

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.248.25

(03/2013)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication
procedures

Gateway control protocol: Basic CAS packages

Recommendation ITU-T H.248.25



ITU-T H-SERIES RECOMMENDATIONS
AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
Ubiquitous sensor network applications and Internet of Things	H.640–H.649
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	H.770–H.779
Digital Signage	H.780–H.789

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T H.248.25

Gateway control protocol: Basic CAS packages

Summary

Recommendation ITU-T H.248.25 defines basic channel associated signalling (CAS) and R1 packages and supplemental CAS packages that, in association with the ITU-T H.248 Protocol, can be used to control a media gateway (MG) from an external media gateway controller (MGC).

This revision adds a new read-only property containing the current CAS state of the termination, to allow the MGC to resynchronize itself in the event it loses track of this state.

This revision incorporates an update to the optionality of the "Pulse off" and "Pulse On" events.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248.25	2003-07-14	16
1.1	ITU-T H.248.25 (2003) Cor. 1	2004-03-15	16
2.0	ITU-T H.248.25	2007-01-13	16
3.0	ITU-T H.248.25	2013-03-16	16

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2013

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

	Page
1 Scope	1
2 References.....	1
3 Definitions	1
4 Abbreviations and acronyms	1
5 Assumptions and partitioning	2
6 Basic CAS package.....	2
6.1 Properties.....	2
6.2 Events	3
6.3 Signals	5
6.4 Statistics.....	6
6.5 Procedures	7
7 Basic CAS addressing package	8
7.1 Properties.....	8
7.2 Events	8
7.3 Signals	10
7.4 Statistics.....	11
7.5 Procedures	11
8 Robbed bit signalling package.....	11
8.1 Properties.....	11
8.2 Events	12
8.3 Signals	14
8.4 Statistics.....	14
8.5 Procedures	14
9 Operator services and emergency services package.....	14
9.1 Properties.....	15
9.2 Events	15
9.3 Signals	15
9.4 Statistics.....	15
9.5 Procedures	15
10 Operator services extension package.....	15
10.1 Properties.....	16
10.2 Events	16
10.3 Signals	17
10.4 Statistics.....	18
10.5 Procedures	19

	Page
Appendix I – Call flows	20
I.1 Basic single-stage MF or DTMF wink start or immediate start	20
I.2 EAOSS termination – Telephone company operator services call	21
I.3 EAOSS termination – IC/INC operator services call indirect through an access tandem (Overlap outpulsing).....	22
I.4 EAOSS termination – IC/INC operator services call indirect through an access tandem (No overlap outpulsing).....	23
I.5 EAOSS termination – IC/INC "National" operator direct to the IC/INC (Overlap outpulsing).....	24
I.6 EAOSS termination – IC/INC "National" operator direct to the IC/INC (No overlap outpulsing).....	24
I.7 EAOSS origination – Telephone operating company serves the call.....	25

Recommendation ITU-T H.248.25

Gateway control protocol: Basic CAS packages

1 Scope

The basic channel associated signalling (CAS) package provides a baseline package. Basic CAS defines abstract events and signals that are common to all CAS protocols. For some protocols, basic CAS provides all of the functionality required to satisfy the line interface, such as North American single-stage dialling applications or R1 signalling. For other protocols, basic CAS provides a baseline package for which additional protocol specific extension packages can be defined. Further line signals and events required for international signalling protocols can be provided through extension packages.

The basic CAS addressing package extends the basic CAS package to add the signals and events required for basic addressing. This would satisfy addressing functionality for many protocols such as North American single-stage dialling applications or R1 signalling.

The robbed bit signalling (RBS) package, operator services and emergency services package and the operator services extension package can be used to provide functionality required in addition to the basic CAS package.

The support of these packages is optional.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T H.248.1] Recommendation ITU-T H.248.1 (2013), *Gateway Control Protocol: Version 3*.

3 Definitions

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CAS Channel Associated Signalling
MG Media Gateway
MGC Media Gateway Controller
RBS Robbed Bit Signalling
TS Time Slot

5 Assumptions and partitioning

The termination the MGC addresses is the channel. With TS16, the MG associates the line signal with the appropriate channel.

For some applications, the basic CAS package provides all of the functionality needed to satisfy the interface. In other cases (e.g., operator services), additional supplementary packages may be needed to meet the complete interface requirements. This Recommendation includes three supplementary packages which may be used to provide additional functionality required by some interfaces:

- The robbed bit signalling package provides basic RBS supervisory signalling that is required in addition to the basic CAS package.
- The operator services and emergency services package provides supervisory signalling that is specific to North American operator services and emergency services.
- The operator services extension package provides supervisory signalling that is specific to North American operator services and is required in addition to the operator services and emergency services package.

6 Basic CAS package

Package name:	Basic CAS package
Package ID:	bcas (0x003f)
Description:	This package provides basic event and signal handling for terminations that support CAS signalling.
Version:	2
Extends:	None

6.1 Properties

6.1.1 CAS near-end line state

Property name:	CAS near-end line state
Property ID:	nels (0x0002)
Description:	Specifies the current CAS near-end line state of the termination by reflecting the last applied line signal.
Type:	Enumeration
Possible values:	Idle (0x01) The CAS termination near-end is in the idle state Seize (0x02) The CAS termination near-end is in the seize state SeizeAck (0x03) The CAS termination near-end is in the seize acknowledge state Answer (0x04) The CAS termination near-end is in the answer state
Default:	The last applied line signal. If no line signal has been applied by the MGC, Idle.
Defined in:	TerminationState Descriptor
Characteristics:	ReadOnly

6.1.2 CAS far-end line state

Property name:	CAS far-end line state
Property ID:	fels (0x0003)
Description:	Specifies the current CAS far-end line state of the termination by reflecting the last detected line event.
Type:	Enumeration
Possible values:	Idle (0x01) The CAS termination far-end is in the idle state Seize (0x02) The CAS termination far-end is in the seize state SeizeAck (0x03) The CAS termination far-end is in the seize acknowledge state Answer (0x04) The CAS termination far-end is in the answer state
Default:	The last detected line event. If no line event has been detected by the MG, Idle.
Defined In:	TerminationState Descriptor
Characteristics:	ReadOnly

6.2 Events

6.2.1 Seizure

Event name:	Seizure
Event ID:	sz (0x0001)
Description:	Seizure event shall be reported when an incoming "Seizing" signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The line signal condition against which the "Seizing" signal is verified is provisioned in the MG.

6.2.1.1 EventsDescriptor parameters

None.

6.2.1.2 ObservedEventsDescriptor parameters

None.

6.2.2 Seize acknowledge

Event name:	Seize acknowledge
Event ID:	sza (0x0002)
Description:	The Seize Acknowledge event shall be reported when an incoming "Seize Acknowledge" signal occurs on the termination. This event also acts as a start dial notification, indicating that out-pulsing should begin. For R1 interfaces, the event is reported when the "start dialling"/"proceed to send" signal occurs. For wink start trunks, the "Seize Acknowledge" event is reported when the trailing edge of the wink-start signal occurs. For immediate start trunks, the "Seize Acknowledge" event is provided by the media gateway as an immediate response to the request for that event from the MGC.

6.2.2.1 EventsDescriptor parameters

None.

6.2.2.2 ObservedEventsDescriptor parameters

None.

6.2.3 Answer

Event name: Answer

Event ID: ans (0x0003)

Description: The Answer event shall be reported when an incoming line signal "Answer" occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The line signal condition against which the "Answer" signal is verified is provisioned in the MG.

6.2.3.1 EventsDescriptor parameters

None.

6.2.3.2 ObservedEventsDescriptor parameters

None.

6.2.4 Idle

Event name: Idle

Event ID: idle (0x0004)

Description: This event applies to an incoming interface and is reported when a "Clear" or "Idle" line signal occurs on the termination. For an R1 interface, the Idle event shall be reported when an "Idle" line signal occurs on the termination. For robbed bit signalling digital interfaces, it corresponds to an "on-hook" indication on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG.

6.2.4.1 EventsDescriptor parameters

6.2.4.1.1 Idle guard timing

Parameter name: Idle guard timing

Parameter ID: idlgt (0x0001)

Description: Specifies whether the MG shall start an idle guard timer for the receipt of the "Idle" signal. If the idle guard timer expires prior to the detection of idle signal and the CAS Failure event is active, the MG shall report a CAS Failure event with a "IDLTO" error. The timer value is provisioned on the MG.

Type: Boolean

Optional: Yes

Possible values: On when the idle guard timing is requested
Off when the idle guard timing is turned off.

Default: Off

6.2.4.2 ObservedEventsDescriptor parameters

None.

6.2.5 CAS failure

Event name: CAS failure

Event ID: casf (0x0005)

Description: Reports general CAS failures associated with this package.

6.2.5.1 EventsDescriptor parameters

None.

6.2.5.2 ObservedEventsDescriptor parameters

6.2.5.2.1 Error code

Parameter name: Error code

Parameter ID: ec (0x0001)

Description: Describes the reasons for CAS failures encountered at an MG. The MGC may take corrective actions upon receiving one of these error codes (clear the call, reattempt on new trunk, etc.). "ULS" is reported when the MG encounters a line signal on the CAS trunk other than the one expected for the current state of the trunk. "LTO" is reported when a timeout occurs locally on the MG while waiting for a line signal on the CAS trunk. "SME" is reported when the MG encounters an internal CAS protocol or processing error. "IDLTO" is reported when the idle guard timer expires on the MG while waiting for the idle line signal on the trunk.

Type: Enumeration

Optional: No

Possible values:

ULS (0x0001)	Unexpected line signal
LTO (0x0002)	Line signal timeout
SME (0x0004)	Protocol State machine malfunction
IDLTO (0x0005)	Idle Guard Timeout

Default: None

6.3 Signals

6.3.1 Seize

Signal name: Seize

Signal ID: sz (0x0001)

Description: Applies a "Seizing" signal on the termination. The signal that is actually sent on the physical termination is provisioned in the MG.

Signal type: Brief

Duration: Not applicable (See "Signal Procedures".)

6.3.1.1 Additional parameters

None.

6.3.2 Seize acknowledge

Signal name:	Seize acknowledge
Signal ID:	sza (0x0002)
Description:	Applies a "Seize Acknowledge" signal on the termination. The signal that is actually sent on the physical termination is provisioned in the MG.
Signal type:	Brief
Duration:	Not applicable (See "Signal Procedures".)

6.3.2.1 Additional parameters

None.

6.3.3 Answer

Signal name:	Answer
Signal ID:	ans (0x0003)
Description:	Applies an "Answer" signal on the termination. The signal that is actually sent on the physical termination is provisioned in the MG.
Signal type:	Brief
Duration:	Not applicable (See "Signal Procedures".)

6.3.3.1 Additional parameters

None.

6.3.4 Idle

Signal name:	Idle
Signal ID:	idle (0x0004)
Description:	This signal applies to an outgoing interface and is used to idle a trunk. This signal is used as a clear signal in some variants to clear down a call either in the forward or backward direction. The signal that is actually sent on the physical termination is provisioned in the MG.
Signal type:	Brief
Duration:	Not applicable (See "Signal Procedures".)

6.3.4.1 Additional parameters

None.

6.4 Statistics

None.

6.5 Procedures

6.5.1 Glare procedures

MGs shall have a configurable glare information element on a per-DS0 basis that can be set to indicate whether the MG is the controlling or non-controlling "switch".

In the case of PBX interconnect, PBXs are either preconfigured or can be configured to behave as non-controlling switches. In this case, if they see an off-hook that exceeds the allowable wink length, they will attach a receiver, go on-hook and await digits for a new call. The PBX will, in addition, retry its original call on another trunk.

In the case where the DS0 is configured for the non-controlling switch, the MG will indicate a glare occurrence by reporting a seizure event to the MGC. Upon receipt of the seizure event, the MGC begins procedures to release the outgoing call attempt and begins procedures to process the incoming call attempt.

If the MG is a controlling switch, when glare is detected, the MG will wait for a timeout value (default value of 4 seconds) until the incoming off-hook changes to an on-hook state, at which time it will start out-pulsing in the normal manner. If the timeout occurs before the state change to on-hook occurs, the far end has refused to back down. This may occur if both ends of the interface are provisioned as the controlling switch. In this case, when the timeout occurs, the MG reports the seizure event to the MGC. The MGC, upon receipt of the notify with seizure event, begins procedures to back down on the outgoing call attempt and begins procedures to process the incoming call attempt.

It is possible for internal glare to occur between the MGC and the MG. With internal glare, the MG detects a seizure event on the DS0, signals a seize acknowledge and reports the seizure event to the MGC. At the same time, the MG reports the seizure event to the MGC, the MGC sends a request to the MG to signal a seizure on the DS0. In this case, the start dial has already been signalled by the MG in response to the incoming seizure. Therefore, the MGC must back down on the outgoing call attempt. The MG, upon receipt of the modify request to signal a seizure, recognizes internal glare has occurred and takes no action on the modify request. The MGC, upon receipt of the notify with seizure event, recognizes internal glare has occurred and begins procedures to back down on the outgoing call attempt and begins procedures to process the incoming call attempt.

6.5.2 Timestamp procedures

Inclusion of a timestamp in the ObservedEvents descriptor is mandatory for the basic CAS package. The timestamp reflects the detection time for the event and may be used by services (e.g., automatic message accounting) on the MGC.

6.5.3 Signal procedures

A line signal must always be present on a CAS interface. Therefore, the Seizure, Answer, Seize Acknowledge and Idle signals shall be considered to be state changes in the line signal state, rather than as persistent signals in themselves. The state change shall be considered to be completed instantaneously by the MG. Consequently, there is no active signal to be terminated by any subsequent event detection.

The MG shall maintain the existing line signal state on a CAS interface until such time as the MGC sends a new line signal to the MG to change state.

6.5.4 Property procedures

The nels property shall reflect the most recently successfully applied line signal from the MGC. As per the requirements in clause 6.5.3, the line signal shall not change without explicit instruction from the MGC and therefore the nels property shall also require explicit signal application in order to alter its value. If the MGC has not applied a signal to this termination, then the value is Idle.

The fels property shall reflect the most recent line event detected by the MG. The property shall be updated upon detection of the event, and shall not depend upon the success or failure of the reporting of the event to the MGC. If the MG has not detected an event, then the value is Idle.

Note that the default value for the properties are defined as the last applied signal or detected event. This has the effect of negating the "reset" of the properties due to a Subtract Command, by making the MG reset the property to its current value. This is necessary to provide continuity for the properties and to align the values to the actual working of the CAS interface.

7 Basic CAS addressing package

Package name:	Basic CAS addressing package
Package ID:	bcasaddr (0x006d)
Description:	This package defines events and signals that are specific to Basic CAS Addressing and are required in addition to the base CAS functionality provided by the bcas package.
Version:	1
Extends:	bcas version 1

7.1 Properties

None.

7.2 Events

7.2.1 Address

Event name:	Address
Event ID:	addr (0x0006)
Description:	Reports the collected address parameter and termination method for the digits received by the MG.

7.2.1.1 EventsDescriptor parameters

7.2.1.1.1 Address coding

Parameter name:	Address coding
Parameter ID:	ac (0x0001)
Description:	Specifies the possible coding options of incoming Digit events as tones and/or DC pulses. The default value is the value(s) provisioned as an attribute of the circuit associated with the signal.
Type:	Sublist of enumeration
Optional:	Yes

Possible values: MF (0x0001) Multifrequency
DTMF (0x0002) Dual-tone Multi-frequency
DP (0x0003) Dial Pulse
Default: Provisioned

7.2.1.2 ObservedEventsDescriptor parameters

7.2.1.2.1 Digit string

Parameter name: Digit string
Parameter ID: ds (0x0001)
Description: The string of collected digits that matched all or part of the sequence specified in the digit map.
Type: String
Optional: No
Possible values: A sequence of the characters '0' through '9' as well as 'A' through 'H'. 'A' through 'H' are used for MF signalling; refer to the symbols defined for the digit map in the MF Tone Detection package. 'A' through 'F' are used for DTMF signalling – refer to the symbols defined for the digit map in the DTMF Detection package.
Default: None

7.2.1.2.2 Termination method

Parameter name: Termination method
Parameter ID: meth (0x0002)
Description: Indicates the reason for the generation of the Address event.
Type: Enumeration
Optional: No
Possible values: UM (0x0001) Unambiguous Match
PM (0x0002) Partial Match
FM (0x0003) Full Match
Default: None

7.2.2 CAS failure

EventID: casf (0x0005)
Description: Extends the bcas casf event to handle general failure or abnormal line and register signalling conditions associated with this package.

7.2.2.1 EventsDescriptor parameters

None.

7.2.2.2 ObservedEventsDescriptor parameters

7.2.2.2.1 Error code

Parameter name: Error code

Parameter ID:	ec (0x0001)
Description:	Describes the failure reason.
Type:	Enumeration
Optional:	No
Possible values:	RTO (0x0003) Register Signalling Timeout ADR (0x0006) Error during outpulsing
Default:	None

7.3 Signals

7.3.1 Address

Signal name:	Address
SignalID:	addr (0x0005)
Description:	Applies the address signals in the form of DTMF, dial-pulse or MF-tones on the trunk. The actual frequency, cadence, duration and amplitude values for the multi-frequency tones that convey the address information are provisioned in the MG.
Signal type:	Brief
Duration:	Provisioned

7.3.1.1 Additional parameters

7.3.1.1.1 Digit string

Parameter name:	Digit string
Parameter ID:	ds (0x0001)
Description:	The digit string that needs to be sent as address signals.
Type:	String
Optional:	No
Possible values:	A sequence of the characters '0' through '9' as well as 'A' through 'H' ('A' through 'H' used for MF signalling; refer to the symbols defined for the digit map in the MF Tone Detection package).
Default:	None

7.3.1.1.2 Address delay

Parameter name:	Address delay
Parameter ID:	ad (0x0002)
Description:	Specifies a timed delay that is applied prior to the signalling address being outpulsed. The address delay is optional. If the address delay parameter is not provided, the MG uses the provisioned value by default.
Type:	Integer
Optional:	Yes
Possible values:	0 and up in milliseconds

Default: Provisioned

7.3.1.1.3 Address coding

Parameter name: Address coding

Parameter ID: ac (0x0003)

Description: Specifies the coding of Digit String parameter in tones or DC pulses. Address Coding is optional; if not provided, the MG uses the value provisioned as an attribute of the circuit associated with the signal.

Type: Enumeration

Optional: Yes

Possible values: DTMF (0x0001) DTMF Digits
MF (0x0002) MF Digits
DP (0x0003) Dial Pulse Digits

Default: Provisioned

7.4 Statistics

None.

7.5 Procedures

None.

8 Robbed bit signalling package

Package name: Robbed bit signalling package

Package ID: rbs (0x0040)

Version: 1

Extends: None

Description: This package defines events and signals that are specific to robbed bit signalling and are required in addition to the base CAS functionality provided by the bcas package.

8.1 Properties

8.1.1 Pulse generation duration

Property name: Pulse generation duration

Property ID: psgen (0x0001)

Description: Specifies the duration for a pulse signal.

Type: Integer

Possible values: Any non-negative integral number of milliseconds

Defined in: TerminationState descriptor

Characteristics: Read/Write

8.1.2 Minimum pulse detection duration

Property name:	Minimum pulse detection duration
Property ID:	minpsdet (0x0002)
Description:	Specifies the minimum duration for detecting a pulse.
Type:	Integer
Possible values:	Any non-negative integral number of milliseconds
Defined in:	TerminationState descriptor
Characteristics:	Read/Write

8.1.3 Maximum pulse detection duration

Property name:	Maximum pulse detection duration
Property ID:	maxpsdet (0x0003)
Description:	Specifies the maximum duration for detecting a pulse.
Type:	Integer
Possible values:	Any non-negative integral number of milliseconds
Defined in:	TerminationState descriptor
Characteristics:	Read/Write

8.2 Events

8.2.1 Pulse off

Event name:	Pulse off
Event ID:	psoff (0x0001)
Description:	The MG detects and reports a timed transition from on-hook to off-hook (leading edge) to on-hook (trailing edge). The parameter "pulse timeout" can be optionally included to specify a timeout for the receipt of the pulse. The default value for the timer is provisioned in the MG. The minimum and maximum duration of the pulse are defined by the minimum pulse detection duration and maximum pulse detection duration properties respectively.

8.2.1.1 EventsDescriptor parameters

8.2.1.1.1 Pulse timeout

Parameter name:	Pulse timeout
Parameter ID:	psto (0x0001)
Type:	Integer
Optional:	Yes
Possible values:	Any non-negative integral number of milliseconds
Description:	Specifies the timer for the receipt of the pulse. A value of 0 indicates a timer should not be applied.
Default:	Provisioned

8.2.1.2 ObservedEventsDescriptor parameters

None.

8.2.2 Pulse on

Event name:	Pulse on
EventID:	pson (0x0002)
Description:	The MG detects and reports a timed transition from off-hook to on-hook (leading edge) to off-hook (trailing edge). The parameter "pulse timeout" can be optionally included to specify a timeout for the receipt of the pulse. The default value for the timer is provisioned in the MG. The minimum and maximum duration of the pulse are defined by the minimum pulse detection duration and maximum pulse detection duration properties respectively.

8.2.2.1 EventsDescriptor parameters

8.2.2.1.1 Pulse timeout

Parameter name:	Pulse timeout
Parameter ID:	psto (0x0001)
Description:	Specifies the timer for the receipt of the pulse. A value of 0 indicates a timer should not be applied.
Type:	Integer
Optional:	Yes
Possible values:	Any non-negative integral number of milliseconds
Default:	Provisioned

8.2.2.1.2 ObservedEventsDescriptor parameters

None.

8.2.3 RBS failure

Event name:	RBS failure
Event ID:	rbsfail (0x0003)
Description:	Reports a failure condition when a RBS failure occurs.

8.2.3.1 EventsDescriptor parameters

None.

8.2.3.2 ObservedEventsDescriptor parameters

8.2.3.2.1 Error code

Parameter name:	Error code
Parameter ID:	ec (0x0001)
Description:	Describes the RBS failure reason.
Type:	Enumeration
Optional:	No
Possible values:	PSTO (0x0001) Timeout waiting for a pulse event

Default: None

8.3 Signals

8.3.1 Pulse off-hook

Signal name: Pulse off-hook

Signal ID: psoff (0x0001)

Description: The MG signals a timed transition from on-hook to off-hook (leading edge) to on-hook (trailing edge).

Signal type: Brief

Duration: Defined by pulse generation duration property.

8.3.1.1 Additional parameters

None.

8.3.2 Pulse on-hook

Signal name: Pulse on-hook

Signal ID: pson (0x0002)

Description: The MG signals a timed transition from off-hook to on-hook (leading edge) to off-hook (trailing edge).

Signal type: Brief

Duration: Defined by pulse generation duration property.

8.3.2.1 Additional parameters

None.

8.4 Statistics

None.

8.5 Procedures

8.5.1 Timestamp procedures

Inclusion of a timestamp in the ObservedEvents descriptor is mandatory for the RBS package. The timestamp reflects the detection time for the event and may be used by services (e.g., automatic message accounting) on the MGC.

9 Operator services and emergency services package

Package name: Operator services and emergency services package

Package ID: oses (0x0041)

Description: This package defines the CAS events and signals that are required for North American operator services and North American emergency services signalling.

Version: 1

Extends: None

9.1 Properties

None.

9.2 Events

9.2.1 Ringback

Event name: Ringback

Event ID: rgbk (0x0001)

Description: The ringback event is reported when a ringback signal is detected. The type of ringback signal and characteristics of the ringback signal are provisioned in the MG.

9.2.1.1 EventsDescriptor parameters

None.

9.2.1.2 ObservedEventsDescriptor parameters

None.

9.3 Signals

9.3.1 Ringback

Signal name: Ringback

Signal ID: rgbk (0x0001)

Description: Applies a ringback signal on the termination. The type of ringback signal and characteristics of the ringback signal are provisioned on the MG.

Signal type: Brief

Duration: Provisioned

9.3.1.1 Additional parameters

None.

9.4 Statistics

None.

9.5 Procedures

None.

10 Operator services extension package

Package name: Operator services extension package

Package ID: osex (0x0042)

Description: This package defines the CAS events and signals that are specific to North American operator services signalling and are required in addition to the events and signals defined in the operator services and emergency services package.

Version: 1

Extends: oses version 1

10.1 Properties

None.

10.2 Events

10.2.1 Recall

Event name: Recall

Event ID: rcl (0x0002)

Description: The recall event is reported when a recall signal is detected on a termination. The recall signal is a timed transition from off-hook to on-hook (leading edge) to off-hook (trailing edge). The duration of the timed transition is provisioned on the MG.

10.2.1.1 EventsDescriptor parameters

None.

10.2.1.2 ObservedEventsDescriptor parameters

None.

10.2.2 Coin collect

Event name: Coin collect

Event ID: cc (0x0003)

Description: The coin collect event is reported when a coin collect signal is detected on a termination. The type of coin collect signal and characteristics of the coin collect signal are provisioned on the MG.

10.2.2.1 EventsDescriptor parameters

None.

10.2.2.2 ObservedEventsDescriptor parameters

None.

10.2.3 Coin return

Event name: Coin return

Event ID: cr (0x0004)

Description: The coin return event is reported when a coin return signal is detected on a termination. The type of coin return signal and characteristics of the coin return signal are provisioned on the MG.

10.2.3.1 EventsDescriptor parameters

None.

10.2.3.2 ObservedEventsDescriptor parameters

None.

10.2.4 Operator attached

Event name: Operator attached

Event ID: oa (0x0005)

Description: The operator attached event is reported when an operator attached signal is detected on a termination. The type of operator attached signal and characteristics of the operator attached signal are provisioned on the MG.

10.2.4.1 EventsDescriptor parameters

None.

10.2.4.2 ObservedEventsDescriptor parameters

None.

10.2.5 Operator released

Event name: Operator released

Event ID: or (0x0006)

Description: The operator released event is reported when an operator released signal is detected on a termination. The type of operator released signal and characteristics of the operator released signal are provisioned on the MG.

10.2.5.1 EventsDescriptor parameters

None.

10.2.5.2 ObservedEventsDescriptor parameters

None.

10.3 Signals

10.3.1 Recall

Signal name: Recall

Signal ID: rcl (0x0002)

Description: Applies a timed transition from off-hook to on-hook (leading edge) to off-hook (trailing edge).

Signal type: Brief

Duration: Provisioned

10.3.1.1 Additional parameters

None.

10.3.2 Coin collect

Signal name: Coin collect

Signal ID: cc (0x0003)

Description: Applies a coin collect signal on the termination. The type of coin collect signal and characteristics of the coin collect signal are provisioned on the MG.

Signal type: Brief
Duration: Provisioned

10.3.2.1 Additional parameters

None.

10.3.3 Coin return

Signal name: Coin return
Signal ID: cr (0x0004)
Description: Applies a coin return signal on the termination. The type of coin return signal and characteristics of the coin return signal are provisioned on the MG.
Signal type: Brief
Duration: Provisioned

10.3.3.1 Additional parameters

None.

10.3.4 Operator attached

Signal name: Operator attached
Signal ID: oa (0x0005)
Description: Applies an operator attached signal on the termination. The type of operator attached signal and characteristics of the operator attached signal are provisioned on the MG.
Signal type: Brief
Duration: Provisioned

10.3.4.1 Additional parameters

None.

10.3.5 Operator released

Signal name: Operator released
Signal ID: or (0x0006)
Description: Applies an operator released signal on the termination. The type of operator released signal and characteristics of the operator released signal are provisioned on the MG.
Signal type: Brief
Duration: Provisioned

10.3.5.1 Additional parameters

None.

10.4 Statistics

None.

10.5 Procedures

None.

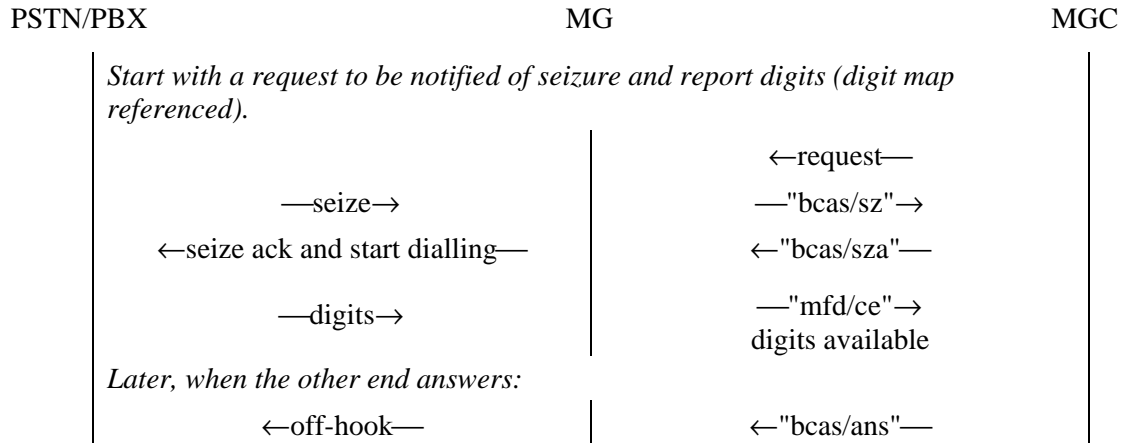
Appendix I

Call flows

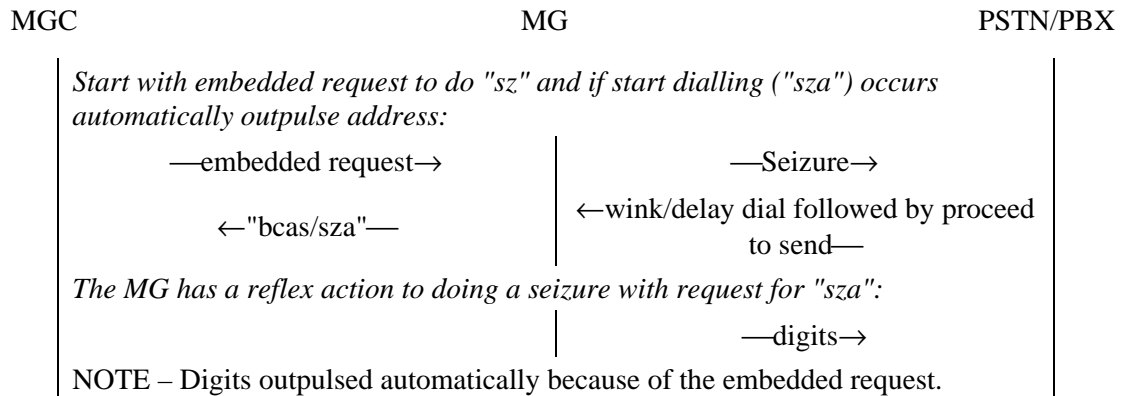
(This appendix does not form an integral part of this Recommendation.)

I.1 Basic single-stage MF or DTMF wink start or immediate start

Origination:

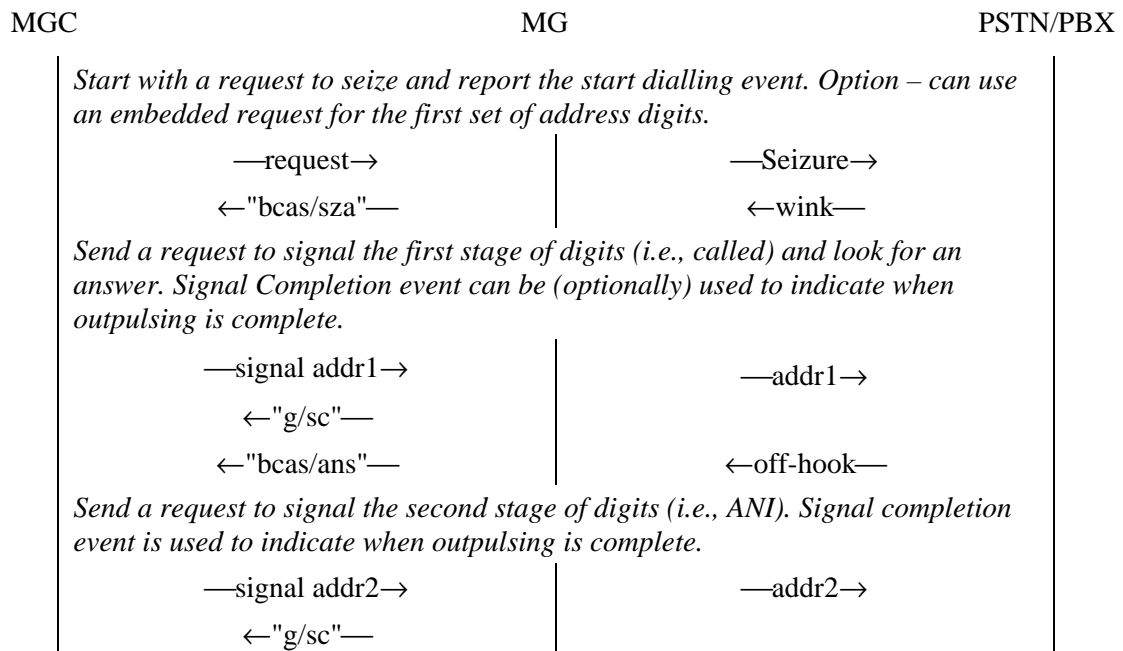


Termination:



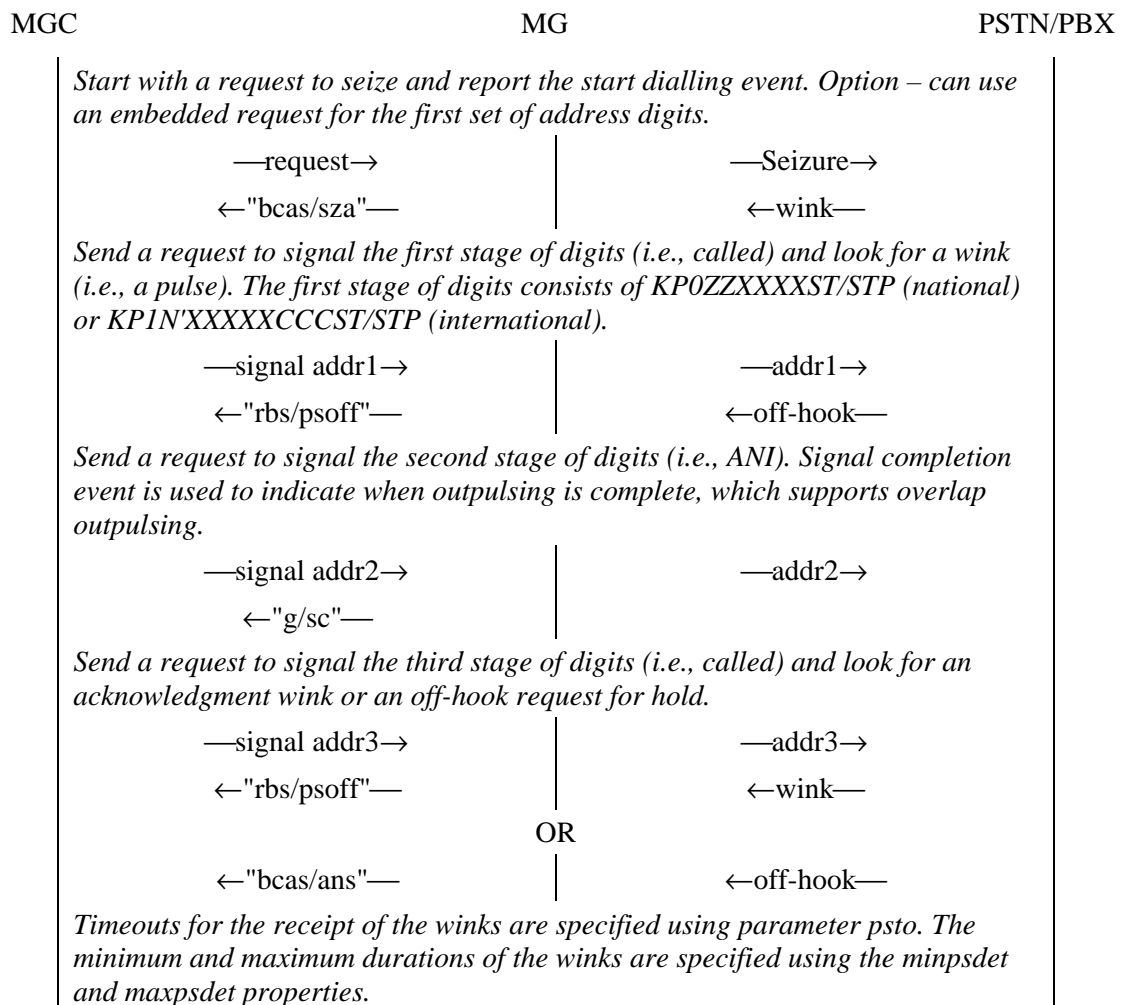
I.2 EAOSS termination – Telephone company operator services call

The following call flow also applies to operator services signalling interfaces defined prior to exchange access operator services signalling (EAOSS).



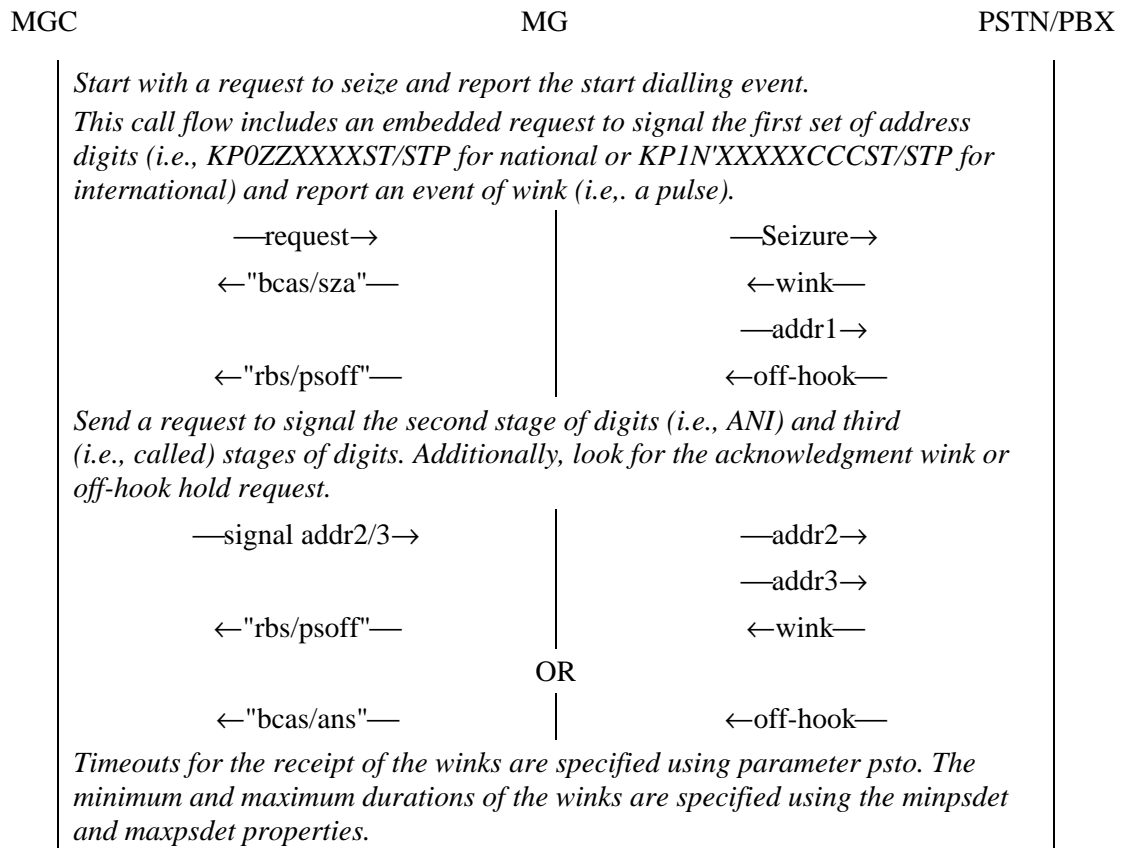
I.3 EAOSS termination – IC/INC operator services call indirect through an access tandem (Overlap outpulsing)

The following call flow also applies to Feature Group D (FGD) signalling with the exception of an acknowledgment wink in place of the off-hook hold request.

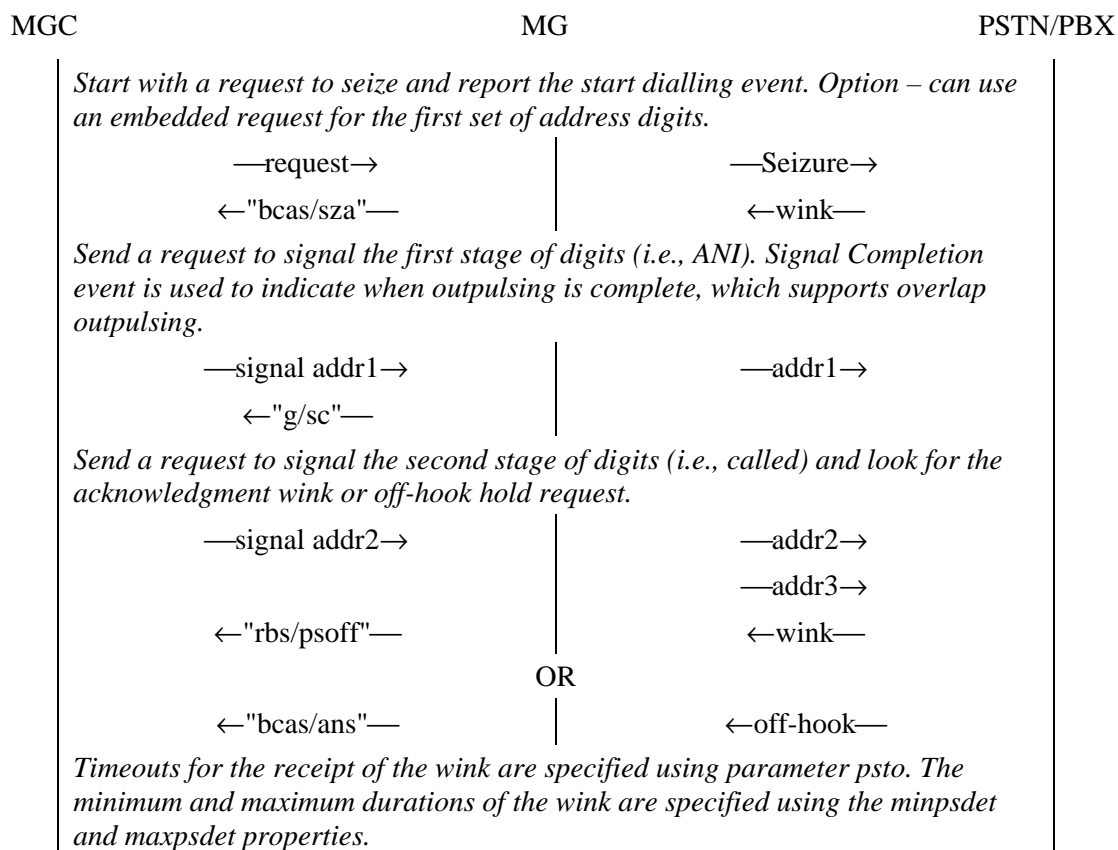


I.4 EAOSS termination – IC/INC operator services call indirect through an access tandem (No overlap outpulsing)

This call flow is an optimization of the previous call flow when overlap outpulsing is not required.

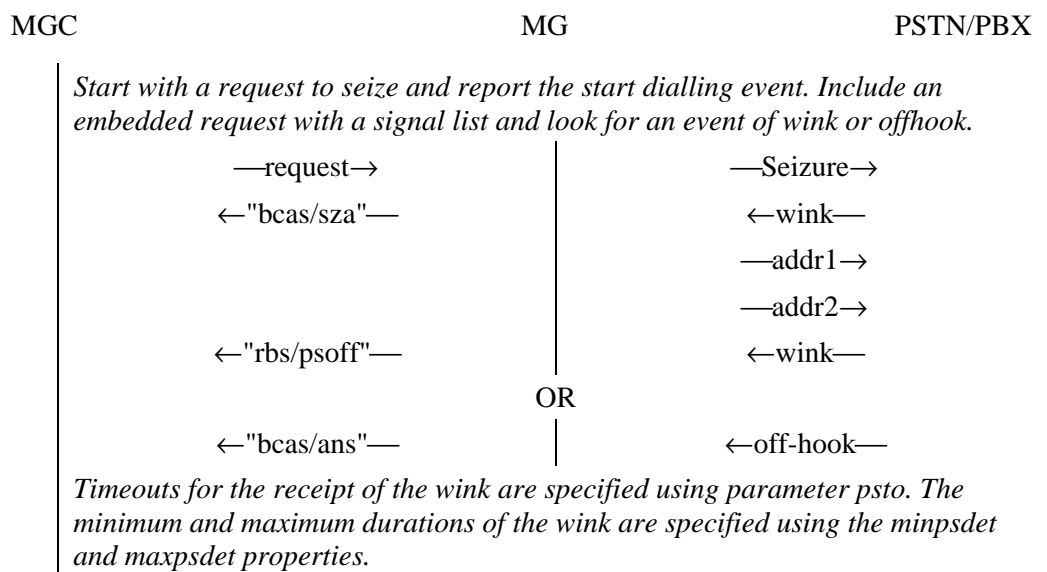


I.5 EAOSS termination – IC/INC "National" operator direct to the IC/INC (Overlap outpulsing)



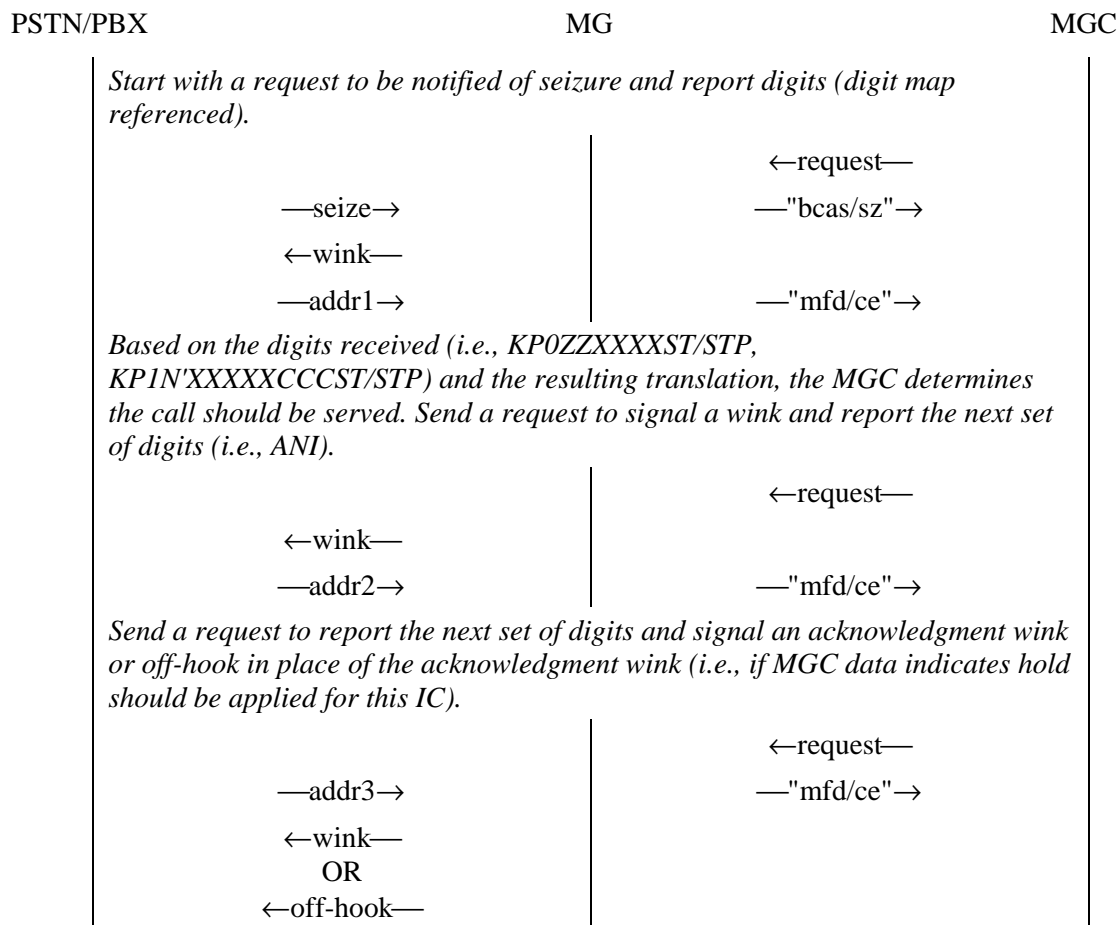
I.6 EAOSS termination – IC/INC "National" operator direct to the IC/INC (No overlap outpulsing)

This call flow is an optimization of the previous call flow when overlap outpulsing is not required.



I.7 EAOSS origination – Telephone operating company serves the call

In this call flow, the MGC is the telephone operating company switch that is providing operator services. The call originates from a PSTN EO and terminates to the MGC for operator handling. Following operator handling, the call completes to the packet network (not shown).



SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems