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Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT) supplementary service - Stage 3 (GSM 04.91)

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Foreword

This Global System for Mobile communications Technical Specification (GTS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This GTS defines stage 3 of Explicit Call Transfer (ECT) supplementary services within the digital cellular telecommunications system (Phase 2/Phase 2+).

GTS are produced by TC-SMG to enable the GSM Phase 2+ specifications to become publicly available, prior to submission for the formal ETSI standards approval procedure to become European Telecommunications Standards (ETS). This ensures the earliest possible access to GSM Phase 2+ specifications for all Manufacturers, Network operators and implementors of the Global System for Mobile communications.

The contents of this GTS are subject to continuing work within TC-SMG and may change following formal TC-SMG approval. Should TC-SMG modify the contents of this GTS it will then be republished by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:

- y the third digit is incremented when editorial only changes have been incorporated in the specification;
- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

Reference is made within this GTS to GSM-TSs (note).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETSs (Phase 1), or ETSS/ETSI Technical Reports (ETRs) (Phase 2). TC-SMG has also produced ETSI GSM TSs which give the technical specifications for the implementation of Phase 2+ enhancements of the digital cellular telecommunications system. These version 5.x.x GSM Technical Specifications may be referred to as GTSS.

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1 Scope

This Global System for Mobile communications Technical Specification (GTS) gives the stage 3 description of the call transfer supplementary services.

This specification specifies the procedures used at the radio interface (Reference point Um as defined in technical specification GSM 04.02) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of call transfer 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 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 specifications GSM 02.04, GSM 02.8x and GSM 02.9x-series. Technical specification GSM 02.91 is related specifically to call transfer supplementary services.

The technical realization of supplementary services is described in technical specifications GSM 03.11, GSM 03.8x and 03.9x-series. Technical specification GSM 03.91 is related specifically to call transfer 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 services belong to the call transfer supplementary services and are described in this specification:

- Explicit Call Transfer (ECT) (see clause 4).

2 Normative references

This specification 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 specification 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 02.30 (ETS 300 511): "European digital cellular telecommunication system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS)". |
| [4] | GSM 02.81 (ETS 300 514): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 1". |
| [5] | GSM 02.82 (ETS 300 515): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1". |
| [6] | GSM 02.83 (ETS 300 516): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1". |

- [7] GSM 02.84 (ETS 300 517): "European digital cellular telecommunications system (Phase 2); Multi Party (MPTY) supplementary services - Stage 1".
- [8] GSM 02.85 (ETS 300 518): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1".
- [9] GSM 02.86 (ETS 300 519): "European digital cellular telecommunications system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1".
- [10] GSM 02.88 (ETS 300 520): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 1".
- [11] GSM 02.90 (ETS 300 625): "European digital cellular telecommunications system (Phase 2); Unstructured Supplementary Services Data (USSD) - Stage 1".
- [12] GSM 02.91: "Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT) supplementary services operation - Stage 1".
- [13] GSM 02.93: "Digital cellular telecommunications system (Phase 2+); Completion of Calls to Busy Subscriber (CCBS) supplementary service operation - Stage 1".
- [14] GSM 03.11 (ETS 300 529): "European digital cellular telecommunications system (Phase 2); Technical realization of supplementary services".
- [15] GSM 03.81 (ETS 300 542): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 2".
- [16] GSM 03.82 (ETS 300 543): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 2".
- [17] GSM 03.83 (ETS 300 544): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
- [18] GSM 03.84 (ETS 300 545): "European digital cellular telecommunications system (Phase 2); Multi Party (MPTY) supplementary services - Stage 2".
- [19] GSM 03.85 (ETS 300 546): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 2".
- [20] GSM 03.86 (ETS 300 547): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 2".
- [21] GSM 03.88 (ETS 300 548): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 2".
- [22] GSM 03.90 (ETS 300 549): "European digital cellular telecommunications system (Phase 2); Unstructured Supplementary Service Data (USSD) - Stage 2".
- [23] GSM 03.91: "Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT) supplementary service - Stage 2".

- [24] GSM 03.93 "Digital cellular telecommunications system (Phase 2+); Completion of Calls to Busy Subscriber (CCBS) supplementary service - Stage 2".
- [25] GSM 04.02 (ETS 300 551): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [26] GSM 04.07 (ETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".
- [27] GSM 04.08 (ETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- [28] GSM 04.10 (ETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".
- [29] GSM 04.80 (ETS 300 564): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".

3 Abbreviations

The abbreviations used in this specification are listed in GSM 01.04 [1].

4 Explicit Call Transfer (ECT)

4.1 Normal operation

The Explicit Call Transfer (ECT) function should be invoked in association with two existing calls which one is answered and in the held state and the other is answered and active or alerting. The invocation of the ECT function does not affect the existing TS GSM 04.08 call states, but does affect the auxiliary state of the held call. The request for ECT retrieves the auxiliary state of the held call return to the idle state and afterwards connects the two calls.

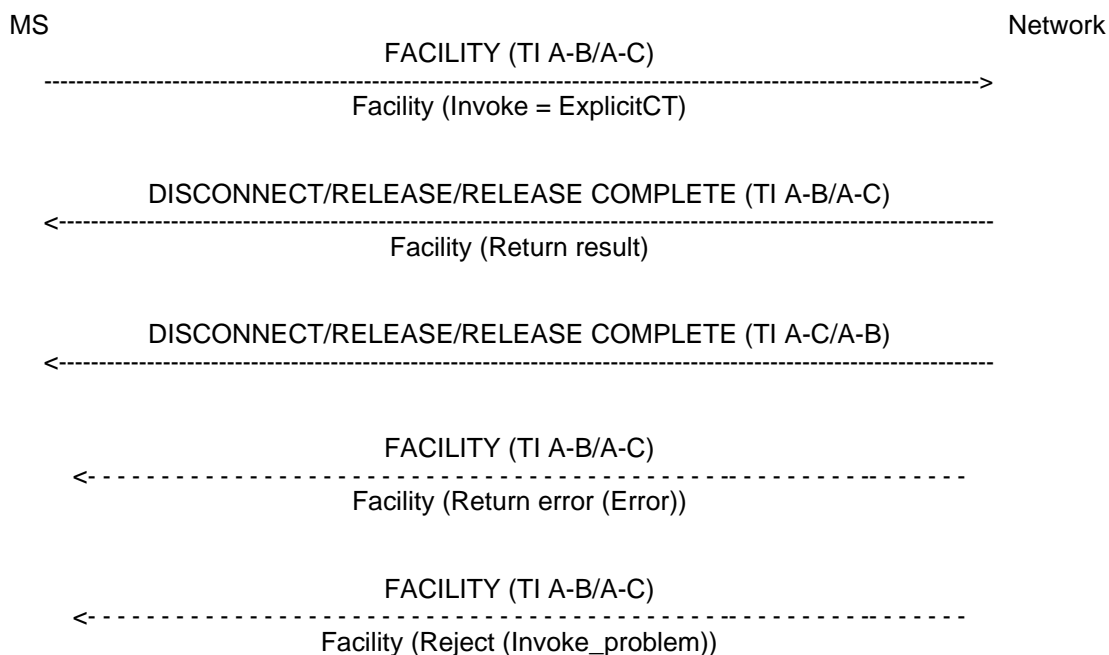
The Mobile Station (MS) invokes the service by sending a FACILITY message to the network containing the ECT request (ECT request). This ECT request indicates to the network that the mobile subscriber wishes the two calls to be connected together.

The network will normally accept the ECT request and connect the two calls, indicates the success of the ECT request to the served subscriber and disconnect afterwards the served mobile subscriber from both calls (see figure 1).

If the ECT request is not accepted, the network will indicate the error to the served subscriber (see figure 1) and leaves the two calls to the condition it was in prior to the ECT request. The network confirms with the same transaction identifier. The detailed coding of the different error values are specified in TS GSM 04.80. Which error value is used in which error case is described below.

During the ECT operation the MS shall run a timer T_{ECT} . 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.

4.2 Explicit Call Transfer invocation



NOTE: A-B/A-C indicates a choice. The Transaction Identifier (TI) used for the invocation of ECT shall be that of the active/answered call or of the held call.
 A-C/A-B indicates the TI of the other call.

Figure 1: Invocation of Explicit Call Transfer

In the following table the use of the different error values is described:

Table 1: Error values

Error	Error case
IllegalSS-Operation	- operation violates the general rules applicable to the service
	- different calls and either off them or two are not TS 11 (telephony)
	- one or both of the calls are in the wrong call states
	- having only one call or one call is clearing
	- creation of a traffic channel loop
SS-ErrorStatus	- the served subscriber has not subscribed to ECT
SS-NotAvailable	- SS is not available in current location area
SS-Incompatibility	- SS-Interaction violation
FacilityNotSupported	- Facility not supported in VPLMN
SystemFailure	- problems in an entity or network resources
ResourcesNotAvailable	- problems to allocate resources
CallBarred	- contravention with the active barring program

4.3 Notification to the remote parties

If the network received a non-zero SS Screening indicator from the remote party's MS the network shall send a notification to the remote party indicating that the call has been transferred and towards the previously-held party to indicate that he is now retrieved.

If the network did not receive a non-zero SS Screening indicator from the remote party's MS it shall not send a notification.

The content of the Notification Indicator and the Redirection Number in detail is given in GSM 03.91 and the coding in TS GSM 04.80. For the following it is assumed that the Line Identities of the remote parties are available and allowed to be presented to the remote parties.

4.3.1 Notification to the held remote party

If ECT was invoked in the active state the previous-held remote party will be notified at the invocation of ECT (see figure 2).

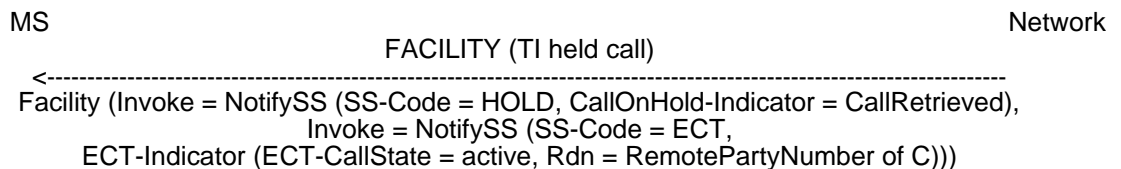


Figure 2: Notification of invocation (at active state) to held remote party

If ECT was invoked in the alerting state the previous-held remote party will be notified at the invocation of ECT (figure 3) and again at the receipt of the ANSWER message from the previous-alerting remote party (figure 4).

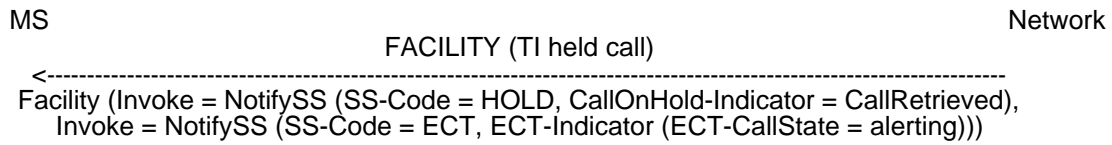


Figure 3: Notification of invocation (at alerting state) to held remote party

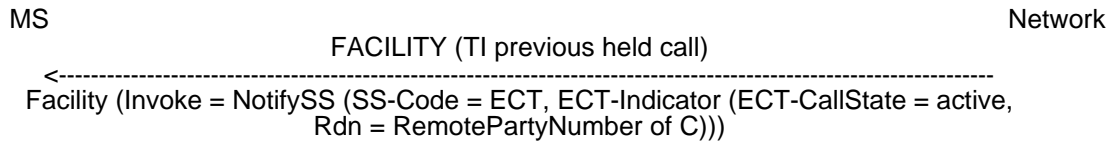


Figure 4: Notification to the previous-held remote party at receipt of the ANSWER message by the previous-alerting remote party

4.3.2 Notification to the active or alerting remote party

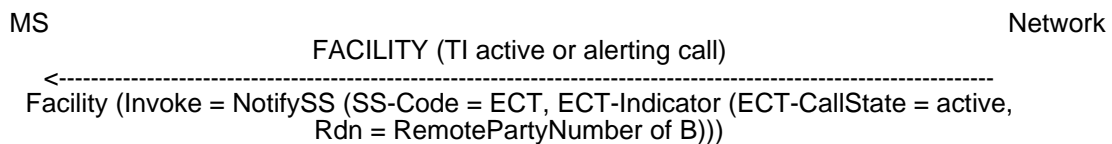


Figure 5: Notification of invocation to previous-active or previous-alerting remote party

4.4 Activation and deactivation

Activation and deactivation of ECT cause no signalling on the radio path.

4.5 Registration, erasure and interrogation

Registration, erasure and interrogation of ECT are not applicable.

5 Support by "old" MSs

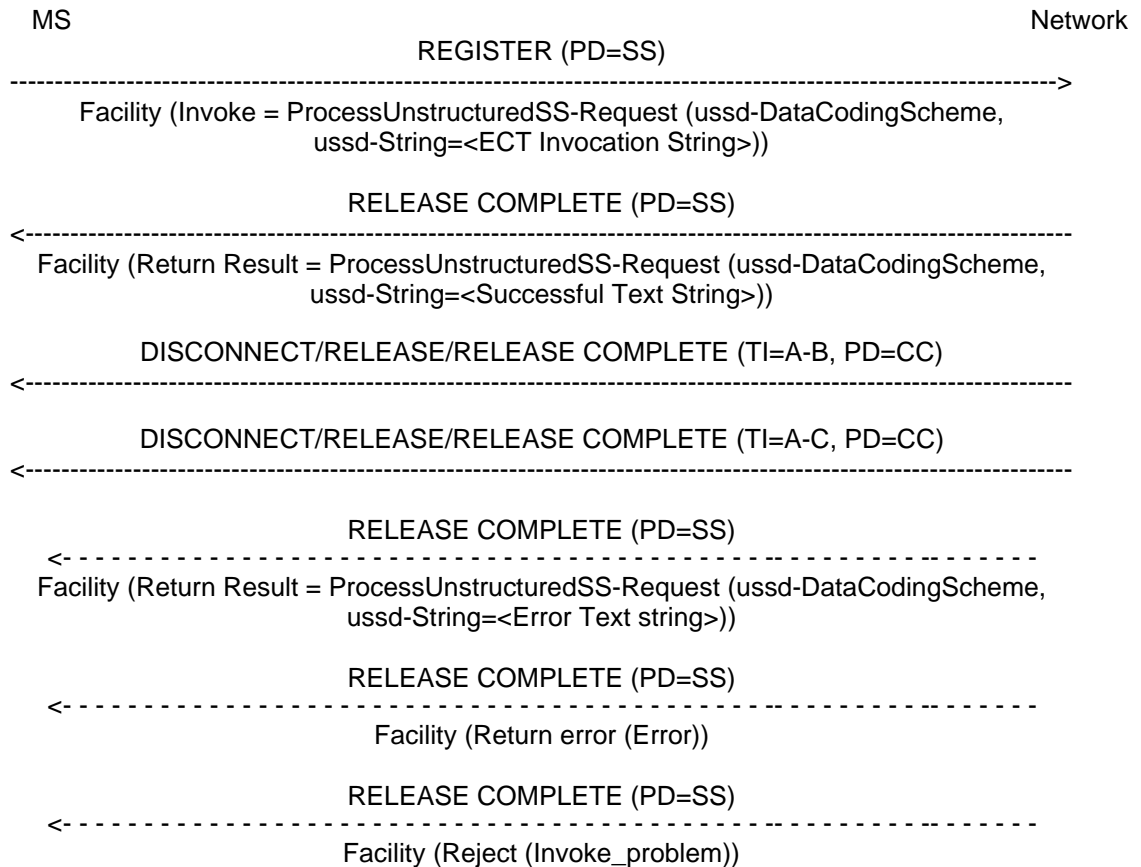
MSs which do not explicitly support ECT are not precluded from attempting to invoke ECT. It is however, an operator option to support the invocation of ECT by these mobile stations. Where operators support this option, the mechanism employed to offer the ECT service to these MSs shall be USSD. However, it should be noted that it may not be possible using this mechanism to offer the same degree of service to the served subscriber as described in clause 4.

5.1 Explicit Call Transfer invocation

MS A invokes the service by sending a REGISTER message to the network using a call independent supplementary service (SS) transaction, with the facility information element, indicating ProcessUnstructuredSS-Request (the MMI is specified in GSM 02.30).

If the invocation of ECT is successful, then after the SS transaction has been cleared, the network shall release the CC transactions.

If the invocation of ECT is not successful, then the CC transactions shall not be released.



NOTE: The text strings "<Successful Text String>" and "<Error Text String>" shall be defined by the network operator. Each network shall define only one "<Successful Text String>" and only one "<Error Text string>" for each error identified in table 1.

For Phase 1 USSD the operation ProcessUnstructuredSS-Request is replaced by ProcessUnstructuredSS-Data.

Figure 6: Invocation of Explicit Call Transfer for non supporting MSs

5.2 Notification to the remote parties

No alternative procedures are defined for sending notifications to remote parties indicating that the call has been transferred.

History

Status of Technical Specification GSM 04.91		
Date	Version	Remarks
		No phase 1 version
June 94	1.0.0	To SMG#11 for information
April 95	4.0.0	TS approved by SMG#14
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CR 04.91-001 (category F)		
Oct 95	5.0.0	change requests approved by SMG#16:
CR 04.91-002r2 (category B)		
CR 04.91-003 (category B)		

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