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Digital cellular telecommunications system (Phase 2+) (GSM); Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3 (GSM 04.83 version 7.0.1 Release 1998)

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European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
Call Waiting (CW) and Call Hold (HOLD)
supplementary services;
Stage 3
(GSM 04.83 version 7.0.1 Release 1998)**

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Foreword

This European Standard (Telecommunications series) has been produced by the Special Mobile Group (SMG).

The present document specifies the procedures used at the radio interface for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of call completion supplementary services within the digital cellular telecommunications system.

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

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- 7 indicates Release 1998 of GSM Phase 2+.
 - x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
 - y the third digit is incremented when editorial only changes have been incorporated in the specification.

National transposition dates

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Date of withdrawal of any conflicting National Standard (dow):	30 September 2000

0 Scope

The present document specifies the procedures used at the radio interface (Reference point Um as defined in GSM 04.02) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of call completion supplementary services. Provision and withdrawal of supplementary services is an administrative matter between the mobile subscriber and the service provider and cause no signalling on the radio interface.

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

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

Definitions and descriptions of supplementary services are given in GSM 02.04 and GSM 02.8x and GSM 02.9x-series. GSM 02.83 is related specially to call completion supplementary services.

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

GSM 03.83 is related specially to call completion supplementary services.

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

The following supplementary services belong to the call completion supplementary services and are described in the present document:

- Call waiting (CW) (clause 1);
- Call hold (HOLD) (clause 2).

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0.1 References (standards.iteh.ai)

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

- [1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 02.04: "Digital cellular telecommunications system (Phase 2+); General on supplementary services".
- [3] GSM 02.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 1".
- [4] GSM 02.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 1".
- [5] GSM 02.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".
- [6] GSM 02.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPPTY) supplementary services - Stage 1".

- [7] GSM 02.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 1".
- [8] GSM 02.86: "Digital cellular telecommunications system (Phase 2+); Advice of charge (AoC) supplementary services - Stage 1".
- [9] GSM 02.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 1".
- [10] GSM 02.90: "Digital cellular telecommunications system (Phase 2+); Unstructured Supplementary Services Data (USSD) - Stage 1".
- [11] GSM 02.91: "Digital cellular telecommunications system (Phase 2+); ECT supplementary services operation - Stage 1".
- [12] GSM 03.11: "Digital cellular telecommunications system (Phase 2+); Technical realization of supplementary services".
- [13] GSM 03.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 2".
- [14] GSM 03.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 2".
- [15] GSM 03.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
- [16] GSM 03.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 2".
- [17] GSM 03.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 2".
- [18] GSM 03.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 2".
- [19] GSM 03.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 2".
- [20] GSM 03.90: "Digital cellular telecommunications system (Phase 2+); Unstructured supplementary services operation - Stage 2".
- [21] GSM 03.91: "Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT) supplementary service - Stage 2".
- [22] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [23] GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".
- [24] GSM 04.08: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
- [25] GSM 04.10: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3; Supplementary services specification; General aspects".
- [26] GSM 04.80: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification; Formats and coding".
- [27] GSM 04.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 3".

0.2 Abbreviations

Abbreviations used in the present document are listed in GSM 01.04.

1 Call Waiting (CW)

1.1 Waiting call indication and confirmation

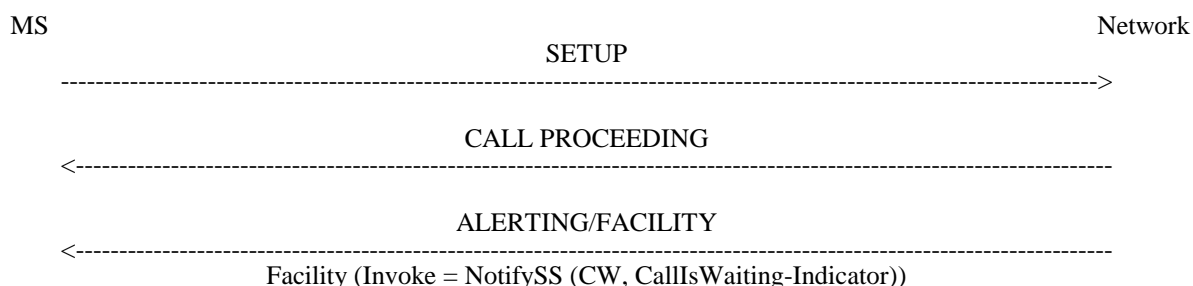
When this service is activated for the controlling subscriber B and the B-subscriber has calls only in states U10 (Active) or U26 (MO Modify) as defined in GSM 04.08, the arrival of an incoming call from subscriber C shall, if no other call is waiting be signalled to the mobile station B by a normal call indication. In that case the network and the mobile station shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) allocated to the waiting call and must not be the same as the transaction identifier (A-B) for the already existing call (see figure 1.1). In the CALL CONFIRMED message sent to the network the Cause information element shall be included with cause #17 "user busy" (see figure 1.1). When the ALERTING message is received by the network the call waiting timer T2 shall be started or if call forwarding on no reply is activated for the B-subscriber the no reply condition timer T3 shall be started.

If the network received a non-zero SS Screening indicator from the calling users mobile station the ALERTING/FACILITY message sent to a calling mobile user shall include the Facility information element with an invoke of the Notification operation indicating that the call is waiting (see figure 1.2). If the network did not receive a non-zero SS Screening indicator from the calling users mobile station it shall not send a notification, i.e. either the ALERTING message does not include the Notification operation or the FACILITY message is omitted.



NOTE: The SETUP message shall include a "Signal Information" element with value #7 (call waiting tone on). This shall be used by the MS to generate an appropriate call waiting indication.

Figure 1.1: Call indication to the mobile station on arrival of an incoming call and call confirmation from the mobile station



NOTE: If possible, the ALERTING message shall be used as the carrier message for the Call Waiting notification. Otherwise the FACILITY message shall be used.

Figure 1.2: Notification to a calling mobile station that the call is in the waiting state

1.2 Normal operation with successful outcome

1.2.1 Waiting call accepted; existing call released

If the mobile user B before expiry of timer T2 determines to accept the waiting call and release the existing call the mobile station shall release the existing call firstly and accept the waiting call secondly.

For the release of the existing call the mobile station and the network shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (A-B) of the already existing call. The Cause information element in the first clearing message shall indicate cause #16 "normal clearing".

For the acceptance of the waiting call the mobile station and the network shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call.

When the network receives the CONNECT message the timer T2 or if applicable the timer T3 shall be stopped.

1.2.2 Waiting call accepted; existing call on hold

If the mobile user B before expiry of timer T2 or if applicable timer T3 determines to accept the waiting call and put the existing call on hold the mobile station shall put the existing call on hold firstly and accept the waiting call secondly.

In case there is one active call (A-B) and another call (D-B) on hold and call (C-B) waiting, and the mobile user B wants to accept the waiting call (C-B) and put the active call (A-B) on hold, the held call (D-B) has to be released first, either by user B or user D, in accordance with GSM 04.08.

To put the existing call on hold the mobile station and the network shall act in accordance with clause 2. The hold function shall be initiated by the mobile station and the transaction identifier shall be the transaction identifier (A-B) of the existing call (see figure 1.3).

For the acceptance of the waiting call the mobile station and the network shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call (see figure 1.3).

When the network receives the CONNECT message the timer T2 or if applicable the timer T3 shall be stopped.

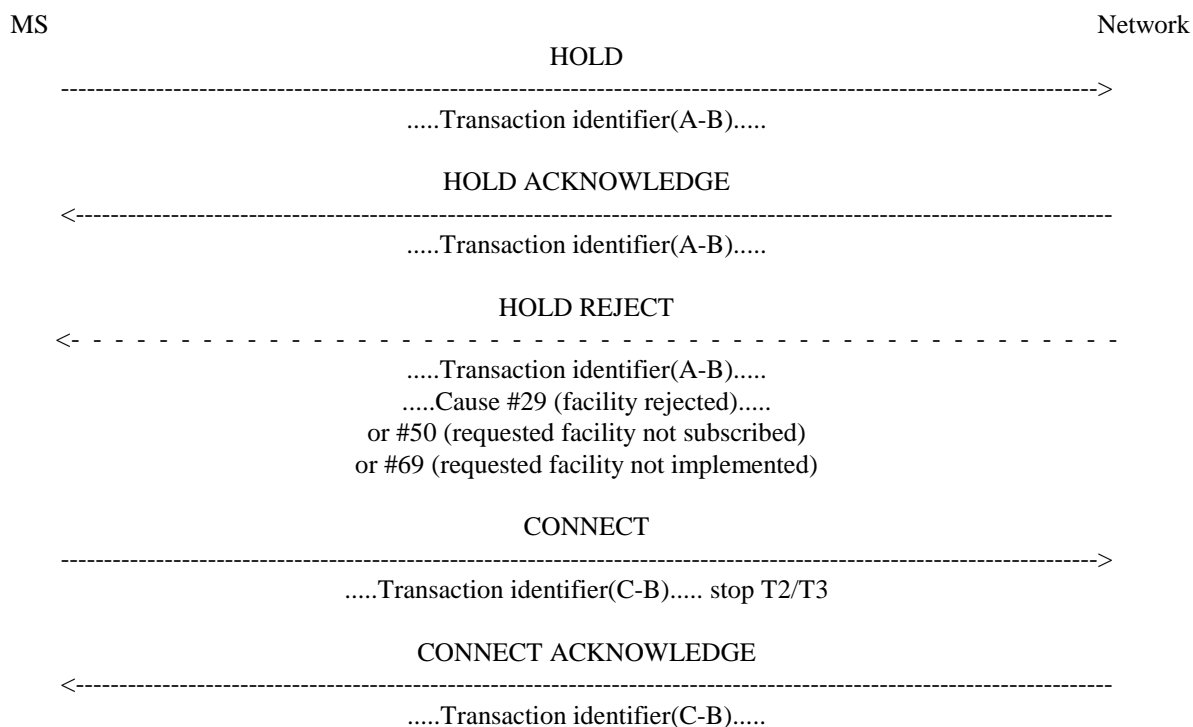


Figure 1.3: Existing call on hold and acceptance of waiting call by the mobile station

1.2.3 Existing call released by user A; waiting call accepted

If user A before the expiry of timer T2 or if applicable timer T3 determines to release the existing call then the existing call shall be released by the network firstly and the waiting call may be accepted by the mobile station secondly.

For the release of the existing call the network and the mobile station shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (A-B) of the existing call.

For the acceptance of the waiting call the mobile station and the network shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call.

When the network receives the CONNECT message the timer T2 or if applicable the timer T3 shall be stopped.

1.3 Normal operation with unsuccessful outcome

1.3.1 Waiting call released by subscriber B

For the release of the waiting call the mobile station and the network shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call.

- * If the B subscriber indicates UDUB by the sending of the first clearing message with cause information element #17 (User Busy), and call forwarding on mobile subscriber busy is activated for the B subscriber the call shall be forwarded by the network. If call forwarding is not active the call will be cleared.
- * If any other causes are given in the first clearing message the call will be released.

1.3.2 Waiting call released by calling user C

If the calling user C, before the expiry of timer T2 or timer T3 (if applicable), releases the waiting call then the network shall release the waiting call against the mobile station.

For the release of the waiting call the network and the mobile station shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call.

When the network initiates clearing by sending a clearing message to the mobile station the timer T2 or, if applicable, the timer T3 shall be stopped.

1.3.3 Waiting call times out

If the timer T2 expires the network shall release the waiting call. The network and the mobile station shall act in accordance with GSM 04.08. The transaction identifier shall be the transaction identifier (C-B) of the waiting call. The Cause information element in the first clearing message shall indicate cause #102 "recovery on timer expiry".

1.3.4 No reply condition timer expires

If call forwarding on no reply is activated for the B-subscriber and the no reply condition timer expires the waiting call shall be forwarded in accordance with GSM 04.82. The network shall clear the waiting call towards the B-subscriber as in subclause 1.3.3.

1.4 Activation

Activation of the supplementary service call waiting will be performed by the subscriber. The network will send a return result indication of acceptance of the request (see figure 1.4).

If the network cannot accept an activation request, an error indication is returned to the served mobile subscriber. Error values are specified in GSM 04.80 (see figure 1.4).

If the mobile subscriber does not indicate a specific basic service group the activation of call waiting is valid for all applicable basic services (see figure 1.4).