



**Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 12: Supplementary services stage 3;
Sub-part 13: Call Completion to Busy Subscriber (CCBS)**

[ETSI EN 300 392-12-13 V1.2.1 \(2012-03\)](https://standards.iteh.ai/catalog/standards/etsi/2062a53c-271d-4430-96ac-092a22249bfc/etsi-en-300-392-12-13-v1-2-1-2012-03)

<https://standards.iteh.ai/catalog/standards/etsi/2062a53c-271d-4430-96ac-092a22249bfc/etsi-en-300-392-12-13-v1-2-1-2012-03>

Reference

REN/TETRA-03213

Keywords

CCBS, data, radio, speech, stage 3,
supplementary service, TETRA, V+D

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

(<https://standards.iteh.ai>)
Document Preview

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the 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

<http://portal.etsi.org/tb/status/status.asp>

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

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.
All rights reserved.

DECTTM, PLUGTESTSTM, UMTSTM and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPPTM and LTETM are Trade Marks of ETSI registered for the benefit of its Members and
of the 3GPP Organizational Partners.
GSM[®] and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	7
Foreword.....	7
1 Scope	9
2 References	9
2.1 Normative references	9
2.2 Informative references.....	10
3 Definitions, symbols and abbreviations	10
3.1 Definitions.....	10
3.2 Symbols.....	12
3.3 Abbreviations	12
4 SS-CCBS Service Description	13
4.1 General	13
4.2 SS-CCBS services offered over the TNSS-SAP	13
4.2.1 CALL-INFORMATION-RELEASE indication	14
4.2.2 CALL-INFORMATION-RETENTION indication	14
4.2.3 CANCEL request.....	15
4.2.4 CANCEL confirm.....	15
4.2.5 CANCELLED indication.....	15
4.2.6 FAILED indication	15
4.2.7 LIST-CCBS request.....	15
4.2.8 LIST-CCBS confirm.....	16
4.2.9 RECALL request	16
4.2.10 RECALL-ACCEPTED request	16
4.2.11 REQUEST request.....	16
4.2.12 REQUEST confirm.....	17
4.2.13 USER-B-FREE indication	17
4.3 Parameter description	17
5 Signaling protocol for the support of SS-CCBS.....	19
5.1 SS-CCBS Operational requirements	19
5.1.1 Requirements on the served user MS.....	19
5.1.2 Requirements on the Originating SwMI	20
5.1.3 Requirements on the Terminating SwMI.....	20
5.1.4 Requirements on a Participating SwMI	20
5.1.5 Requirements on the Group Controlling SwMI.....	20
5.2 SS-CCBS Coding Requirements	20
5.2.1 SS-CCBS PDUs.....	20
5.2.1.1 CALL-INFORMATION-RELEASE PDU	20
5.2.1.2 CALL-INFORMATION-RETENTION PDU	21
5.2.1.3 CANCEL PDU.....	21
5.2.1.4 CANCEL ACK PDU	21
5.2.1.5 CANCELLATION PDU	22
5.2.1.6 CANCELLED PDU	22
5.2.1.7 CCBSI PDU	23
5.2.1.8 FAILED PDU	23
5.2.1.9 FREE-NOTIFICATION PDU.....	23
5.2.1.10 LIST PDU	24
5.2.1.11 LIST ACK PDU.....	24
5.2.1.12 MONITOR PDU	25
5.2.1.13 MONITOR ACK PDU.....	26
5.2.1.14 RECALL PDU	26
5.2.1.15 RECALL-ACCEPTED PDU	27
5.2.1.16 REQUEST PDU.....	27
5.2.1.17 REQUEST ACK PDU	28

5.2.1.18	RESUME-COMPLETION PDU	28
5.2.1.19	SUSPEND-COMPLETION PDU	29
5.2.1.20	USER-B-FREE PDU	29
5.2.2	TETRA PDU information element coding	29
5.2.2.1	Accept/Reject	29
5.2.2.2	Basic Service Information	29
5.2.2.3	Call Priority	30
5.2.2.4	Called party extension	30
5.2.2.5	Called party SSI	31
5.2.2.6	Called party type identifier	31
5.2.2.7	Calling party extension	31
5.2.2.8	Calling party SSI	31
5.2.2.9	Calling party type identifier	31
5.2.2.10	Cancellation Cause	32
5.2.2.11	Cancellation Result	32
5.2.2.12	CCBS-PDU type	33
5.2.2.13	CCBSI	33
5.2.2.14	Failure Cause	34
5.2.2.15	Length of CCBS List	34
5.2.2.16	Number of CCBS requests	34
5.2.2.17	Reject Cause	34
5.2.2.18	List Request	35
5.2.2.19	Request Maintained	35
5.2.2.20	Retain Capability	36
5.2.2.21	SS-Type	36
5.2.2.22	TETRA Call Identifier	36
5.2.3	Additional coding requirements over the ISI	36
5.2.3.1	Remote operations protocol and application association control	36
5.3	SS-CCBS State Definitions	38
5.3.1	States at User A MS	38
5.3.1.1	CCBS-Idle	38
5.3.1.2	CCBS-Wait-ACK	38
5.3.1.3	CCBS-Invoked_User_A	38
5.3.1.4	CCBS-Wait-User-A-Answer	38
5.3.1.5	Wait-Alert/Connect	38
5.3.1.6	CCBS-LIST-Requested	38
5.3.1.7	CCBS-CANCEL-Requested	38
5.3.1.8	CCBS_Wait_UserA_Free	39
5.3.1.9	CCBS-Retention-Idle	39
5.3.1.10	CCBS-Retention-Active	39
5.3.2	States at the Originating SwMI	39
5.3.2.1	CCBS-Idle	39
5.3.2.2	CCBS-Invoked-User-A	39
5.3.2.3	CCBS-WAIT-ACK	39
5.3.2.4	CCBS-Wait-User-A-Answer	39
5.3.2.5	CCBS-Path-Setup	39
5.3.2.6	CCBS-Wait-User-A-Free	39
5.3.2.7	CCBS-Retention-Idle	39
5.3.2.8	CCBS-Retention-Active	39
5.3.3	States at the Group Controlling SwMI	39
5.3.3.1	CCBS-Idle	39
5.3.3.2	CCBS-Await-Call-Completion	40
5.3.3.3	CCBS-Invoked-Group	40
5.3.3.4	CCBS-Path-Complete	40
5.3.3.5	CCBS-Suspended-Group	40
5.3.3.6	CCBS-Wait-Group-Alert	40
5.3.4	States at the Terminating SwMI	40
5.3.4.1	CCBS-Idle	40
5.3.4.2	CCBS-Await-Call-Completion	40
5.3.4.3	CCBS-Invoked-User-B	40
5.3.4.4	CCBS-Suspended-User-B	40
5.3.4.5	CCBS-Wait-User-B-Alert	40

5.3.5	States at User B.....	40
5.4	SS-CCBS Signaling Procedures	41
5.4.1	Major Options	41
5.4.2	Actions at the served user MS	41
5.4.2.1	Normal procedures	41
5.4.3	Actions at the Originating SwMI	41
5.4.3.1	Normal Procedures.....	41
5.4.3.1.1	Invocation	41
5.4.3.1.2	Operation	43
5.4.3.1.3	User initiated cancellation procedure	45
5.4.3.1.4	CCBS List Request.....	46
5.4.3.2	Exceptional Procedures	46
5.4.3.2.1	Invocation	46
5.4.3.2.2	User initiated cancellation procedure	47
5.4.3.2.3	CCBS List request	47
5.4.3.2.4	Operation.....	47
5.4.4	Actions at the Terminating SwMI.....	49
5.4.4.1	Normal Procedures.....	49
5.4.4.1.1	Determination that CCBS is available	49
5.4.4.1.2	Acceptance of a CCBS MONITOR request	49
5.4.4.1.3	Queue B processing.....	49
5.4.4.1.4	Determination of user B free	50
5.4.4.1.5	CCBS Call set-up	50
5.4.4.1.6	CCBS Call without Path Reservation	50
5.4.4.2	Exceptional Procedures.....	50
5.4.4.2.1	CCBS Invocation.....	50
5.4.4.2.2	Acceptance of a CCBS Monitor Request	51
5.4.4.2.3	Queue B processing.....	51
5.4.4.2.4	Determination of user B free	51
5.4.4.2.5	CCBS Call set-up	51
5.4.5	Actions at the Group Controlling SwMI.....	51
5.4.5.1	Normal Procedures.....	52
5.4.5.1.1	Determination that CCBS is available	52
5.4.5.1.2	Acceptance of a CCBS Monitor Request	52
5.4.5.1.3	Queue B processing.....	52
5.4.5.1.4	Determination of Group B free.....	52
5.4.5.1.5	CCBS Call set-up	53
5.4.5.1.6	Acceptance of a CCBS Monitor Request	53
5.4.5.1.7	Queue B processing.....	53
5.4.5.1.8	Determination of group B free.....	53
5.4.5.1.9	CCBS Call set-up	54
5.4.6	Actions at the Participating SwMI	54
5.5	Impact of inter-working with public ISDN	54
5.5.1	Incoming Gateway SwMI procedures: SS-CCBS request from a public ISDN	54
5.5.2	Outgoing Gateway SwMI procedures: SS-CCBS request to a public ISDN	55
5.6	Protocol Interaction between SS-CCBS and Other Supplementary Services and ANFs.....	55
5.6.1	Calling/Connected Line Identification Restriction (SS-CLIR).....	55
5.6.2	Call Completion on Busy Subscriber (SS-CCBS)	56
5.6.3	Call Completion on No Reply (SS-CCNR)	56
5.6.4	Call Forwarding Unconditional (SS-CFU)	56
5.6.4.1	Originating SwMI procedures for invoking SS-CCBS at a SS-CFU diverted-to user	56
5.6.4.2	Originating SwMI procedures if SS-CFU is activated by User A MS	56
5.6.4.3	Terminating SwMI procedures if SS-CFU is activated by User B after SS-CCBS has been invoked.....	56
5.6.5	Call Forwarding Busy (SS-CFB).....	57
5.6.5.1	Originating SwMI procedures for invoking SS-CCBS at a SS-CFB diverted-to user	57
5.6.5.2	Originating SwMI procedures if SS-CFB is activated by User A MS	57
5.6.5.3	Terminating SwMI procedures if SS-CFB is activated by User B after SS-CCBS has been invoked.....	57
5.6.6	Call Forwarding on No Reply (SS-CFNR).....	57
5.6.7	List Search Call (SS-LSC).....	57
5.6.8	Call Authorized by Dispatcher (SS-CAD).....	57

5.6.9	Area Selection (SS-AS)	57
5.6.10	Priority Call (SS-PC)	57
5.6.11	Interactions with ISI Mobility Management (ANF-ISIMM)	58
5.6.12	User A MS migrates	58
5.6.12.1	PROFILE EXCHANGE PDUS	59
5.6.12.1.1	PROFILE REJECT	59
5.6.12.1.2	PROFILE UPDATE	59
5.6.12.1.3	PROFILE UPDATE RESPONSE	60
5.6.12.1.4	SS-PROFILE UPDATE	60
5.6.12.1.5	SS-PROFILE UPDATE RESPONSE	61
5.6.12.1.6	Individual basic migration profile	61
5.6.12.1.7	SS-migration profile (original and temporary)	61
5.6.12.1.8	SS-information	62
5.6.12.1.9	SS-information response	62
5.6.12.1.10	SS-response status	62
5.6.12.1.11	SS-status	62
5.6.12.1.12	SS-type	62
5.6.12.2	SS-CCBS profiles	63
5.6.12.2.1	SS-CCBS migration original profile	63
5.6.12.3	User A MS SS-CCBS migration information PDU	63
5.6.12.3.1	SS-CCBS state at User A MS SwMI at the time of the User A MS migration information element	64
5.6.12.3.2	Timer T _j (i) running Information Element content	64
5.6.12.4	User B migrates	65
5.6.12.4.1	SS-CCBS state at terminating SwMI at the time of the user B migration information element	66
5.6.12.4.2	Timer T6(i) running Information Element content	67
5.7	Parameter values (timers)	67
5.7.1	Timers at the Originating SwMI	67
5.7.2	Timers at the Terminating SwMI	68
Annex A (informative):	SDL Representation of Procedures	69
A.1	Behavior of the Originating SwMI	69
A.2	Behavior of the Group Controlling SwMI	78
A.3	Behavior of the Terminating SwMI	78
A.4	Behavior at CCBS User A MS	83
Annex B (informative):	Bibliography	88
Annex C (informative):	Change requests	89
History		90

Intellectual Property Rights

IPRs essential or potentially essential to the present document 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 (<http://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.

Foreword

This final draft European Standard (EN) has been produced by ETSI Technical Committee Terrestrial Trunked Radio (TETRA), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document is part 12, sub-part 13 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

EN 300 392-1: "General network design";

EN 300 392-2: "Air Interface (AI)";

EN 300 392-3: "Interworking at the Inter-System Interface (ISI)";

ETS 300 392-4: "Gateways basic operation";

EN 300 392-5: "Peripheral Equipment Interface (PEI)";

EN 300 392-7: "Security";

EN 300 392-9: "General requirements for supplementary services";

EN 300 392-10: "Supplementary services stage 1";

EN 300 392-11: "Supplementary services stage 2";

EN 300 392-12: "Supplementary services stage 3";

EN 300 392-12-1: "Call Identification (CI)";

ETS 300 392-12-2: "Call Report (CR)";

EN 300 392-12-3: "Talking Party Identification (TPI)";

EN 300 392-12-4: "Call Forwarding (CF)";

ETS 300 392-12-5: "List Search Call (LSC)";

EN 300 392-12-6: "Call Authorized by Dispatcher (CAD)";

ETS 300 392-12-7: "Short Number Addressing (SNA)";

EN 300 392-12-8: "Area Selection (AS)";

ETS 300 392-12-9: "Access Priority (AP)";

EN 300 392-12-10: "Priority Call (PC)";

ETS 300 392-12-11: "Call Waiting (CW)";

EN 300 392-12-12: "Call Hold (HOLD)";