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*European Standard (Telecommunications series)*

**Terrestrial Trunked Radio (TETRA);  
Voice plus Data (V+D);  
Part 10: Supplementary services stage 1;  
Sub-part 17: Include Call (IC)**

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document is part 10, sub-part 17 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";**

- Sub-part 1: "Call identification";
- Sub-part 2: "Call report";
- Sub-part 3: "Talking Party Identification (TPI)";
- Sub-part 4: "Call Forwarding (CF)";
- Sub-part 5: "List Search Call (LSC)";
- Sub-part 6: "Call Authorized by Dispatcher (CAD)";
- Sub-part 7: "Short number addressing";
- Sub-part 8: "Area selection";
- Sub-part 9: "Access priority";
- Sub-part 10: "Priority Call (PC)";
- Sub-part 11: "Call Waiting (CW)";
- Sub-part 12: "Call Hold (CH)";
- Sub-part 13: "Call completion to busy subscriber";
- Sub-part 14: "Late Entry (LE)";

Sub-part 15: "Transfer of control";

Sub-part 16: "Pre-emptive Priority Call (PPC)";

**Sub-part 17: "Include Call (IC)";**

Sub-part 18: "Barring of Outgoing Calls (BOC)";

Sub-part 19: "Barring of Incoming Calls (BIC)";

Sub-part 20: "Discreet Listening (DL)";

Sub-part 21: "Ambience Listening (AL)";

Sub-part 22: "Dynamic Group Number Assignment (DGNA)";

Sub-part 23: "Call completion on no reply";

Sub-part 24: "Call Retention (CRT)";

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

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

ETS 300 392-13: "SDL model of the Air Interface (AI)";

ETS 300 392-14: "Protocol Implementation Conformance Statement (PICS) proforma specification";

TS 100 392-15: "TETRA frequency bands, duplex spacings and channel numbering";

TS 100 392-16: "Network Performance Metrics";

TS 100 392-17: "TETRA V+D and DMO Release 1.1 specifications".

<b>Proposed national transposition dates</b>	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
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Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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# 1 Scope

The present document defines the stage 1 specifications of the Include Call (IC) supplementary service for the Trans-European Trunked RAdio as provided by European operators. Stage 1 is an overall service description from the users point of view but does not deal with the details of the human interface itself.

The present document specifies the service description of the supplementary service and the procedures to be expected with successful and unsuccessful outcomes. In addition the present document specifies the interactions with other TETRA supplementary services and interworking considerations.

Charging principles are outside the scope of the present document.

The IC supplementary service enables the served user, while having a call in progress, to make a new call and have the new party included in the original call.

The present document applies to TETRA speech teleservices and speech bearer services only.

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# 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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

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# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document the following terms and definitions apply:

**bearer service:** type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces

**call owner:** individual user who controls a multipoint call and is able to clear it down

NOTE: It is normally the user who has originally set up the multipoint call or has obtained the control following a successful SS-TC invocation.

**resulting call:** call resulting from the inclusion of the second call in the original call

**second call:** call originated by the served user after invocation of the IC supplementary service, to be included in the original call

**supplementary service:** service that modifies or supplements a bearer service or a teleservice

NOTE: A supplementary service cannot be offered to a customer as a stand-alone service; it should be offered in combination with a bearer service or a teleservice.

**Switching and Management Infrastructure (SwMI):** All of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals. The SwMI enables subscriber terminals to communicate with each other via the SwMI.

**teleservice:** type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols

**(Served) User A:** specific (individual) user who invokes the supplementary service

NOTE: If the original call is a multipoint call, only the call owner of the original call is allowed to invoke the IC supplementary service.

**User B:** The other party in the original call. It can be either an individual user (the called party in an individual call) or a group of users (if the original call is a multipoint call).

**User C:** The other party in the second call. It can be either an individual user (the called party in an individual call) or a group of users (if the second call is a multipoint call).

## 3.2 Abbreviations

### 3.2.1 General abbreviations

For the purposes of the present document the following general abbreviations apply:

ISDN	Integrated Services Digital Network
SDL	(Functional) Specification and Description Language
SS	Supplementary Service

NOTE: The abbreviation SS is only used when referring to a specific supplementary service.

SwMI	Switching and Management Infrastructure
TETRA	Trans-European Trunked RAdio

### 3.2.2 Supplementary service abbreviations

For the purposes of the present document the following supplementary service abbreviations apply:

AL	Ambience Listening
AP	Access Priority
BIC	Barring of Incoming Calls
BOC	Barring of Outgoing Calls
CAD	Call Authorized by Dispatcher
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CRT	Call Retention
CW	Call Waiting
DGNA	Dynamic Group Number Assignment
DL	Discreet Listening
HOLD	call HOLD
IC	Include Call
LE	Late Entry
LSC	List Search Call
PC	Priority Call
PPC	Pre-emptive Priority Call
SNA	Short Number Addressing
TC	Transfer of Control of Call
TPI	Talking Party Identification

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## 4 Conformance

Not applicable.



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## 5 SS-IC stage 1 specification

### 5.1 Description

#### 5.1.1 General description

Include call is a supplementary service which enables a served User A, while being involved in an active call (original call) with User B, to make a second call to User C and have this new party included in the original call.

#### 5.1.2 Qualifications on applicability to telecommunication services

This supplementary service is applicable to TETRA speech teleservices and to TETRA speech bearer services.

### 5.2 Procedures

#### 5.2.1 Provision/Withdrawal

SS-IC may be provided after pre-arrangement with the service provider (by means of service profile control), or may be available generally to all users. SS-IC may be withdrawn on request of the user or for administrative reasons. Possible limitations (e.g. maximum number of successive invocations of SS-IC) shall be an implementation matter.

#### 5.2.2 Normal procedures

##### 5.2.2.1 Activation/Deactivation/Definition/Registration/Interrogation/Cancellation

SS-IC shall be permanently activated by the service provider as a result of the provision. SS-IC shall be deactivated by the service provider as a result of withdrawal.

###### 5.2.2.1.1 Definition

Definition is not applicable.

###### 5.2.2.1.2 Registration

Registration is not applicable.

###### 5.2.2.1.3 Interrogation

Interrogation is not applicable. User will be informed the reason of a failed SS-IC invocation.

###### 5.2.2.1.4 Cancellation

User A can interrupt SS-IC operation before completion using an appropriate basic call control procedure.

##### 5.2.2.2 Invocation and operation

SS-IC shall be invoked by the served User A.

The served User A is initially involved in an active call (original call) with User B. If the original call is an individual call, any of the two parties may invoke SS-IC. If the original call is a multipoint call, User A shall be the call owner of the original call. When User A invokes SS-IC to an individual User C, the SwMI shall include him into the ongoing call as soon as User C has responded positively. When User A invokes SS-IC to a user group C, the SwMI shall immediately include the user group C into the ongoing call. SS-IC invocation shall not produce any interruption in the original service.

The resulting call is considered as a multipoint call, whatever the nature of the original call may be. The precise nature of the resulting call is as shown in table 1.

**Table 1: Nature of resulting call**

SS-IC invocation	Original call			
	Individual call	Group call	Acknowledged group call	Broadcast call
<b>Individual Call</b>	Group Call	Group Call	Acknowledged Group Call	Not defined
<b>Group Call</b>	Group Call	Group Call	Group Call	Not defined
<b>Acknowledged Group Call</b>	Acknowledged Group Call	Group Call	Acknowledged Group Call	Not defined
<b>Broadcast Call</b>	Not Allowed	Not Allowed	Not Allowed	Broadcast Call

All concerned users should be informed by the SwMI about the state of their calls whenever necessary. In particular the establishment of the resulting call should be notified to all users involved, with an indication that a new participant are included into the call.

A particular request for the service may fail after invocation for one of the following reasons:

- the second call cannot reach the active state (e.g. User C is busy; not reachable, no reply, or barring/restriction conditions are encountered); or
- User B disconnects from the original call after User A has invoked SS-IC but before the resulting call is established.

In some of the above situations, the request may be cancelled by the SwMI. In that case User A shall be notified. However, a special notification is not mandatory.

## 5.2.3 Exceptional procedures

### 5.2.3.1 Activation/Deactivation/Definition/Registration/Interrogation/Cancellation

#### 4.2.3.1.1 Activation/Deactivation

Activation/deactivation is not applicable.

#### 4.2.3.1.2 Definition

Definition is not applicable.

#### 4.2.3.1.3 Registration

Registration is not applicable.

#### 4.2.3.1.4 Interrogation

Interrogation is not applicable.

#### 4.2.3.1.5 Cancellation

Cancellation utilizes basic call disconnection.

### 5.2.3.2 Invocation and operation

#### 5.2.3.2.1 Rejection of SS-IC service request

If User A is not permitted to request SS-IC, the SwMI shall reject the SS-IC request with an indication of denial in the disconnect message. Rejection of SS-IC service request shall not affect the normal operation of the original call.

A short term denial shall be used for temporary conditions where a later request for SS-IC might be successful. Examples of conditions that may result in a short term denial are:

- maximum number of successive SS-IC requests already reached;
- User A is not the call owner of the original call; or
- basic service of the original call or of the second call incompatible with SS-IC or incompatible between themselves.

A long term denial shall be used when later requests will also be rejected. Example of conditions that may result in a long term denial are:

- SS-IC not provided to User A; or
- interworking with a network which does not support SS-IC.

## 5.3 Interactions with other supplementary services

Interactions with other TETRA supplementary services are specified below.

### 5.3.1 Calling line identification presentation

Include call shall not have any interaction with calling line identification presentation.

### 5.3.2 Connected line identification presentation

Include call shall not have any interaction with connected line identification presentation. As the User B is not the calling user he shall not receive the identification of User C.

### 5.3.3 Calling/Connected line identification restriction

Include call shall not have any interaction with calling/connected line identification restriction.

### 5.3.4 Call report

Include call shall not have any interaction with call report.

### 5.3.5 Talking party identification

Include call shall not have any interaction with talking party identification.

### 5.3.6 Call forwarding unconditional

Include call shall not have any interaction with call forwarding unconditional. If the called party in the second call has call forwarding unconditional active, and the appropriate forwarding conditions are met, the SwMI shall attempt to establish the second call with the forwarded-to subscriber and subsequently proceed as if the second call had been placed to him.

### 5.3.7 Call forwarding on busy

Same as the interaction with call forwarding unconditional.

### 5.3.8 Call forwarding on no reply

Same as the interaction with call forwarding unconditional.

### 5.3.9 Call forwarding on not reachable

Same as the interaction with call forwarding unconditional.

### 5.3.10 List search call

Include call shall not have any interaction with list search call supplementary service. After SS-IC invocation, the second call can be established using SS-LSC.

### 5.3.11 Call authorized by dispatcher

Include call shall not have any interaction with call authorized by dispatcher supplementary service.

### 5.3.12 Short number addressing

Include call shall not have any interaction with short number addressing supplementary service. SS-SNA may be used in the SS-IC invocation.

### 5.3.13 Area selection

Include call may have interaction with area selection supplementary service. If area selection is used in the original call or in the inclusion or in both the resulting call area is not defined by the present document.

### 5.3.14 Access priority

Include call shall not have any interaction with access priority supplementary service. The SS-IC invocation may use SS-AP.

### 5.3.15 Priority call

Include call shall not have any interaction with priority call supplementary service. SS-IC invocation does not support SS-PC.

### 5.3.16 Call waiting

Include call shall not have any interaction with call waiting supplementary service. Assuming that User A, User B and User C have subscribed to the call waiting service, then:

- in any case, SS-IC cannot be used to include a waiting call, presented to User A or User B, in the original call;
- if a call waiting indication is presented to User A either before or during SS-IC invocation, then the call waiting indication should still be present after completion of SS-IC.

### 5.3.17 Call hold

The interactions with call hold supplementary service are outside the scope of the present document except the following special cases.

If User C is already involved in an active call when User A invokes SS-IC, User C may receive a call offer indication; then User C may put his active call on hold to accept the second call; the former active call should still be present and on hold after completion of SS-IC and User C may then retrieve it.

If the User B puts the original call on hold before SS-IC invocation or completion of the SS-IC operation and subsequently attempts to retrieve the original call, the retrieval should fail.

None of the participants in an SS-IC call can put the call on hold after the completion of the SS-IC operation as the SS-HOLD is applicable to individual calls only.

User A should not put the original call on hold prior to SS-IC invocation. If after putting the original call on hold User A invokes SS-IC the SwMI may reject the inclusion or retrieve the original call before SS-IC operation.

### 5.3.18 Call completion to busy subscriber

If User A encounters a busy condition when invoking SS-IC to User C, he should not invoke SS-CCBS against User C. SS-IC shall be completed with a failure corresponding to the condition encountered and SS-CCBS invocation should be rejected. If SwMI accepts the SS-CCBS invocation the actions due that are outside the scope of the present document.

### 5.3.19 Late entry

Include call shall not have any interaction with late entry supplementary service and users shall be able to receive late entry messages.

### 5.3.20 Transfer of control

Void.

### 5.3.21 Pre-emptive priority call

Include call shall not have any interaction with pre-emptive priority call supplementary service. After SS-IC invocation, the second call can be established using SS-PPC.

### 5.3.22 Include call

A user may successively invoke SS-IC several times; any limitation to this procedure is an operator option.

A user may be included in several calls, if the user terminal is capable to support multiple group calls.

### 5.3.23 Advice of charge

Void.

### 5.3.24 Barring of outgoing calls

Include call shall not have any interaction with barring of outgoing calls supplementary service. In case of conflict with SS-IC, then barring of outgoing calls shall prevail. In particular, if SS-BOC is activated against User A before SS-IC invocation, and if the second call falls in the category of calls barred to User A, then the attempt to set up the second call to User C shall be rejected by the SwMI, thus producing a failure of SS-IC request.

### 5.3.25 Barring of incoming calls

Include call shall not have any interaction with barring of incoming calls supplementary service. In case of conflict with SS-IC, then barring of incoming calls shall prevail. In particular, if SS-BIC is activated against User C before SS-IC invocation, and if the second call falls in the category of calls barred to User C, then the attempt to set up the second call to User C shall be rejected by the SwMI, thus producing a failure of SS-IC request.

### 5.3.26 Discreet listening

Include call shall not have any interaction with discreet listening supplementary service.

### 5.3.27 Ambience listening

Include call shall not have any interaction with ambience listening supplementary service.

### 5.3.28 Dynamic group number assignment

Include call shall not have any interaction with dynamic group number assignment supplementary service.

### 5.3.29 Call completion on no reply

If User A encounters a no reply condition when making the second call to User C, he should not invoke SS-CCNR against User C. SS-IC shall be completed with a failure corresponding to the condition encountered and the SS-CCNR invocation should be rejected. If SwMI accepts the SS-CCBS invocation the actions due that are outside the scope of the present document.

### 5.3.30 Call retention

Include call shall not have any interaction with call retention supplementary service.

## 5.4 Interworking considerations

When users A, B and C are on different networks, the availability of SS-IC to User A shall be limited by the capabilities of the other networks and the interworking functions between the SwMI and the other networks.

## 5.5 Overall SDL

Figure 1 contains the dynamic description of SS-IC using the Specification Description Language (SDL) defined in ITU-T Recommendation Z.100 [1]. The SDL process represents the behaviour of the network in providing SS-IC.

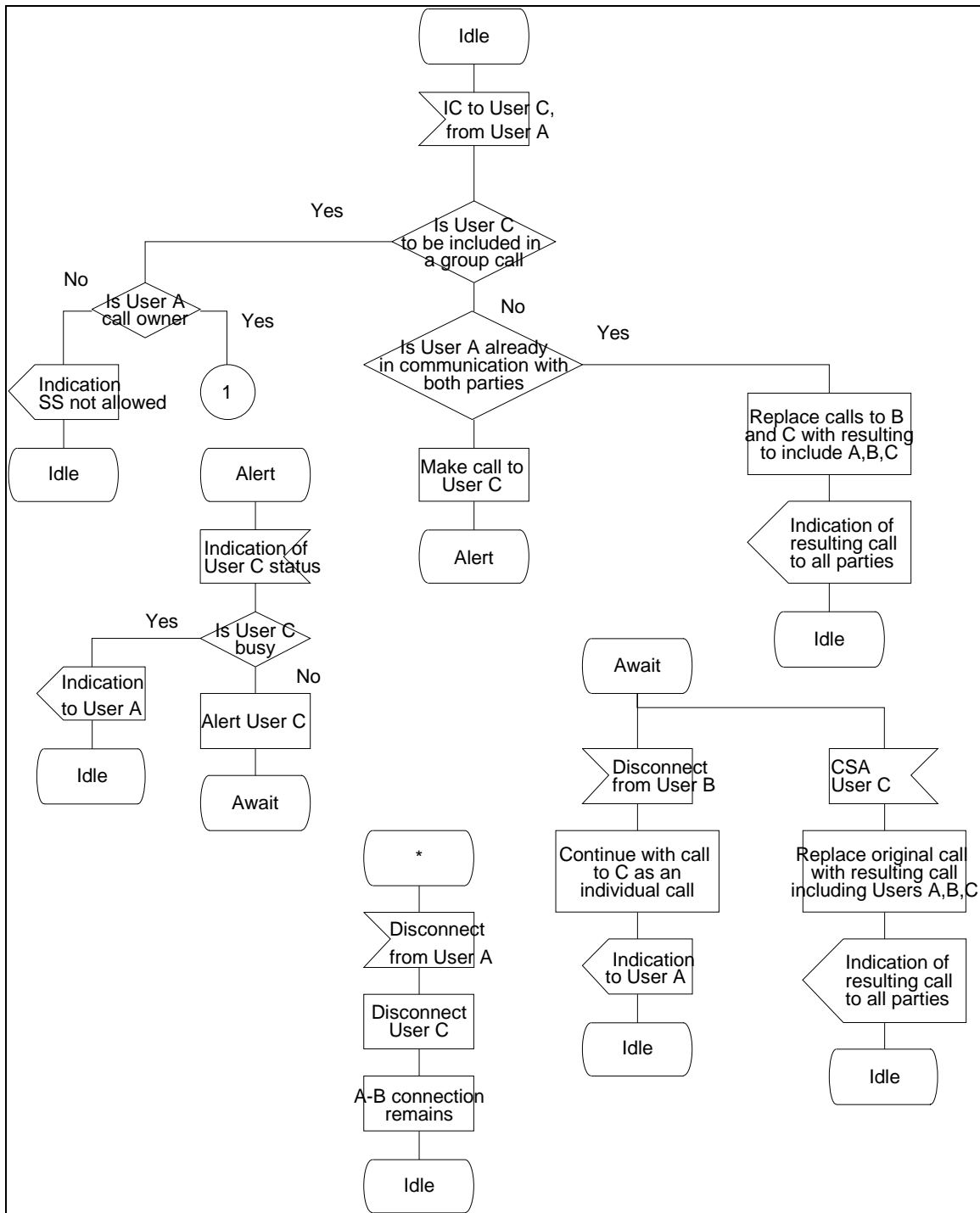


Figure 1: Sheet 1 of 2, SS IC, overall SDL

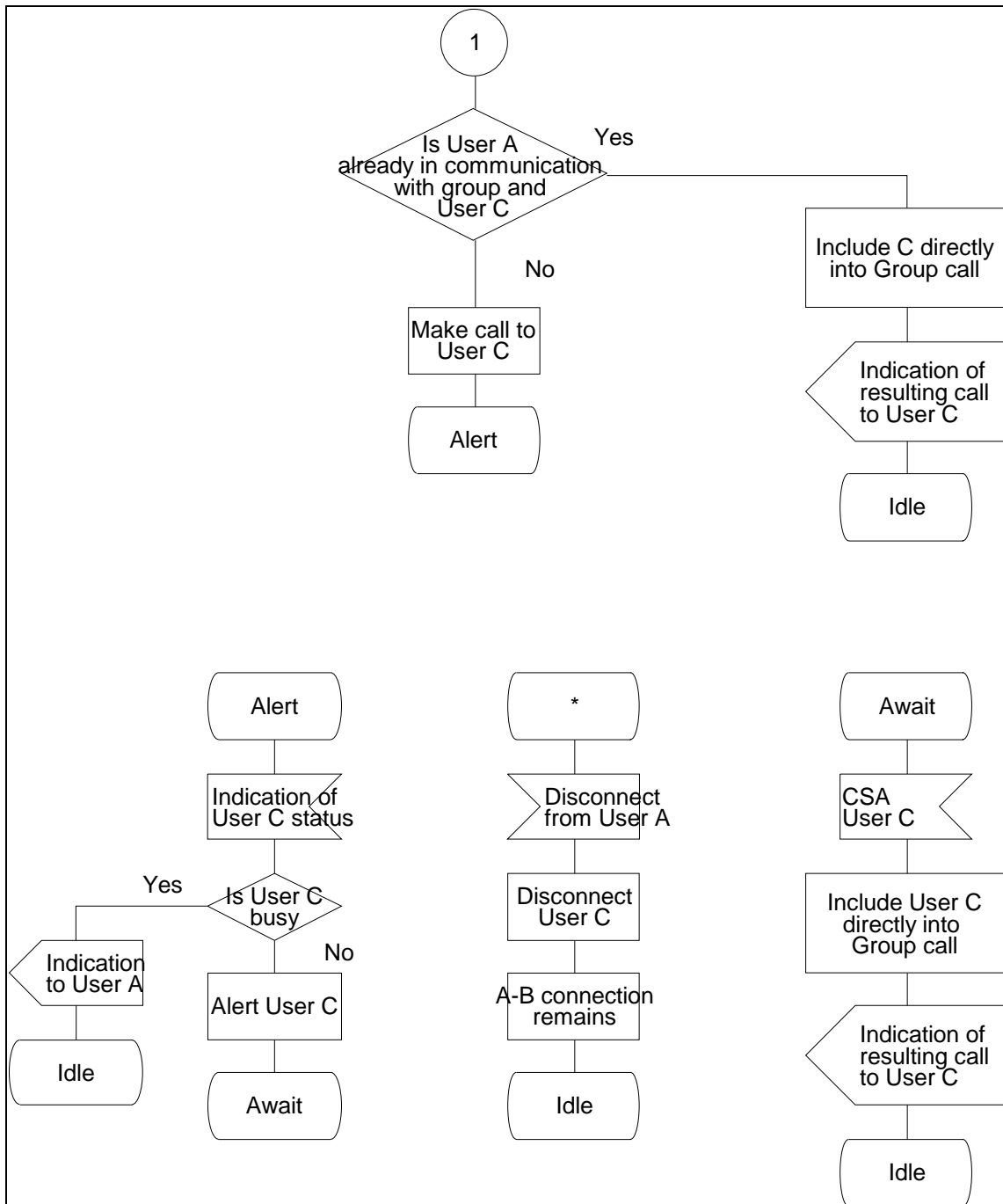


Figure 2: Sheet 2 of 2, SS IC, overall SDL



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## Annex A (informative): Bibliography

- ITU-T Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- ITU-T Recommendation X.25 (1993): "Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

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## History

<b>Document history</b>		
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