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**European digital cellular telecommunications system (Phase 2);
Multi Party (MPTY) supplementary service - Stage 3
(GSM 04.84)**

ETSI

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the procedures used at the radio interface (Reference point Um as defined in ETS 300 551) for normal operation and invocation of multi party supplementary services within the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM technical specification, GSM 04.84 version 4.3.2.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM Technical Specifications (GSM-TS) (NOTE).

Reference is also made within this ETS to GSM 02.8x and 03.8x series. The specifications in the series can be identified, with their full title, within the normative reference Clause of this ETS by the last two digits of their GSM reference number e.g. GSM 03.8x series, refers to GSM 03.81, GSM 03.82, etc.

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TS). These TSs may have subsequently become I-ETTs (Phase 1), or ETSS (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSS.

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0 General

0.1 Scope

This technical specification specifies the procedures used at the radio interface (Reference point Um as defined in technical specification GSM 04.02) for normal operation and invocation of multi party supplementary services.

In technical specification GSM 04.10 the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

Technical specification GSM 04.80 specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in technical specification GSM 02.04 and the GSM 02.8x and 02.9x-series.

Technical specification GSM 02.84 is related specially to multi party supplementary services.

Technical realization of supplementary services is described in technical specification GSM 03.11 and the GSM 03.8x and 03.9x-series.

Technical specification GSM 03.84 is related specially to multi party supplementary services.

The procedures for Call Control, Mobility Management and Radio Resource management at the layer 3 radio interface are defined in technical specifications GSM 04.07 and GSM 04.08.

The following supplementary service belongs to the multi party supplementary services and is described in this technical specification:

- Multi party service (MPTY) (section 1).

0.2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

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| [1] | GSM 01.04 (ETR 100): "European digital cellular telecommunications system (Phase 2); "Abbreviations and acronyms". |
| [2] | GSM 02.04 (ETS 300 503): "European digital cellular telecommunications system (Phase 2); General on supplementary services". |
| [3] | GSM 02.81 (ETS 300 514): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 1". |
| [4] | GSM 02.82 (ETS 300 515): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1". |
| [5] | GSM 02.83 (ETS 300 516): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1". |

- [6] GSM 02.84 (ETS 300 517): "European digital cellular telecommunications system (Phase 2); Multi Party (MPPTY) supplementary services - Stage 1".
- [7] GSM 02.85 (ETS 300 518): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1".
- [8] GSM 02.86 (ETS 300 519): "European digital cellular telecommunications system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1".
- [9] GSM 02.88 (ETS 300 520): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 1".
- [10] GSM 02.90 (ETS 300 521): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 1".
- [11] GSM 03.11 (ETS 300 529): "European digital cellular telecommunications system (Phase 2); Technical realization of supplementary services".
- [12] GSM 03.81 (ETS 300 542): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 2".
- [13] GSM 03.82 (ETS 300 543): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 2".
- [14] GSM 03.83 (ETS 300 544): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
- [15] GSM 03.84 (ETS 300 545): "European digital cellular telecommunications system (Phase 2); Multi Party (MPPTY) supplementary services - Stage 2".
- [16] GSM 03.85 (ETS 300 546): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 2".
- [17] GSM 03.86 (ETS 300 547): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 2".
- [18] GSM 03.88 (ETS 300 548): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 2".
- [19] GSM 03.90 (ETS 300 549): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 2".
- [20] GSM 04.02 (ETS 300 551): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [21] GSM 04.07 (ETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".

- [22] GSM 04.08 (ETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- [23] GSM 04.10 (ETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".
- [24] GSM 04.80 (ETS 300 564): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".
- [25] GSM 04.83 (ETS 300 567): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

0.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

1 Multi Party service (MPTY)

1.1 Beginning the multi party service

The served mobile subscriber A may initiate an active multi party call from an active call C and a held call B.

The mobile station invokes the service by sending a FACILITY message to the network containing the BuildMPTY request. This BuildMPTY request indicates to the network that the mobile subscriber wishes all his calls to be connected together in a multi party call. The network will normally accept the request and connect the mobile subscriber with the other existing connections (active call C and held call B). If the request is not accepted, the network will indicate the error to the served mobile, see figure 1.1. The network confirms with the same transaction identifier. Error values are specified in TS GSM 04.80.

During the BuildMPTY operation the MS shall run a timer T(BuildMPTY). This timer is started when the operation is sent, and stopped when a response is received from the network. If this timer expires the MS shall assume that the operation has failed, locally release the invokeID, and may re-attempt the operation or inform the user of the failure.

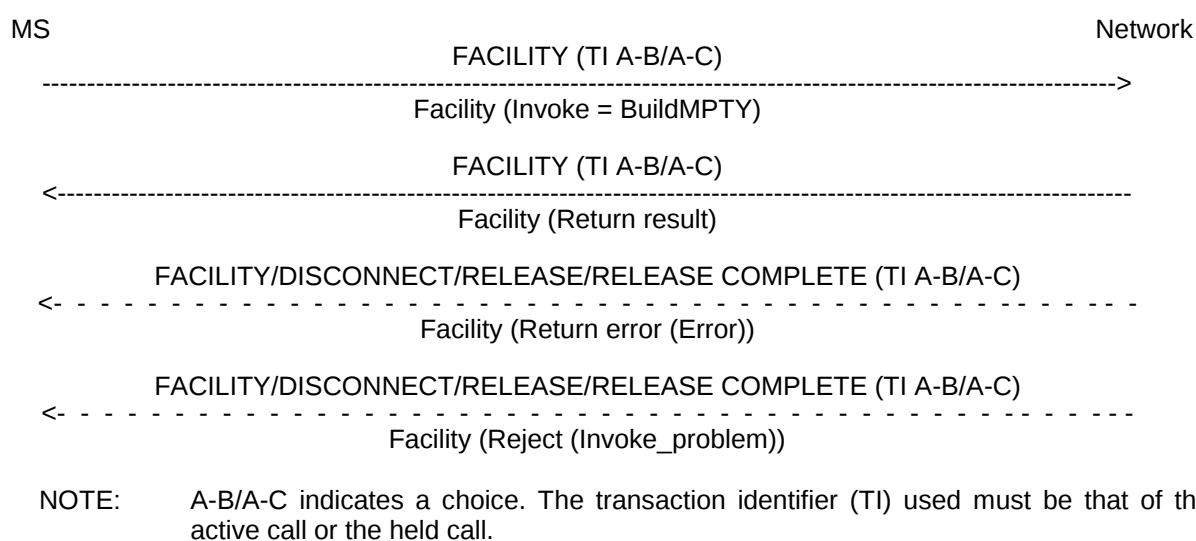


Figure 1.1: Invocation of the multi party call

If the network received a non-zero SS Screening indicator from the remote party's mobile station the network will also send indications towards the remote parties that the multi party call has been invoked, and towards the previously-held party to indicate that he is now retrieved, see figures 1.2 and 1.3. If the network did not receive a non-zero SS Screening indicator from the remote party's mobile station it shall not send a notification.

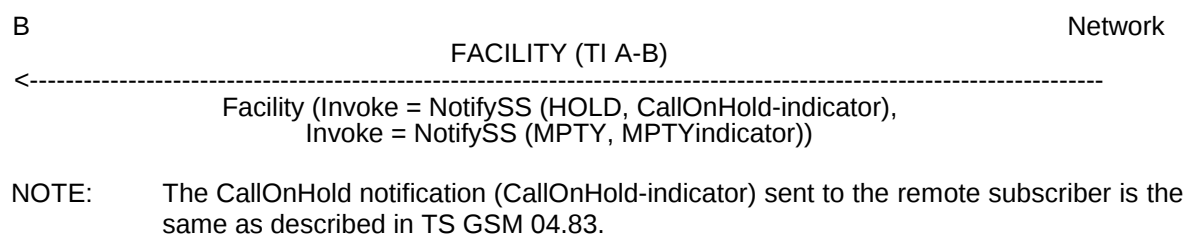


Figure 1.2: Notification of invocation to previously-held remote party

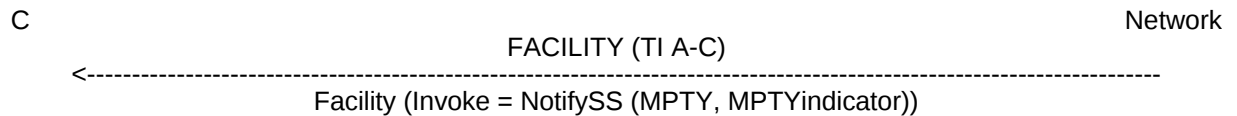


Figure 1.3: Notification of invocation to previously-active remote party

1.2 Managing an active multi party call

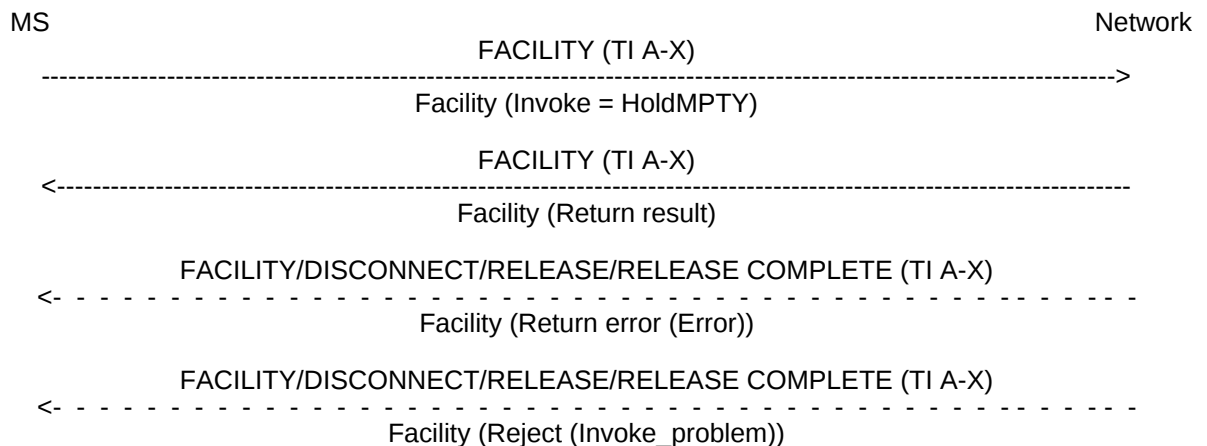
1.2.1 Served mobile subscriber

During an active multi party call the served mobile subscriber can request the network to:

1.2.1.1 Put the multi party call on hold

This is achieved by sending a FACILITY message to the network with any transaction identifier corresponding to a call within the multi party call. This requests the network to place the mobile subscriber's connection to the multi party call on hold. The network confirms with another message containing the same transaction identifier, see figure 1.4.

During the HoldMPTY operation the MS shall run a timer T(HoldMPTY). This timer is started when the operation is sent, and stopped when a response is received from the network. If this timer expires the MS shall assume that the operation has failed, locally release the invokeID, and may re-attempt the operation or inform the user of the failure.



NOTE: X = Any remote party in multi party call.

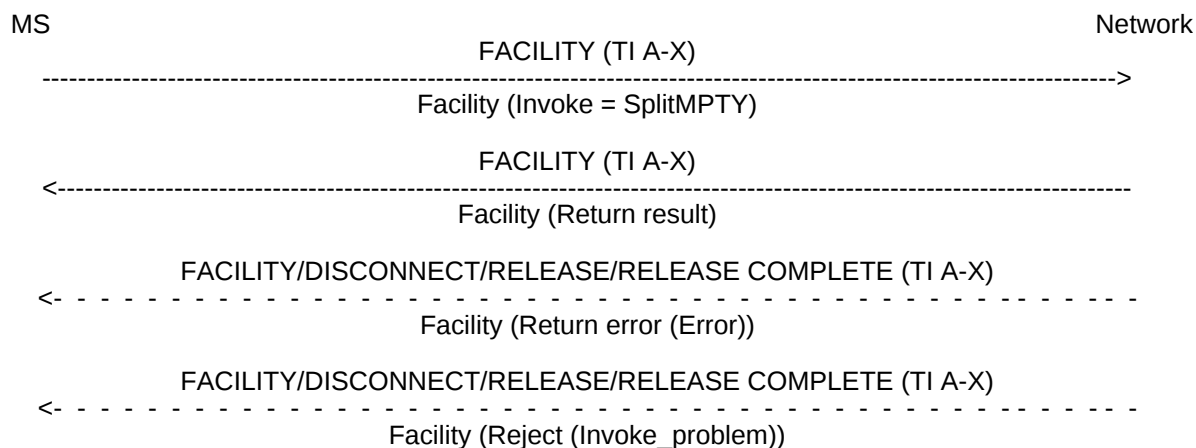
Figure 1.4: Served mobile subscriber places his connection to the multi party call on hold

Indications are sent towards all remote parties in the multi party call by means of normal CallOnHold notifications as described in TS GSM 04.83.

1.2.1.2 Create a private communication with one of the remote parties

To create a private communication with one of the remote parties, the served mobile will send a SplitMPTY message to the network, see figure 1.5. The network will send normal CallOnHold notifications to the remote parties on hold in the MPTY call.

During the SplitMPTY operation the MS shall run a timer T(SplitMPTY). This timer is started when the operation is sent, and stopped when a response is received from the network. If this timer expires the MS shall assume that the operation has failed, locally release the invokeID, and may re-attempt the operation or inform the user of the failure.



NOTE: X = Party with which to establish a private communication.

Figure 1.5: Served mobile subscriber requests a private communication with a single remote party

1.2.1.3 Terminate the entire multi party call

The multi party call is terminated by disconnecting all individual parties as described in section 1.2.1.4.

1.2.1.4 Explicitly disconnect a remote party

Any remote party may be individually disconnected by initiation of call clearing as defined in TS GSM 04.08 with the same transaction identifier corresponding to that party.

1.2.2 Remote Parties

During an active multi party call any conferee is able to:

1.2.2.1 Release from the multi party call

In this case, the network will initiate the call clearing procedure towards the served mobile subscriber as defined in TS GSM 04.08 with the transaction identifier corresponding to the disconnecting party.

1.2.2.2 Place his connection to the multi party call on hold, and typically later retrieve it

Where a held/retrieved indication is received from any remote party, the network will forward this to the served mobile subscriber (see TS GSM 04.83).

1.3 Managing a held multi party call

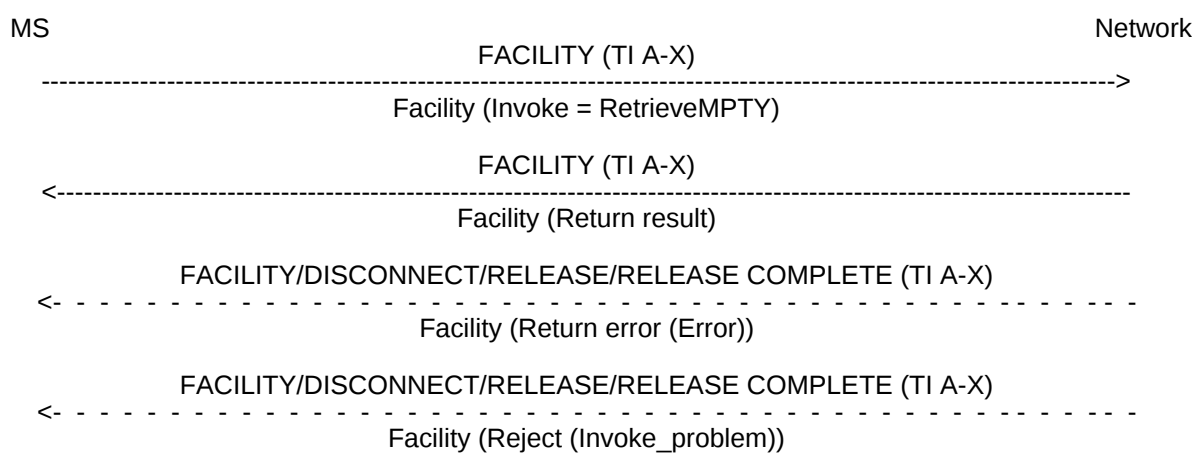
1.3.1 Served mobile subscriber

During a held multi party call the served mobile subscriber can request the network to:

1.3.1.1 Retrieve the held multi party call

To retrieve the held multi party call, a FACILITY message is sent to the network with a transaction identifier corresponding to any call in the MPTY. The network confirms the retrieval with another message containing the same transaction identifier, see figure 1.6.

During the RetrieveMPTY operation the MS shall run a timer T(RetrieveMPTY). This timer is started when the operation is sent, and stopped when a response is received from the network. If this timer expires the MS shall assume that the operation has failed, locally release the invokeID, and may re-attempt the operation or inform the user of the failure.



NOTE: X = Any remote party in multi party call.

Figure 1.6: Served mobile subscriber retrieves multi party call

Indications are sent towards all remote parties by means of normal CallOnHold (=CallRetrieved) notifications as described in TS GSM 04.83.

1.3.1.2 Initiate a new call

This is achieved by normal call set-up procedures (TS GSM 04.08).

1.3.1.3 Process a call waiting request

This is described in TS GSM 04.83.

1.3.1.4 Terminate the held multi party call

This is achieved by the same procedure as in section 1.2.1.3.

1.3.1.5 Explicitly disconnect a remote party

This is achieved by the same procedure as in section 1.2.1.4.

1.3.2 Remote parties

During a held multi party call any remote party is able to perform the same operations as described for an active multi party call in section 1.2.2.

1.4 Managing a single call and a multi party call

1.4.1 Served mobile subscriber

If the served mobile subscriber is connected to a multi party call (active or on hold) and another single call (active or on hold), he can request the network to:

1.4.1.1 Disconnect the single call

This is achieved by using the call clearing procedure as described in TS GSM 04.08 with the transaction identifier corresponding to the single call.

1.4.1.2 Disconnect the MPTY

This is achieved by the same procedure as disconnecting a held/active MPTY without another call, see section 1.2.1 and 1.3.1.

1.4.1.3 Disconnect all calls

This is achieved by using the procedures in sections 1.4.1.1 and 1.4.1.2.

1.4.1.4 Add the single call to the MPTY

The served mobile subscriber may request the connection of all his calls, held and active, into an active multi party call at any time by sending a FACILITY message with the transaction identifier corresponding to any remote party and containing the BuildMPTY invoke component, see section 1.1. This procedure will apply whether the multi party call is on hold or active, and whether the single call is on hold or active.

If the request is successful, previously held remote parties will receive an MPTY notification and a CallRetrieved notification as shown in figure 1.2, and previously active remote parties will receive an MPTY notification as shown in figure 1.3. If the network did not receive a non-zero SS Screening indicator from the remote party's mobile station it shall not send a notification.

If the request is unsuccessful e.g. because the maximum number of remote parties has already been reached, then an error is returned to the served mobile subscriber, as shown in figure 1.1. Error values are specified in TS GSM 04.80.

1.4.1.5 Alternate between the MPTY call and the single call

This procedure follows the Alternate procedure defined in TS GSM 04.83 with the exception that the MPTY call is held/retrieved using HoldMPTY/RetrieveMPTY in place of HOLD/RETRIEVE as follows:

<u>Single call</u>	<u>MPTY call</u> (Facility)
HOLD	Invoke (HoldMPTY)
HOLD ACKNOWLEDGE	Return result
HOLD REJECT	Return error (error)
RETRIEVE	Invoke (RetrieveMPTY)
RETRIEVE ACKNOWLEDGE	Return result
RETRIEVE REJECT	Return error (error)

1.5 Adding extra remote parties

Extra remote parties are added by placing the multi party call on hold (section 1.2.1.1), setting up a new connection (either a new call or a waiting call) and then sending a FACILITY message to the network requesting that the active call be joined with the MPTY, using the same signalling as for invocation, see figure 1.1. This results in an active multi party call.

Notifications are sent as for the initial invocation (i.e. previously-held parties in MPTY receive CallRetrieved notifications and MPTY notifications; the new remote party only receives an MPTY notification), see figures 1.2 and 1.3. If the network did not receive a non-zero SS Screening indicator from the remote party's mobile station it shall not send a notification.

If the request is not accepted, e.g. because the maximum number of remote parties has already been reached, then the error is indicated to the mobile station. Error values are specified in TS GSM 04.80.

1.6 Auxiliary states for MPTY

In the call hold service (TS GSM 04.83), a two dimensional state space is defined, where the first dimension corresponds to the GSM 04.08 call control state and the second dimension corresponds to the call hold state (Idle, Hold Request, Call Held, Retrieve Request). For the purposes of the MPTY service, it is necessary to introduce another dimension to this state space, i.e. the multi party state.

There are four auxiliary states associated with the MPTY service:

- * Idle;
- * MPTY request;
A request has been made to add this call to the MPTY.
- * Call in MPTY;
This call is in the MPTY.
- * Split request;
A request has been made to remove this call from the MPTY.

These Auxiliary states apply in addition to the GSM 04.08 call control states and the GSM 04.83 call hold states. Thus for example, an active call in a held MPTY has the state (Active, Call held, Call in MPTY). Not all states are allowed, for example an MPTY cannot be split while it is held, so (Active, Call held, Split request) is forbidden.

1.7 Activation, deactivation, registration, erasure and interrogation

Activation, deactivation, registration, erasure and interrogation of the multi party service are not applicable.

1.8 Simultaneous use of multi party operations

The operations BuildMPTY, SplitMPTY, HoldMPTY and RetrieveMPTY interact with each other, and cannot be applied simultaneously. Once the mobile station has initiated one of these operations, it shall not initiate another multi party operation until the first operation has been acknowledged by the network, or the MS locally determines (due to timer expiry) that the first operation has failed.

The use of several multi party operations as different components in the same message is not allowed.

History

Document history	
February 1995	First Edition
November 1995	Converted into Adobe Acrobat Portable Document Format (PDF)