

ETSI TS 124 091 V15.0.0 (2018-07)



**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
Explicit Call Transfer (ECT) supplementary service;
Stage 3
(3GPP TS 24.091 version 15.0.0 Release 15)**



Reference

RTS/TSGC-0424091vf00

Keywords

GSM,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2018.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M logo is protected for the benefit of its Members.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Foreword

This Technical Specification (TS) has been produced by 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 <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Foreword.....	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope	5
2 References	5
3 Abbreviations	6
4 Explicit Call Transfer (ECT).....	6
4.1 Normal operation.....	6
4.2 Explicit Call Transfer invocation	7
4.3 Notification to the remote parties	7
4.3.1 Notification to the held remote party	8
4.3.2 Notification to the active or alerting remote party	8
4.4 Activation and deactivation	8
4.5 Registration, erasure and interrogation.....	8
5 Support by "old" MSs.....	9
5.1 Explicit Call Transfer invocation	9
5.2 Notification to the remote parties	10
Annex A (informative): Change history	11
History	12

Foreword

This Technical Specification has been produced by the 3GPP.

This TS specifies the procedures used at the radio interface for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of call transfer supplementary services 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 this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 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 specification;

1 Scope

The present document gives the stage 3 description of the call transfer supplementary services.

The present document specifies the procedures used at the radio interface (Reference point Um as defined in 3GPP TS 24.002) 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 3GPP TS 24.010 the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

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

Definitions and descriptions of supplementary services are given in 3GPP TS 22.004, 3GPP TS 22.08x and 3GPP TS 22.09x-series. 3GPP TS 22.091 is related specifically to call transfer supplementary services.

The technical realization of supplementary services is described in 3GPP TS 23.011, 3GPP TS 23.08x and 3GPP TS 23.09x-series. 3GPP TS 23.091 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 3GPP TS 24.007 and 3GPP TS 24.008.

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

- Explicit Call Transfer (ECT) (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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.004: "General on supplementary services".
- [3] 3GPP TS 22.030: "Man-Machine Interface (MMI) of the Mobile Station (MS)".
- [4] 3GPP TS 22.081: "Line identification supplementary services - Stage 1".
- [5] 3GPP TS 22.082: "Call Forwarding (CF) supplementary services - Stage 1".
- [6] 3GPP TS 22.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".
- [7] 3GPP TS 22.084: "MultiParty (MPTY) supplementary services - Stage 1".
- [8] 3GPP TS 22.085: "Closed User Group (CUG) supplementary services - Stage 1".
- [9] 3GPP TS 22.086: "Advice of Charge (AoC) Supplementary Services - Stage 1".
- [10] 3GPP TS 22.088: "Call Barring (CB) supplementary services - Stage 1".
- [11] 3GPP TS 22.090: "Unstructured Supplementary Service Data (USSD)- Stage 1".
- [12] 3GPP TS 22.091: "Explicit Call Transfer (ECT)".

- [13] 3GPP TS 23.011: "Technical realization of supplementary services".
- [14] 3GPP TS 23.081: "Line identification supplementary services - Stage 2".
- [15] 3GPP TS 23.082: "Call Forwarding (CF) supplementary services - Stage 2".
- [16] 3GPP TS 23.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
- [17] 3GPP TS 23.084: "MultiParty (MPTY) supplementary services - Stage 2".
- [18] 3GPP TS 23.085: "Closed User Group (CUG) supplementary services - Stage 2".
- [19] 3GPP TS 23.086: "Advice of Charge (AoC) supplementary services - Stage 2".
- [20] 3GPP TS 23.088: "Call Barring (CB) supplementary services - Stage 2".
- [21] 3GPP TS 23.090: "Unstructured supplementary services operation - Stage 2".
- [22] 3GPP TS 23.091: "Explicit Call Transfer (ECT) supplementary service - Stage 2".
- [23] 3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".
- [24] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".
- [25] 3GPP TS 24.008: "Mobile radio interface layer 3 specification".
- [26] 3GPP TS 24.010: "Mobile radio interface layer 3; Supplementary services specification; General aspects".
- [27] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".

3 Abbreviations

The abbreviations used in the present document are listed in 3GPP TR 21.905.

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 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 MS shall not change the basic call state or the auxiliary state of either call when sending ECT request.

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 3GPP TS 24.080. 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

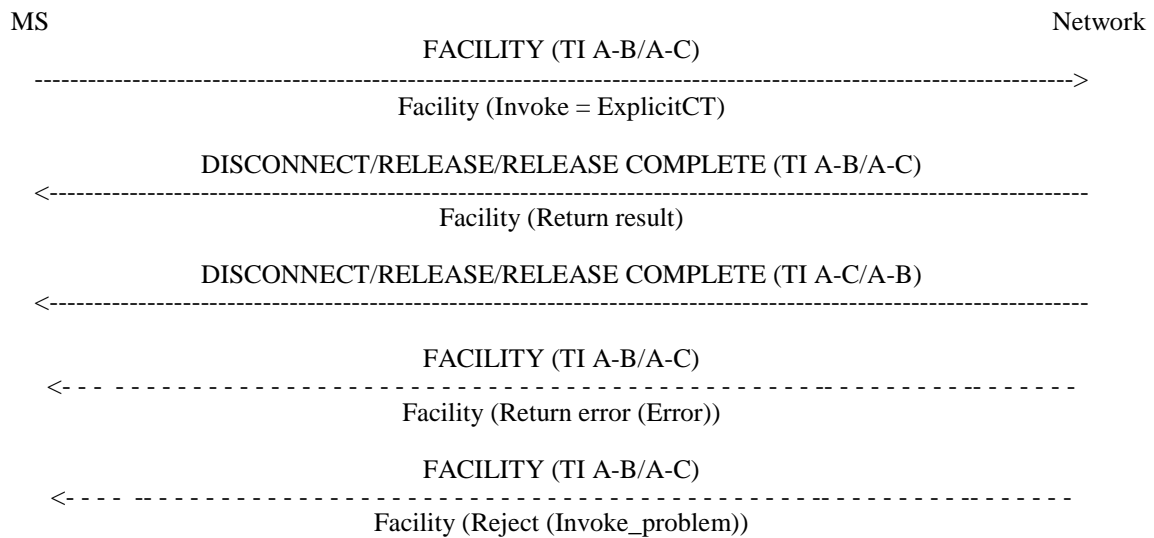


Figure 1: Invocation of Explicit Call Transfer

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.

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 3GPP TS 23.091 and the coding in 3GPP TS 24.080. 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).

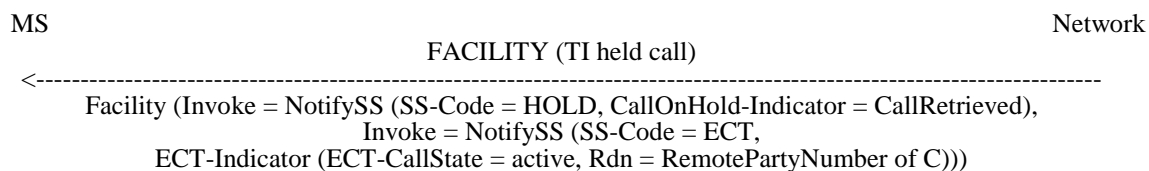


Figure 2: Notification of invocation (at active state) to held remote party

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).

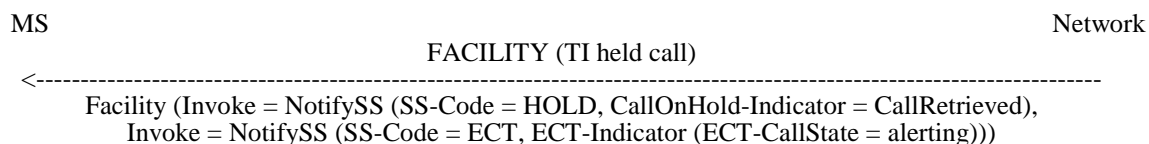


Figure 3: Notification of invocation (at alerting state) to held remote party

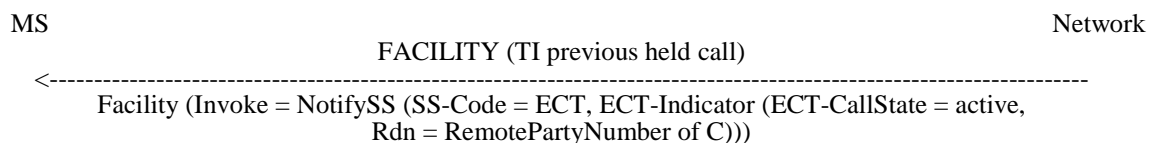


Figure 4: Notification to the previous-held remote party at receipt of the ANSWER message by the previous-alerting remote party

4.3.2 Notification to the active or alerting remote party

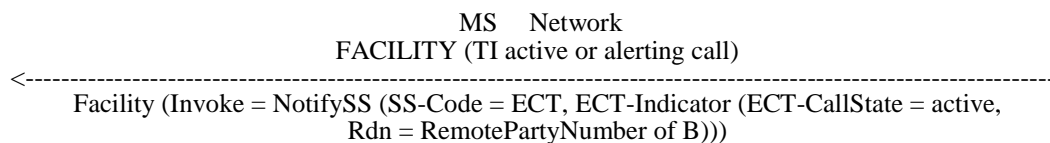


Figure 5: Notification of invocation to previous-active or previous-alerting remote party

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 3GPP TS 22.030).

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.

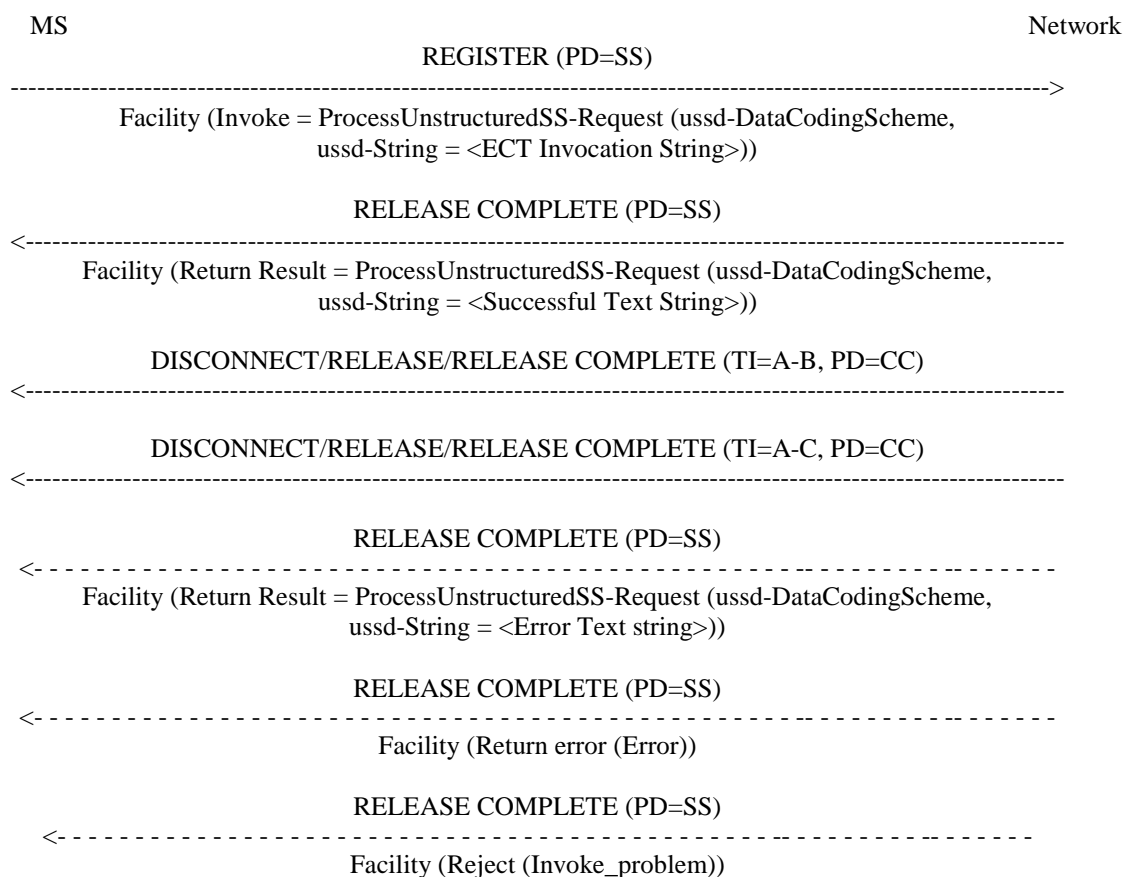


Figure 6: Invocation of Explicit Call Transfer for non supporting MSs

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.

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.

Annex A (informative): Change history

Change history						
TSG CN#	Spec	Version	CR	<Phase>	New Version	Subject/Comment
Apr 1999	GSM 04.91	6.0.0				Transferred to 3GPP CN1
CN#03	24.091			R99	3.0.0	Approved at CN#03
CN#11	24.091	3.0.0		Rel-4	4.0.0	Approved at CN#11
CN#16	24.091	4.0.0		Rel-4	4.0.1	References updated
CN#16	24.091	4.0.1		Rel-5	5.0.0	Rel-5 created after CN#16
CN#26	24.091	5.0.0		Rel-6	6.0.0	Rel-6 created after CN#26
CT#36	24.091	6.0.0		Rel-7	7.0.0	Upgraded unchanged from Rel-6
CT#42	24.091	7.0.0		Rel-8	8.0.0	Upgraded unchanged from Rel-7
2009-12	24.091	8.0.0	-	Rel-9	9.0.0	Update to Rel-9 version (MCC)
2011-03	24.091	9.0.0	-	Rel-10	10.0.0	Update to Rel-10 version (MCC)
2012-09	24.091	10.0.0	-	Rel-11	11.0.0	Update to Rel-11 version (MCC)
2014-09	24.091	11.0.0	-	Rel-12	12.0.0	Update to Rel-12 version (MCC)
2015-12	24.091	12.0.0	-	Rel-13	13.0.0	Update to Rel-13 version (MCC)
2017-03	24.091	13.0.0	-	Rel-14	14.0.0	Update to Rel-14 version (MCC)
2018-06	24.091	14.0.0	-	Rel-15	15.0.0	Update to Rel-15 version (MCC)

History

Document history		
V15.0.0	July 2018	Publication