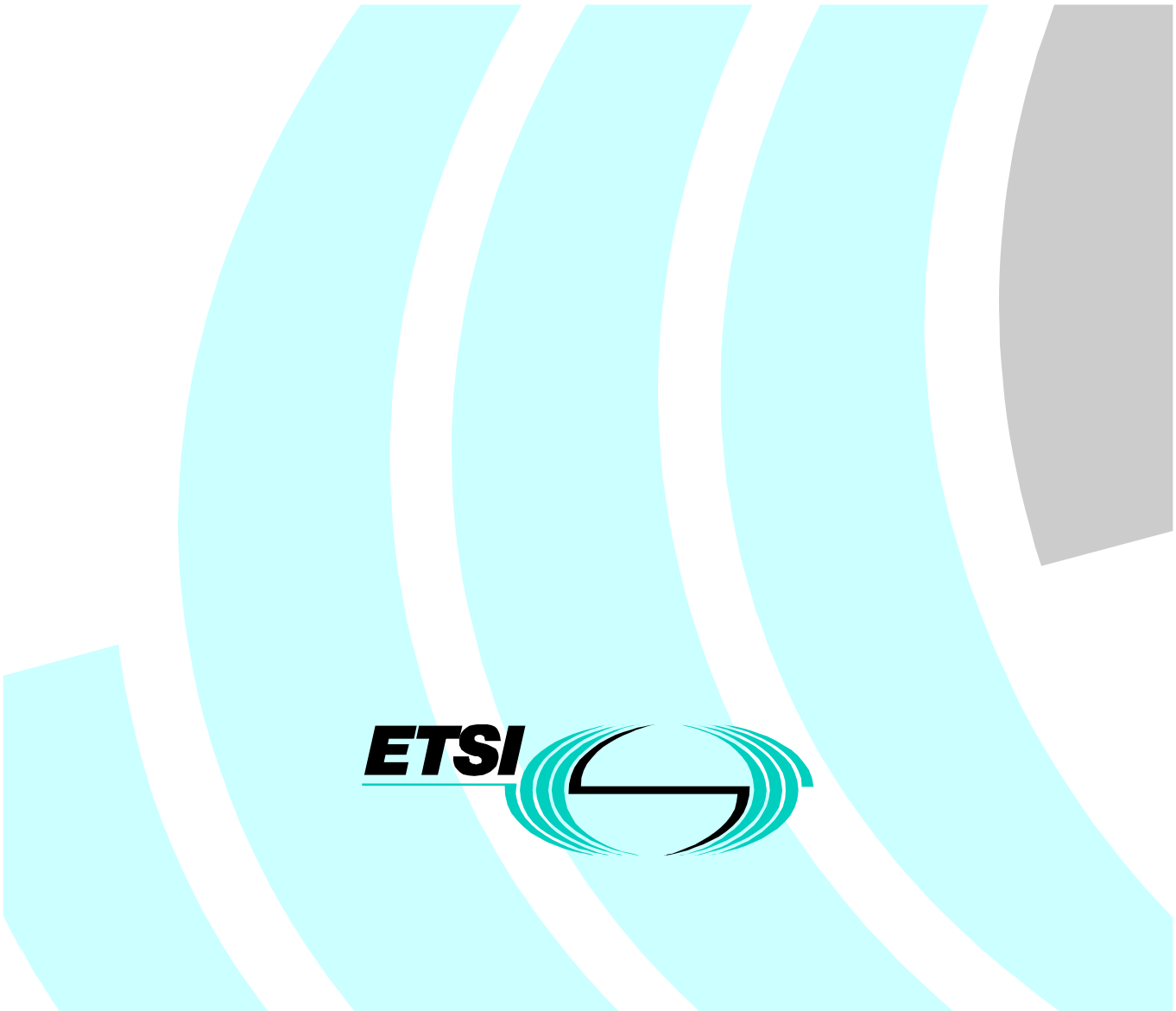
ES 201 275 V1.1.1 (1998-08)

ETSI Standard

Human Factors (HF);
User control procedures in basic call,
point-to-point connections,
for Integrated Services Digital Network (ISDN) videotelephony



Reference
DES/HF-01018 (bt000icp.PDF)

Keywords
HF, ISDN, MMI, video, telephony

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - 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

Internet
secretariat@etsi.fr
http://www.etsi.fr
http://www.etsi.org

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 1998.
All rights reserved.

Contents

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 SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.fr/ipr or http://www.etsi.org/ipr).

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 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 ETSI Standard (ES) has been produced by ETSI Technical Committee Human Factors (HF).

Introduction

The intended users of the present document include:

Table 1: Intended users and potential benefits

	User	ES used for	Potential Benefit
1	Service and terminal designers	Definition of user control procedures for ISDN videotelephones and ISDN videotelephony	Conformance to a harmonized and supportive set of user control procedures that establish a minimum level of usability
2	Service providers	To assist the qualification of ISDN videotelephony user control procedures	Minimum level of usability of services from services conformant to the present document
3	Service and terminal procurers	To choose among terminals complying with ES	To compare terminals on equal grounds
4	User groups	To identify ISDN videotelephony user control procedures	Increased awareness by user groups of the value of a minimum level of usability through harmonized control procedures and a consistent level of supportive indications
5	ETSI Technical committees	Definition of ISDN videotelephony standards that support user's control and indication needs	Conformance to a minimum level of usability of services by ensuring provision for the controls and indications necessary
6	TC-HF	Development of user control procedures for other services	Demonstration of a methodology for establishing a minimum level of usability through the specification of user control procedures

1 Scope

The present document specifies the minimum set of user procedures required to control basic call, point-to-point connection, for the ISDN videotelephony service from ISDN videotelephones. This includes the procedures required to support the fallback from ISDN videotelephony to ISDN or PSTN telephony. It describes the requirements to be met jointly by the ISDN videotelephone manufacturer, the ISDN videotelephony service provider and the network operator enabling access to the ISDN videotelephony service.

The document applies to ISDN videotelephones and any equipment which acts as an ISDN videotelephone which is connected to the public ISDN videotelephony service.

The present document is not concerned with:

- ISDN Videotelephony point-to-multipoint connections;
- access and control of supplementary services;
- any accidental disconnection protection;
- the interworking of an ISDN videotelephone and the ITU-T defined PSTN videotelephone. (ITU-T Recommendations H.223 [12], H.263 [14], H.324 [15], H.245 [13]);
- call charges and billing arrangements, especially related to changes in videotelephone communication modes;
- user controlled establishment of local and remote test loops;
- the addition of data capabilities beside audio and video;
- procedures related to ISDN telephony or mobile networks;
- interworking with the PSTN (except in the case of fallback as stated above).

These matters are, or will be, defined in other standards.

While considerations are given in the normative references for Videotelephony and Private ISDNs, and most of the principles brought forward for those user interfaces would also be applicable to attachment to a Private ISDN, no special attention has been made in the present document to any requirements for interworking with terminals within Private ISDNs.

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, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETS 300 264: "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Service description".

[2] EN 300 267-1: "Integrated Services Digital Network (ISDN); Telephony 7 kHz and videotelephony teleservices; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[3] ETS 300 145: "Integrated Services Digital Network (ISDN); Audiovisual services; Videotelephone systems and terminal equipment operating on one or two 64 kbit/s channels".

[4] ITU-T Recommendation Z.100: "CCITT Specification and description language (SDL)".

[5] ETS 300 375: "Human Factors (HF); Pictograms for point-to-point videotelephony".

[6] ETR 170 (1995): "Human Factors (HF); Generic user control procedures for telecommunication terminals and services".

[7] ETR 198 (1995): "Human Factors (HF); User trials of control procedures for Integrated Services Digital Network (ISDN) videotelephony".

[8] ETR 297 (1997): "Human Factors (HF); Human factors in videotelephony".

[9] ETS 300 143 (1994): "Integrated Services Digital Network (ISDN); ISDN Audiovisual services Inband signalling procedures for audiovisual terminals using digital channels up to 2 048 kbit/s".

[10] ETS 300 144 (1996): "Integrated Services Digital Network (ISDN); Audiovisual services; Frame structure for a 64 kbit/s to 1 920 kbit/s channel and associated syntax for inband signalling".

[11] ETS 300 738 (1996): "Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services".

[12] ITU-T Recommendation H.223 (1996): "Multiplexing protocol for low bit rate multimedia communication".

[13] ITU-T Recommendation H.245 (1996): "Control protocol for multimedia communication".

[14] ITU-T Recommendation H.263 (1997): "Video coding for low bit rate communication".

[15] ITU-T Recommendation H.324 (1996): "Terminal for low bit rate Multimedia Communication".

[16] ITU-T Recommendation H.261 (1993): "Video codec for audiovisual services at p x 64 kbit/s".

[17] ITU-T Recommendation I.112 (1988): "Vocabulary of terms for ISDN".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

3,1 kHz terminal: see ETS 300 264 [1] (a terminal that supports only the ISDN telephony 3,1 kHz teleservice).

7 kHz terminal: see ETS 300 264 [1] (a terminal which supports the ISDN telephony 7 kHz teleservice).

A-Party: the user who originates a telecommunications call.

basic call: an outgoing or incoming telecommunication call, from call set-up or call alerting through to call termination.

Bit-rate Allocation Signal (BAS): bit position within the frame structure to transmit, e.g. commands, control and indication signals, capabilities (ETS 300 144 [10]).

B-Party: the user who receives a telecommunications call.

camera on/off: a videotelephone terminal facility for switching on and off the videotelephone camera. At the terminal designer's discretion it may also control the transmission of the video signal (see also ETS 300 375 [4]). No change in the communication mode is expected.

change default communication mode: a videotelephone terminal facility for changing the default communication mode, within the options available in the terminal.

change communication mode: a videotelephone terminal facility for changing the current communication mode. During call set-up the change is expected on a per call basis, i.e. the terminal is expected to reset to the default communication mode when it next returns to idle. During the connected phase the change may result in an upgrade or downgrade communication mode request.

communication mode: a videotelephone and videotelephony facility for defining the audio and video coding used by the terminal or service. Within the current ISDN videotelephony standards seven communication modes are specified.

default communication mode: a videotelephone terminal facility for prescribing the preferred communication mode to be used by the terminal at call set-up and/or call answering.

down-grade: a videotelephone and videotelephony service facility for responding to a request for a change in the current communication mode to a lower level communication mode during the connected phase, typically from 2B AV to 1B AV or audio only, or from 1B AV to audio only. The typical request may require a renegotiation of the bearer capability and/or high layer compatibility. Downgrading may be requested by either the A-party or B-party. Any in-compatibility between the terminals detected during the re-negotiation may result in the downgrade request being cancelled and the call returning to the previous communication mode.

fallback: see ETS 300 264 [1] and EN 300 267-1 [2] (the network mechanism for selecting, at the time of call request and establishment, an alternative bearer capability, or high layer compatibility to that primarily requested by the calling user. Fallback may occur either due to the network being unable to provide the primarily requested bearer capability, or high layer compatibility, or due to the called user desiring an alternative bearer capability, or high layer compatibility.). Within videotelephony, with permission from the calling user (i.e. terminal, not human user), fallback may occur to the telephony 7 kHz or telephony 3,1 kHz teleservices.

fallback capability: a videotelephone terminal facility for defining whether the terminal is enabled to accept fallback to the telephony 7 kHz or telephony 3,1 kHz teleservices.

point-to-point (ISDN) connection: see ITU-T Recommendation I.112 [17] (an ISDN connection that is established between two specified ISDN interfaces). In this case between an ISDN videotelephone and another ISDN compatible Audio or AV terminal.

scenarios: a descriptive illustration of a typical user activity within a telecommunications environment, in this case the videotelephony service. A scenario may be composed of a number of user tasks.

SDL procedure: within the SDL system specification hierarchy, the level below an SDL process, typically used to specify a subroutine referenced in an SDL process.

SDL process: within the SDL system specification hierarchy, the level of SDL used to specify the user control procedures, by linking two or more call states with a sequence of controls, indications, intermediate wait states, and perhaps SDL procedures.

self-view: a videotelephone terminal facility for displaying the video picture currently seen by the same videotelephone's camera, as opposed to the connected party's camera (see also ETS 300 375 [4]). No change in the user-class of service is expected.

subscriber: the user or organizational body who has made arrangements with a network provider to have connection with a telecommunications network and who may make arrangements for the provision of telecommunications services via that network with a service provider.

up-grade: a videotelephone and videotelephony service facility for responding to a request for a change in the current communication mode to a higher level communication mode during the connected phase, typically from a 1B audio only call to 1B or 2B AV call, or from a 1B AV to 2B AV call. The typical request will require a renegotiation of the videotelephony communication mode. To ensure B-party privacy, upgrades from audio only to AV may also require the B-party user to accept the upgrade. Non-acceptance would result in the upgrade request being cancelled and the call returning to the previous communication mode.

user: the person who uses a telecommunications terminal, e.g. an ISDN videotelephone terminal, to gain access to and control of a telecommunications service, e.g. ISDN videotelephony. The user may or may not be the person who has subscribed to the provision of the service. Also, a user may or may not be a person with an impairment, e.g. elderly or disabled persons.

user control procedure: comprises a sequence of user control actions and equipment display indications targeted to enable completion of a user's task or sub-task. Within the present document the user control procedures are defined in the SDL diagrams.

video freeze: a videotelephone terminal facility for changing the transmitted video picture's moving image to a still image (see also ETS 300 375 [4]).

video pause: a videotelephone terminal facility for the transitory switching off (and on) the transmission of the video signal. At the terminal designer's discretion it may simply be another name for the Camera Off facility. No change in the user-class of service is expected.

videotelephone/telephone: a videotelephone terminal facility for switching between the teleservice modes videotelephony and telephony (see also ETS 300 375 [4]).

videotelephone terminal: see ETS 300 264 [1] (a terminal that supports the ISDN videotelephony teleservice).

videotelephony teleservice: see ETS 300 264 [1] (a real-time AV teleservice in which speech and moving pictures are interchanged by means of one or two 64 kbit/s circuit-mode connections in the ISDN. The videotelephony teleservice comprises two cases:

case I: videotelephony based on using one circuit-mode 64 kbit/s connection (often known as 1B); and

case II: videotelephony based on using two circuit-mode 64 kbit/s connections (often known as 2B).

Definitions for the user states, control and indications defined as part of the user control procedures are found in the relevant clauses.

3.2 Symbols

For the purposes of the present document the symbols used within the SDL figures included in clause 6, are defined in ITU-T Recommendation Z.100 [5].

3.3 Abbreviations

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

AIA	Audio Indicate Active
AIM	Audio Indicate Muted
AV	Audio-Visual (applicable to case 1 and case 2 of the videotelephony teleservice)
BAS	Bit-rate Allocation Signal
BC	Bearer Capability
C	Control (as compared to an indication in a control procedure)
CIF	Common Intermediate Format (ITU-T Recommendation H.261[16])
ES	ETSI Standard
ETS	European Telecommunication Standard
GSM	Global System for Mobile communications
HF	Human Factors
HLC	Higher Level Compatibility
I	Indication (as compared to a Control in a control procedure)
IC	Incoming Call (as in a call acceptance)
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union- Telecommunications Standardization Sector
LED	Light Emitting Diode
N	Network (used to show network generated control actions in control procedures)
OC	Outgoing Call (as in a call set-up)
PSTN	Public Switched Telephone Network
QCIF	Quarter Common Intermediate Format (ITU-T Recommendation H.261[16])
SDL	Service and Description Language
T	Terminal (used to show Terminal generated control actions in control procedures)
T/A	Tones/Announcements
TE	Terminal Equipment
TEA	Terminal Equipment Alarm
UDI	Unrestricted Digital Information
VCF	Video Command Freeze
VIA	Video Indicate Active
VIR	Video Indicate Ready-to-activate

4 Videotelephone terminal descriptions and functional requirements

This clause describes the set of functional requirements needed to support the user control procedures for basic call, point-to-point connections, for ISDN videotelephones defined in the present document. The subclauses summarize the functional descriptions extracted from other standards and documents and define the required controls.

4.1 Videotelephone, choice of teleservice

In order to make and receive calls within the ISDN, a terminal needs to declare both its BC and its HLC, and to recognize a common BC and HLC with the other party's terminal. To enable the breadth of services to interact and remain compatible with the PSTN, the ISDN defines these within a hierarchical framework. The levels of BC and HLC, defined in ETS 300 264 [1], that are relevant to an ISDN videotelephone are:

- Bearer Capability: Speech, and UDI with T/A;
- High Level Compatibility: telephony 3,1 kHz, telephony 7 kHz, and videotelephony.

Within this small range of BC and HLC table 2 describes the five possible teleservices that may be available from an ISDN videotelephone.

Table 2: Possible teleservices available from an ISDN videotelephone

Possible terminal teleservice settings	Associated BC and High level compatibility
Videotelephony with fallback	BC1 Speech BC2 UDI with T/A HLC1 Telephony HLC2 Videotelephony
Videotelephony no fallback	BC1 UDI with T/A HLC1 Videotelephony
Telephony 7 kHz with fallback	BC1 Speech BC2 UDI with T/A HLC1 Telephony HLC2 Telephony 7 kHz
Telephony 7 kHz no fallback	BC1 UDI with T/A HLC1 Telephony 7 kHz
Telephony 3,1 kHz	BC1 Speech HLC1 Telephony

Within any particular ISDN videotelephone terminal, the degree of control that is provided for a user over the selection of a teleservice for any particular call, is a matter for the manufacturer. The minimum teleservice that will permit ISDN videotelephony is either: Videotelephone with fallback, or videotelephony no fallback. There is no requirement to enable user selection of ISDN telephony teleservices within an ISDN videotelephone.

If user selection of the teleservice is provided, the controls required to control the preferred teleservice/s for incoming and outgoing calls are described in table 3.

Table 3: Teleservice control requirements

Possible teleservice controls	Requirement
Set default teleservice for outgoing calls	Mandatory: if multiple BC/HLC capabilities are provided (see notes 1 and 2)
Set default teleservice for ICs	Mandatory: if multiple BC/HLC capabilities are provided (see notes 1 and 2)
Change teleservice on per OCbasis	Optional: if multiple BC/HLC capabilities are provided (see note 3)
Change teleservice on per IC basis	No requirement (see note 4)
NOTE 1: Setting different default teleservices for outgoing and ICs is not currently recommended. NOTE 2: The set default teleservice controls for outgoing and ICs may or may not be the same control. NOTE 3: Changes must be completed before call set-up is started. NOTE 4: It is not possible to change teleservice settings for an IC during an alerting phase.	

The teleservice of the call that results from the terminal setting of the initiating terminal and the capability and compatibility of the receiving terminal is described in table 7.

4.2 Videotelephone communication modes

Once a communication path has been established between the two videotelephones, the receiving videotelephone declares a preferred communication mode by sending a capability set to the calling videotelephone. The calling party typically selects the highest common denominator from its preferred setting and the call will be established in this mode. The capability sets that can be declared are shown in table 4.

Typically in point to point conversational videotelephony the communication mode is expected to be symmetrical, though this is not mandatory, ETS 300 143 [9].

Table 4: Setting videotelephone communication mode by declaring a capability set

Terminal communication mode setting	Declared Capability Sets
Audio Only = a_0	Audio = G.711 Video = absent Transfer = absent or 1B
1B Audio Visual = a_1 (has to include a_0)	Audio = G.728 Video = QCIF or CIF Transfer = absent or 1B
1B Video = a_v (see note 1)	Audio = None Video = QCIF or CIF Transfer = absent or 1B
2B Audio Visual = b_1 Best Audio (see note 2) (has to include a_0)	Audio = G.711 Video = QCIF or CIF Transfer = 2B
2B Audio Visual = b_2 Moderate Audio and Video (see note 2) (has to include a_0 and b_1)	Audio = G.722 Video = QCIF or CIF Transfer = 2B
2B Audio Visual = b_3 Best Video (see note 2) (has to include a_0 a_1, and b_1)	Audio = G.728 Video = QCIF or CIF Transfer = 2B
2B Video = b_v (see note 1)	Audio = None Video = QCIF or CIF Transfer = 2B
NOTE 1: Full Video modes are non-standard modes shown in ETS 300 145 [3], but are not included in the declarations given in ETS 300 143 [9]. NOTE 2: The use of the terms "best" and "moderate" in table 4 is designed to add clarity for the reader. The terms are not intended as formal descriptions of these audio and video capabilities.	

Given the communication modes defined in table 4, a set of possible terminals types may be derived. These terminals are listed in table 5.

Table 5: Predicted terminal types, based on videotelephone communication mode capabilities

Terminal types	Mode Choices
Xa = a0 and a1	audio = a0 AV 1B = a1
Xb1 = a0, a1, b1 and b3	audio = a0 AV 1B = a1 AV 2B = b1 AV 2B = b3
Xb2/3 = a0, a1, b1, b2 and b3	audio = a0 AV 1B = a1 AV 2B = b1 AV 2B = b2 AV 2B = b3
Xb4 = a0 and b1	audio = a0 AV 2B = b1
Xb5 = a0, b1 and b2	audio = a0 AV 2B = b1 AV 2B = b2
NOTE: Full Video modes are not included in the terminal types defined in ETS 300 143 [9].	

The user of a videotelephone may be provided with controls to change the videotelephone communication mode of the terminal. If user selection of communication modes is provided, table 6 shows the possible videotelephone communication mode requirements.

Table 6: Videotelephone Communication Mode control Requirements

Type of controls	Requirement
Set Default Communication Mode for Outgoing Calls (see notes 1 and 2)	Mandatory: Between Audio and AudioVisual Modes Optional: Within AudioVisual Modes
Set Default Communication Mode for ICs (see notes 1 and 2)	Mandatory: Between Audio and AudioVisual Modes Optional: Within AudioVisual Modes
Change Communication Mode on a per OCbasis (see note 3)	Optional: Between Audio and AudioVisual Modes Optional: Within AudioVisual Modes
Change Communication Mode on a per IC basis (see note 3)	Mandatory: Between Audio and AudioVisual Modes Optional: Within AudioVisual Modes
Change Communication Mode During a call (see note 4)	Optional:
NOTE 1: Setting different Default Communication Modes for Outgoing and ICs is not currently recommended. NOTE 2: The Set Default Communication Mode controls for Outgoing and ICs may or may not be the same control. NOTE 3: The Change Communication Mode controls for Outgoing and ICs may or may not be the same control. NOTE 4: The Change Communication Mode control for During a call may or may not be the same control as that for Outgoing and ICs.	

Changes in communication modes can be requested at any time during a call. Changes from 1B to 2b communication modes may currently only be acceptable from the calling party.

The communication modes achieved and the range of valid mode changes that users may request is dependant on the modes/s declared by the receiving terminal and the preference setting of the initiating terminal. Table 8 lists all these combinations.

4.3 Privacy

Enabling user control over the degree of visual privacy that they are able to maintain is an essential requirement within videotelephony. There are a number of techniques that the manufacturer may provide for the user.

4.3.1 Reciprocity or Video Indicate Ready-to-activate

Within the ISDN videotelephony standards ETS 300 144 [10] and ETS 300 145 [3] there is a facility defined to enable signalling between the terminals designed to ensure a level of visual privacy for the calling and called parties. The facility, VIR, is optional, but where it is provided, there are mandatory aspects which govern its behaviour.

ETS 300 145 [3] states: if terminal A has VIR set to On, it sends an indication (VIR) to the other terminal whenever a capability exchange (to set or change the communication mode) is made. Terminal A then waits until it receives back either a Video-On command or a VIR returned from the other terminal, before it (terminal A) transmits video.

The user control requirement is a facility to switch VIR on and off, together with the appropriate user indications to confirm the current status and status changes.

4.3.2 Video Pause or Video Indicate Suppressed

Within the videotelephony standards ETS 300 144 [10] and ETS 300 145 [3] there is a Video Pause facility defined to enable a temporary level of visual privacy for calling and called parties. The facility, Video Indicate Suppressed, is optional, but where it is provided, there are mandatory aspects which govern its behaviour.

ETS 300 145 [3] states: if terminal A has a VIS control, it sends an indication (VIS) to the other terminal whenever VIS is switched ON and a second indication VIA to indicate when VIS is switched OFF.

NOTE: VIA2 and VIA3 may be sent as alternatives to VIA if appropriate for different cameras.

The user control requirement is a facility to switch VIS on and off, together with the appropriate user indications to confirm the current status and status changes.

Typically, the use of this control is intended as a complementary to Microphone Off (Mute), i.e. as a temporary privacy switch during a call; but at the manufacturer's discretion it can also be used to ensure privacy at the start of a videotelephony call. That is, the user may be able to switch Video Pause on (VIS On) before or just as they answer a videotelephony call.

Depending on the manufacturers implementation the facility may also be referred to as Camera Off or even Camera Mute, see subclause 4.4.3.

4.3.3 Set default communication mode to audio only

For privacy reasons users may choose to set their terminal such that all videotelephony calls are answered in an audio - only mode. Where this is done, the calling videotelephone user shall be informed that the called party has a videotelephone currently set to operate in audio only mode.

4.3.4 Set default teleservice to telephony

For privacy reasons users may choose to set their terminal such that all calls are answered as an ISDN telephone. This is clearly of limited value as it does not enable the parties to upgrade the call without disconnecting and re-establishing the call as a videotelephony call.

4.4 Other terminal facilities

4.4.1 Self-view

No provision is made in the videotelephone terminal standards for a Self View facility, even though it is considered an essential facility within ETR 198 [7]. Provision of such a facility to enable the user to check their video image is an option for the terminal manufacturer. The user control procedures in clause 6 specify that invocation of this facility will have no effect on the remote image. If it is provided, the recommended user requirement is a control facility to switch Self View on and off, together with the appropriate user indications to confirm the current status and status changes.

NOTE: ETR 297 [8] also states: the main principles governing self view are:

- self-view may be selected at any time, on or off-hook or during a call;
- self-view should have no effect on outgoing video.

In videotelephones with a single fixed camera system, self-view should be displayed in mirror image form to comply with user expectations of movement direction, and in coded form to enable checking of the transmitted image quality.

4.4.2 Remote still picture or Video Command Freeze

ETS 300 144 [10] and ETS 300 145 [3] define a facility to enable a user to freeze the transmitted video signal and present a still picture on the remote terminal. The facility, Video Command Freeze, is optional, but where it is provided, there are mandatory aspects which govern its behaviour. The facility may also be referred to as Freeze Frame or Freeze Picture.

If terminal A has a VCF control, it sends an indication (VCF) to the other terminal whenever VCF is switched ON, terminal B then completes updating the current video frame and then freezes the picture. To maintain the frozen picture terminal A must continue to send VCF indications to the remote terminal. The picture is released when the Freeze Picture Release command is received embedded in the video signal or after a time-out of at least a six seconds on the receipt of the previous VCF indication.

The user control requirement is a facility to switch VCF on and off, together with the appropriate user indications to confirm the current status and status changes.

4.4.3 Local still picture

No provision is made in the videotelephone terminal standards for a Local Still Picture facility. Provision of such a facility to enable the user to freeze the incoming video signal and present a still picture on their display is a matter for the terminal manufacturer. If it is provided, the recommended user requirement is a control facility to switch Local Still Picture on and off, together with the appropriate user indications to confirm the current status and status changes.

4.4.4 Camera off

No provision is made in the videotelephone terminal standards for a Camera Off facility. Provision of such a facility to enable the user to switch off, close or cover the camera/s is an option for the terminal manufacturer.

If it is provided, the recommended user requirement is a control facility to switch Camera on and off, together with the appropriate user indications to confirm the current status and status changes. For example, to help the user to be aware why a particular camera view is blank.

Camera Off and the Video Pause facility (described in subclause 4.3.2) may or may not be independent functions. Essentially, a Camera Off facility is expected to control the local camera/s capability to receive light and a Video Pause facility is expected to control the temporary suspension of transmission of a live video signal. The integration of these two facilities is a matter for the terminal manufacturer. See subclause 4.3.2.

NOTE: To the videotelephone user, a simple shutter or cover for the camera is probably the simplest and most direct method to ensure privacy, by stopping one's picture from reaching the other party.

4.4.5 Change camera

Within the videotelephony standards ETS 300 144 [10] and ETS 300 145 [3] there are signals defined to enable a terminal to designate video from more than one camera. The facility to signal Video Indicate Active (VIA), is mandatory, but where there is more than one camera the facility to signal VIA2 and/or VIA3 can be provided.

ETS 300 145 [3] also describes a signal to designate video from a Document Camera (embedded within the video signal defined in ITU-T Recommendation H.261 [16]) and states this is mandatory where a document camera is provided.

The user control requirements for a terminal with more than one camera can include, the ability to:

- control the currently active camera, (i.e. the current source of the transmitted video);
- change to self view from each camera;
- maintain privacy irrespective of the currently active camera.

The user indication requirements for a terminal with more than one camera can include:

- indication of the currently active camera;
- indication of the status of a self-view picture (coded or non-coded image).

4.4.6 Encryption

Within the videotelephony standards ETS 300 143 [9], ETS 300 144 [10] and ETS 300 145 [3] there is an Encryption facility defined to enable encryption of the video and audio signals between two terminals. The facility, Encryption (ECS), is optional, but where it is provided, there are mandatory aspects which govern its behaviour.

ETS 300 143 [9] states: each terminal shall, either automatically or at user request, transmit the encryption capability code if it is able to handle the ECS channel. No terminal may activate the channel without first receiving the corresponding capability code. Once an ECS capability code has been transmitted it cannot be cancelled by omission from a subsequent capability exchange (i.e. to change the communication mode, from e.g. 1 B to 2B AV). Thus once a terminal has received, stored and made use of an ECS capability code (i.e. switched Encryption ON) the terminal should assume continued validity until cancelled by the local user.

The user control requirement is a facility to switch Encryption on and off, together with the appropriate user indications to confirm the potential availability of Encryption, its current status and subsequent status changes to the user.

4.4.7 Microphone off

Within the videotelephony standards ETS 300 144 [10] and ETS 300 145 [3] there is a Microphone Off facility defined to enable a temporary level of audio privacy for calling and called parties. The facility, AIM, is optional, but where it is provided, there are mandatory aspects which governs its behaviour. The facility may also be referred to as Microphone Mute.

ETS 300 145 [3] states if terminal A has a AIM control, it sends an indication (AIM) to the other terminal whenever AIM is switched ON and a second indication AIA to indicate when AIM is switched OFF.

The user control requirement is a facility to switch AIM on and off, together with the appropriate user indications to confirm the current status and status changes to the user.

5 Basic call scenarios

This clause describes the possible basic call scenarios that a user can complete with an ISDN videotelephone.

The basic call scenarios consider both the A-party and B-party perspective, independent from the number of 64 kbit/s circuit mode connections (1B or 2B) provided to the terminal. The range of basic call scenarios that may be possible with an ISDN videotelephone depend on two attributes, the resultant teleservice and the resultant communication mode.

5.1 Defining the resultant teleservice

With an ISDN videotelephone, three general situations arise:

1) basic calls between two ISDN videotelephones, with or without a fallback capability, where the resultant teleservice is videotelephony;

2) basic calls between an ISDN videotelephone (with or without a fallback capability) and an ISDN, PSTN or mobile (digital or analogue) telephone, where the resultant teleservice is caused by fallback to telephony or the call set up fails;

3) basic calls between an ISDN videotelephone acting as an ISDN telephone and another ISDN telephone (or ISDN videotelephone acting as one).

The full range of these basic call scenarios and the resulting teleservice are shown in table 7. The third situation, where the basic call is effectively, between two ISDN telephones, is shown by the shaded area in the table for completeness, but is outside the scope of the present document.

Table 7: Determination of teleservice in the range of possible Basic Calls

	Incoming: Receiving terminal					
Outgoing: Call Initiating terminal	Videotelephony With Fallback BC1 Speech BC2 UDI with T/A BC3 UDI with T/A HLC1 Telephony 3.1 HLC2 Telephony 7 HLC2 Videotelelephony	Videotelephony With Fallback BC1 Speech BC2 UDI with T/A HLC1 Telephony 3.1 HLC2 Videotelelephony	Videotelephony No Fallback BC1 UDI with T/A HLC1 Videotelelephony	Telephony 7 kHz With Fallback BC1 Speech BC2 UDI with T/A HLC1 Telephony 3.1 HLC2 Telephony 7	Telephony 7 kHz No Fallback BC1 UDI with T/A HLC1 Telephony 7	Telephony 3,1 kHz BC1 Speech HLC1 Telephony 3.1
Videotelephony With Fallback BC1 Speech BC2 UDI with T/A BC3 UDI with T/A HLC1 Telephony 3.1 HLC2 Telephony 7 HLC3 Videotelephony	Videotelephony	Videotelephony	Videotelephony	FALLBACK Telephony 7 kHz	FALLBACK Telephony 7 kHz	FALLBACK Telephony 3,1 kHz
Videotelephony With Fallback BC1 Speech BC2 UDI with T/A HLC1 Telephony 3.1 HLC2 Videotelephony	Videotelephony	Videotelephony	Videotelephony	FALLBACK Telephony 3,1 kHz	FAIL	FALLBACK Telephony 3,1 kHz
Videotelephony No Fallback BC1 UDI with T/A HLC1 Videotelephony	Videotelephony	Videotelephony	Videotelephony	FAIL	FAIL	FAIL
Telephony 7 kHz With Fallback BC1 Speech BC2 UDI with T/A HLC1 Telephony 3.1 HLC2 Telephony 7	FALLBACK Telephony 7 kHz	FALLBACK Telephony 3,1 kHz	FAIL	Telephony 7 kHz	Telephony 7 kHz	FALLBACK Telephony 3,1 kHz
Telephony 7 kHz No Fallback BC1 UDI with T/A HLC1 Telephony 7	FALLBACK Telephony 7 kHz	FAIL	FAIL	Telephony 7 kHz	Telephony 7 kHz	FAIL
Telephony 3,1 kHz BC1 Speech HLC1 Telephony 3.1	FALLBACK Telephony 3,1 kHz	FALLBACK Telephony 3,1 kHz	FAIL	FALLBACK Telephony 3,1 kHz	FAIL	Telephony 3,1 kHz

5.2 Defining the Resultant Videotelephony Communication Mode

Within an ISDN videotelephony call the originating and receiving terminal may have one of five preferred communication modes. These may be set as defaults for outgoing and incoming call or may be set on a per call basis, see subclause 4.2 table 6.

As soon as a videotelephony call is accepted the receiving terminal declares its preferred communication mode and a negotiation may take place to try to find the highest common mode.

The full range of all possible results of the negotiation phase depending on the A and B-parties declared preferences is shown in table 8. The referenced ETSI standards specify that all ISDN videotelephony terminals should support Audio mode a_0. The availability of changes to different AV 1B and 2B communication modes are terminal type dependent, see table 5. Some special terminals may also include 1B and/or 2B full Video modes (a_v or b_v). Terminals which only provide these full video modes may be outside the scope of ETSI's definition of videotelephony and, hence, outside the scope of the present document.

Table 8: Determination of Resultant Videotelephone Communication Mode

	Incoming terminal Preferred Mode				
Outgoing terminal Requested Mode	Audio = a_0	AV 1B = a_1	AV 2B = b_1	AV 2B = b_2	AV 2B = b_3
Audio = a_0	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available
AV 1B = a_1	Audio = a_0 Upgrades to AV 1B or 2B may be available	AV 1B = a_1 Downgrade to Audio OK Upgrades to AV 2B may be available	Audio = a_0 Upgrades to AV 1B or 2 B may be available	Audio = a_0 Upgrades to AV 1B or 2 B may be available	AV 1B = a_1 Downgrade to Audio OK Upgrades to AV 2B may be available
AV 2B = b_1	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available
AV 2B = b_2	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV 1B or 2B may be available	Audio = a_0 Upgrades to AV may be available	AV 2B = b_2 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available
AV 2B = b_3	Audio = a_0 Upgrades to AV 1B or 2B may be available	AV 1B = a_1 Downgrade to Audio OK Upgrades to AV 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available	AV 2B = b_1 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available	AV 2B = b_3 Downgrade to Audio OK Downgrades to AV 1B and Changes at AV 2B may be available

5.3 Making a call from an ISDN videotelephone

5.3.1 Making a videotelephony call to another ISDN Videotelephone

When an A-party makes a videotelephony call on an ISDN videotelephone the attempted call will be in the default outgoing communication mode of the terminal (audio only, 1B or 2B AV) unless the user has previously changed mode. The terminal may allow the user to make a per call request to change the outgoing mode (e.g. from AV to audio only).

The terminal facility enabling a per call change of mode request shall, if provided, enable the change to be made in any combination with overlap or en bloc dialling (or a combination of both of them) and initiating a "Start" control action (e.g. going off-hook or pressing a "Send" key). Table 9 shows the choice of sequences that shall be available of these user actions:

Table 9: Available user control sequences when making a call and changing default communication mode on a per call basis

First user action	Second user action	Third user action
Mode	Dial	Start
Mode	Start	Dial
Dial	Mode	Start
Dial	Start	Mode
Start	Mode	Dial
Start	Dial	Mode

The call will progress to an alerting phase where the calling terminal can be identified as an AV terminal. When the remote terminal answers the call, if both parties are able to support the mode set by the A-party terminal, they will both be informed that a call in that mode is being set-up and the call will be connected.

Where the B-party terminal is unable to support the requested mode the terminals will negotiate the highest level of communication capability that they can both support and connect at that level. In exceptional circumstances the call may fail.

The full range of all possible results of the negotiation phase depending on the A and B-parties declared preferences is shown in table 8.

5.3.2 Making a videotelephony call to an ISDN, PSTN or mobile telephone

The call set-up procedures required to make an call from an ISDN videotelephone to a PSTN or ISDN telephone are the same as those required to set-up a call to another ISDN videotelephone. Where the user's terminal is set to No Fallback, the call will fail.

The setting of the outgoing videotelephony communication mode is unimportant as the resultant call, if any, will be a telephony teleservice call whether the request was for an AV or an audio call. If the call is to an ISDN telephone the A-party may have the choice of using the 3,1 kHz or 7 kHz teleservice, as part of their call set-up procedure. This is outside the scope of the present document.

5.3.3 Making a telephony call to an ISDN, PSTN or mobile telephone

Videotelephony terminals may allow the user to explicitly choose to place an OCas a telephony teleservice call. Where such an option is selected, users shall be informed that the terminal is behaving as a telephony terminal and that they will be unable to engage in videotelephony operations until they cancel this option. Terminal manufacturers may choose to cancel this option on the completion of each explicitly selected telephony call.

5.4 Receiving a call at an ISDN videotelephone

5.4.1 Receiving a videotelephony call from another ISDN videotelephone

All videotelephony calls from an ISDN videotelephone shall cause AV alerting to occur at the B-party terminal. The B-party shall be able to:

- accept the IC, which may be audio or AV, by the normal call acceptance procedure (e.g. going off-hook);
- accept the IC in audio only (for privacy) by opting not to transmit a video signal, (e.g. by temporarily changing the incoming default to audio or by using the camera off control) and going off-hook;
- reject the IC.

If the B-party is busy, unreachable, does not answer or rejects the IC, the call may be subject to supplementary service procedures.

If the B-party has an auto-answer facility which is switched on, the IC may not progress to an alerting phase but may progress direct to a connected state. In this case the minimum of an audio only call should be established. At the terminal's discretion a higher level AV call may be established and whether an auditory or other indication is given to warn the B-party of the connected IC.

After acceptance of the call the mode is negotiated between the A-party terminal and the B-party terminal based on the declared modes of the two parties in order to achieve the highest possible common capability. The negotiation should be able to achieve at least an agreement on the lowest videotelephony audio only mode (a_0). The connection is made in the negotiated mode and charging is started.

The full range of all possible results of the negotiation phase depending on the A and B-parties declared preferences is shown in table 8.

5.4.2 Receiving mobile, PSTN or ISDN telephone calls at an ISDN videotelephone with fallback

When the B-party has an ISDN videotelephone with fallback, a call from a PSTN or ISDN telephone shall alert the terminal as a telephony teleservice call. The B-party shall be able to:

- accept the incoming telephony call by the normal acceptance procedure (e.g. by going off-hook);
- reject the IC.

If the B-party is busy, does not answer or rejects the call, the call may be subject to supplementary service procedures.

After acceptance, the call connection is made by fallback to the telephony teleservice call and charging is started.

5.4.3 Receiving mobile, PSTN or ISDN telephone calls at an ISDN videotelephone no fallback

When a B-party terminal is an ISDN videotelephone without fallback, a telephony teleservice call from any source shall not alert the terminal (the alerting phase is not completed as the call and terminal are incompatible) and an appropriate indication shall be given to the A-party terminal.

NOTE: The indication giving the reason for the call set-up failure should be in a form that maybe able to be presented to the A-party, irrespective of the type of originating terminal (PSTN, or ISDN, GSM, etc.).

5.5 Connected in a videotelephony call

Once connected within a videotelephony call the parties shall be able to change the communication modes and/or call status. The possible changes include:

- changing the teleservice;
- changing the communication mode:
  - up-grading;
  - down-grading;
- changing other terminal facilities, e.g. self view, change camera, video pause (camera off), microphone off, encryption, etc;
- call termination.

The availability of any of these changes is dependent on the range of facilities available in either or both of the terminals participating in the call.

5.5.1 Changing the teleservice

Terminal manufacturers may allow users to request a change to the teleservice of a call, e.g. from videotelephony to telephony (or vice versa). This request may only be achieved by aborting the current call and establishing a new call with the requested teleservice. Both parties should be informed that the call is being aborted and re-established. The calling party may also be informed that they will be unable to engage in videotelephony operations until they cancel this option.

5.5.2 Changing the communication mode

5.5.2.1 Up-grading

After connection as a videotelephony call between two ISDN videotelephones, either party should be able to initiate a request to upgrade the communication mode of the call, e.g. from an audio only to a full AV call using one or two 64 kbit circuit mode connections. At the time of the request to upgrade, the non-initiating party shall be offered the opportunity to accept or reject the upgrade request. If the request is accepted the call set-up as an AV call proceeds, without long interruption to the audio communication. If the A-party initiated the request for upgrade to 2 B channels, the calling party will place a second ISDN call and B-party places its second ISDN interface in auto-answering mode. If the request to upgrade is rejected the call resorts to the previous communication mode. After the upgrade is completed either party should be able to request a subsequent downgrade. There is no limit expected to the number of upgrade and downgrade requests that either party may initiate.

5.5.2.2 Down-grading

After connection as a videotelephony call between two ISDN videotelephones, either party shall be able to initiate a request to downgrade the communication mode of the call, e.g. from a full AV call to an audio call using one 64 kbit circuit mode connections. At the time of the request to downgrade, the non-initiating party shall receive an appropriate indication. If the call is successfully downgraded either party should be able to request a subsequent upgrade. There is no expected limit to the number of up or downgrades that can be made by either party.

If the B-party accepts the call as an AV call but in audio only (e.g. for temporary reasons of privacy or by auto-answer) the call is expected to continue as an AV call but with audio only transmitted from the B-party. Appropriate indications should be presented to both parties to inform them that although an AV call is established the B-party is temporarily not transmitting video.

NOTE: It is at the terminal and service provider's discretion whether the B-party continues to receive full AV or whether the connection is downgraded to audio only, after a time-out.

5.5.3 Changing other terminal facilities

5.5.3.1 Changing to self-view

At any time (during idle, call set-up, alerting and connected phases) the videotelephone should enable the user to change the current local display to self-view. The video display presented may then depend on the status of the currently active camera (e.g. camera on/off, camera-1, camera-2, document camera, etc.) and the status of the self-view facility (e.g. mirror image vs. non-mirror, coded vs. non-coded). Equally, at any time the user should be able to change out of self-view. Neither action shall affect the transmitted video image.

Self view may be expected to automatically reset to off when the terminal next returns to idle.

5.5.3.2 Change camera

If more than one camera is provided, the videotelephone should enable the default or current active camera to be changed, at any time (during idle, call set-up, alerting and/or the connected phase). During the connected phase, changing the currently active camera will change the video signal sent to the remote terminal, and equally it would be expected that if the local display is in self-view, the relative images would change depending on the view from the current active camera.

When more than one camera is provided, one camera shall be designated the main default camera. It is expected that any specially selected camera choices and settings should automatically reset to their preferred default values when the terminal next returns to idle.

5.5.3.3 Select Video pause

At any time (during idle, call set-up, alerting or the connected phase) the terminal should enable the user to select Video Pause. During the connected phase the local terminal should indicate when video pause is on and temporarily suspend video transmission. During the call set-up or alerting phase, it may be expected that the user is trying to ensure privacy at the start of a subsequent connected phase, and indication declaring video pause is on should be given and a null video signal transmitted at the start of an audio visual connection. If the connection is established in audio-only communication mode, this may be confirmed and the video pause may at the manufacturer's discretion be released. During idle, selecting video pause may be regarded as a privacy precaution preliminary to a call set-up, however a time out may be appropriate to reset video pause to off, if no call set-up proceeds.

Video pause should automatically reset to off (i.e. video on) when the terminal next returns to idle.

5.5.3.4 Select Camera off

The behaviour associated with selecting camera off, will depend on the manufacturer's specific implementation. The typical camera off facility is expected to behave in a way similar to putting a shutter over the particular camera. For example, if the main camera was on self-view during idle the local display should expect to show the main camera's image (typically in un-coded mirror view). If camera off is then selected (i.e. for that camera), it may be expected that the self-view display would go blank, only to return when the camera is next set to on.

If more than one camera is provided, then following the shutter analogy, it may be expected that camera off should work independently for each camera.

Camera off should automatically reset to on when the terminal next returns to idle.

5.5.3.5 Select Microphone off

At any time (during idle, call set-up, alerting or the connected phase) the terminal should enable the user to select Microphone off (or mute). During the connected phase the local terminal should indicate when the microphone is off and temporarily suspend the audio transmission. During the call set-up or alerting phase, it may be expected that the user is trying to ensure auditory privacy at the start of a subsequent connected phase, and an indication declaring microphone off should be given and a null audio signal transmitted at the start of an audio only or audio visual connection. During idle, selecting microphone off may be regarded as an audio privacy precaution preliminary to a call set-up, however a time out may be appropriate to reset the microphone to on, if no call set-up proceeds. Alternatively the terminal may choose to ignore the selection during idle.

5.5.3.6 Select Encryption on

If the facility is provided, at any time during the call set-up, alerting and connected phases, the terminal should enable the user to select encryption on. Agreement to encryption of the transmission will depend on the capability of the receiving terminal and potentially the other party's declared or stated preference. It is expected that typically both users must positively accept encryption before it can be started, but that it can only be cancelled by a specific action by the local user.

Typically, encryption should automatically reset to off when the terminal next returns to idle.

NOTE 1: This does not preclude a manufacturer from offering a terminal with a preferred default for encryption on. Thereby ensuring that all videotelephony calls that can be encrypted, are encrypted.

NOTE 2: The interaction of encryption and third party calls involving supplementary services, like call waiting, hold, explicit call transfer, etc. are outside the scope of the present document.

5.5.3.7 Select Video Freeze - Remote still picture

If the facility is provided, the terminal should enable the user to select Video freeze (remote still picture) at any time during the connected phase. The local terminal should show an indication that the transmitted video signal is frozen confirming that the remote display is showing a still picture. At the manufacturer's discretion selecting video freeze may or may not affect a self-view image from the same active camera source. Equally, at any time the user may deselect video freeze, and an indication should confirm that the remote display is now receiving live video again.

Video freeze should automatically reset to off when the terminal next returns to idle.

5.5.3.8 Select Local still picture

If the facility is provided, the terminal should enable the user to select local still picture at any time during the connected phase. The local terminal should show an indication that the received video signal is frozen confirming that the local display is showing a still picture. Equally, at any time the user may deselect local still picture and the display should confirm that it is now showing live video again.

Local still picture should automatically reset to off when the terminal next returns to idle.

5.5.4 Terminating a call

Call termination shall be initiated if either party disconnects the call or the network disconnects the call. At the time of disconnection by one of the parties an appropriate indication shall be presented to the other party. Accidental disconnection protection is outside the scope of the present document.

5.6 Connected in a telephony teleservice call

5.6.1 Connection between two videotelephones in an ISDN telephony call

After connection to another videotelephone in an ISDN telephony call (either 7 kHz or 3,1 kHz), no facilities are available to change the teleservice to videotelephony, except by terminating the current call and initiating a new call within the ISDN videotelephony service.

The user procedures, controls and indications for call handling, and the facilities available during connection, for connections between two ISDN videotelephones in an ISDN telephony call are outside the scope of the present document.

5.6.2 Connected to a PSTN or ISDN telephone

After connection to either a PSTN telephone or an ISDN telephone in a telephony teleservice, no facilities will be available to change the teleservice to videotelephony. Call termination shall be initiated if either party or the network disconnects the call. At the time of disconnection by one of the parties an appropriate indication shall be presented to the other party, if the original connection was with an ISDN telephone. Accidental disconnection protection is outside the scope of the present document.

5.7 State Transition Diagram

This subclause provides State Transition Diagrams which indicate the states that may be available to the videotelephone terminal and the transition paths that should be provided between any two supported states. They are provided to give a simplified overview of the behaviour described by the SDL diagrams of clause 6. The SDL diagrams in clause 6 can include some transitory "Wait" states which the terminal or network need to consider but which have been excluded from the State Transition Diagrams for clarity.

As these State Transition Diagrams are less precise than the SDL diagrams, they are not considered as an essential part of the user control procedure specification. The SDL diagrams always have precedence over the equivalent parts of the State Transition Diagrams.

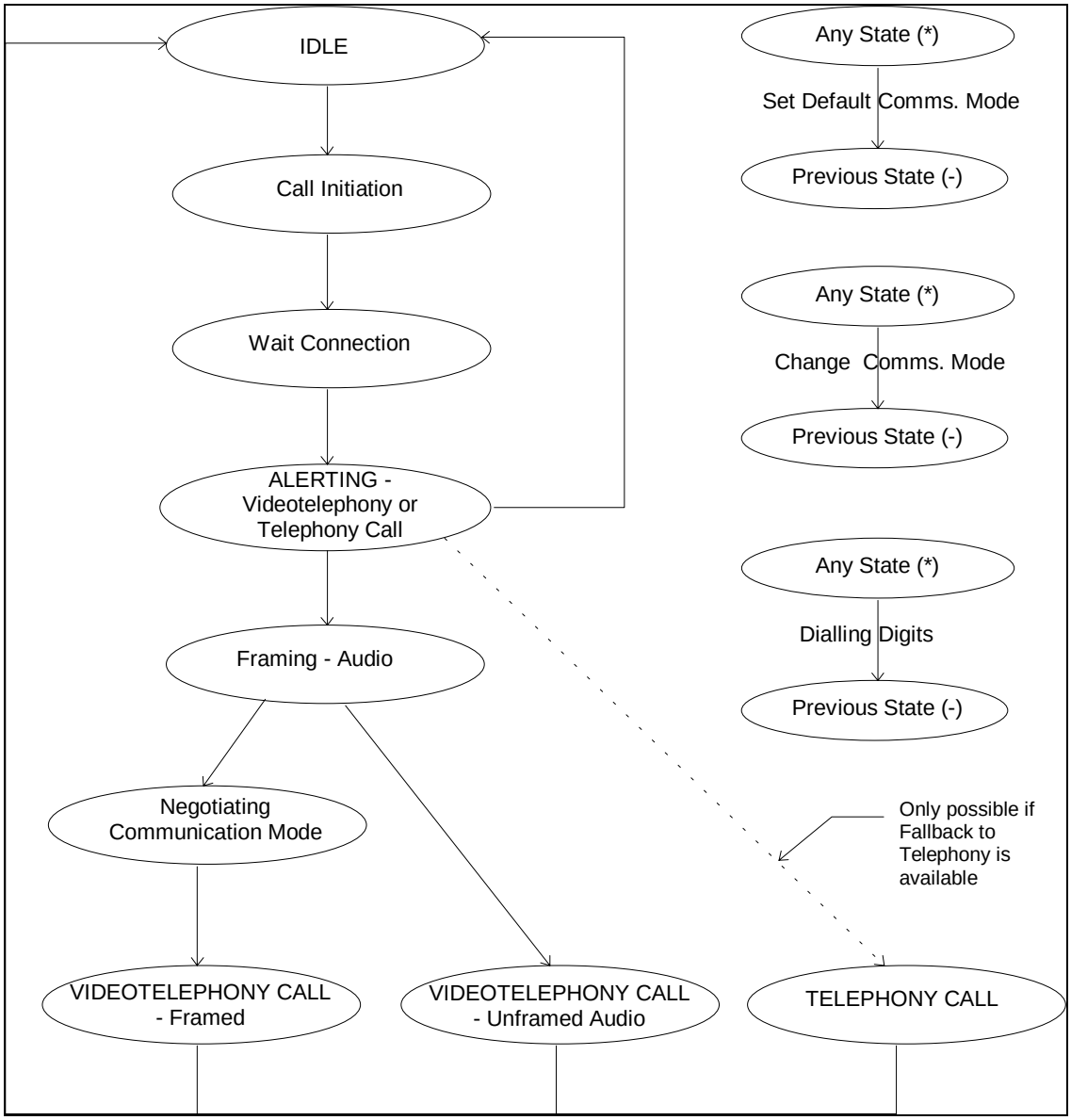


Figure 1: Outgoing Calls - State Transition Diagram

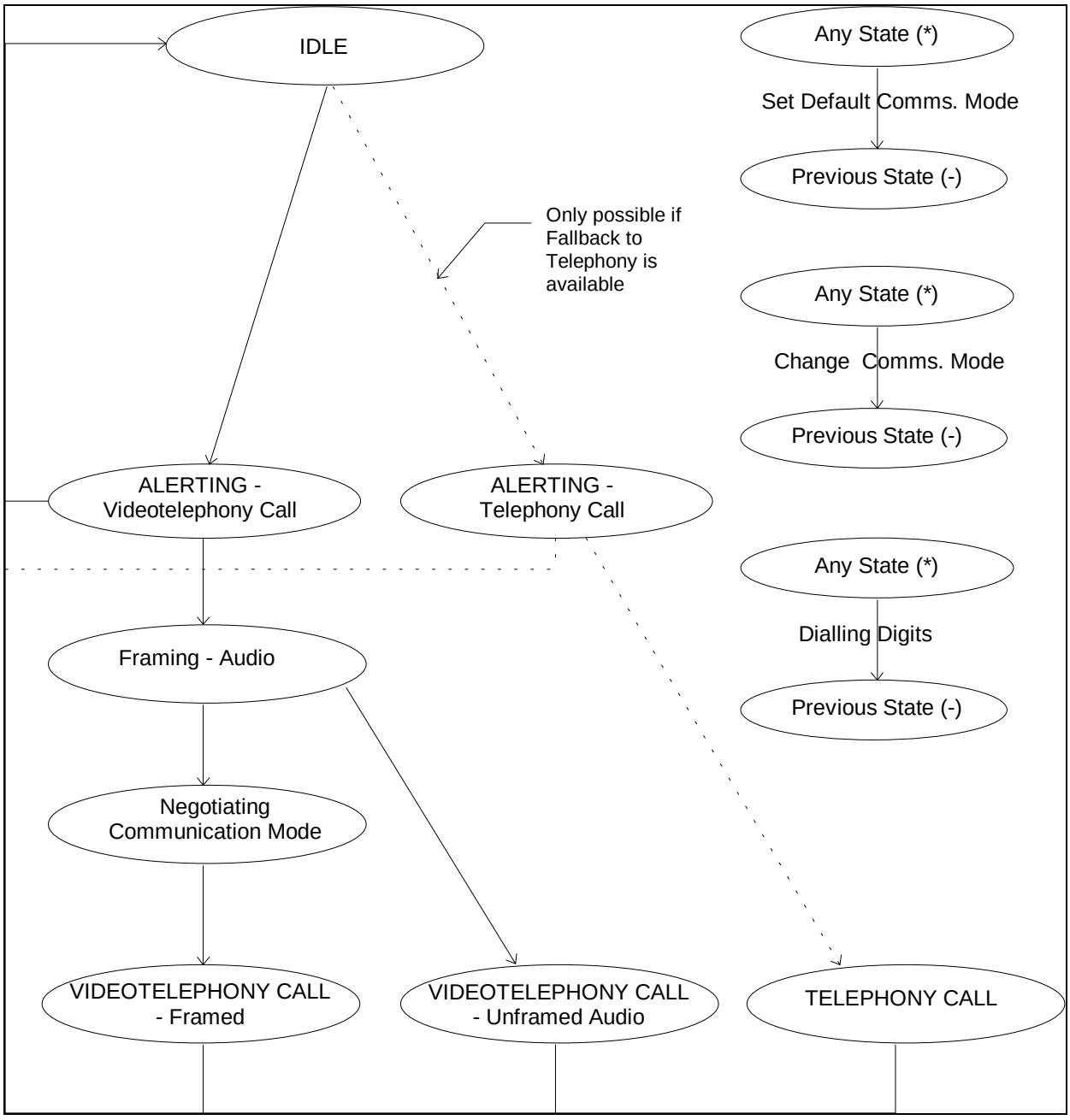


Figure 2: ICs - State transition diagram

6 User control procedures

6.1 General principles

The user control procedures defined for basic call, point-to-point connections, for ISDN videotelephones are based on the general principle, general rules and generic user control procedures defined in ETR 170 [6].

The general principle for user control procedures can be summarized as:

CONTROL - INDICATE - CONTROL; or

PROMPT - CONTROL - FEEDBACK.

The principle intends that the user should have information available about the status of the system (terminal, network or service) before making a control action, and should be given fresh information on the change (or lack of it) in the status of the system caused by the control action.

In a user control procedure, because the system is in a wait state immediately after a prompt (waiting for the control action) this translates into the sequence:

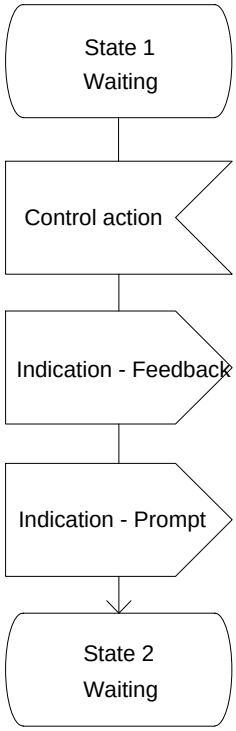


Figure 3: The general principle as an SDL sequence

In practice, the prompting and feedback indications are often combined into a single event and even as a single indication (e.g. dial tone - feedback that the user has gone off-hook and a prompt for an address). However, throughout the user control procedures defined below they are kept separate to ensure that both aspects of the indications required by the user at that point of the procedure are considered. For example, if a Handsfree Button is used to go off-hook, the user will invariably be given an indication that the button has been pressed (e.g. an LED illuminated or a symbol displayed to show handsfree is active) as well as the dial tone.

Where a user control procedure defined in subclause 6.2 requires a sequence of two or more control actions to progress between states, the user control procedure defined below requires that the user can complete the control actions in any order. For example. to make an AV call may require the three control actions: go off-hook, select mode and dial address, the user control procedure in this case will allow the user to either:

1) go off-hook;

2) select mode; and

3) dial address;

or

1) dial address;

2) go off-hook;

3) select mode;

or any combination of the above.

6.2 SDL charts defining user control procedures

This subclause provides the SDL process charts which defines the User control Procedures for ISDN Videotelephones. Each chart represents a process that runs in parallel to all other processes. As a consequence of the parallel running of the processes the defined user procedures are very tolerant of users operating controls in a variety of different orders. In particular, all the sequences of user operations for the initiating of ISDN videotelephony calls shown in table 8 are supported.

A number of states are defined in the processes. At any time each process may be in one of its defined states. The complete set of states is shown in table 10.

Table 10: List of states

State Name
Idle
AV_Call
Tel_Call
Unframed_Audio
W_Connection
N_Alerting
Wait_for_Stops_Call
Wait_Release_Complete
IC_Telephony_Alerting
IC_AV_Alerting
Framing
Negotiating
Camera_On
Camera_Off
Self_View_On
Self_View_Off
Waiting

Because these states exist in different processes and these processes exist in parallel, several of the states in table 10 can co-exist.

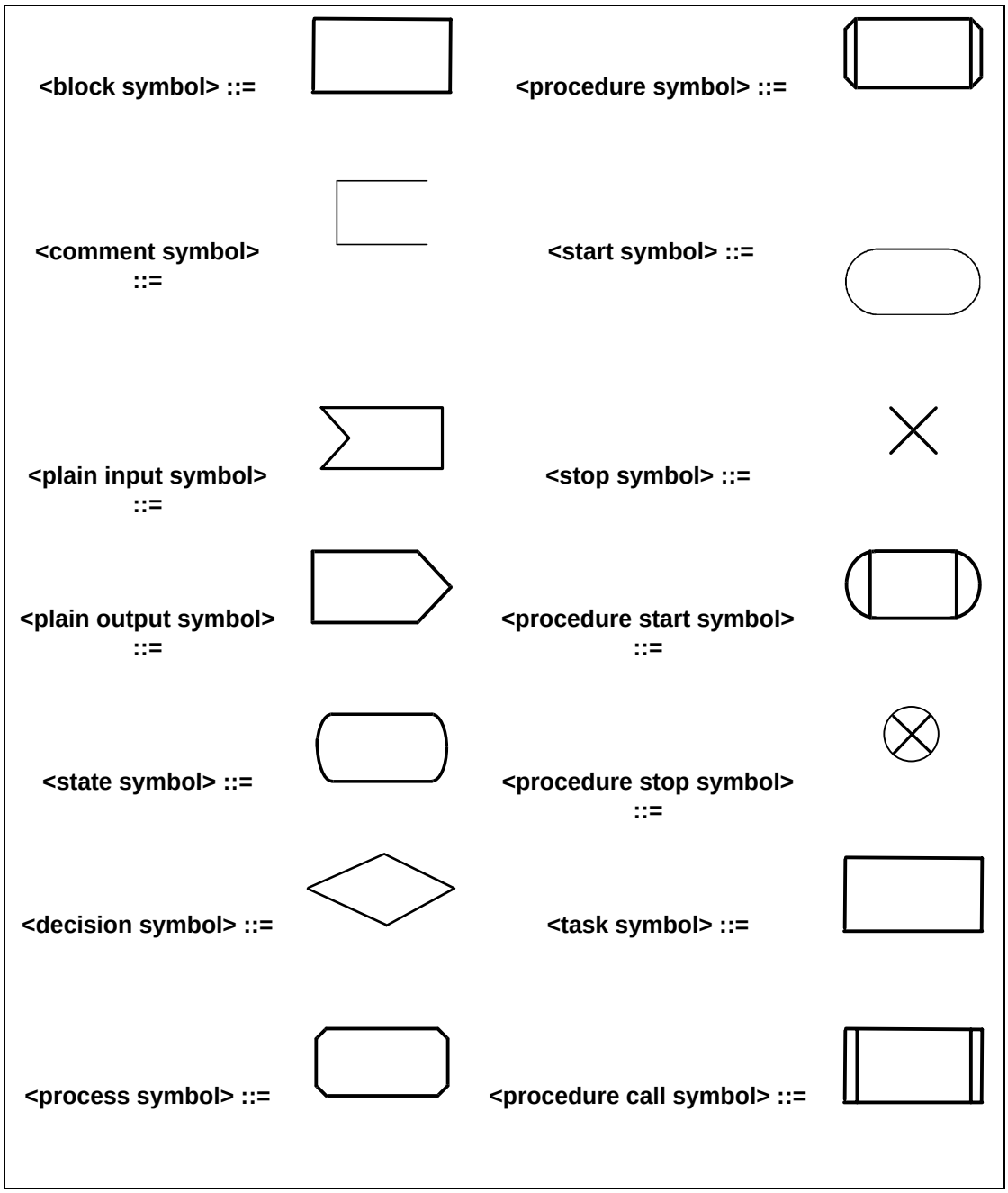


Figure 4: The SDL symbols used in the present document

6.2.1 Call_handling process

The Call_Handling Process, shown in figure 5, belongs to the Block Call_Handling and is entered with either side in an Idle mode. Call set-up may be initiated by the user initiating an OCor as the result of an IC and leads to the establishment of an AV_Call, a Tel_Call, an Unframed Audio call or a return to the idle state. This return to the idle state may be due to the called party rejecting an IC or to an attempt to set up an incompatible call (which leads to an automatic call release).

There are four important SDL procedures that are called within the Call_Handling process - OutGoing_Call, Incoming_Call, Framing and Negotiating. User procedures relating to dialling, call disconnection and mode selection are three parts of the process that can operate independent of the state of the main call set-up part of the process. Three SDL procedures are called by these user procedures - Digit_Entry, Mode_Selection and Disconnect. These procedures and additional parts of the Call_handling process are described in other subclauses.

The control used to initiate a call (C_Start) is equivalent to but not necessarily limited to handset off-hook and is activated by the user either after entering digits, prior to entering any digit or part way through digit entry. Most of the procedure for dialling is described in the Digit_Entry procedure (see subclause 6.2.1.3). The detail of how the initial stages of outgoing and ICs are handled are contained in the OutGoing_Call and Incoming_Call procedures (see subclauses 6.2.1.1 and 6.2.1.2). If the result of these procedures indicates that the call will be a Telephony Teleservice call then the user shall be so informed and a Telephony Teleservice call is set-up. For Audiovisual calls, both outgoing and ICs proceed through a framing and negotiating phase - described in the Framing and Negotiating SDL procedures (see subclauses 6.2.1.6 and 6.2.1.7). Failure to achieve framing synchronization leads to an Unframed Audio call being set-up, and the user shall be appropriately informed. If the two videotelephones are able to negotiate a common videotelephony communication mode (see table 8), then the user shall be informed of the resultant communication mode and an Audiovisual call is set-up.

For an IC, a communication mode is negotiated according to the terminal settings that were current when the IC was first connected to the videotelephone. Where the user attempts to change the communication mode of an IC, their request shall be noted and an attempt to renegotiate the communication mode shall be made immediately the initial call is set-up. The logic for this behaviour is contained in the lower portion of figure 5. At any point in the process, either B-party may stop the call or the network may release the call; the network may release the call either due to A-Party having released the call or due to network circumstances such as congestion. This is handled by the Disconnect procedure in 6.2.1.4.

Table 11: List of User and NCs and indications in the Call_handling main part

User controls	User indications	NCs	NIs
C_Start	I_Start	N_Alerting	
C_Digit(x)	I_Digit(x)		
	I_Call_Mode(x)		
	I_Tel_Call		
	I_Unframed		
	I_Restricted		

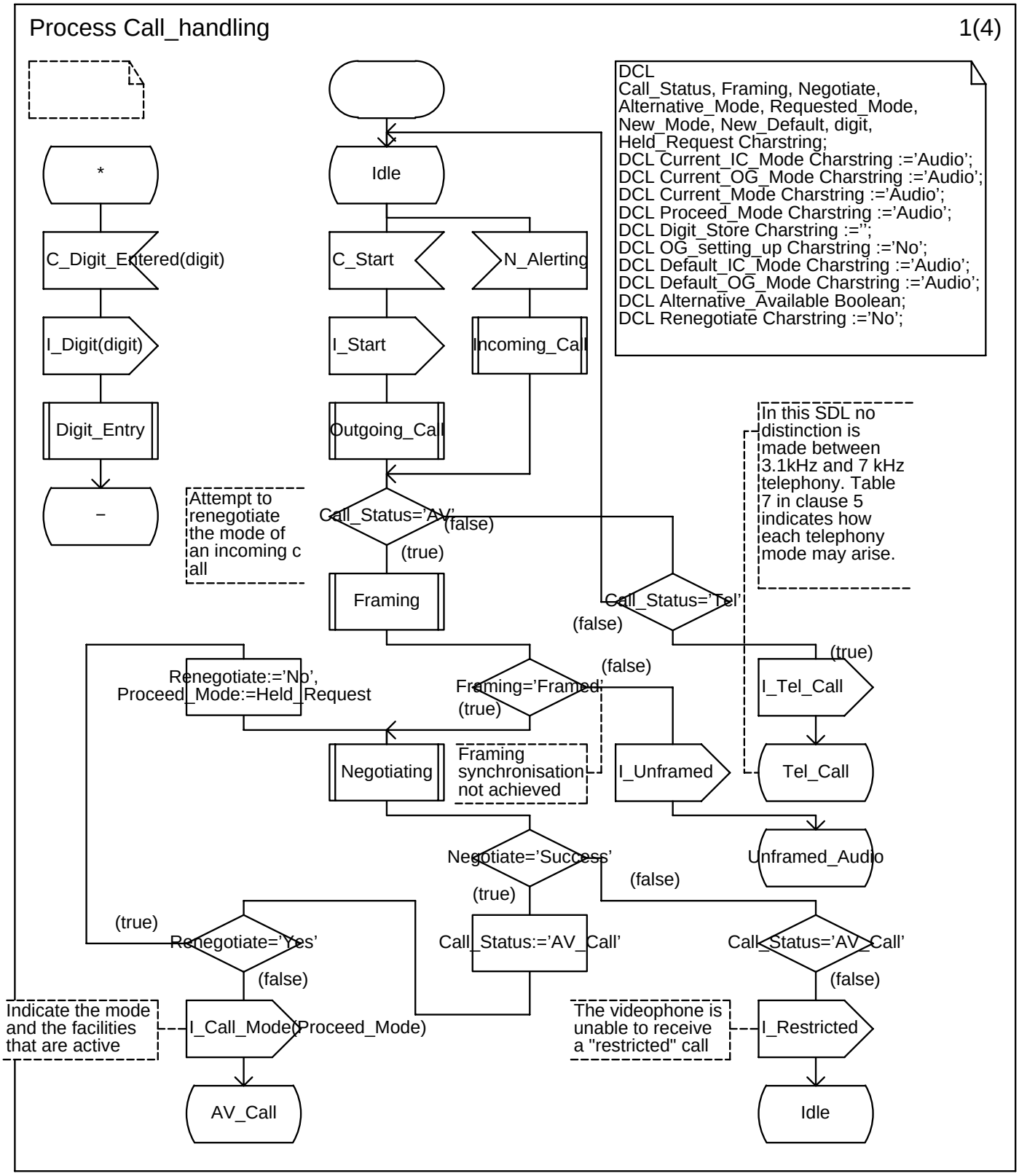


Figure 5: Main Call_handling process

6.2.1.1 Outgoing_Call_procedure

The Outgoing_Call procedure is called when the user selects the C_Start control from Idle and results in the B-channel being connected as an AV or a Telephony call (if fallback occurs). The address of the called party B (its phone number) may be entered by the user either en-block, digit-by-digit in an overlap mode or in a combination of en-block followed by overlap. Digits can be entered at any time, as shown above in figure 5, and the way they are handled is described in the Digit_Entry Procedure (see subclause 6.2.1.3).

The state Call_Init_Awaited is reached directly C_Start has been activated and any stored digits have been sent to line. Call_Init_Awaited will be followed by the terminal receiving a call progress message (indicating sufficient digits have been received). During the second stage of the Outgoing_Call procedure, the network informs the terminal and therefore the user of the progress of the call, mostly by alerting tones such as the starting and stopping of ring tone (corresponding to the ringing and answering of the B-party terminal), busy tone and others. If the call has been requested as videotelephony without fallback, it may happen that there is no indication provided to the user on the reason why the call is ignored by the called party. At the time the B-channel is connected (the conclusion of the alerting), the user shall be informed of the progress of the call to that state (e.g. a message on a screen).

The handling of digits entered after the Call_Init_Awaited state has been reached is not defined in this procedure as digits entered after this point will not affect the resultant call that is set up (and is thus beyond the basic set of user control procedures defined in the present document).

At any point in the process, either B-party may stop the call or the network may release the call; the network may release the call either due to A-Party having released the call or due to network circumstances such as congestion. This is handled by the Disconnect procedure in subclause 6.2.1.4.

Table 12: List of User and NCs and indications in Outgoing_Call Procedure

USER CONTROL	USER INDICATION	NETWORK CONTROL	NETWORK INDICATION
C_Digit_Entered	I_Digit(x)		
	I_Dial_Tone		N_Digits_to_line
		N_Call_Progress	
	I_Wait_Connection	N_Alerting	
	I_Alerting_Start		
	I_Alerting_Stop	N_Connect_AV	
		N_Connect_Tel	

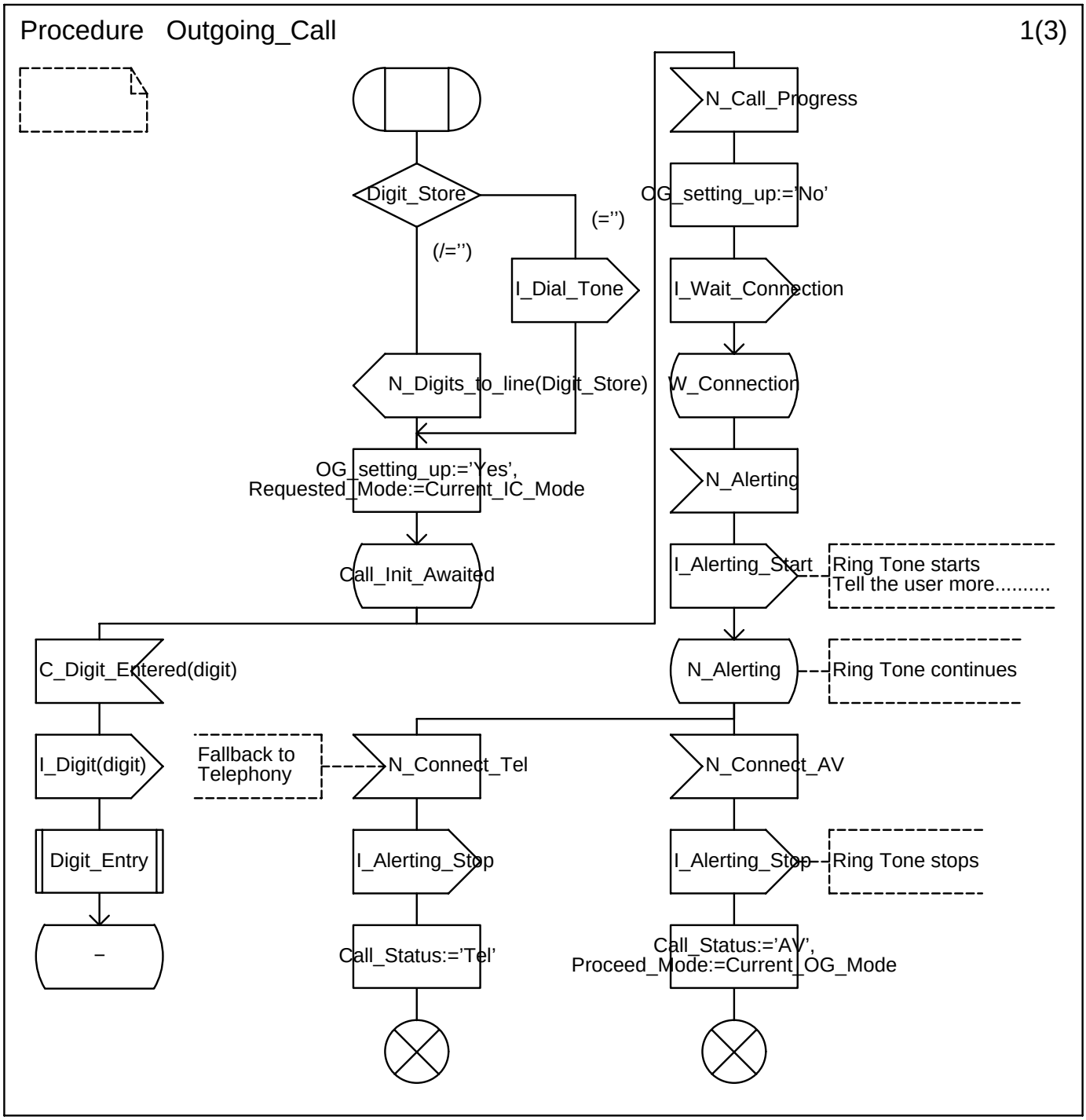


Figure 6: Outgoing_Call procedure

6.2.1.2 Incoming_Call procedure

The procedure starts from the state Idle and is completed when the B-channel is connected as a videotelephony or telephony call. The network presents a new call in an alerting message which contains the type of call requested by the A-party. Prior to receipt of the call the receiving terminal will be set to a recognized Teleservice (Telephony, Videotelephony with fallback or Videotelephony without fallback). The terminal decodes the alerting message and determines from the coded BC(s) and HLC(s) (Bearer Capabilities and High Level Capabilities) respectively and in ascending order if it can accept the call or not (as described in table 7).

The call will be accepted in the highest common set of parameters in the successive Alerting and Connect messages. It has been assumed that the call is alerted to the B-party by a signal which allows the user to distinguish between a simple telephony call and a Videotelephony call. The user may either accept or ignore the call depending on the nature of the call and the user's readiness to accept it. Upon acceptance of the call the network connects the B-channel.

Upon receipt of the NAlerting message, the internal variable "Call_Status" will be set to "IC_Setting_up" (IC for IC). Any Teleservice change requested by the user from the time this variable is set will prevent the Mode_Selection procedure (see subclause 6.2.1.5) from attempting to change the mode until "Call_Status" is changed to "AV".

At any point in the process, either B-party may stop the call or the network may release the call; the network may release the call either due to A-Party having released the call or due to network circumstances such as congestion. This is handled by the Disconnect procedure in subclause 6.2.1.4.

Table 13: List of User and NCs and indications in Incoming_Call Procedure

USER CONTROL	USER INDICATION	NETWORK CONTROL	NETWORK INDICATION
C_Accept_IC_AV	I_IC_AV_Alerting_Start	N_Incompatible	
C_Rejects_AV_Call	I_IC_AV_Alerting_Stop	N_IC_AV	N_Alerting
C_Accept_IC_Telephony	I_IC_Telephony_Alerting_Stop		N_IC_AV
C_Rejects_Telephony_Call	I_IC_Telephony_Alerting_Starts	N_IC_Telephony	N_Connect

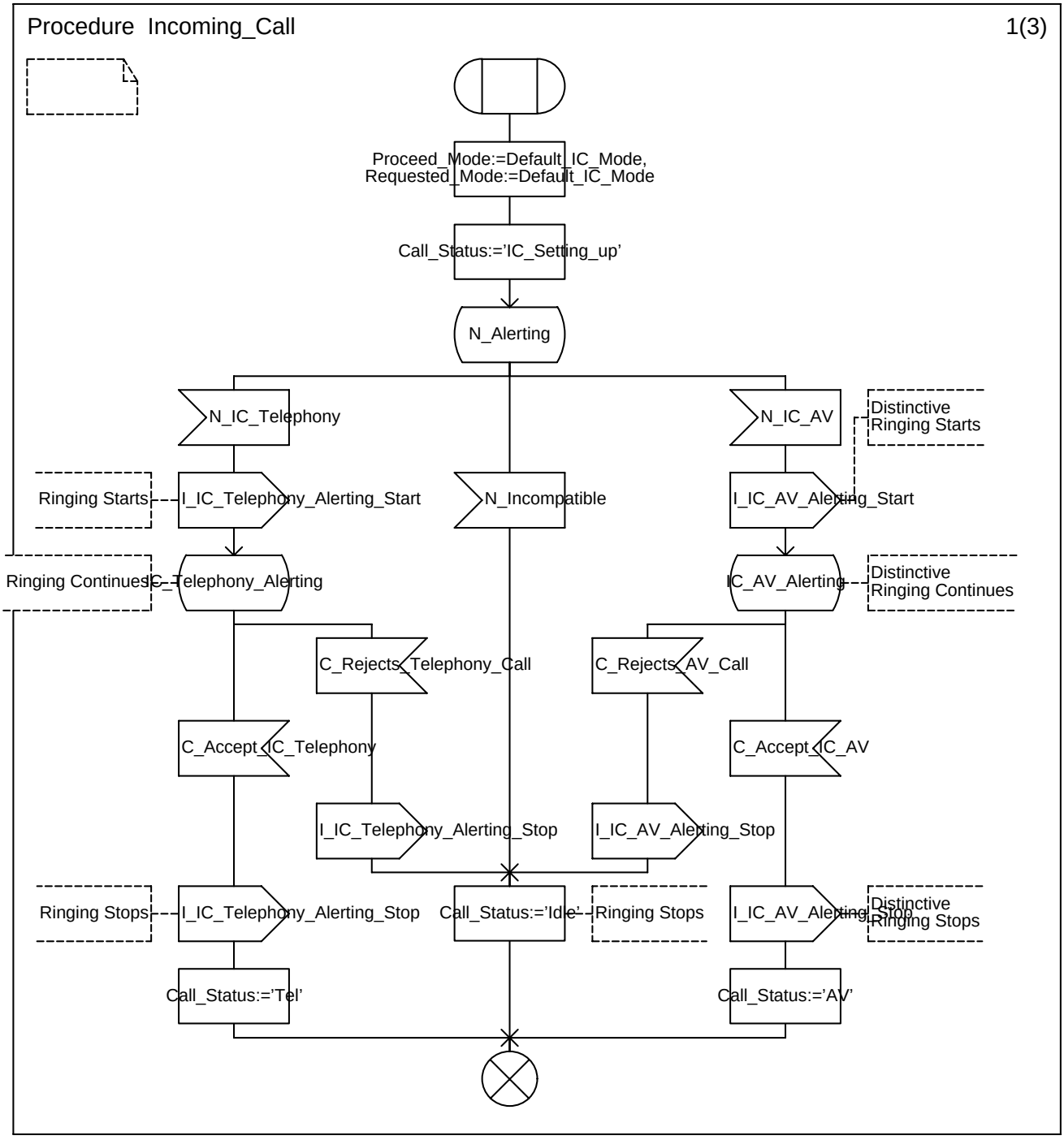


Figure 7: Incoming_Call procedure

6.2.1.3 Digit Entry Procedure

The Digit Entry Procedure is called when the user dials a digit at any time (in the Call_Handling process and in the Incoming_Call and Outgoing_Call procedures) allows the User to enter digits for number selection and to have those digits presented to the network for call set up. As digits can be entered from any state of the Call_handling process, including the idle state, the user may present digits first and then start the call, start the call and then enter digits or enter some of the digits, start the call and then send the remaining digits. Note that the network may see only one of two presentations, en-block dialling or overlap dialling and may not see the combination of en-block and overlap dialling seen by the user.

The user starts the process by entering a digit. As soon as a digit is entered it is added to the end of a digit string in variable "Digit_Store" and, if the value of the variable "OC_Setting_up" is "Yes", indicating that OCset-up is in progress, the digit is sent to the network.

All digits entered are stored in the terminal and if call set-up to the network has not started this is all that happens. Control of sending digits to the network is Cled by the "Outgoing_Call" procedure (see subclause 6.2.1.1). When call set up commences, all stored digits are send to the network by the "N_digits_to_line" signal in the Outgoing_Call procedure. During the "Call_Init_Awaited" state of the "Outgoing_Call" procedure each digit is immediately sent to the network.

Table 14: List of User and NCs in the Digit_Entry procedure

User controls	User indications	NCs	NIs
	I_ready_to_send		N_Digit_to_line(x)

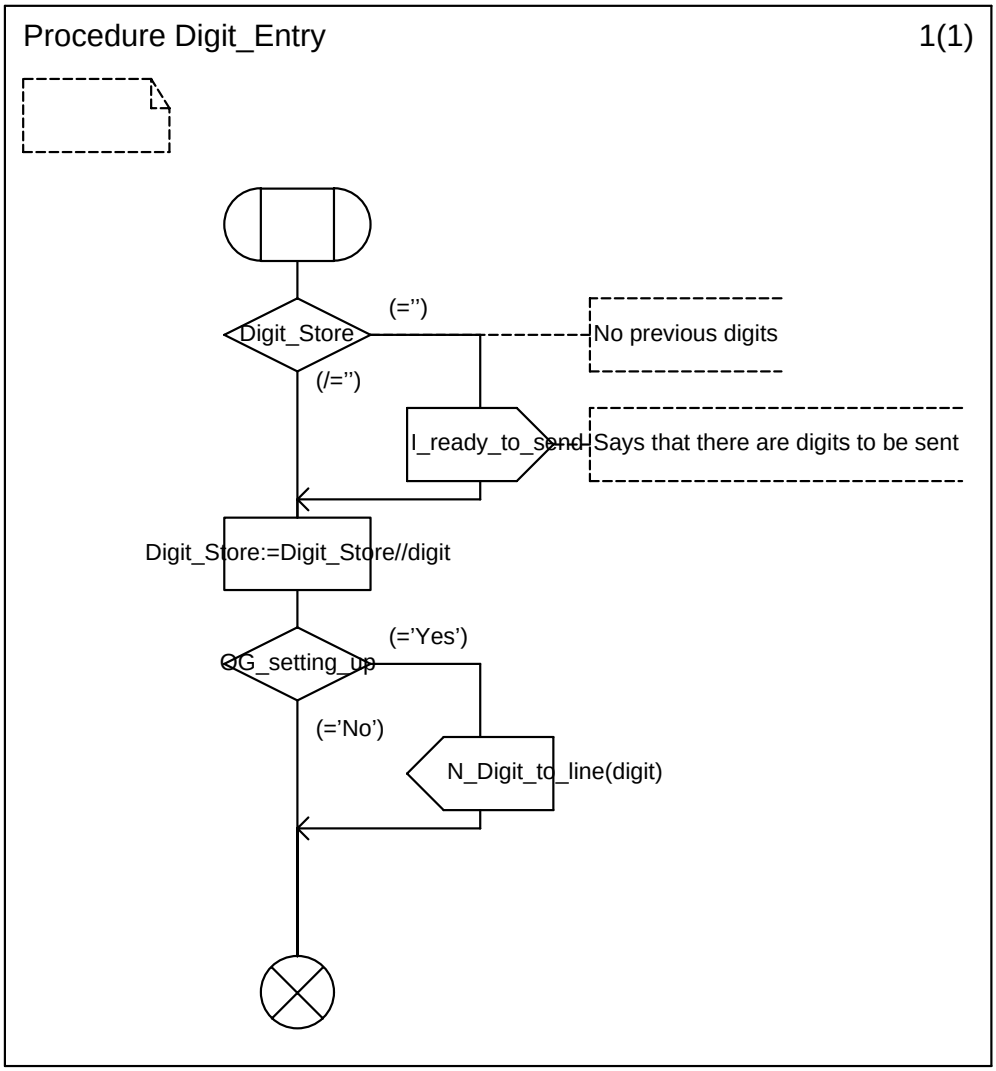


Figure 8: Digit_Entry procedure

6.2.1.4 Disconnect

From any state in the Call_handling process, Incoming_Call procedure, or Outgoing_Call procedures the user may disconnect the call by using the control C_Stops_Call (equivalent to going on-hook). The network may also request a disconnect from any of these same states either as a result of a remote user request or as a consequence of network action (congestion, incompatible call request).

In the case of a network initiated call process release, the user is alerted and is asked to stop the call; once C_Stops_Call has been activated the user shall be notified and the behaviour described in the Disconnect procedure is begun. If the user does not stop the call, the terminal remains in an non idle state (Wait_for_Stops_Call) and cannot accept a new call on that B-channel.

Figure 9 represents the handling of the user and network controls associated with the initiation of the Disconnect procedure. Figure 9 is part of the main Call_handling process. The SDL included in the Incoming_Call and Outgoing_Call procedures is identical (except that the AV_Call, Unframed_Audio and Tel_Call states shown in figure 9 are not needed and not shown in the SDL associated with these procedures).

Table 15: List of User and NCs and indications in the Disconnect part of the Call_handling Process

User controls	User indications	NCs	NIs
C_Stops_Call	I_Stops_Call	N_Req_Disconnect	
	I_Req_Disconnect		N_Release_Req

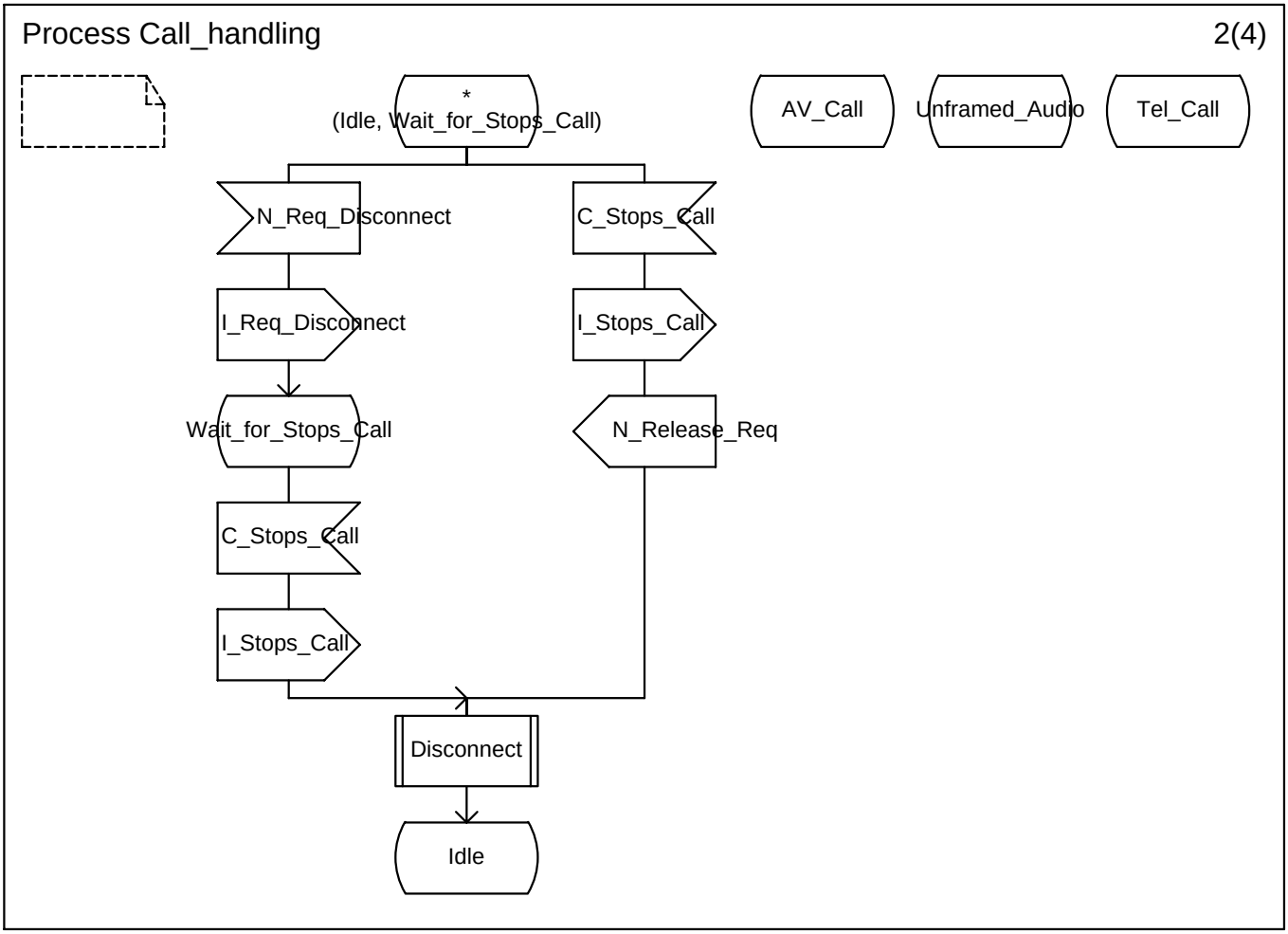


Figure 9: Disconnect part of Call handling process

The Disconnect procedure, in figure 10, starts with the videotelephone in the state of waiting for the network to finally release the call. Once the network has released the call, many of the videotelephone settings are reset and the user shall be informed that the call has been terminated.

Table 16: List of User and NCs and indications in the Call_handling Procedure

User controls	User indications	NCs	NIs
	I_Call_Terminated	N_Release_Complete	

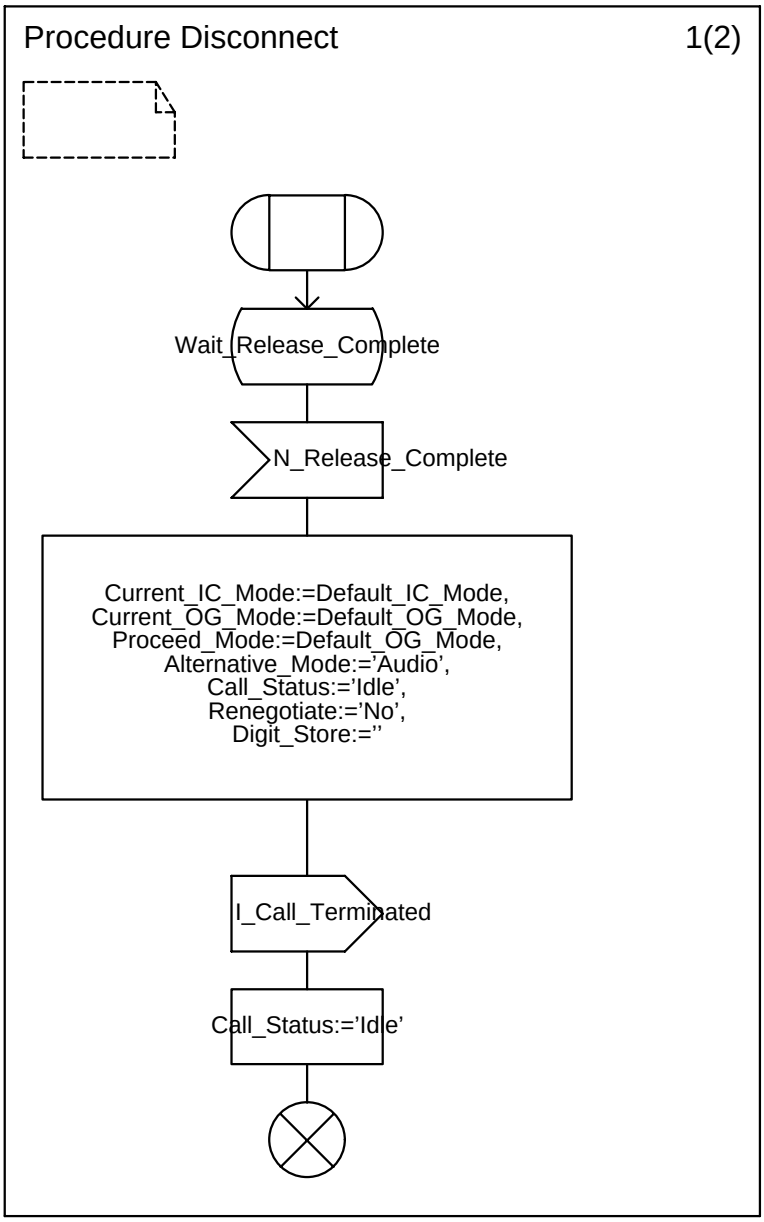


Figure 10: Disconnect procedure

6.2.1.5 Mode and default mode selection

When the C_Ch_Mode control is activated in any state of the Call_handling process, Incoming_Call procedure, Outgoing_Call procedure, or Disconnect procedure the behaviour described in the Mode_Selection procedure (figure 12) is begun.

When the default outgoing mode control (C_OG_Default_Mode) is set to a new value (New_Default) the default outgoing mode (Default_OG_Mode) is immediately changed to the new value and the user shall be informed. Similarly the default incoming mode (Default_IC_Mode) is changed and the user shall be informed in an identical way by the use of the default incoming mode control (C_IC_Default_Mode).

An alternative to two separate controls is a single control (C_Default_Mode) that sets the value of Default_OG_Mode and Default_IC_Mode to the same common value determined by C_Default_Mode. There is evidence that the adoption of a common default mode setting for incoming and outgoing calls is more readily understood by videotelephone users and is therefore recommended.

When a call is terminated, the Disconnect procedure (see subclause 6.2.1.4) resets the value of Current_IC_Mode to the value of Default_IC_Mode and the Current_OG_Mode is set to the value of Default_OG_Mode which may be identical.

Figure 11 shows the SDL diagram for mode and default selection for the main Call_handling process. The diagrams in the Incoming_Call and Outgoing_Call procedures are identical and the diagram in the Disconnect procedure is identical except that the mode change branch of the SDL is omitted, as modes are all reset at the exit of this procedure.

Table 17: List of User and NCs and indications in the Current Mode Selection part of the Call_handling Process

User controls	User indications
C_Ch_Mode(x)	I_Ch_Mode(x)
C_OG_Default_Mode(x)	I_OG_Default_Mode(x)
C_IC_Default_Mode(x)	I_IC_Default_Mode(x)
C_Default_Mode(x)	I_Default_Mode(x)

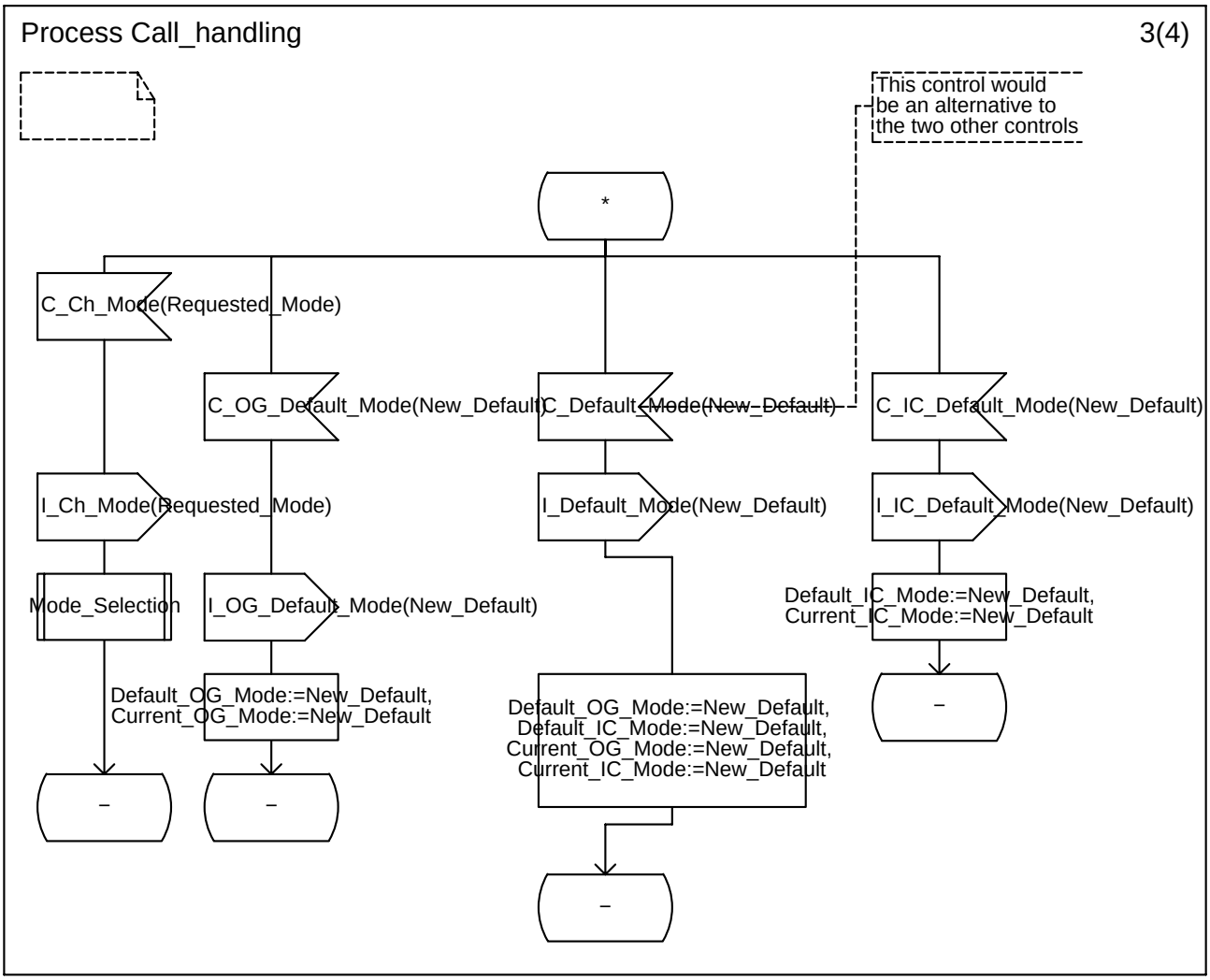


Figure 11: Mode change part of Call handling process

If the "Call_Status" variable has been set to "IC_Setting_up" by the Incoming_Call procedure (see subclause 6.2.1.2) this indicates that an IC has arrived and the mode change request is interpreted as a request to influence the videotelephone communication mode (see Table 8) of the call that will be set up. At this point it is, however, too late to influence the initial communication mode that is set up and the request has to be handled as an upgrade or downgrade of the communication mode immediately the call has been connected. A variable "Renegotiate is set to "Yes' and this variable is read and the upgrade or downgrade request is handled in the Main Call_handling process (figure 5).

If Call_Status is set to "AV" it indicates that a videotelephony call is in progress and the mode change request is interpreted as a wish to change the videotelephone communication mode of the current call. This can only be achieved by an exchange of terminal capabilities, which is represented in the present document by the Negotiating procedure (see subclause 6.2.1.7).

In all other circumstances, the request for a change of mode is interpreted as a change of the Current_OG_Mode. This mode is used to define the required videotelephone communication mode of the next outgoing call.

Table 18: List of User and NCs and indications in the Mode Selection procedure

User controls	User indications
	I_Ch_OG_Mode(x)
	I_Call_Mode(x)

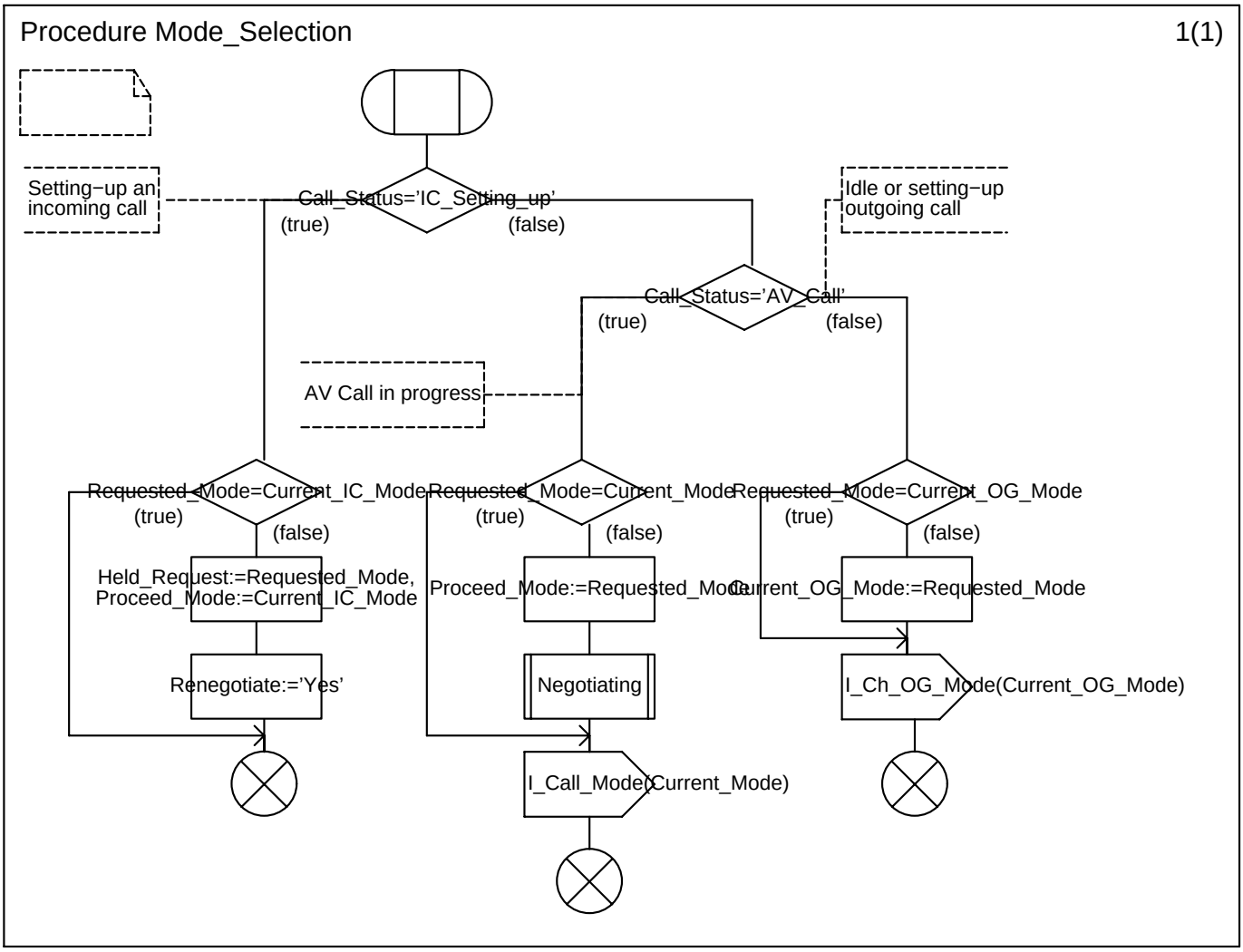


Figure 12: Mode Selection procedure

6.2.1.6 Framing procedure

This procedure has no user involvement. If ISDN framing is achieved the "Framing" variable is set to "Framed", if not the "Framing" variable is set to "Not_Framed". In the Call_handling procedure the result of the Framing procedure determines if the resultant call is completed as a videotelephony call or as an unframed audio call.

Table 19: List of terminal control and indications in the Framing Procedure

TERMINAL CONTROL	TERMINAL INDICATION
T_Frame_Failure	T_Attempt_Frame
T_Frame_Success	

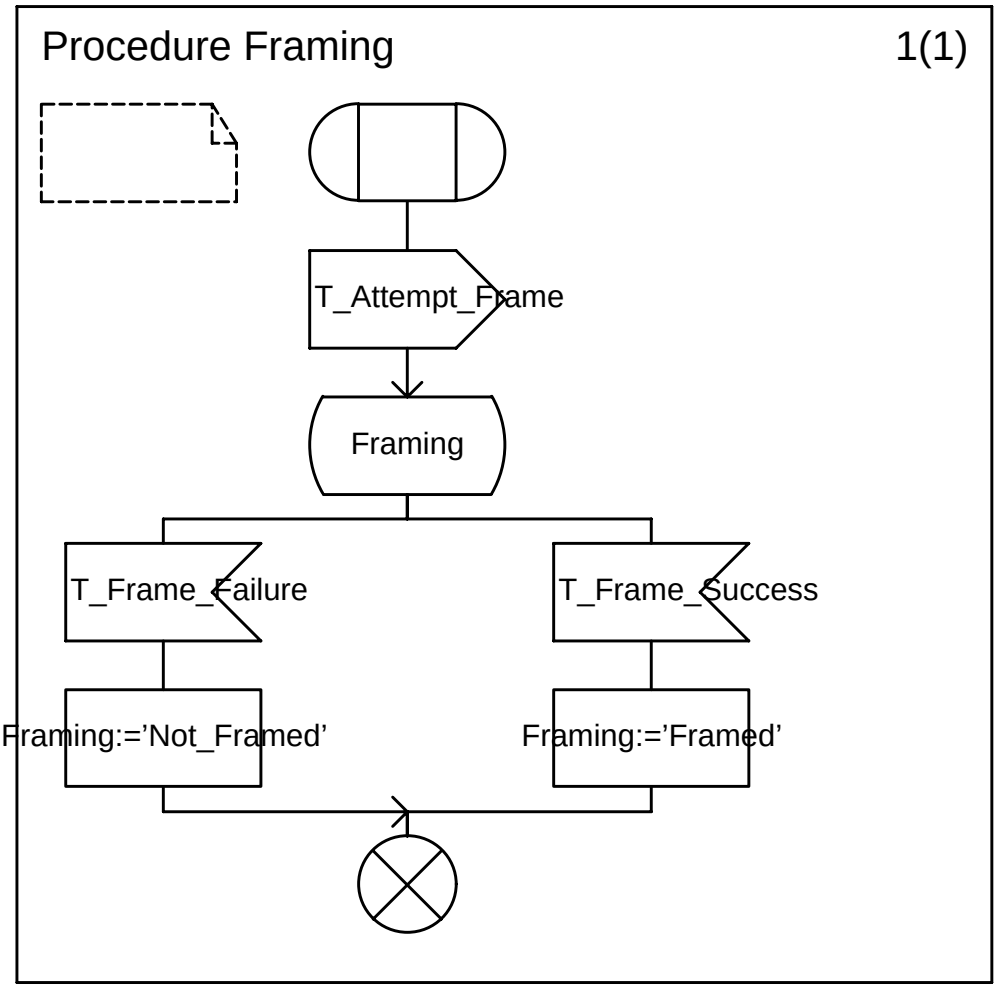


Figure 13: Framing procedure

6.2.1.7 Negotiating procedure

Table 8 details the range of Videotelephone Communication Modes that can arise as a result of the negotiation between two terminals. The Negotiating procedure represents the mechanism for achieving this negotiation. There is no user involvement in this procedure. The user influences the resultant Videotelephone Communication Mode by setting the incoming and outgoing modes in the Mode selection part of the Call-handling procedure prior to the start of the negotiation procedure (see subclause 6.2.1.6).

Table 20: List of User and terminal controls and indications in the Negotiating Procedure

User controls	User indications	Terminal controls	Terminal indications
			T_Negotiate(x)
	I_Cannot_Set_Mode	T_Negotiate_success	
	I_Not_Achieved	T_Negotiate_failure	

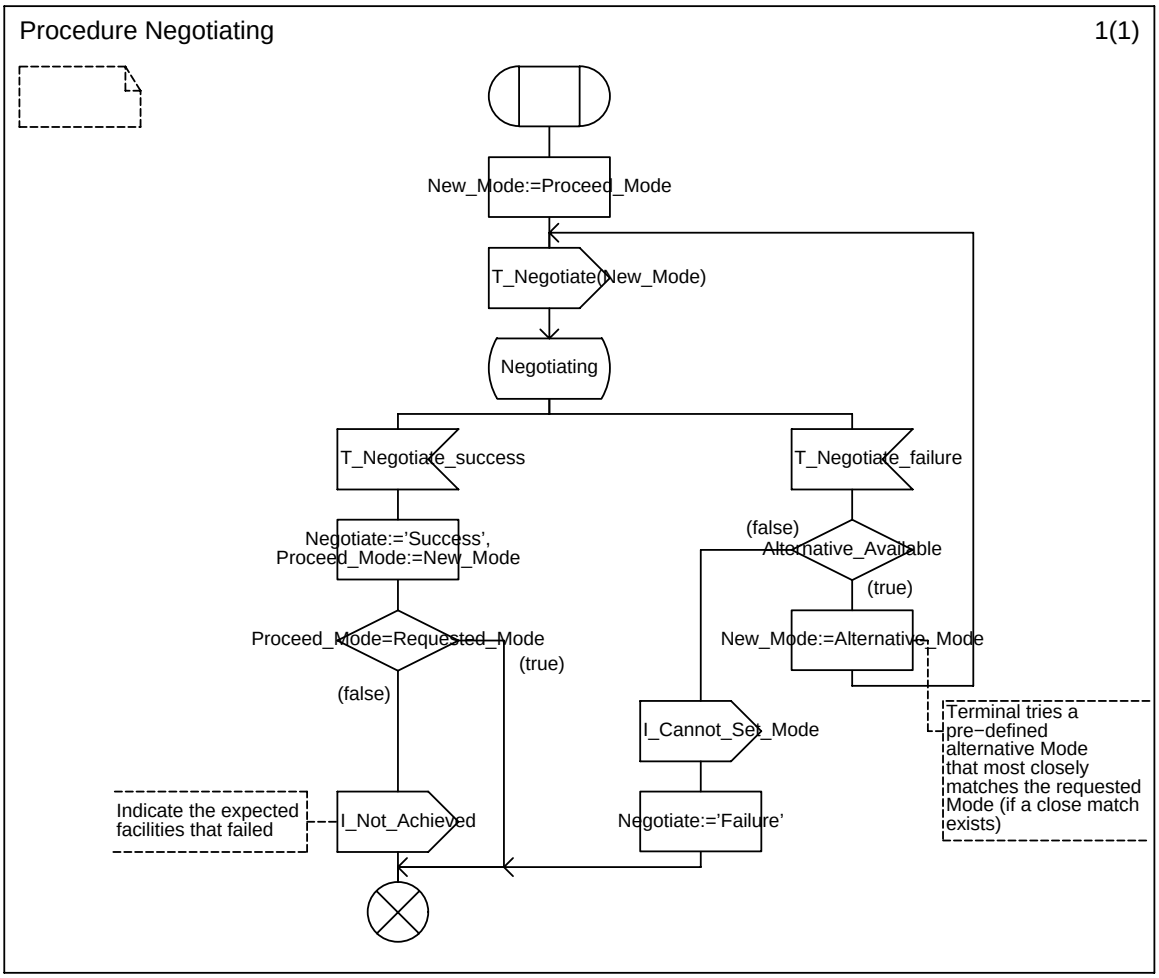


Figure 14: Negotiating procedure

6.2.2 Other controls

The previous subclauses describe the user control procedures for those controls specifically associated with the setting-up, management and cessation of videotelephony calls. The Other controls process defines a single mechanism by which a videotelephony terminal shall handle the different user controls listed in Table 25 in subclause 7.3.

The process examines the generic control C_1 to see if its value corresponds to one of the controls defined in the A_Control column of Table 25. If it does, the indications in the same row as that control are read from the columns I1 and I2 of Table 25 and given to the user via the generic indications I_1 and I_2. The "Send_Out" column in the same row of Table 25 is also examined to see if it contains the name of a signal. If it does contain the name of a signal that name is sent to the remote terminal via the generic signal T_Out. If there is no signal name in Table 25, no signal is sent to the remote terminal.

One set of controls in table 24 that is a particularly common function is C_Camera_On/C_Camera_Off. Switching the camera on and off requires indications to be given to local users as they will be unlikely to notice that the camera is switched off (unless they happen to have self-view activated). As shown in Table 25, these controls also require a signal to be sent to the remote end. Although the switching on and off of the camera will be visible to the remote user, the signals are required to inform the remote videotelephone that the temporary loss of video signal is deliberate and not a fault condition.

In contrast to the above, the controls C_Self_View_On/C_Self_View_Off do not require a signal to the remote videotelephone, as it is a purely local decision that the user has taken to look at themselves and the remote user does not need to know this.

Some control operations require confirmation by the remote user before any change is affected. In these circumstances the sequence control operation by party A, external signal receipt by party B, control operation by party B, and receipt of signal by party A occurs. The SDL of figures 15 and 16 handle these control operations and signal receipts in the standard way, but tables 24 and 25 have control and signal entries that ensure that the correct behaviour occurs.

Table 21: List of User controls and User and terminal indications in the Other controls Process

USER CONTROL	TERMINAL INDICATION	USER INDICATION
C_1(x)		I_1(x)
	T_Out(x)	I_2(x)

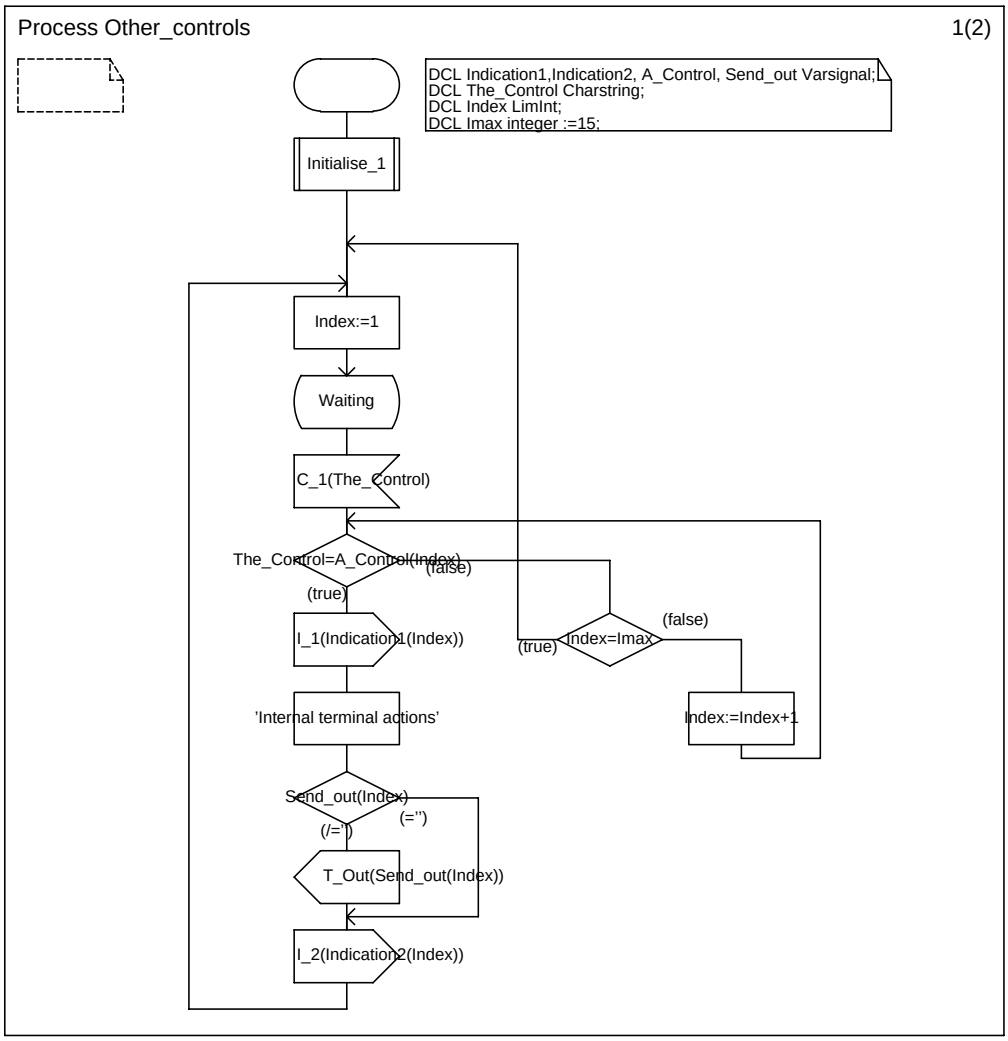


Figure 15: Other controls process

6.2.3 External signals

The External Signals process is identical in the mechanism of its operation to the Other controls procedure in subclause 6.2.2. It differs in defining the response to signals sent from a remote terminal rather than the response to local control actions. The mechanism used to check the signal received from the remote terminal to see if the process can process it is identical to that used in the Other controls process except that the table that is examined to determine the appropriate indications to be given to the local user and the remote terminal is Table 26.

As stated at the end of subclause 6.2.2, the SDL in figure 16 will, in conjunction with the SDL of figure 15 and tables 24 and 25 handle cases where confirmation is needed by the remote party before a user requested change can occur.

Table 22: List of User and NCs and indications in External Systems Process

TERMINAL CONTROL	TERMINAL INDICATION	USER INDICATION
T_In(x)		I_1(x)
	T_Out(x)	I_2(x)

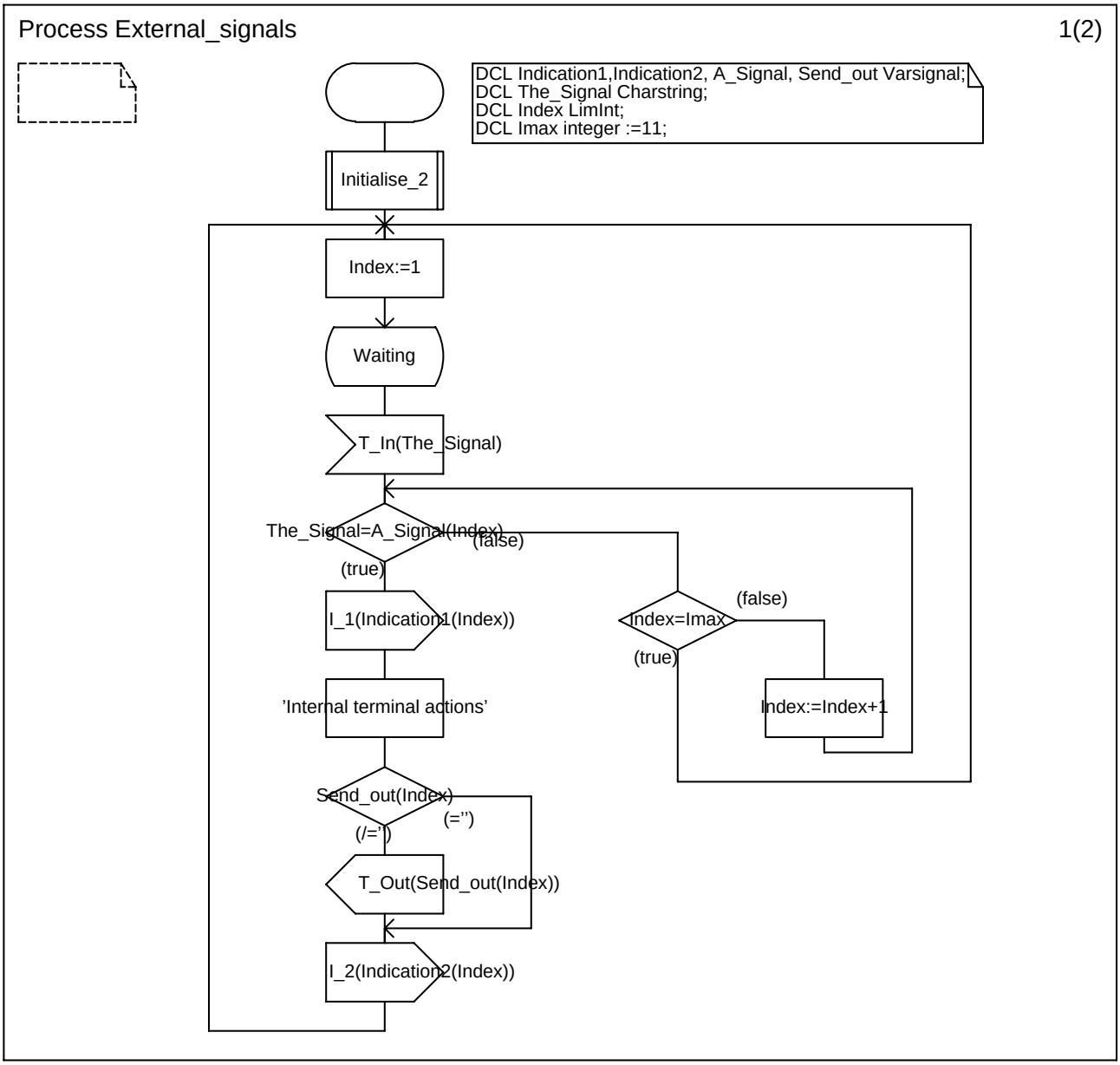


Figure 16: External Signals process

6.2.4 SDL system and block diagrams

The following diagrams complete the specification of the videotelephony user procedures system. The organizer view gives the structure and organization of the videotelephone system. The remaining diagrams are of most value to someone wishing to recreate the videotelephone system on a software tool.

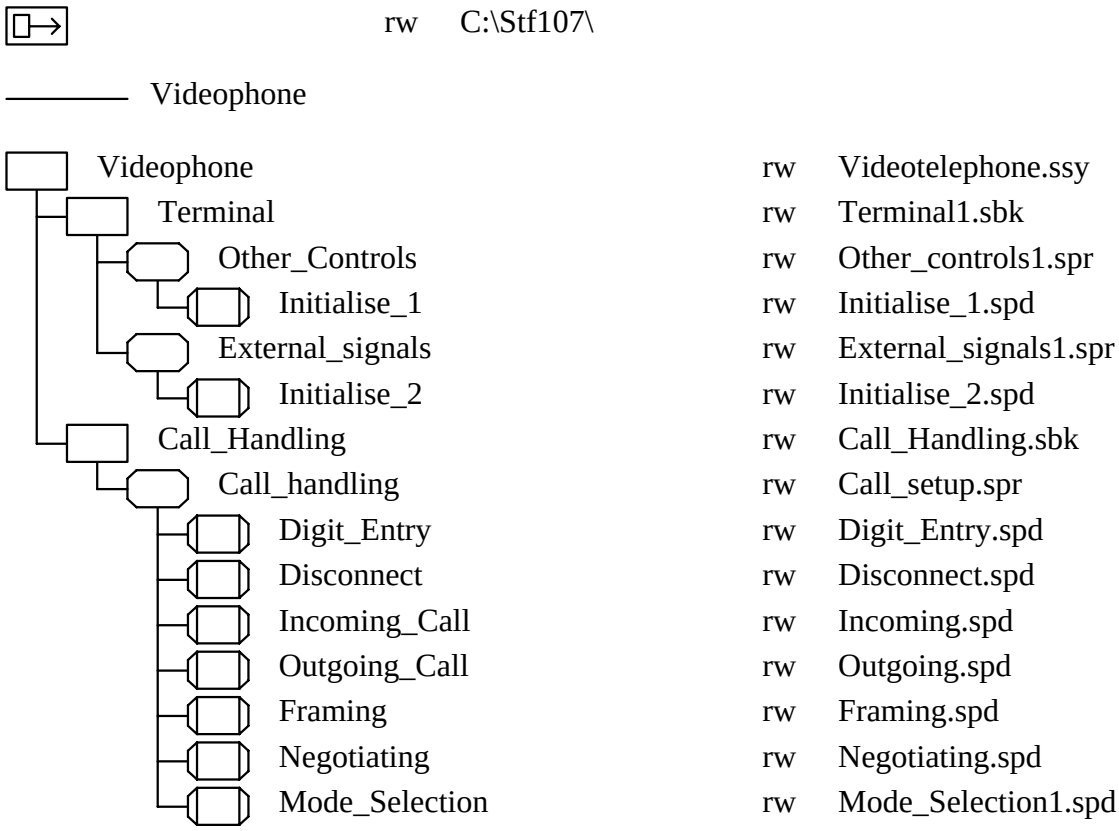


Figure 17: SDL structure (SDT organizer view)

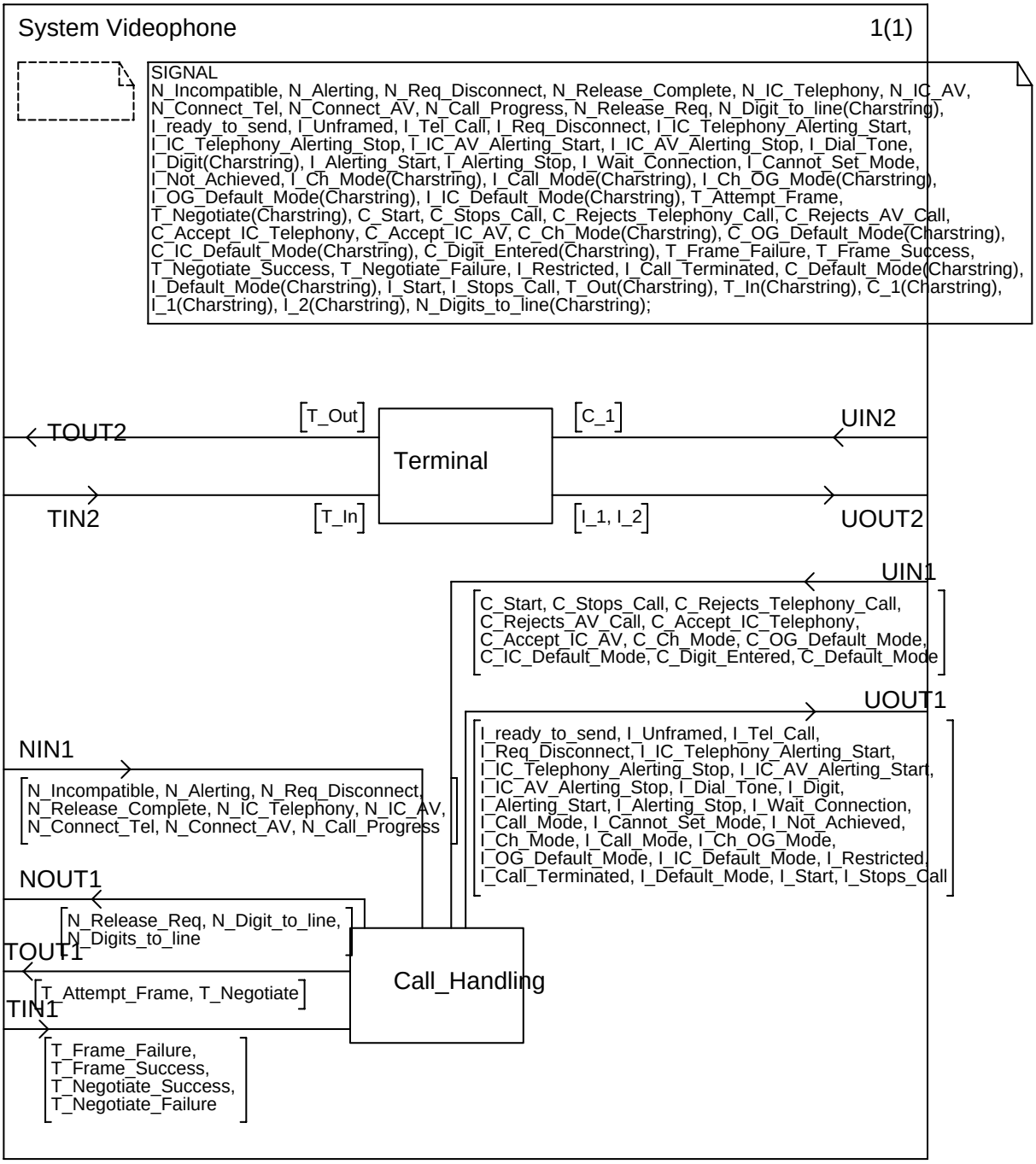


Figure 18: Videophone system diagram

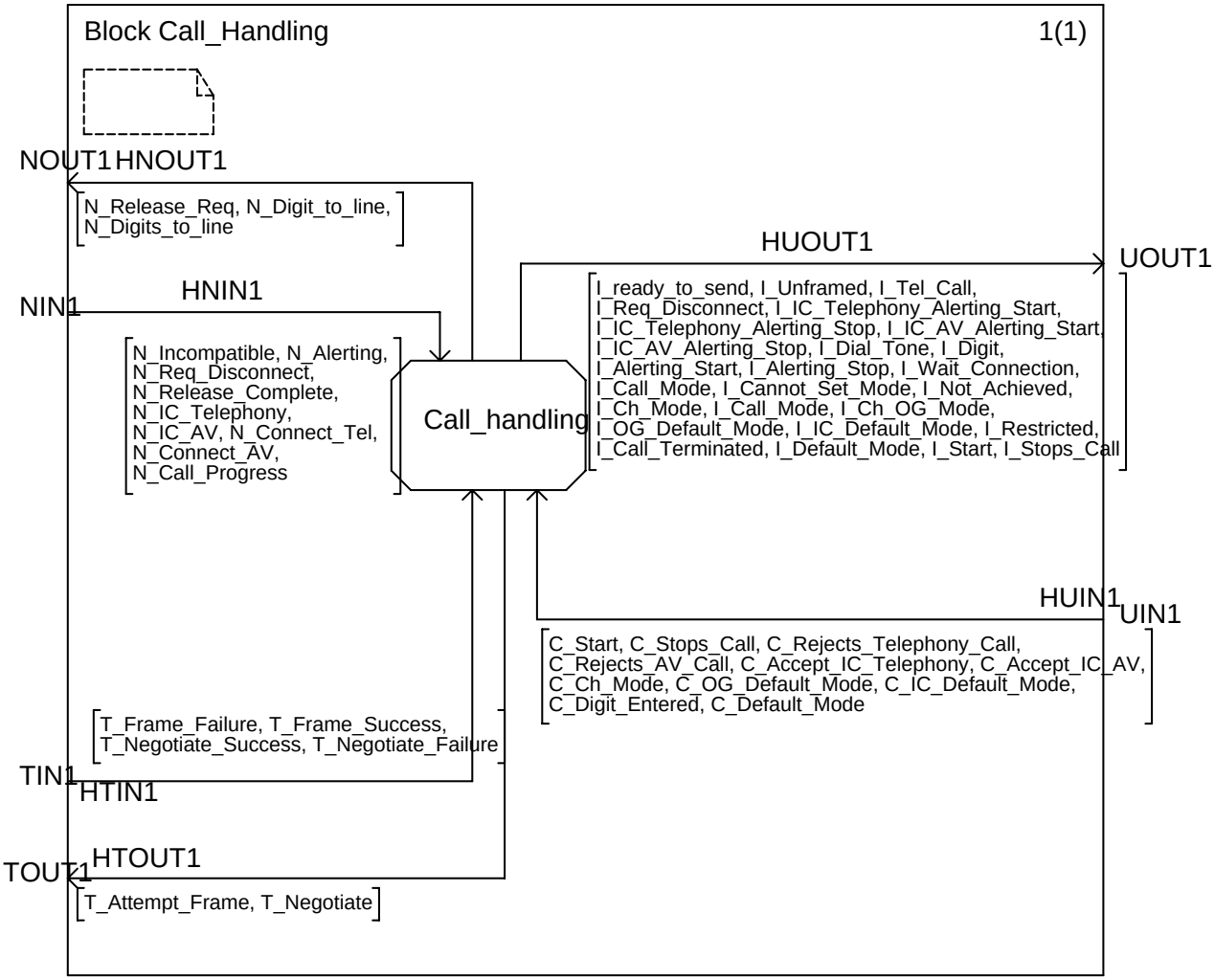


Figure 19: Call handling block

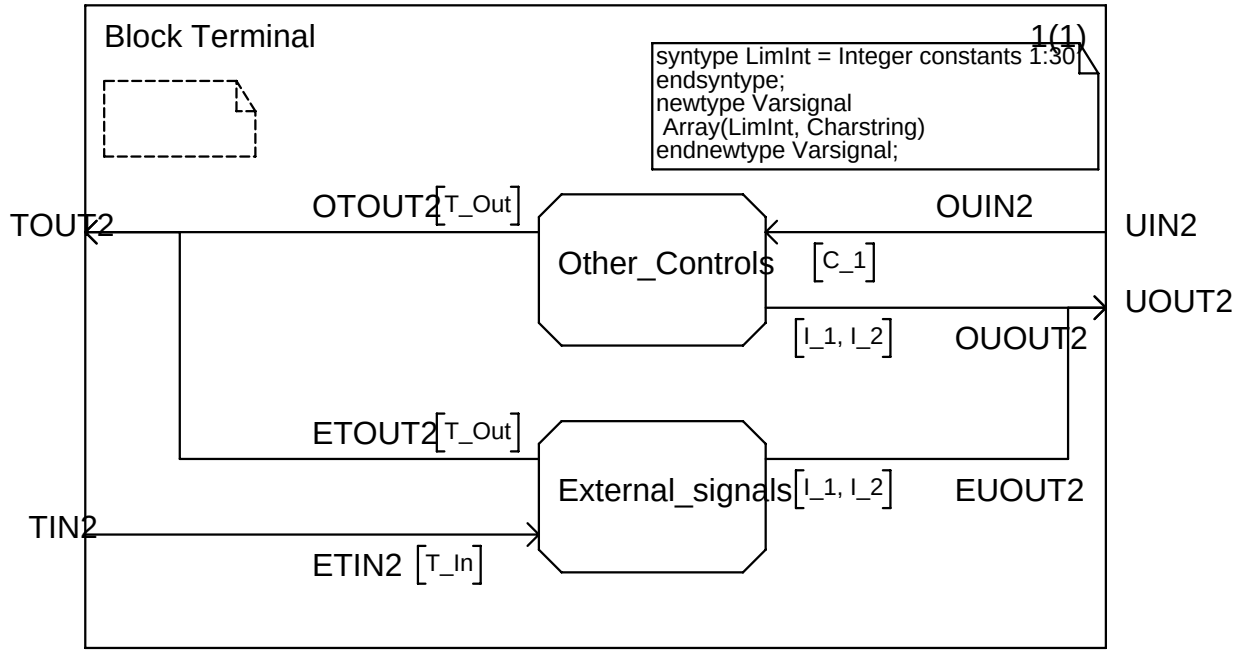


Figure 20: Terminal block

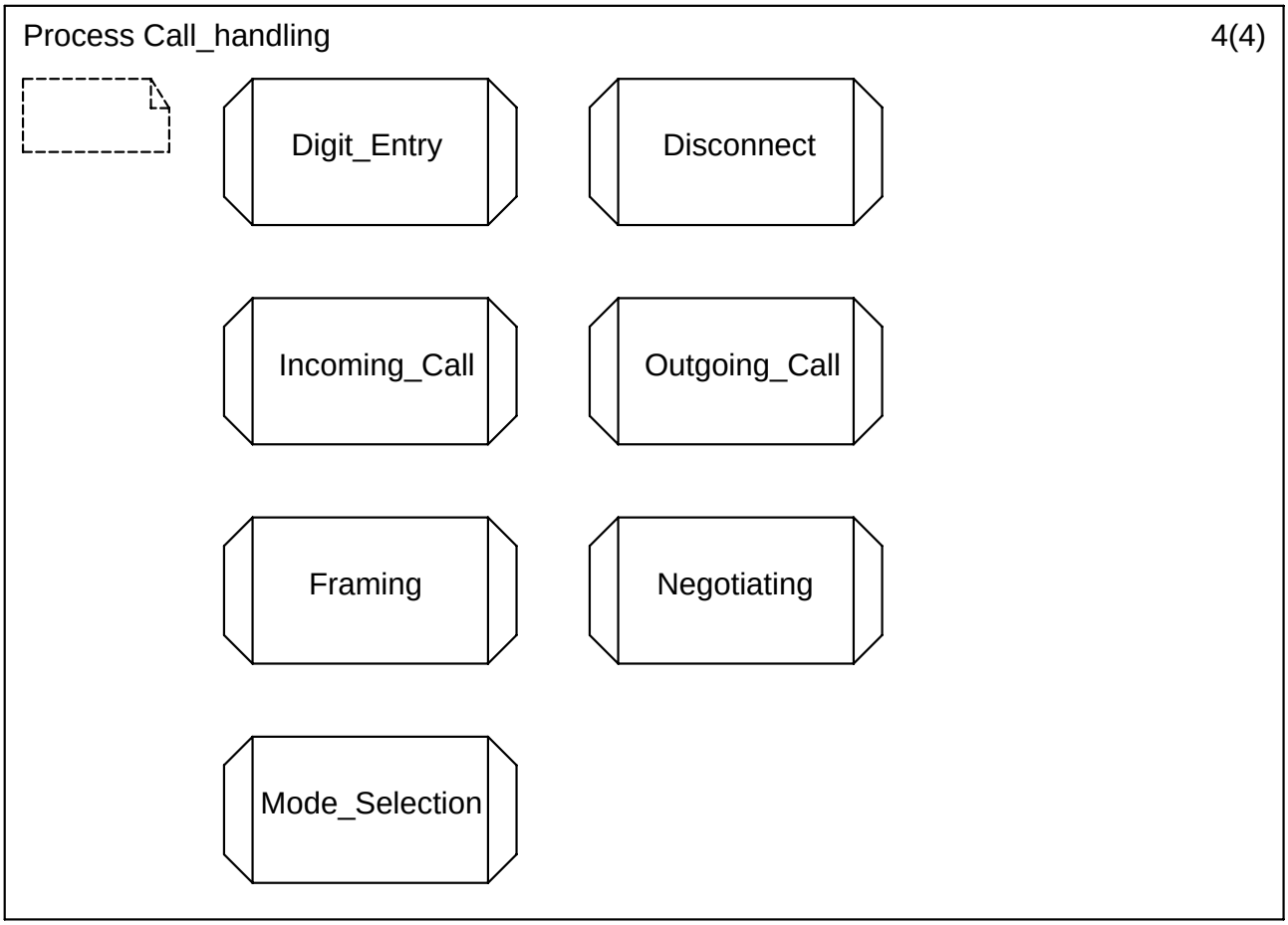


Figure 21: Call handling procedures

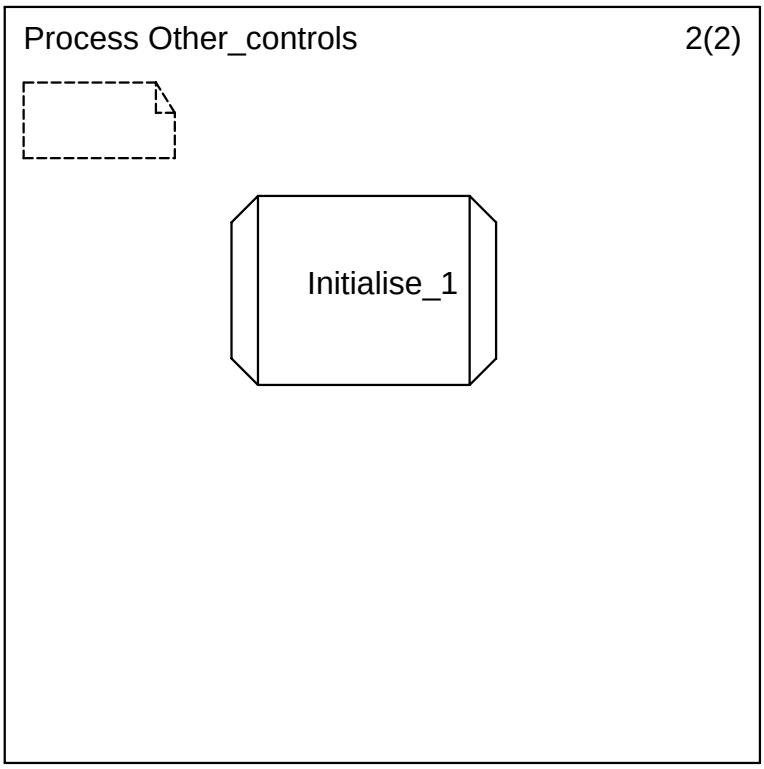


Figure 22: Process Other_controls - Procedure definition

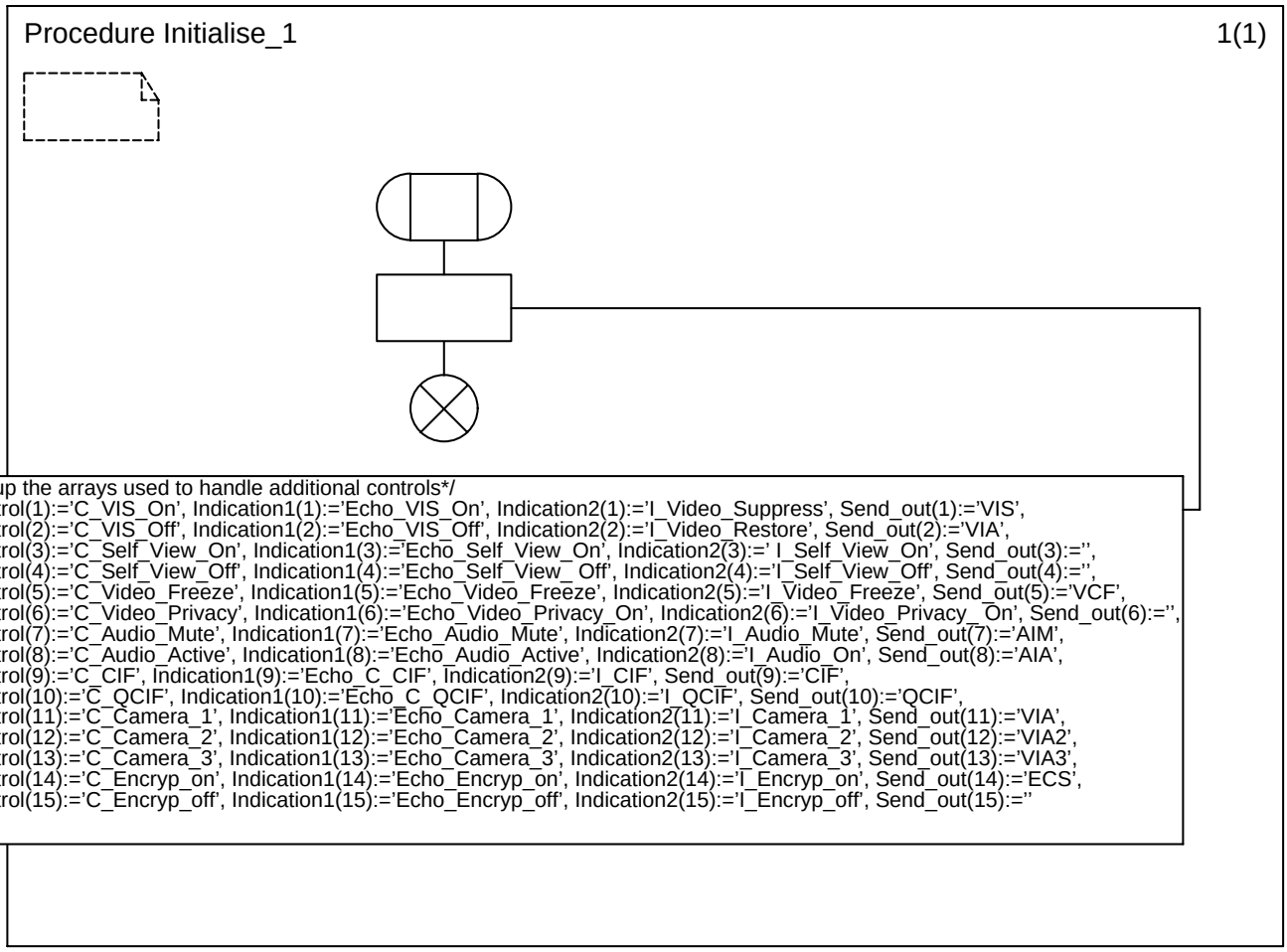


Figure 23: Initialization procedure for Other_controls process (data from table 25)

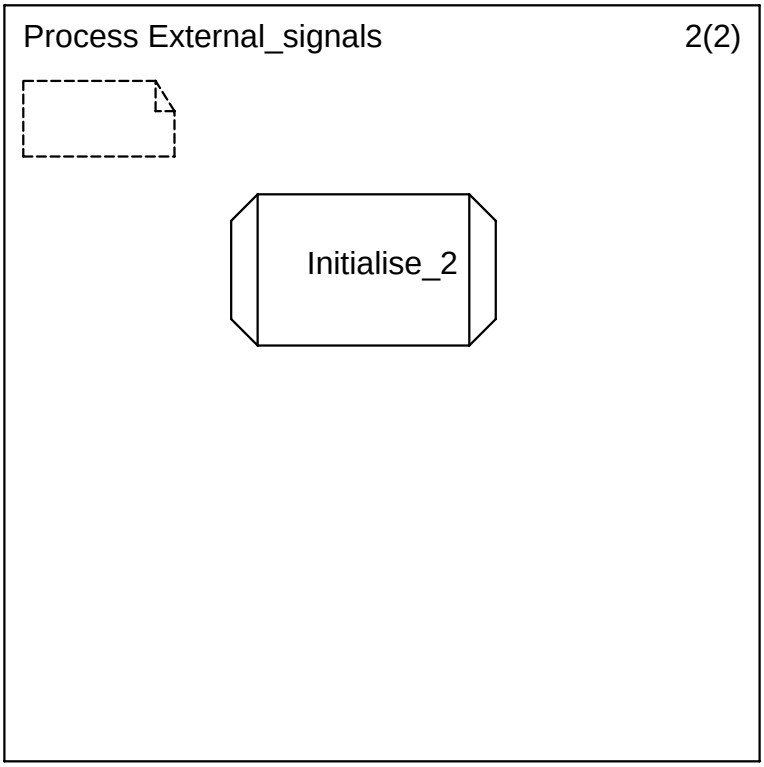


Figure 24: Process External_signals - Procedure definition

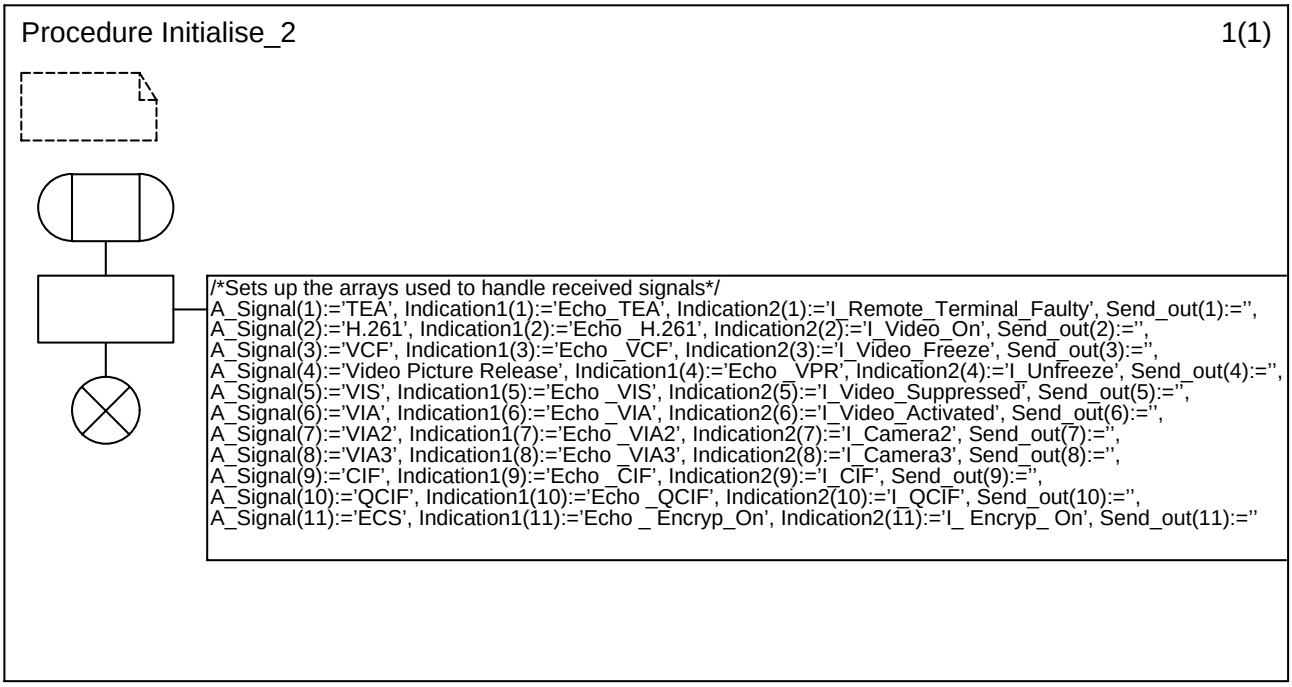


Figure 25: Initialization procedure for External_signals process (data from table 26)

7 User controls and indications

7.1 User controls

This subclause describes the functional capability for the ISDN videotelephone's controls. There are many ways in which a terminal may implement a user control. Where the SDL diagrams in clause 6 show a number of separate controls, the terminal manufacturer may choose to implement the control as a single control with multiple settings. Similarly, the SDL diagrams in clause 6 may imply a single control with multiple settings, but the terminal manufacturer may choose to implement this functionality as a number of separate or linked controls.

The controls that are defined are:

Table 23: List of User controls

Name of control	Function	SDL Process
C_Stops_Call	Calling user terminates call	Call_handling Process (Disconnect) (see subclause 6.2.5)
C_Start	Calling user activates sending of digits to network	Call_handling Process (see subclause 6.2.1)
C_Digit_Entered(digit)	Calling user enters at least one selection digit	Dial_process (see subclause 6.2.4)
C_Rejects_IC_Telephony_Call	Called user rejects a non AV call	IC Procedure (see subclause 6.2.3)
C_Accept_IC_Telephony	Called user accepts a non AV call	IC Procedure (see subclause 6.2.3)
C_Accept_IC_AV	Called user accepts an AV call	IC Procedure (see subclause 6.2.3)
C_Rejects_AV_Call	Called user rejects an AV call	IC Procedure (see subclause 6.2.3)
C_Ch_Mode(x)	User requests change to a new mode	Mode selection part of the Call_handling process (see subclause 6.2.6)
C_OG_Default_Mode(x)	User requests change to a new default mode for OG call	Mode selection part of the Call_handling process (see subclause 6.2.6)
C_IC_Default_Mode(x)	User requests change to a mode different from default mode for IC Call	Mode selection part of the Call_handling process (see subclause 6.2.6)
C_Default_Mode(x)	User requests change to a mode different from default mode for both OG and IC calls	Mode selection part of the Call_handling process (see subclause 6.2.6)
C_1(x)	Other user controls	Other controls process (see subclause 6.2.9)

7.2 User indications

This subclause describes the functional capability for the ISDN videotelephone's displays and indications. The present document does not specify the precise content of the indications given to the user. The indications shall convey the information given in the information content column of Table 24.

The indications defined are:

Table 24: List of User indications

Name of indication	Function/Source of requirement	SDL Process	Information Content
I_Start	Confirmation of the user activating the C_Start control	Call_handling_Process (Subclause 6.2.1)	The indication shall confirm that the control_Start control has been activated.
I_Dial_Tone	User invitation to proceed to dial [1]	Outgoing_Call Procedure (Subclause 6.2.2)	The indication shall indicate that the user should dial digits.
I_Digit(x)	User gets feedback of the digit(s) entered by him	Dial part of the Call_handling Process (Subclause 6.2.4)	The indication shall indicate that the digit (x) entered has been accepted. Ideally the indication should indicate the complete set of digits that have been entered since the accumulated digit store was last reset.
I_Ready_to_send	Digits presented by user are ready to be sent	Dial part of the Call_handling Process (Subclause 6.2.4)	The indication shall indicate that the user may send the presented digits.
I_Wait_Connection	User gets indication that the call is progressing waiting for called party B to accept the call [1]	Outgoing_Call Procedure (Subclause 6.2.2)	The indication shall indicate that the called party is being asked to accept the call.
I_Alerting_Start	User gets from the network either positive call progress information (like ring tone) or negative call progress signal such as B_busy, incorrect or invalid ISDN number, B answer time out [1]	Outgoing_Call Procedure (Subclause 6.2.2)	If the call is progressing satisfactorily the indication shall convey this to the user. If the call is not progressing satisfactorily then some indication of the class of problem shall be given.
I_Alerting_Stop	End of provision of above indication to user [1]	Outgoing_Call Procedure (Subclause 6.2.2)	The indication shall indicate that the alerting phase has stopped. This is usually best achieved by removing the continuous presentation of I_Alerting_Start.
I_AV_Call	User is informed that the resulting call is AV	Call_handling Process (Subclause 6.2.1)	The indication shall indicate that an AV call has been established.
I_Tel_Call	User is informed that the resulting call is Telephony	Call_handling Process (Subclause 6.2.1)	The indication shall indicate that a Telephony call has been established.
I_Unframed	Frame Alignment has not been reached	Call_handling Process (Subclause 6.2.1)	The indication shall indicate that the requested call has not been established and that a very basic voice call has been established instead.
I_Restricted	Operation with restricted network has not been reached	Call_handling Process (Subclause 6.2.1)	The indication shall indicate that the call failed because it met a restricted network..
I_Stops_Call	Confirmation of the user activating the C_Stops_Call control	Disconnect part of the Call_handling Process (Subclause 6.2.5)	The indication shall confirm that the C_Stops_Call control has been activated.

Name of indication	Function/Source of requirement	SDL Process	Information Content
I_Req_Disconnect	User is informed that network (or remote party) is requesting disconnect [1]	Disconnect part of the Call_handling Process (Subclause 6.2.5)	The indication shall indicate that the call has been ended remotely and that the user should terminate the call at their end. This would usually indicate what the user needs to do to return the terminal to its idle state.
I_Call_Terminated	User has accepted the disconnect request and is informed that the call is terminated [1]	Disconnect part of the Call_handling Process (Subclause 6.2.5)	The indication shall indicate that the terminal is no longer involved in the previous call. This may be an explicit indication or an unambiguous indication of an idle state.
I_IC_AV_Alerting_Start	Called user gets AV IC indication [1]	Icoming_Call Procedure (Subclause 6.2.3)	The indication shall indicate to the user that an AV call is being presented and that they should answer the call.
I_IC_AV_Alerting_Stop	Called user gets AV IC indication [1]	Icoming_Call Procedure (Subclause 6.2.3)	The indication shall indicate that an AV call has been answered.
I_IC_Telephony_Alerting_Start	Called user gets telephony IC indication	Icoming_Call Procedure (Subclause 6.2.3)	The indication shall indicate to the user that a Telephony call is being presented and that they should answer the call.
I_IC_Telephony_Alerting_Stop	Called user gets telephony IC indication	Icoming_Call Procedure (Subclause 6.2.3)	The indication shall indicate that a Telephony call has been answered.
I_Ch_Mode(x)	indication given to the user that a new current mode has been requested	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate that the user's requested for the current mode to be changed has been acknowledged.
I_Call_Mode(x)	indication given to the user that a call mode has been negotiated [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the mode of the current call that has resulted from their change request.
I_Ch_IC_Mode(x)	indication given to the user that the current IC Mode has been negotiated [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the IC Mode that has resulted from their change request.
I_Ch_OG_Mode(x)	Indication to the user that the Out Going call mode has been negotiated [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the OCMode that has resulted from their change request.
I_Default_Mode(x)	Indication given to the user that a new default mode has been set up for both OG and IC Calls [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the default mode for incoming and outgoing calls that has resulted from their change request.
I_OG_Default_Mode(x)	Indication given to the user that a new default mode has been set up for Outgoing Calls [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the default mode for outgoing calls that has resulted from their change request.
I_IC_Default_Mode(x)	Indication given to the user that a new default mode has been set up for ICs [2]	Mode_Selection part of the Call_handling process (Subclause 6.2.6)	The indication shall indicate to the user the default mode for ICs that has resulted from their change request.
I_Cannot_Set_Mode	User request for new mode cannot be honoured [2]	Negotiating Procedure (Subclause 6.2.8)	The indication shall indicate that it has been impossible to achieve a compatible mode and that the call will be terminated.

Name of indication	Function/Source of requirement	SDL Process	Information Content
I_Not_Achieved	Mode requested by user is not achieved and reasons for failure are given [2]	Negotiating Procedure (Subclause 6.2.8)	The indication shall indicate that a new mode has been negotiated and also indicate those requested capabilities that have not been successfully achieved.
I_AV_Call	Indication given to the user that an AV call has been successfully established [2]	Call_handling_Process (Subclause 6.2.1)	The indication shall indicate that an AV call is in progress.
I_Restricted	Indication given to the user that a successful AV call has not been established [2]	Call_handling_Process (Subclause 6.2.1)	The indication shall indicate that an AV call is in progress.
I_Unframed	Indication given to the user that an unframed audio call has been established [2]	Call_handling_Process (Subclause 6.2.1)	The indication shall indicate that due to incompatibility with the remote terminal an AV call was not set up and that the call has been terminated.
I_Tel_Call	Indication given to the user that a Telephony Teleservice has been established [2]	Call_handling_Process (Subclause 6.2.1)	The indication shall indicate that an AV call has not been set up but that a Telephony call has been set up instead.

7.3 Additional controls and indications

Table 25 describes the indications and responses associated with additional user controls that may be provided on a videotelephony terminal. The reference ETSI standards do not mandate that any of these controls have to be provided. However, when they are provided they shall operate as described in table 24 and figure 13.

The information in the four columns is used in conjunction with the process described in subclause 6.2.9. The four columns have the following meanings:

- Index - is the reference number that associates all the other elements in the same row of the table together (the row number);
- A_Control(Index) - the value that describes the user control to be used in the procedure in subclause 6.2.9;
- I1(Index) - the value that describes the first user indication to be used in the procedure in subclause 6.2.9;
- I2(Index) - the value that describes the second user indication to be used in the procedure in subclause 6.2.9;
- Send_out(Index) - the value that describes the signal to be sent to the remote terminal in the procedure in subclause 6.2.9;
- Action - describes the effect of the control, indication and signal transmitted to the remote terminal when used in the procedure in subclause 6.2.9.

Where the "Send_out(Index)" column is blank, the process defined in subclause 6.2.9 determines that no signal is sent to the remote terminal. In these circumstances the user at the remote terminal will be unaware that the control has been pressed unless it causes a visible change in the video or audio signal that is transmitted.

Table 25: User indications resulting from additional user controls

Index	A_Control(Index)	I1(Index) (see note)	I2(Index) (see note)	Send_out (Index)	Action (see note)
1	C_VIS_On	Echo_VIS_On	I_Video_Suppress	VIS	The user shall be informed that the remote user can no longer see them and the remote terminal shall be sent a Video-indicate suppressed (VIS) [10], [3] message.
2	C_VIS_Off	Echo_VIS_Off	I_Video_Restore	VIA	The user shall be informed that the remote user can now see them and the remote terminal shall be sent a Video-indicate active (VIA) [10] message.
3	C_Self_View_On	Echo_Self_View_On	I_Self_View_On		The local terminal shall allow the user to view their own outgoing image and shall inform them that they are in self-view.
4	C_Self_View_Off	Echo_Self_View_ Off	I_Self_View_Off		The local terminal shall show only the incoming image and shall confirms the removal of self-view.
5	C_Video_Freeze	Echo_Video_Freeze	I_Video_Freeze	VCF	The user shall be given an indication that their picture has been frozen and a VCF [10], [3] message shall be sent to the remote terminal.
6	C_Video_Privacy	Echo_Video_Privacy_ On	I_Video_Privacy_ On		This control sets the terminal such that it will send the VIR signal rather than automatically switch video on when it receives a request to set-up a video call.
7	C_Audio_Mute	Echo_Audio_Mute	I_Audio_Mute	AIM	The user shall be informed that the remote user cannot hear them and the remote terminal shall be sent an Audio Indicate Muted (AIM) [10] message.
8	C_Audio_Active	Echo_Audio_Active	I_Audio_On	AIA	The user shall be informed that the remote user can hear them again (this may be done by removing the audio muted message) and the remote terminal shall be sent an Audio Indicate Active (AIA) [10] message.
9	C_CIF	Echo_C_CIF	I_CIF	CIF	The user shall be given an indication that CIF has been requested and a CIF [10], [3] message shall be sent to the remote terminal. If responding to a request for CIF: The user shall be given an indication that CIF has been agreed to, CIF shall be initiated on the user's terminal and a CIF [10], [3] message shall be sent to the remote terminal.

Index	A_Control(Index)	I1(Index) (see note)	I2(Index) (see note)	Send_out (Index)	Action (see note)
10	C_QCIF	Echo_C_QCIF	I_QCIF	QCIF	If initiating a request for QCIF: The user shall be given an indication that QCIF has been requested and a QCIF [10], [3] message shall be sent to the remote terminal. If responding to a request for QCIF: The user shall be given an indication that QCIF has been agreed to, QCIF shall be initiated on the user's terminal and a QCIF [10], [3] message shall be sent to the remote terminal.
11	C_Camera_1	Echo_Camera_1	I_Camera_1	VIA	The user shall be given an indication that the Camera 1 signal is being shown to the remote user and a VIA [10], [3] message shall be sent to the remote terminal.
12	C_Camera_2	Echo_Camera_2	I_Camera_2	VIA2	The user shall be given an indication that the Camera 2 signal is being shown to the remote user and a VIA2 [10], [3] message shall be sent to the remote terminal.
13	C_Camera_3	Echo_Camera_3	I_Camera_3	VIA3	The user shall be given an indication that the Camera 3 signal is being shown to the remote user and a VIA3 [10], [3] message shall be sent to the remote terminal.
14	C_Encryp_on	Echo_Encryp_on	I_Encryp_on	ECS	The user shall be given an indication that encryption has been switched on and an ECS [10], [3] message shall be sent to the remote terminal.
15	C_Encryp_off	Echo_Encryp_off	I_Encryp_off		The user shall be given an indication that encryption has been switched off and the ECS [10], [3] message shall no longer be sent to the remote terminal.
NOTE: I1 merely confirms that the control has been activated, whereas I2 confirms that the appropriate internal actions within the videotelephone and have been carried out and any signals have been sent. Where it can be guaranteed that the videotelephone action will always very promptly follow the operation of the control the two indications may, at the discretion of the manufacturer of the videotelephone, be combined.					

7.4 Received Signals and indications

Table 26 describes the indications and responses associated with signals received from the remote videotelephony terminal. The reference ETSI standards do not mandate that all of these signals have to be handled. However, when they are handled the behaviour described in table 25 and figure 14 shall apply.

The information in the four columns is used in conjunction with the process described in subclause 6.2.10. The four columns have the following meanings:

- Index - is the reference number that associates all the other elements in the same row of the table together (the row number);
- A_Signal(Index) - the value that describes the received signal to be used in the procedure in subclause 6.2.9;
- Indication(Index) - the value that describes the user indication to be used in the procedure in subclause 6.2.9;
- Send_out(Index) - the value that describes the signal to be sent to the remote terminal in the procedure in subclause 6.2.9;
- Action - describes the effect of the received signal, indication and signal transmitted to the remote terminal when used in the procedure in subclause 6.2.9.

Where the "Send_out(Index)" column is blank, the SDL in subclause 6.2.9 determines that no signal is sent to the remote terminal. In these circumstances the user at the remote terminal will be unaware that the control has been pressed unless it causes a visible change in the video or audio signal that is transmitted.

Table 26: User indications resulting from signals from the remote terminal

Index	A_Signal (Index)	I1 (Index) (see note)	I2(Index) (see note)	Send_out (Index)	Action (see note)
1	TEA	Echo_TEA	I_Remote_T_Faulty		When terminal Equipment Alarm (TEA) [9], [10] is received the user shall be informed that the remote terminal has a fault and that the call may be disconnected.
2	H.261	Echo _H.261	I_Video_On		When H.261 (Video On) [10], [3] is received an indication shall be given to the user that the video signal has been established.
3	VCF	Echo _VCF	I_Video_Freeze		When VCF [10], [3] is received an indication shall be given to the user that the remote user has frozen the video picture.
4	Video Picture Release	Echo _VPR	I_Unfreeze		When Video Picture Release has been received the indication initiated by VCF [10], [3] shall be removed.
5	VIS	Echo _VIS	I_Video_Suppressed		The user shall be informed that the remote user has suppressed their video signal (by switching the camera off, etc.) [10], [3].
6	VIA	Echo _VIA	I_Video_Activated		The user shall be informed that the remote user has reactivated their (main) video signal (by switching the camera on, etc.) [10].
7	VIA2	Echo _VIA2	I_Camera2		The user shall be informed that the remote user has activated their Camera 2 [10].
8	VIA3	Echo _VIA3	I_Camera3		The user shall be informed that the remote user has activated their Camera 3 [10].
9	CIF	Echo _CIF	I_CIF		If the user initiated a request for CIF The video shall be switched to CIF mode and the user shall be given an indication to that effect. If no request for CIF was initiated The user shall be asked if they wish to switch to CIF mode.
10	QCIF	Echo _QCIF	I_QCIF		If the user initiated a request for QCIF The video shall be switched to QCIF mode and the user shall be given an indication to that effect. If no request for QCIF was initiated The user shall be asked if they wish to switch to QCIF mode.
11	ECS	Echo _ Encryp_On	I_ Encryp_ On		The user shall be given an indication that the encryption has been switched on.
NOTE: I1 merely confirms that the signal has been received, whereas I2 confirms that the appropriate internal actions within the videotelephone and have been carried out and any signals have been sent. Where it can be guaranteed that the videotelephone action will always very promptly follow the receipt of the signal the two indications may, at the discretion of the manufacturer of the videotelephone, be combined.					

8 Compliance

The present document proposes to establish a minimum level of usability for basic call, point-to-point connection, for ISDN videotelephony by requiring:

- provision of appropriate user controls for the functionality provided in the videotelephone;
- harmonization of the sequence of user control actions required to originate or receive an ISDN videotelephone call;
- flexibility in the order of the necessary control actions within the sequence required to originate or receive an ISDN videotelephone call;
- harmonization of the prompting and feedback indications on the state of the call and the available options;
- compliance with the general principle, general rules, and generic user control procedures;
- the text of clause 6 has precedence over the SDL.

8.1 ISDN Videotelephone terminal Manufacturer or Supplier

Compliance with the present document is achieved by an ISDN videotelephone manufacturer or supplier if:

a) they can demonstrate that they provide the controls that clause 4 defines as necessary to support the functionality that their ISDN videotelephone provides;

b) they can demonstrate that the ISDN videotelephone fully accommodates the user control procedures defined in clause 6 and that the user indications provided convey the information defined in subclause 7.2;

c) they can demonstrate that any controls and associated indications defined in subclause 7.3 that they provide behave as described in subclause 6.2.2 and table 25 of subclause 7.3;

d) they can demonstrate that any of the received signals and associated indications defined in subclause 7.4 that their ISDN videotelephone handles behave as described in subclause 6.2.3 table 26 of subclause 7.4.

In particular, they shall demonstrate:

- how the controls that they provide are associated with the functionality that they support, and;
- the range of user states that the terminal can support, and;
- the defined set of user control procedures for each user state the terminal supports, and;
- provide for the full set of indications that are listed in clause 6 and those from subclauses 7.3 and 7.4 that are required for the additional controls they provide and the additional signals that they handle.

8.2 ISDN videotelephony service provider

Compliance with the present document is achieved by an ISDN videotelephony service provider if they can demonstrate that their ISDN videotelephony service fully accommodates all the user control procedures defined in clause 6. In particular, they shall demonstrate that the service:

- recognizes all the control actions initiated by a user and transferred to the service provider by the terminal listed in clause 6; and
- provides for the transfer of all indications listed in clause 6.

Annex A (informative): Additional features of Videotelephony Systems

A.1 Lip Synchronization

The users perception of the quality of an AV call may be increased by the introduction of delays in the audio path designed to maximize the degree of synchronization between the spoken word and the accompanying lip movements displayed on the screen. The degree of synchronization becomes increasingly important for hard of hearing users using a videotelephone to support their comprehension by lip reading. The provision of lip synchronization is not mandatory, but is a recommended option, ETS 300 145, page 20 [3]. ETR 297 [8] offers guidance on the tolerance margins for achieving an acceptable level of lip synchronization. The provision of user procedures to control lip synchronization is a matter for the terminal manufacturers.

A.2 Supplementary Services

The minimum user procedures for accessing and Cling supplementary services from an ISDN videotelephone are defined in ETS 300 738 [11]. The provision of any other user procedures in addition to these minimum procedures is a matter for the terminal manufacturer.

The specific user procedures, controls and indications required for those supplementary services associated with call set up and call handling (for example: Calling/Connected Line Identification Presentation, terminal Portability, Call Hold, and Call Transfer) referenced in ETS 300 145 pages 22 to23 [3], are outside the scope of the present document. However, many of the controls and indications necessary to manage these services are included in the existing call handling procedures defined in the present document.

A.3 Distinctive or Videotelephony Ring Tone

The complementary indication to the distinctive ring signal, that is presented to the calling party. Within ISDN videotelephones the presentation of distinctive ring tone may be determined by the terminal, on receipt of the B-party's appropriate bearer capability and HLC in association with the network indication that ring signal has been applied.

D-channel signals received	Type of Ring Tone
Ring Signal applied + BC2 = UDI with T/A; HLC2 = Videotelephony	Videotelephone
Ring Signal applied + BC1 = UDI with T/A; HLC1 = Videotelephony	Videotelephone
Ring Signal applied + BC1 (or 2) = UDI with T/A; HLC1 = Telephony	Telephone
Ring Signal applied + BC1 = Speech; HLC1 = Telephony	Telephone

NOTE: The application of distinctive or videotelephony ring signals and tones does not guarantee the following call is an AV call. Depending on the negotiation of the communication mode, a videotelephone call may be connected in audio only mode.

History

Document history			
V1.1.1	May 1998	Membership Approval Procedure	MV 9829: 1998-05-19 to 1998-07-17
V1.1.1	August 1998	Publication	

ISBN 2-7437-2411-0
Dépôt légal : Août 1998