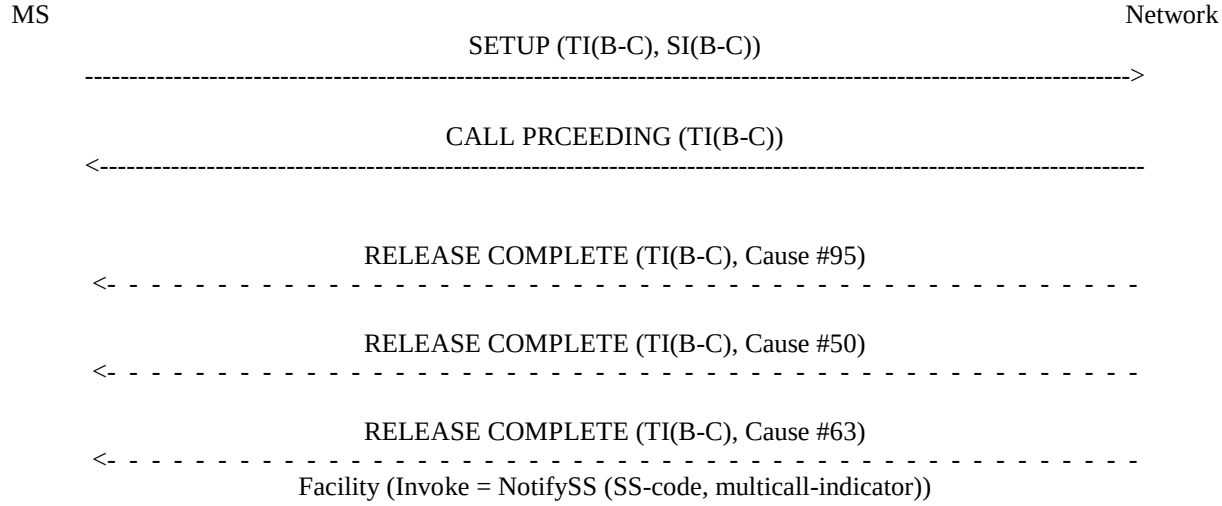

Figure 2: The additional mobile originating call

4.1.2 Mobile originating call (reuse an existing traffic channel)

If there is one active call (A-B) and the served mobile subscriber B wants to initiate another call (B-C) via the existing bearer, the subscriber will put the active call (A-B) on hold first, and initiate the additional mobile originating call (B-C).

The hold function shall be initiated by the mobile subscriber B and the transaction identifier (TI) shall have the same value as the transaction identifier (A-B) of the existing call.

For the initiation of another call (B-C), the mobile subscriber B shall include the stream identifier (SI) in the SETUP message and the stream identifier shall have the same value as the stream identifier (A-B) of the existing call.

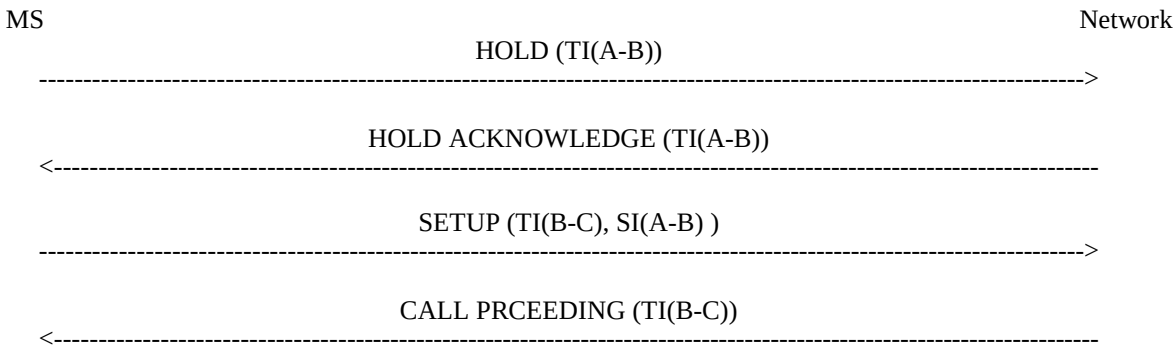

Figure 3: The mobile originating call via an existing traffic channel

4.1.3 Mobile terminating call (request a new traffic channel)

If the served mobile subscriber accepts the arrival of an incoming call (A-B), the mobile subscriber shall include the stream identifier (SI) information element in the CALL CONFIRMED message. For the first call, i.e. when there are no other ongoing calls, the following rules apply:

- NW CC capabilities that indicate the network supports Multicall shall be included in the CALL PROCEEDING message.
- The stream identifier value shall be equal to 1.
- CC capabilities that indicate N_{br}_UE shall be included in the CALL CONFIRMED message.

If the NW CC capabilities is not sent from the network, the mobile subscriber shall assume that the network doesn't support Multicall, and shall not initiate a mobile originating call via a new bearer.

If the network receives a CALL CONFIRMED message with a stream identifier value other than 1 for the first call, the network shall initiate call clearing with cause #95 "semantically incorrect message".

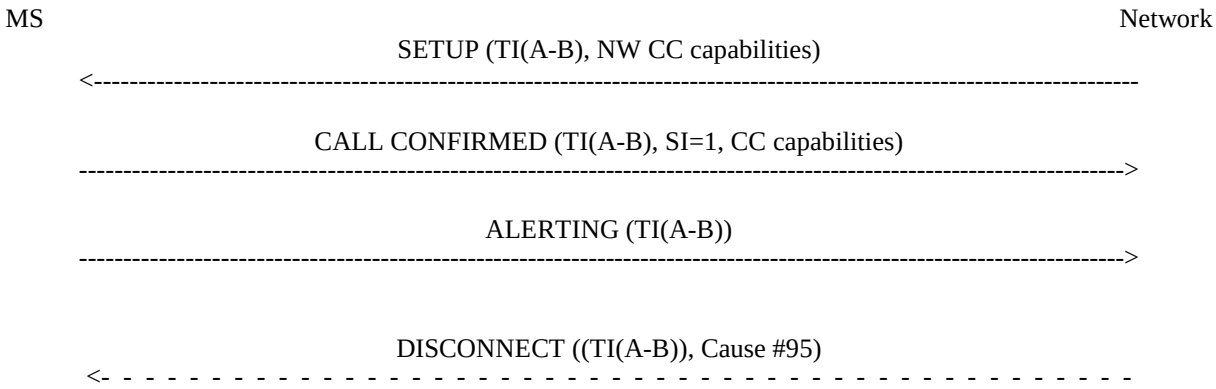

Figure 4: The first mobile terminating call

- If there is one active call (A-B) and the served mobile subscriber B wants to accept another incoming call (B-C) via a new bearer, the mobile subscriber B shall include the stream identifier with either of the following value in the CALL CONFIRMED message.SI = new value (not used for any of the active calls) (Case1).
- SI = "No Bearer" (Case2).

If the mobile subscriber B includes the stream identifier with “No Bearer” in the CALL CONFIRMED message, the mobile subscriber B shall include the stream identifier with a new value in the CONNECT message.

If the network receives a CALL CONFIRMED message with a stream identifier including an invalid content, the network shall initiate call clearing with cause #95 "semantically incorrect message".

If the network can not permit the call because the mobile subscriber is not provisioned with the Multicall supplementary service, the network shall initiate call clearing with cause #50 "requested facility not subscribed".

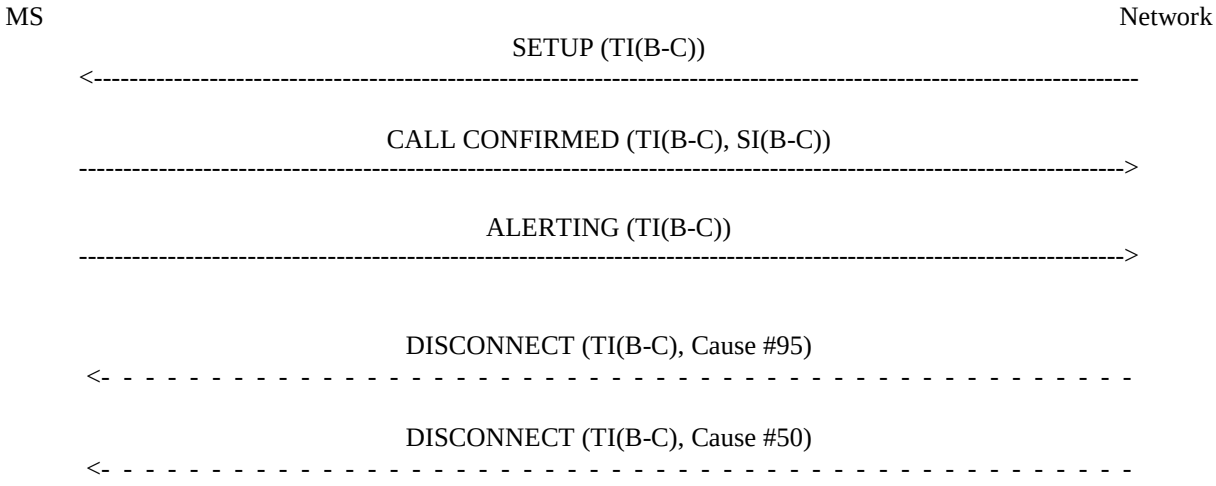

Figure 5: The additional mobile terminating call (Case1)

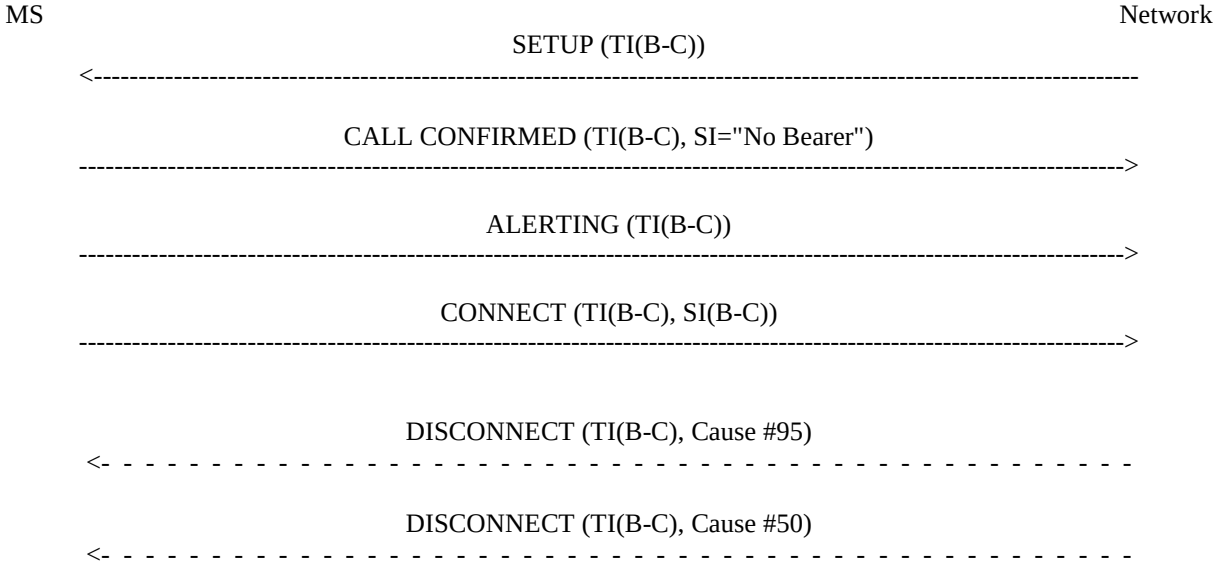

Figure 6: The additional mobile terminating call (Case2)

4.1.4 Mobile terminating call (reuse an existing traffic channel)

If there is one active call (A-B) and the served mobile subscriber B wants to accept another incoming call (B-C) via the existing bearer, the subscriber will put the active call (A-B) on hold first, and accept the additional mobile terminating call (B-C).

The hold function shall be initiated by the mobile subscriber B and the transaction identifier (TI) shall be the transaction identifier (A-B) of the existing call.

To accept the other incoming call (B-C), the mobile subscriber B shall include the stream identifier (SI) with value "No bearer" in the CALL CONFIRMED message. Mobile subscriber B shall include the stream identifier (A-B) in the CONNECT message. (See Figure 6).

If the Call waiting SS is invoked and the mobile subscriber B wants to accept the waiting call, the mobile subscriber B can put an existing call on hold and then accept the waiting call. In this case the mobile subscriber B shall include the stream identifier (SI) with value "No bearer" in the CALL CONFIRMED message, and include the stream identifier value which is used for the held call in the CONNECT message.

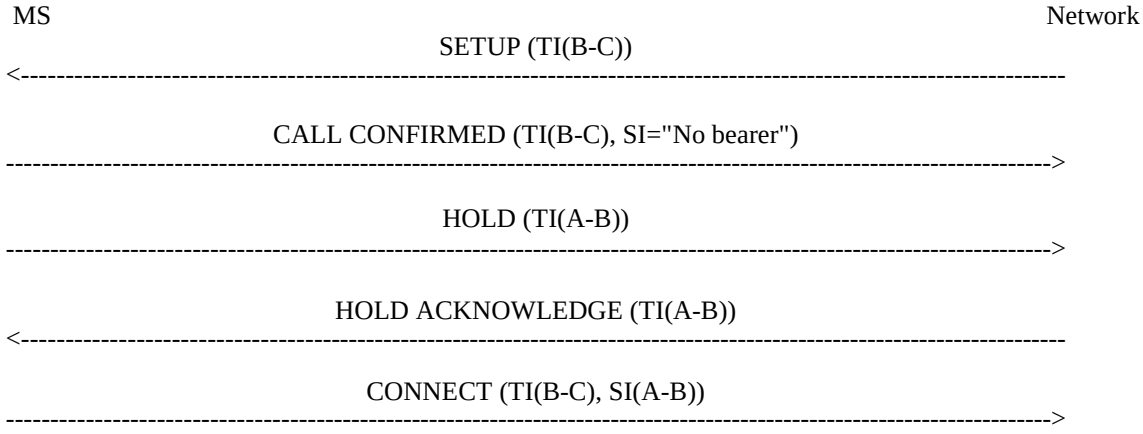

Figure 7: The mobile terminating call via an existing traffic channel

4.1.5 Mobile terminating call (simultaneous Call in Setup)

If there is one call (A-B) that has not reached the established phase and the served mobile subscriber B receives another incoming call (B-C), the served mobile subscriber B may not be able to accept the additional incoming call (B-C). In this case, the mobile subscriber B can initiate call clearing with cause #47 "no resources available, unspecified".

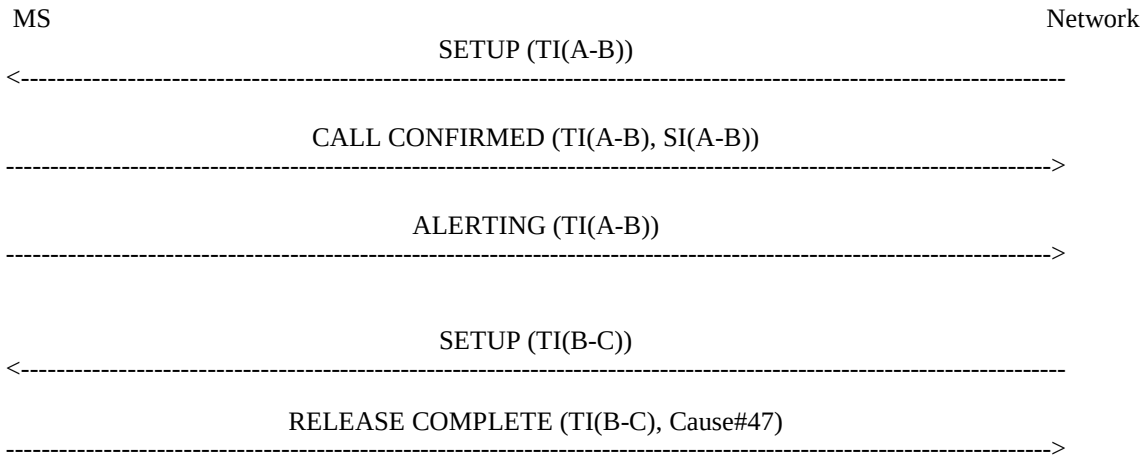

Figure 8: The mobile terminating call in the case of simultaneous Call in Setup

4.2 Registration

The following information has to be registered in the network:

- The maximum number of bearers chosen by the user, N_{br}_User.

4.2.1 Registration by the served mobile subscriber

A Multicall registration request from a mobile user shall include the SS-Code of Multicall. The request applies to all basic services.

If the registration is successful, the Multicall service will be registered. The network will then send a return result indicating acceptance of the request including the value of N_{br}_User. If the MS does not send an SS Version Indicator in the invocation request then the network shall send an SS-Status in the result. If the MS does send an SS Version Indicator in the invocation request then the inclusion of SS-Status in the result is optional. If the SS-Status is included the network shall set it to reflect the state of the service. The MS shall ignore the contents of the SS-Status parameter if one is received. See figure 9.

If the system cannot accept a registration request, a corresponding error indication is returned to the served mobile subscriber that Multicall registration was not successful. Error values are specified in 3G TS 24.080.

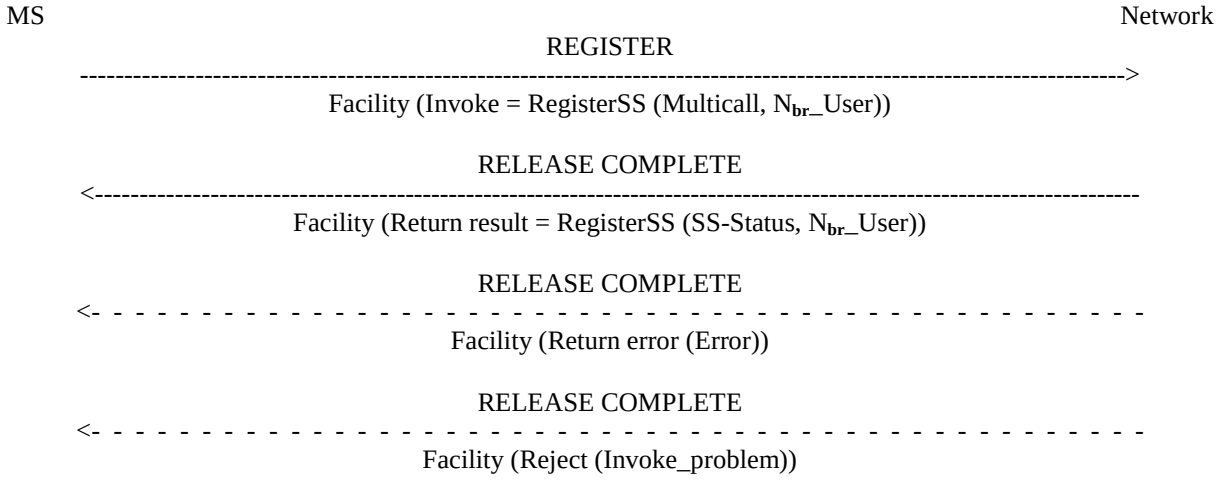

Figure 9: Registration of Multicall

4.3 Interrogation

The interrogation procedure enables the mobile subscriber to obtain information about the data stored in the PLMN. The network shall return the following information:

- The maximum number of bearers set by the user, N_{br}_User.
- The maximum number of bearers defined by Multicall subscription, N_{br}_SB.
- The maximum number of bearers supported by serving network, N_{br}_SN.

See figure 10.

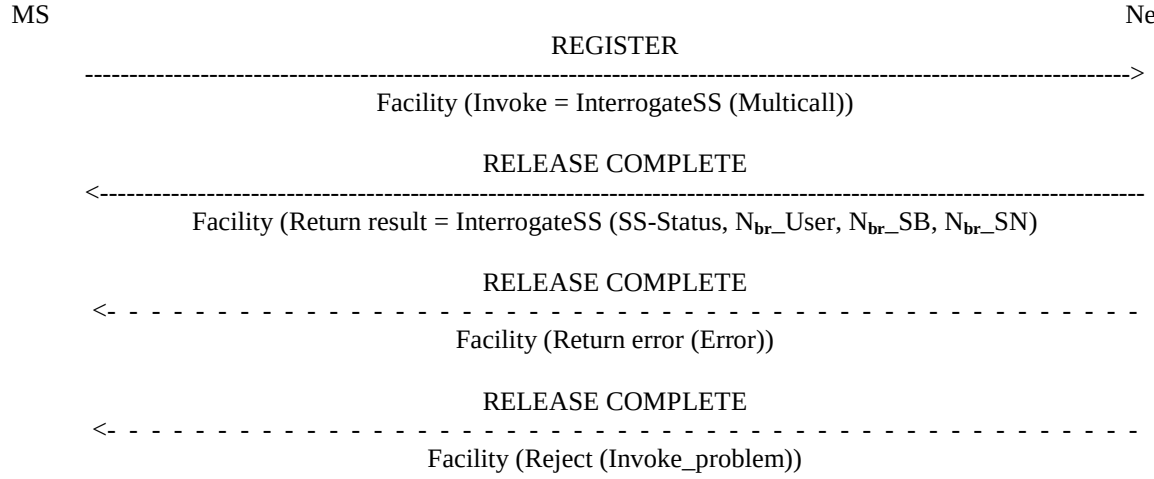

Figure 10: Interrogation of Multicall

Annex A (informative): Change history

Change history						
TSG CN#	**Spec**	**Version**	**CR**	**<Phase>**	**New Version**	**Subject/Comment**
CN#07	24.135	1.0.0		R99	3.0.0	Approved in TSGN#07

History

Document history		
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