

ECMA

Standardizing Information and Communication Systems

**Private Integrated Services
Network (PISN) -
Inter-Exchange Signalling
Protocol -
Message Waiting Indication
Supplementary Service**

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(QSIG-MWI)

Brief History

This Standard is one of a series of ECMA standards defining services and signalling protocols applicable to Private Integrated Services Networks. The series uses the ISDN concepts as developed by ITU-T (formerly CCITT) and is also within the framework of standards for open systems interconnection as defined by ISO.

This particular Standard specifies the signalling protocol for use at the Q reference point in support of the Message Waiting Indication supplementary service.

The Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It has been produced under ETSI work item DE/ECMA-00088. It represents a pragmatic and widely based consensus.

This ECMA Standard is contributed to ISO/IEC JTC1 under the terms of the fast-track procedure, for adoption as an ISO/IEC International Standard.

This ECMA Standard has been adopted by the ECMA General Assembly of June 1996.

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1 Scope

This Standard specifies the signalling protocol for the support of the Message Waiting Indication supplementary service (SS-MWI) at the Q reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

The supplementary service MWI enables a Served User to be sent a Message Waiting Indication and also enables this Message Waiting Indication to be cancelled.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in ETS 300 387. This Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in Standard ECMA-241.

The signalling protocol for SS-MWI uses certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

This Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-MWI and other supplementary services and ANFs.

NOTE 1

Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

This Standard is applicable to PINXs which can interconnect to form a PISN.

2 Conformance

In order to conform to this Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

Conformance to this Standard includes conforming to those clauses that specify protocol interactions between SS-MWI and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

3 References

ECMA-241	Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flow - Message Waiting Indication Supplementary Service (MWISD) (1996)
ISO/IEC 11579-1	Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN exchanges (PINX) (1994)
ISO/IEC 11582	Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol (1995)
ISO/IEC 11873	Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Diversion supplementary services (1995)
ETS 300 387	Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services (1994)
CCITT Rec. I.112	Vocabulary of terms for ISDNs (1988)
CCITT Rec. I.210	Principles of telecommunication services supported by an ISDN and the means to describe them (1988)
CCITT Rec. Z.100	Specification and description language (1988)
ITU-T Rec. Q.950	Digital subscriber signalling system no.1 (DSS1) - Supplementary services protocols, structure and general principles (1993)

4 Definitions

For the purpose of this Standard the following definitions apply:

4.1 External definitions

This Standard uses the following terms defined in other documents:

– Application Protocol Data Unit (APDU)	(ISO/IEC 11582)
– Basic Service	(CCITT Rec. I.210)
– Call-Independent	(ISO/IEC 11582)
– Gateway PINX	(ISO/IEC 11582)
– Originating PINX	(ISO/IEC 11582)
– Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
– Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
– Signalling	(CCITT Rec. I.112)
– Supplementary Service	(CCITT Rec. I.210)
– Supplementary Service Control Entity	(ISO/IEC 11582)
– Terminating PINX	(ISO/IEC 11582)
– Transit PINX	(ISO/IEC 11582)

4.2 Message Centre PINX

The PINX serving the Message Centre entity for activation, deactivation.

4.3 Served User

The user to whom the Message Waiting Indication is sent on initiative of the Message Centre.

4.4 Message Centre

The entity which activates or deactivates the Message Waiting Indication as a result of storage or retrieval of messages.

4.5 Message Waiting Indication

An indication to the Served User when messages are waiting for the Served User.

5 List of acronyms

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS	Supplementary Service

6 Signalling protocol for the support of SS-MWI

6.1 SS-MWI description

SS-MWI enables a Served User to be sent a Message Waiting Indication and also enables this Message Waiting Indication to be cancelled.

This service also includes an option to interrogate the Message Waiting Indication stored against the Served User.

6.2 SS-MWI operational requirements

6.2.1 Requirements on a Message Centre PINX

Generic procedures for the call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX and for a Terminating PINX, shall apply.

6.2.2 Requirements on a Served User PINX

Generic procedures for the call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX and for an Originating PINX, shall apply.

6.2.3 Requirements on a Transit PINX

Generic procedures for the call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.3 SS-MWI coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply.

Table 1 - Operations in support of SS-MWI

SS-MWI-Operations	{iso (1) identified-organization (3) icd-ecma (0012) standard (0) qsig-message-waiting (242) message-waiting-operations (0)}
DEFINITIONS EXPLICIT TAGS ::=	
BEGIN	
IMPORTS	OPERATION, ERROR FROM Remote-Operation-Notation {joint-iso-ccitt (2) remote-operations (4) notation (0)} Extension FROM Manufacturer-specific-service-extension-definition {iso (1) standard (0) pss1-generic-procedures (11582) msi-definition (0)} basicServiceNotProvided, notActivated, notSubscribed, invalidServedUserNr FROM {ccitt (2) recommendation (0) q (17) 950 general-error-list (1) } PartyNumber FROM Addressing-Data-Elements {iso (1) standard (0) pss1-generic-procedures (11582) addressing-data-elements (9) } BasicService FROM Call-Diversion-Operations {iso (1) standard (0) pss1- call-diversion (13873) call-diversion-operations (0) } ;

MWIActivate	::=	OPERATION ARGUMENT MWIActivateArg RESULT DummyRes ERRORS { notSubscribed, invalidServedUserNr, basicServiceNotProvided, unspecified }
MWIDeactivate	::=	OPERATION ARGUMENT MWIDeactivateArg RESULT DummyRes ERRORS { notSubscribed, invalidServedUserNr, basicServiceNotProvided, unspecified }
MWIIInterrogate	::=	OPERATION ARGUMENT MWIIInterrogateArg RESULT MWIIInterrogateRes ERRORS { notSubscribed, invalidServedUserNr, notActivated, unspecified }
MWIActivateArg	::=	SEQUENCE{ basicService BasicService, servedUserNr PartyNumber, msgCentrelId MsgCentrelId OPTIONAL, nbOfMessages [2] IMPLICIT NbOfMessages OPTIONAL, priority [3] IMPLICIT INTEGER (0..9) OPTIONAL, -- The value 0 means the highest priority and 9 the lowest argumentExt CHOICE { extension [4] IMPLICIT Extension, multipleExtension [5] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
DummyRes	::=	CHOICE { null NULL, extension [1] IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension }
MWIDeactivateArg	::=	SEQUENCE{ servedUserNr PartyNumber, basicService BasicService, msgCentrelId MsgCentrelId OPTIONAL, argumentExt CHOICE { extension [2] IMPLICIT Extension, multipleExtension [3] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

MWIIInterrogateArg	::=	SEQUENCE{ basicService BasicService, servedUserNr PartyNumber, msgCentrelId MsgCentrelId OPTIONAL, argumentExt CHOICE { extension [2] IMPLICIT Extension, multipleExtension [3] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
MWIIInterrogateRes	::=	SEQUENCE SIZE(1..10) OF MWIIInterrogateResElt
MWIIInterrogateResElt	::=	SEQUENCE{ basicService BasicService, msgCentrelId MsgCentrelId OPTIONAL, nbOfMessages [2] IMPLICIT NbOfMessages OPTIONAL, priority [3] IMPLICIT INTEGER (0..9) OPTIONAL, -- The value 0 means the highest priority and 9 the lowest argumentExt CHOICE { extension [4] IMPLICIT Extension, multipleExtension [5] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
MsgCentrelId	::=	CHOICE { integer [0] IMPLICIT INTEGER (0..65535), partyNumber [1] PartyNumber }
NbOfMessages	::=	INTEGER (1..65535)
mwiActivate	MWIActivate	::= 80
mwiDeactivate	MWIDeactivate	::= 81
mwiInterrogate	MWIIInterrogate	::= 82
Unspecified	::=	ERROR PARAMETER Extension
unspecified	Unspecified	::=1008
END		-- of SS-MWI-Operations

6.3.2 Information elements

6.3.2.1 Facility information element

The operations defined in 6.3.1 shall be coded in the Facility information element in accordance with ISO/IEC 11582.

When conveying the invoke APDU of operations defined in 6.3.1, the destination Entity data element of the NFE shall contain the value endPINX.

When conveying the invoke APDU of operation mwiActivate, mwiDeactivate and mwiInterrogate, the interpretation APDU shall be omitted.

6.3.2.2 Other information elements

Any other information element (e.g. Calling party number) shall be coded in accordance with ISO/IEC 11582.

6.3.3 Messages

The Facility information element shall be conveyed in messages as specified in clause 10 of ISO/IEC 11582.

6.4 SS-MWI state definitions

6.4.1 States at the Message Centre PINX

The procedures for the Message Centre PINX are written in terms of the following conceptual states existing within the SS-MWI Supplementary Service Control entity in that PINX in association with an activation or deactivation request from the Message Centre entity.

6.4.1.1 State MWI-Mc-Idle

Activation, deactivation is not in progress. The Message Center PINX is ready for receipt of mwiInterrogate invoke APDU.

6.4.1.2 State MWI-Mc-Wait

A mwiActivate or mwiDeactivate invoke APDU has been sent. The Message Centre PINX is waiting for the response.

6.4.2 States at the Served User PINX

The procedures for the Served User PINX are written in terms of the following conceptual states existing within the SS-MWI Supplementary Service Control entity in that PINX in association with a particular call-independent signalling connection for the Served User.

6.4.2.1 State MWI-Ser-Idle

The Served User PINX is ready for receipt of mwiActivate, mwiDeactivate or mwiInterrogate invoke APDU.

6.4.2.2 State MWI-Ser-Wait

A mwiInterrogate invoke APDU has been sent. The Served User PINX is waiting for the response.

6.5 SS-MWI signalling procedures

Examples of message sequences are shown in annex B.

6.5.1 Actions at the Message Centre PINX

The SDL representation of procedures at the Message Centre PINX is shown in C.1 of annex C.

6.5.1.1 Normal procedures

6.5.1.1.1 Activation / deactivation

On receipt of an activation / deactivation request from the Message Centre entity, the Message Centre PINX shall send a mwiActivate/mwiDeactivate invoke APDU to the Served User PINX using the call reference of a call-independent signalling connection. The call-independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ISO/IEC 11582. The Message Centre PINX shall start timer T1 and enter the MWI-Mc-Wait state. The mwiActivate/mwiDeactivate invoke APDU shall contain the PISN number of the Served User and the basic service for which the activation / deactivation applies.

The Message Centre PINX may optionally include the number of messages for the Served User in the element nbOfMessages in the mwiActivate invoke APDU.

The Message Centre PINX may optionally include the highest priority of the message for the Served User in the element priority in the mwiActivate invoke APDU.

In state MWI-Mc-Wait, on receipt of a mwiActivate or mwiDeactivate return result APDU, the Message Centre PINX shall stop timer T1, and enter state MWI-Mc-Idle.

NOTE 2

The Message Centre PINX should indicate acceptance to the Message Centre entity.

The Message Centre PINX is responsible for clearing the call-independent signalling connection towards the Served User PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.1.1.2 Interrogation

In state MWI-Mc-Idle, on receipt of a mwiInterrogate invoke APDU using the call reference of a call-independent signalling connection (as specified in 7.3 of ISO/IEC 11582) and if the interrogation is possible, the Message Centre PINX shall get the status of SS-MWI, send back a mwiInterrogate return result APDU to the Served User PINX and stay in state MWI-Mc-Idle.

6.5.1.2 Exceptional procedures

6.5.1.2.1 Activation / deactivation

In state MWI-Mc-Wait, on receipt of a mwiActivate/mwiDeactivate return error APDU from the Served User PINX, the Message Centre PINX shall stop timer T1 and enter state MWI-Mc-Idle.

If timer T1 expires, the Message Centre PINX shall enter state MWI-Mc-Idle.

NOTE 3

The Message Centre PINX should indicate rejection to the Message Centre entity.

The Message Centre PINX is responsible for clearing the call-independent signalling connection towards the Served User PINX. This may occur on receipt of a return error APDU or on expiry of timer T1. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.1.2.2 Interrogation

On receipt of a mwiInterrogate invoke APDU using the call reference of a call-independent signalling connection (as specified in 7.3 of ISO/IEC 11582) and if interrogation is not possible, the Message Centre PINX shall send back a mwiInterrogate return error APDU to the Served User PINX.

6.5.2 Actions at the Served User PINX

The SDL representation of procedures at the Served User PINX is shown in C.2 of annex C.

6.5.2.1 Normal procedures

6.5.2.1.1 Activation / deactivation

On receipt of a mwiActivate/mwiDeactivate invoke APDU using the call reference of a call-independent signalling connection (as specified in 7.3 of ISO/IEC 11582) and if activation / deactivation is possible, the Served User PINX shall activate / deactivate SS-MWI and send back a mwiActivate/mwiDeactivate return result APDU to the Message Centre PINX and remain in MWI-Ser-Idle state.

6.5.2.1.2 Interrogation

On receipt of an interrogation request from the Served User, the Served User PINX shall send a mwiInterrogate invoke APDU to the Message Centre PINX using the call reference of a call-independent signalling connection. The call-independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ISO/IEC 11582. The Served User PINX shall start timer T2 and enter the MWI-Ser-Wait state. The mwiInterrogate invoke APDU shall contain the PISN number of the Served User.

In state MWI-Ser-Wait, on receipt of a mwiInterrogate return result APDU, the Served User PINX shall stop timer T2, and enter state MWI-Ser-Idle.

NOTE 4

The Served User PINX should indicate the result to the Served User.

The Served User PINX is responsible for clearing the call-independent signalling connection towards the Message Centre PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.2.2 Exceptional procedures

6.5.2.2.1 Activation / deactivation

On receipt of a mwiActivate/mwiDeactivate invoke APDU and if the activation / deactivation request cannot be accepted, the Served User PINX shall send a mwiActivate/mwiDeactivate return error APDU with an appropriate error value and enter or remain in state MWI-Ser-Idle;

6.5.2.2.2 Interrogation

In state MWI-Ser-Wait, on receipt of a mwiInterrogate return error APDU from the Message Centre PINX, the Served User PINX shall stop timer T2, and enter state MWI-Ser-Idle.

If timer T2 expires, the Served User shall enter MWI-Ser-Idle.

NOTE 5

The Served User PINX should indicate rejection to the Served User.

The Served User PINX is responsible for clearing the call-independent signalling connection towards the Message Centre PINX. This may occur on receipt of a return error APDU or on expiry of timer T2. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.3 Actions at a Transit PINX

Not applicable.

6.6 SS-MWI impact of interworking with public ISDNs

The SS-MWI procedures specified in this Standard are compatible with the public ISDN procedures for the T reference point. When interworking with public ISDN, a Gateway PINX shall perform the procedures specified below.

NOTE 6

The interrogation function is not supported in the corresponding public ISDN service.

6.6.1 Incoming Gateway PINX procedures

If a MWI activation or deactivation request is received from the public ISDN, the Incoming Gateway PINX shall translate the received APDU and convert it into a mwiActivate or mwiDeactivate invoke APDU and the procedures specified in 6.5.1 or 6.5.2 shall apply.

The Incoming Gateway PINX shall translate the mwiActivate or mwiDeactivate return result APDU received from the Served User PINX into corresponding information and send it to the public ISDN.

6.6.2 Outgoing Gateway PINX procedures

The Outgoing Gateway PINX shall translate the mwiActivate or the mwiDeactivate invoke APDU and send it to the public ISDN according to the procedures for the T reference point.

When receiving a response, the Outgoing Gateway PINX shall generate a mwiActivate or mwiDeactivate return result APDU (if the activation / deactivation was accepted) or a mwiActivate or mwiDeactivate return error APDU (if the activation / deactivation was rejected).

6.7 SS-MWI impact of interworking with non-ISDNs

Not applicable.

6.8 Protocol interactions between SS-MWI and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 standards had been published at the time of publication of this Standard. For interactions with supplementary services and

ANFs for which stage 3 standards are published subsequent to the publication of this Standard, see those other stage 3 standards.

NOTE 7

Simultaneous conveyance of APDUs for SS-MWI and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 standard, does not, on its own, constitute a protocol interaction.

6.8.1 Interaction with Advice Of Charge (SS-AOC)

No interaction.

6.8.2 Interaction with Call Deflection (SS-CD)

No interaction.

6.8.3 Interaction with Call Forwarding Unconditional (SS-CFU)

No interaction.

NOTE 8

A MWI should not be redirected to the diverted-to user. The indication may be given to the Served User.

6.8.4 Interaction with Call Forwarding Busy (SS-CFB)

No interaction.

NOTE 9

A MWI should not be redirected to the diverted-to user. The indication may be given to the Served User.

6.8.5 Interaction with Call Forwarding No Reply (SS-CFNR)

No interaction.

NOTE 10

A MWI should not be redirected to the diverted-to user. The indication may be given to the Served User.

6.8.6 Interaction with Call Interception (ANF-CINT)

No interaction.

6.8.7 Interaction with Call Intrusion (SS-CI)

No interaction.

6.8.8 Interaction with Call Offer (SS-CO)

No interaction.

6.8.9 Interaction with Call Transfer (SS-CT)

No interaction.

6.8.10 Interaction with Calling Name Identification Presentation (SS-CNIP)

No interaction.

6.8.11 Interaction with Connected Name Identification Presentation (SS-CONP)

No interaction.

6.8.12 Interaction with Completion of Call to Busy Subscriber (SS-CCBS)

No interaction.

6.8.13 Interaction with Completion of Call on No Reply (SS-CCNR)

No interaction.

6.8.14 Interaction with Cordless Terminal Authentication (SS-CTAT)

No interaction.

6.8.15 **Interaction with Cordless Terminal Location Registration (SS-CTLR)**

No interaction.

NOTE 11

A MWI may be directed to the new location.

6.8.16 **Interaction with Cordless Terminal Mobility Incoming Call (SS-CTMI)**

No interaction.

6.8.17 **Interaction with Cordless Terminal Mobility Outgoing Call (SS-CTMO)**

No interaction

6.8.18 **Interaction with Do Not Disturb (SS-DND)**

No interaction.

6.8.19 **Interaction with Do Not Disturb Override (SS-DNDO)**

No interaction.

6.8.20 **Interaction with Path Replacement (ANF-PR)**

No interaction.

6.8.21 **Interaction with Recall (SS-RE)**

No interaction.

6.9 **SS-MWI parameter values (timers)**

6.9.1 **Timer T1**

Timer T1 shall operate at the Message Centre PINX during state MWI-Mc-Wait. Its purpose is to protect against an absence of response to the mwiActivate or mwiDeactivate invoke APDU.

Timer T1 shall have a value not less than 15 seconds.

6.9.2 **Timer T2**

Timer T2 shall operate at the Served User PINX during state MWI-Ser-Wait. Its purpose is to protect against an absence of response to the mwiInterrogate invoke APDU.

Timer T2 shall have a value not less than 15 seconds.

Annex A

(normative)

Protocol Implementation Conformance Statement (PICS) Proforma

A.1 Introduction

The supplier of a protocol implementation which is claimed to conform to this Standard shall complete the following Protocol Implementation Conformance Statement (PICS) proforma.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use:

- by the protocol implementor, as a check-list to reduce the risk of failure to conform to the standard through oversight;
- by the supplier and acquirer, or potential acquirer, of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard's PICS proforma;
- by the user or potential user of the implementation, as a basis for initially checking the possibility of interworking with another implementation - while interworking can never be guaranteed, failure to interwork can often be predicted from incompatible PICSs;
- by a protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.2 Instructions for completing the PICS proforma

A.2.1 General structure of the PICS proforma

The PICS proforma is a fixed-format questionnaire divided into sub-clauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered), and the reference(s) to the clause(s) that specifies (specify) the item in the main body of this Standard.

The “Status” column indicates whether an item is applicable and if so whether support is mandatory or optional. The following terms are used:

m	mandatory (the capability is required for conformance to the protocol);
o	optional (the capability is not required for conformance to the protocol, but if the capability is implemented it is required to conform to the protocol specifications);
o.<n>	optional, but support of at least one of the group of options labelled by the same numeral <n> is required;
x	prohibited;
<c.cond>	conditional requirement, depending on support for the item or items listed in condition <cond>;
<item>;m	simple conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;
<item>;o	simple conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable.

Answers to the questionnaire items are to be provided either in the “Support” column, by simply marking an answer to indicate a restricted choice (Yes or No), or in the “Not Applicable” column (N/A).

A.2.2 Additional information

Items of additional information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended or expected that a large quantity will be supplied, and a PICS can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of additional information may be entered next to any answer in the questionnaire, and may be included in items of exception information.

A.2.3 Exception information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirement. No pre-printed answer will be found in the Support column for this. Instead, the supplier is required to write into the Support column an x.<i> reference to an item of exception information, and to provide the appropriate rationale in the exception item itself.

An implementation for which an exception item is required in this way does not conform to this Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

A.3 PICS proforma for ECMA-242

A.3.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation name(s) and version(s)	
Other information necessary for full identification, e.g., name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms name and version should be interpreted appropriately to correspond with a suppliers terminology (e.g. type, series, model).

A.3.2 Protocol summary

Protocol version	1.0
Addenda implemented (if applicable)	
Amendments implemented	
Have any exception items been required (see A.2.3)?	No [] Yes [] (The answer Yes means that the implementation does not conform to this Standard)

Date of Statement	
-------------------	--

A.3.3 General

Item	Question/feature	References	Status	N/A	Support
A1	Behaviour as Message Centre PINX for activation and deactivation of SS-MWI		o.1		Yes [] No []
A2	Behaviour as Message Centre PINX for interrogation of SS-MWI		A1:o	[]	Yes [] No []
A3	Behaviour as Served User PINX for activation and deactivation of SS-MWI		o.1		Yes [] No []
A4	Behaviour as Served User PINX for interrogation of SS-MWI		A3:o	[]	Yes [] No []
A5	Behaviour as Incoming Gateway PINX for interworking with a public ISDN for activation and deactivation of SS-MWI		o		Yes [] No []
A6	Behaviour as Outgoing Gateway PINX for interworking with a public ISDN for activation and deactivation of SS-MWI		o		Yes [] No []

A.3.4 Procedures

Item	Question/feature	References	Status	N/A	Support
B1	Support of relevant ISO/IEC 11582 procedures at the Message Centre PINX	6.2.1	A1:m	[]	m:Yes []
B2	Support of relevant ISO/IEC 11582 procedures at the Served User PINX	6.2.2	A3:m	[]	m:Yes []
B3	Procedures at the Message Centre PINX for activation and deactivation	6.5.1	A1:m	[]	m:Yes []
B4	Procedures at the Message Centre PINX for interrogation	6.5.1	A2:m	[]	m:Yes []
B5	Procedures at the Served User PINX for activation and deactivation	6.5.2	A3:m	[]	m:Yes []
B6	Procedures at the Served User PINX for interrogation	6.5.2	A4:m	[]	m:Yes []
B7	Procedures at an Incoming Gateway PINX for interworking with a public ISDN for activation and deactivation	6.6.1	A5:m	[]	m:Yes []
B8	Procedures at an Outgoing Gateway PINX for interworking with a public ISDN for activation and deactivation	6.6.2	A6:m	[]	m:Yes []

A.3.5 Coding

Item	Question/feature	References	Status	N/A	Support
C1	Sending of mwiActivate invoke APDU and receipt of mwiActivate return result and error APDU	6.3.1	A1:m	[]	m:Yes []
C2	Receipt of mwiActivate invoke APDU and sending of mwiActivate return result and error APDU	6.3.1	A3:m	[]	m:Yes []
C3	Sending of mwiDeactivate invoke APDU and receipt of mwiDeactivate return result and error APDU	6.3.1	A1:m	[]	m:Yes []
C4	Receipt of mwiDeactivate invoke APDU and sending of mwiDeactivate return result and error APDU	6.3.1	A3:m	[]	m:Yes []
C5	Sending of mwiInterrogate invoke APDU and receipt of mwiInterrogate return result and error APDU	6.3.1	A4:m	[]	m:Yes []
C6	Receipt of mwiInterrogate invoke APDU and sending of mwiInterrogate return result and error APDU	6.3.1	A2:m	[]	m:Yes []



A.3.6 Timers

Item	Question/feature	References	Status	N/A	Support
D1	Support of timer T1	6.9.1	A1:m	[]	m:Yes []
D2	Support of timer T2	6.9.2	A4:m	[]	m:Yes []

Annex B
(informative)
Examples of Message Sequences

This annex describes some typical message flows for SS-MWI. The following conventions are used in the figures of this annex.

1. The following notation is used:

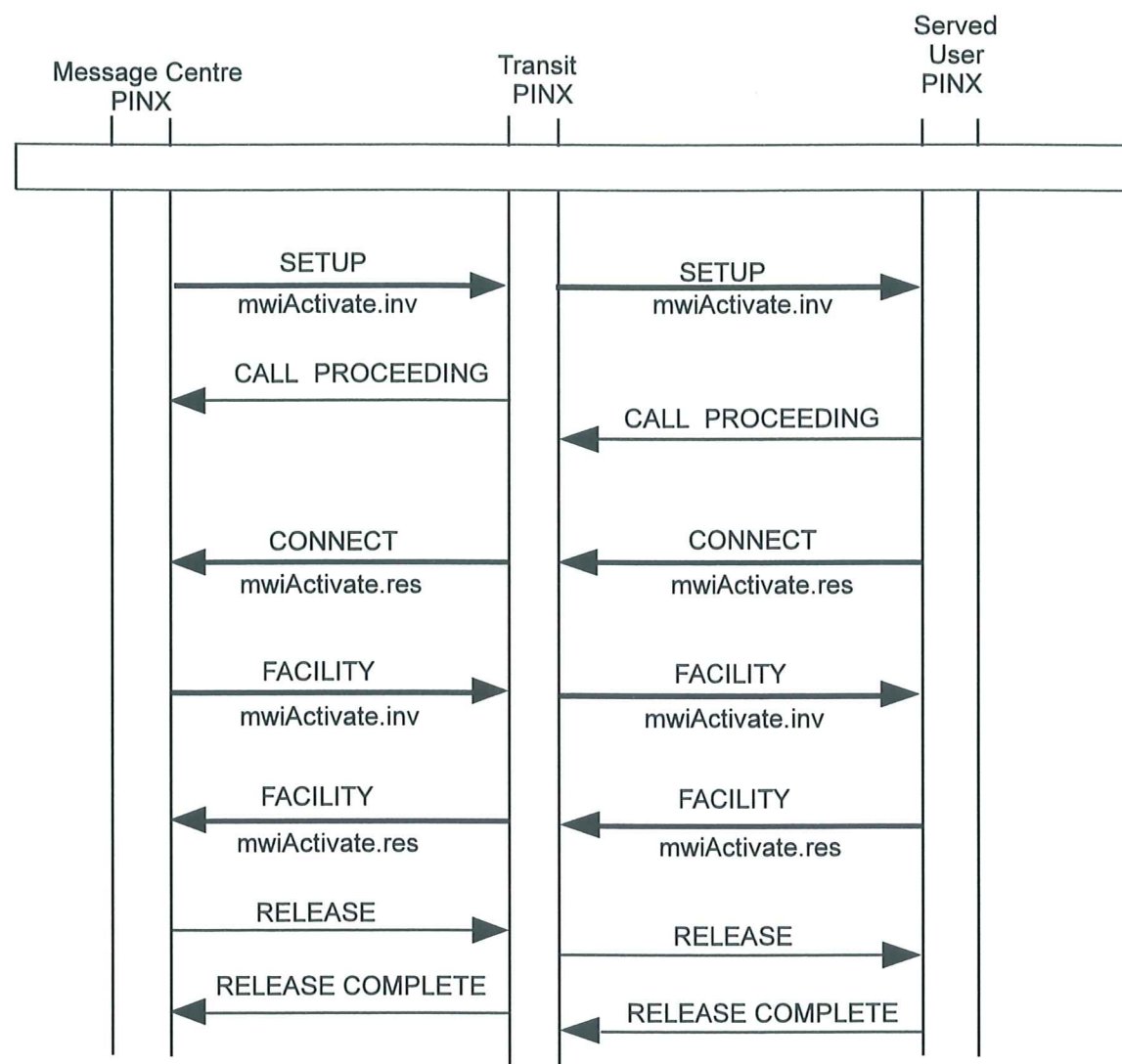
-  Call-independent signalling connection message without SS-MWI information
-  Call-independent signalling connection message containing SS-MWI information

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- 2. The figures show messages exchanged via Protocol Control between PINXs involved in SS-MWI. Only messages relevant to SS-MWI are shown.
- 3. Only the relevant information content (e.g. remote operation APDUs, notifications, information elements) is listed below each message name. The Facility and Notification indicator information elements containing remote operation APDUs and notifications are not explicitly shown. Information with no impact on SS-MWI is not shown.

B.1 Example message sequence for activation of SS-MWI

Figure B.1 shows an example of activation of SS-MWI where the connection is not cleared by the Message Centre PINX after the first activation of MWI.

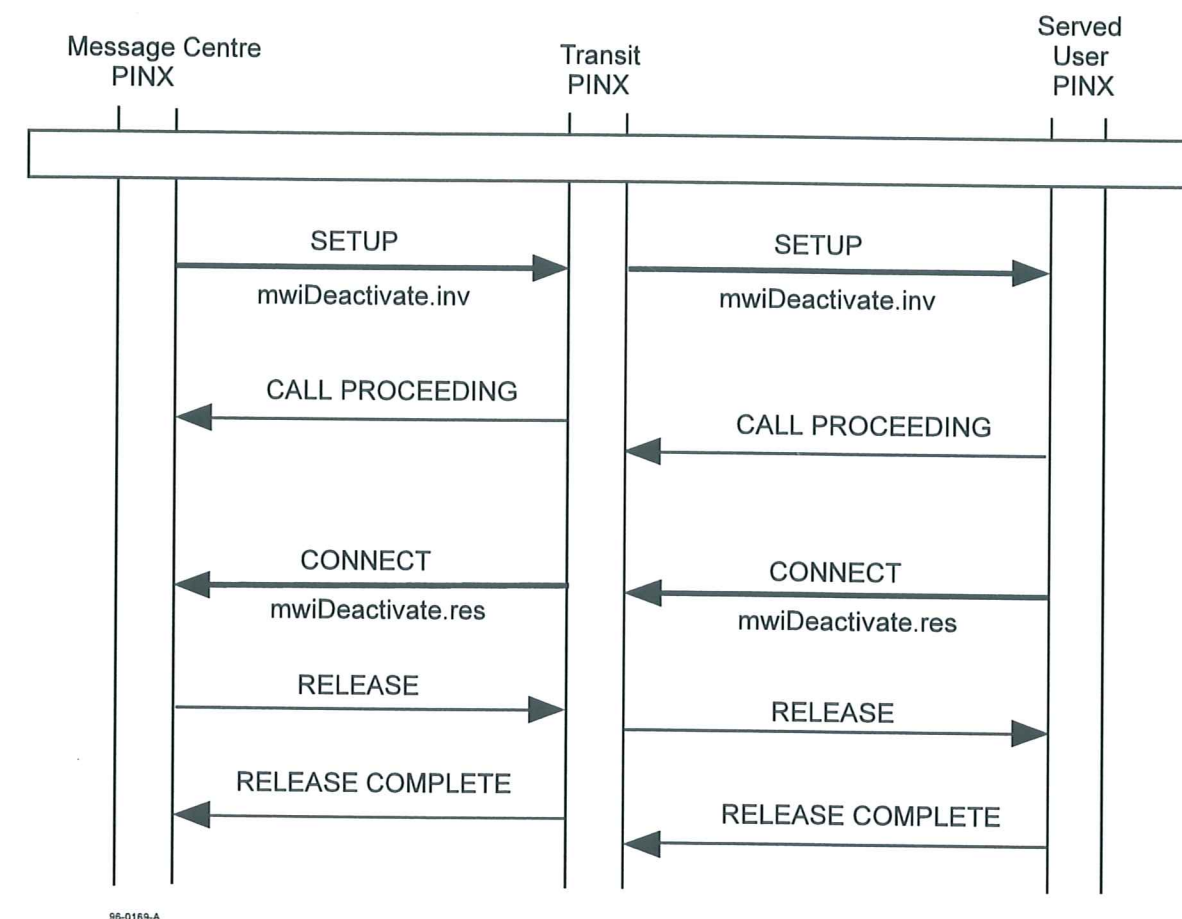


95-0168-A

Figure B.1 - Example of activation of SS-MWI using Connection Retention method

B.2 Example message sequence for deactivation of SS-MWI

Figure B.2 shows an example of deactivation of SS-MWI.

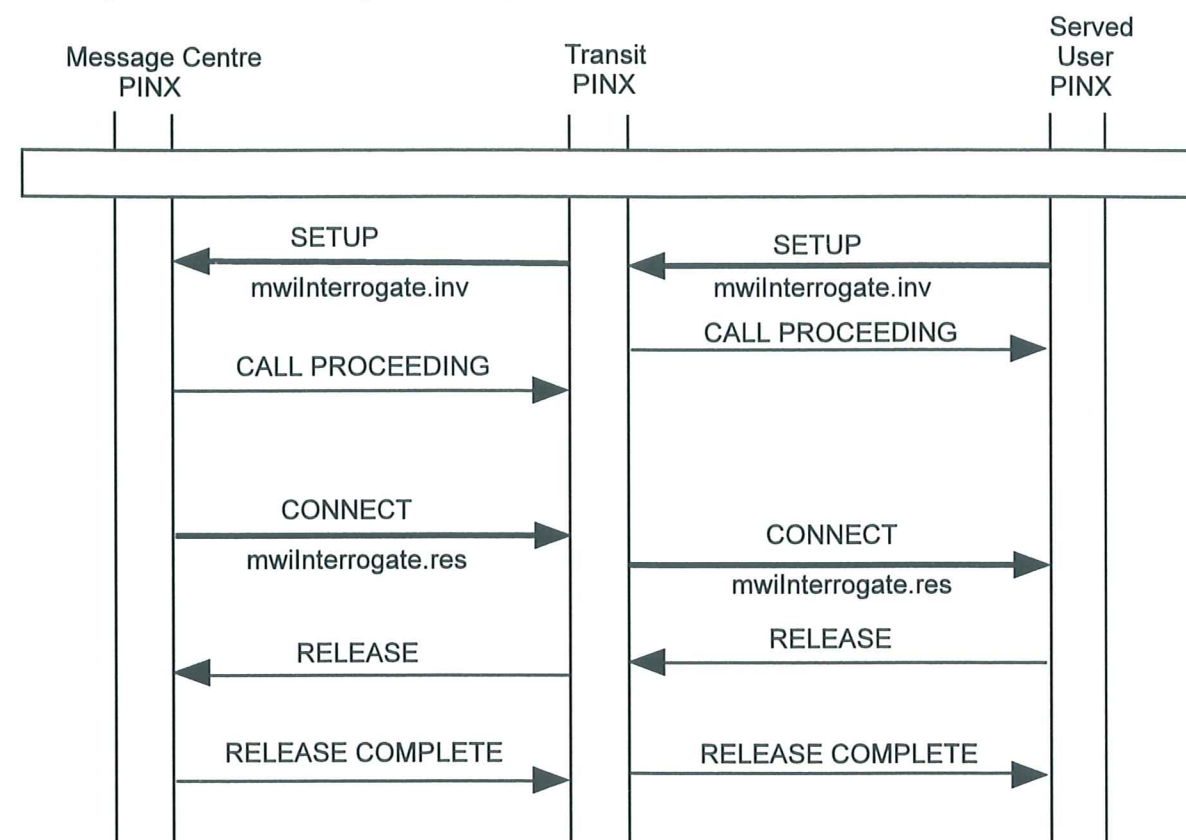


95-0169-A

Figure B.2 - Example of deactivation of SS-MWI

B.3 Example message sequence for interrogation of SS-MWI

Figure B.3 shows an example of interrogation of SS-MWI.



96-0170-A

Figure B.3 - Example of interrogation of SS-MWI

Annex C

(informative)

Specification and Description Language (SDL) Representation of Procedures

The diagrams in this annex use the Specification and Description Language defined in CCITT Rec. Z.100 (1988).

Each diagram represents the behaviour of an SS-MWI Supplementary Service Control entity at a particular type of PINX. In accordance with the protocol model described in ISO/IEC 11582, the Supplementary Service Control entity uses, via the Coordination Function, the services of Generic Functional Procedures Control.

Where an output symbol represents a primitive to the Coordination Function, and that primitive results in a message being sent, the output symbol bears the name of the message and any remote operations APDU(s) or notification(s) contained in that message.

Where an input symbol represents a primitive from the Coordination Function, and that primitive is the result of a message being received, the input symbol bears the name of the message and any remote operations APDU(s) or notification(s) contained in that message. The following abbreviations are used:

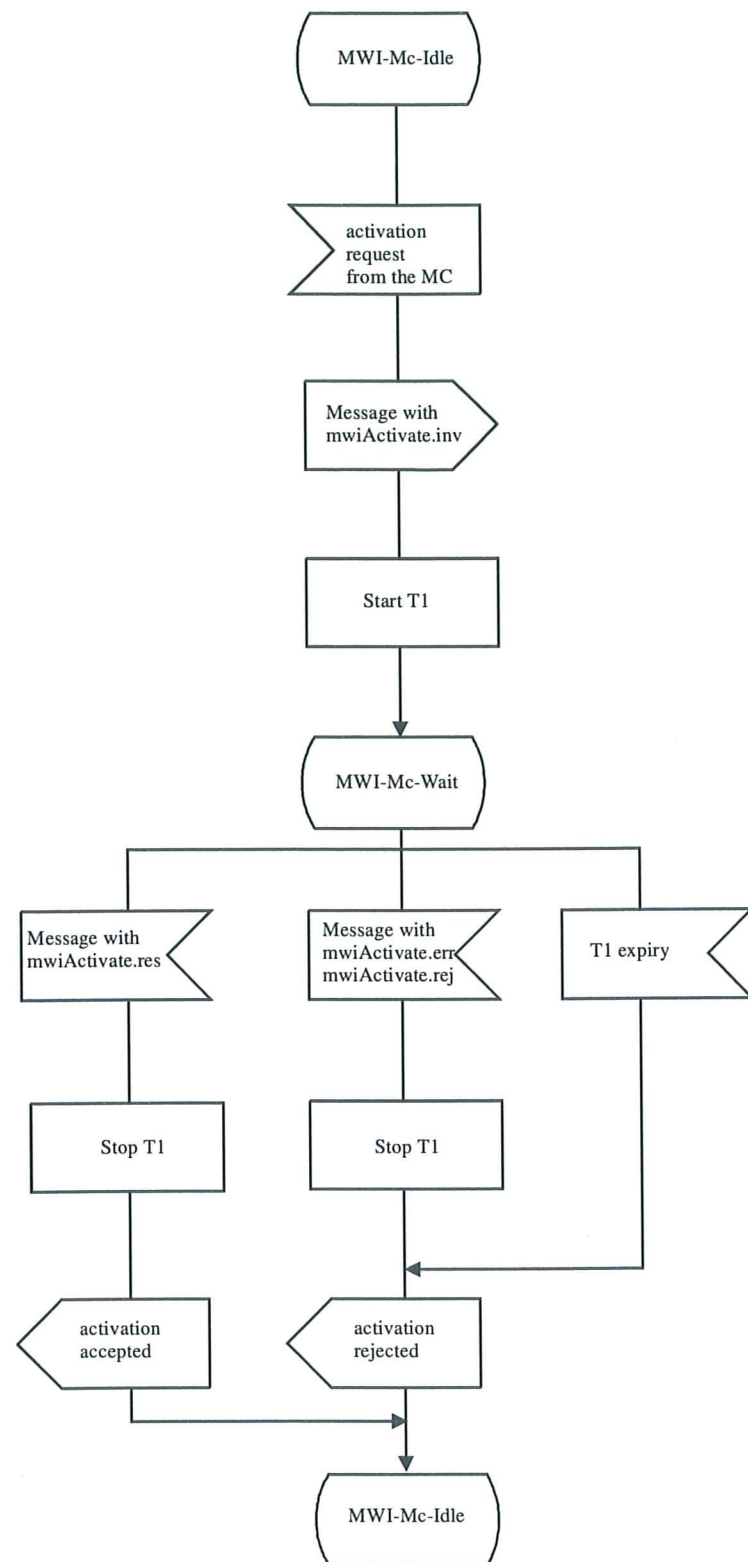
- inv. invoke APDU
- res. return result APDU
- err. return error APDU
- rej. reject APDU

C.1 SDL representation of SS-MWI at the Message Centre PINX

Figures C.1, C.2 and C.3 show the behaviour of an SS-MWI Supplementary Service Control entity within the Message Centre PINX.

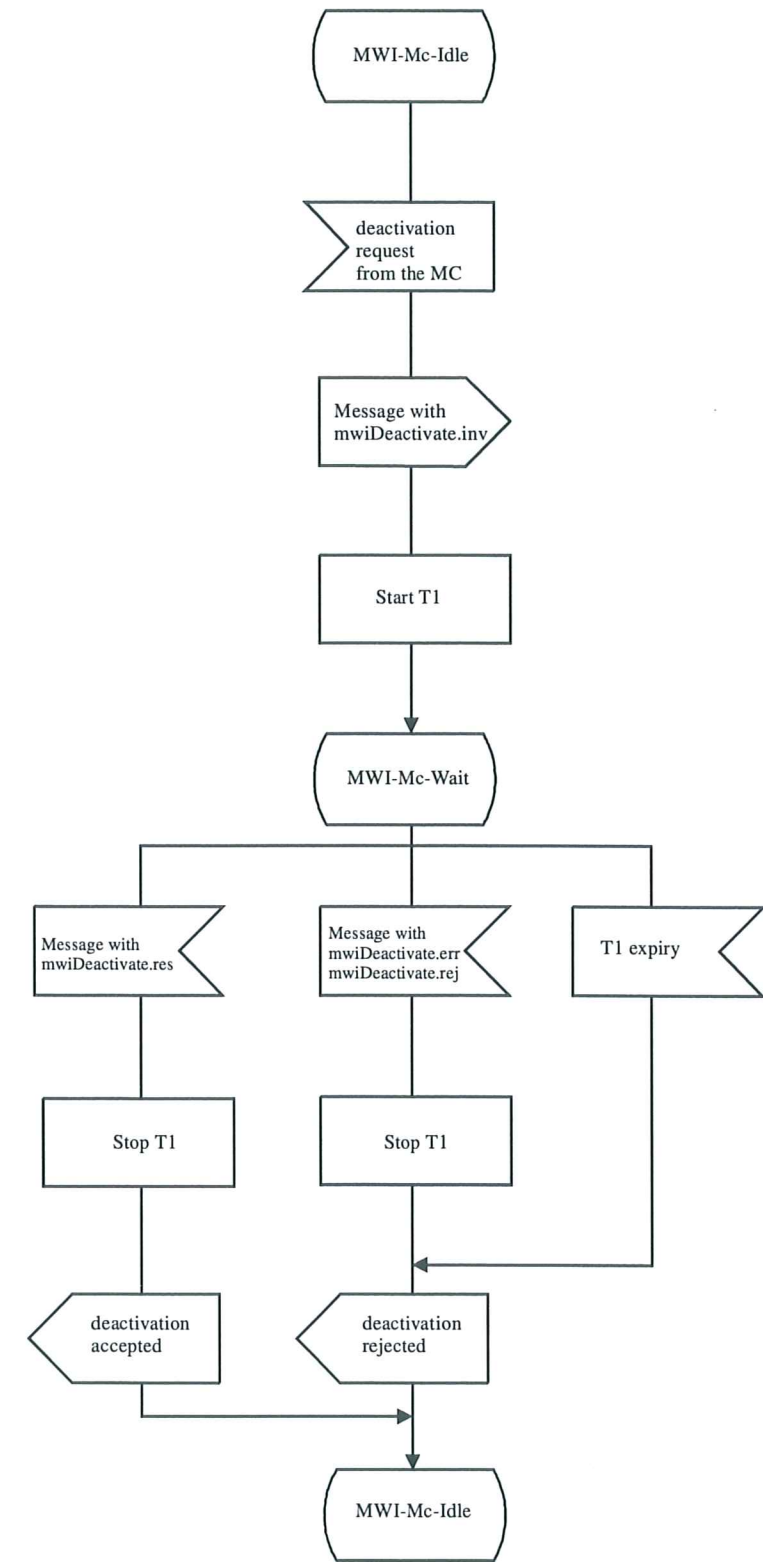
Input signals from the left and output signals to the left represent primitives from and to the Message Centre.

Input signals from the right and output signals to the right represent primitives from and to the Coordination Function in respect of messages received and sent. Also protocol timer expiry is indicated by an input signal from the right.



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Figure C.1 - SDL representation of SS-MWI activation at the Message Centre PINX



96-0172-A

Figure C.2 - SDL representation of SS-MWI deactivation at the Message Centre PINX

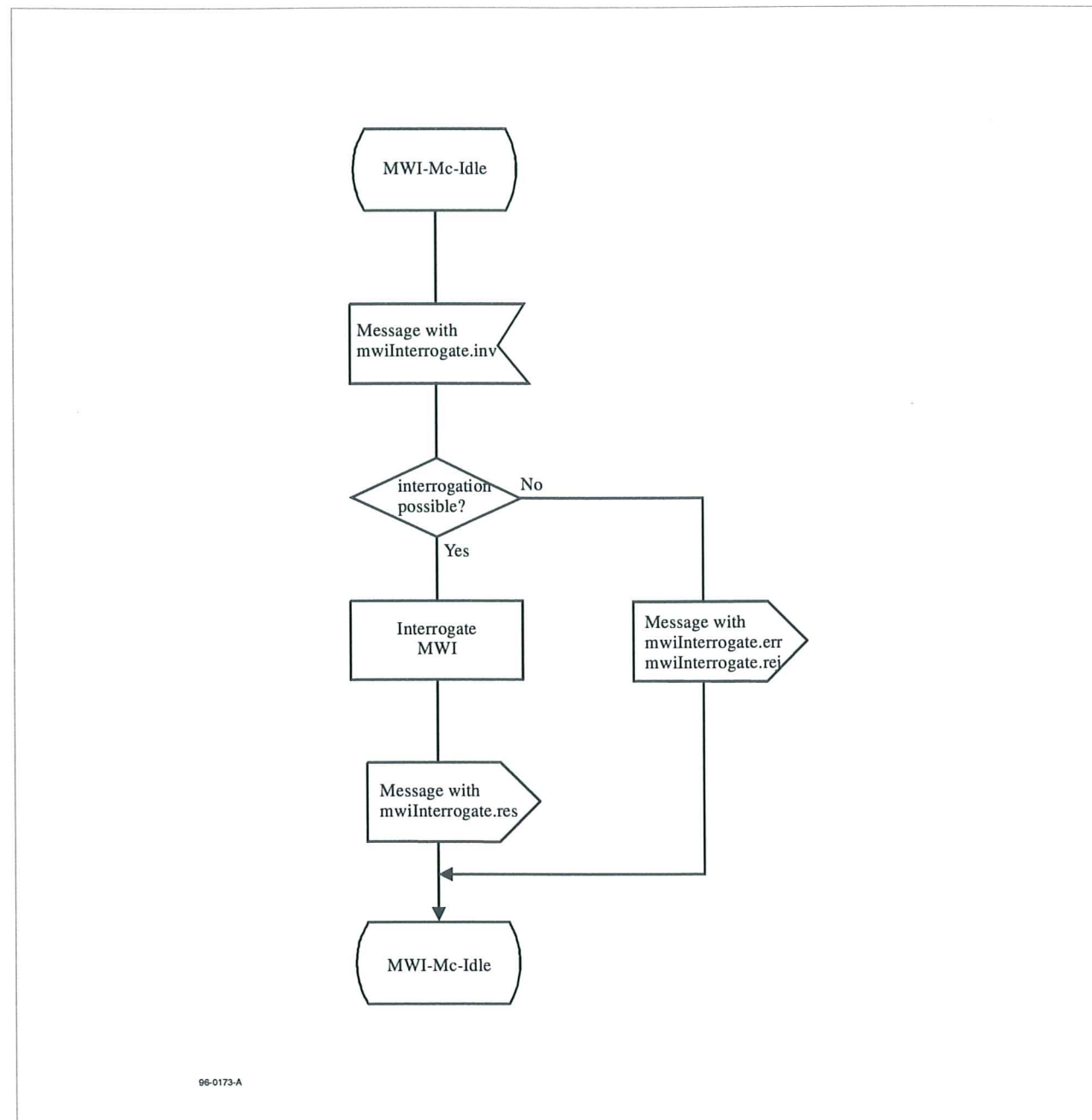


Figure C.3 - SDL representation of SS-MWI interrogation at the Message Centre PINX

C.2 SDL representation of SS-MWI at the Served User PINX

Figures C.4 and C.5 show the behaviour of an SS-MWI Supplementary Service Control entity within the Served User PINX.

Input signals from the right and output signals to the right represent primitives from and to the user.

Input signals from the left and output signals to the left represent primitives from and to the Coordination Function in respect of messages received and sent.

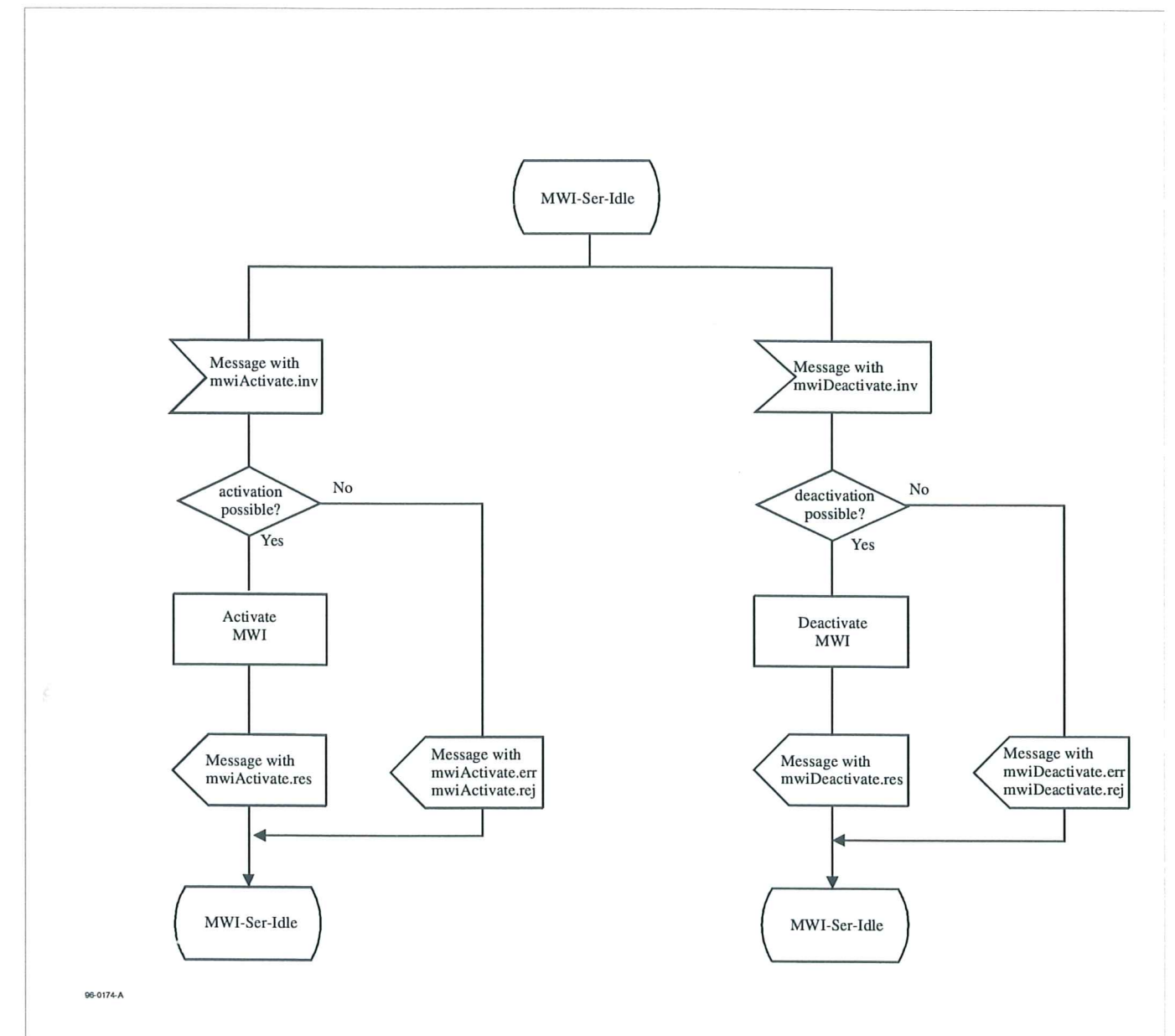
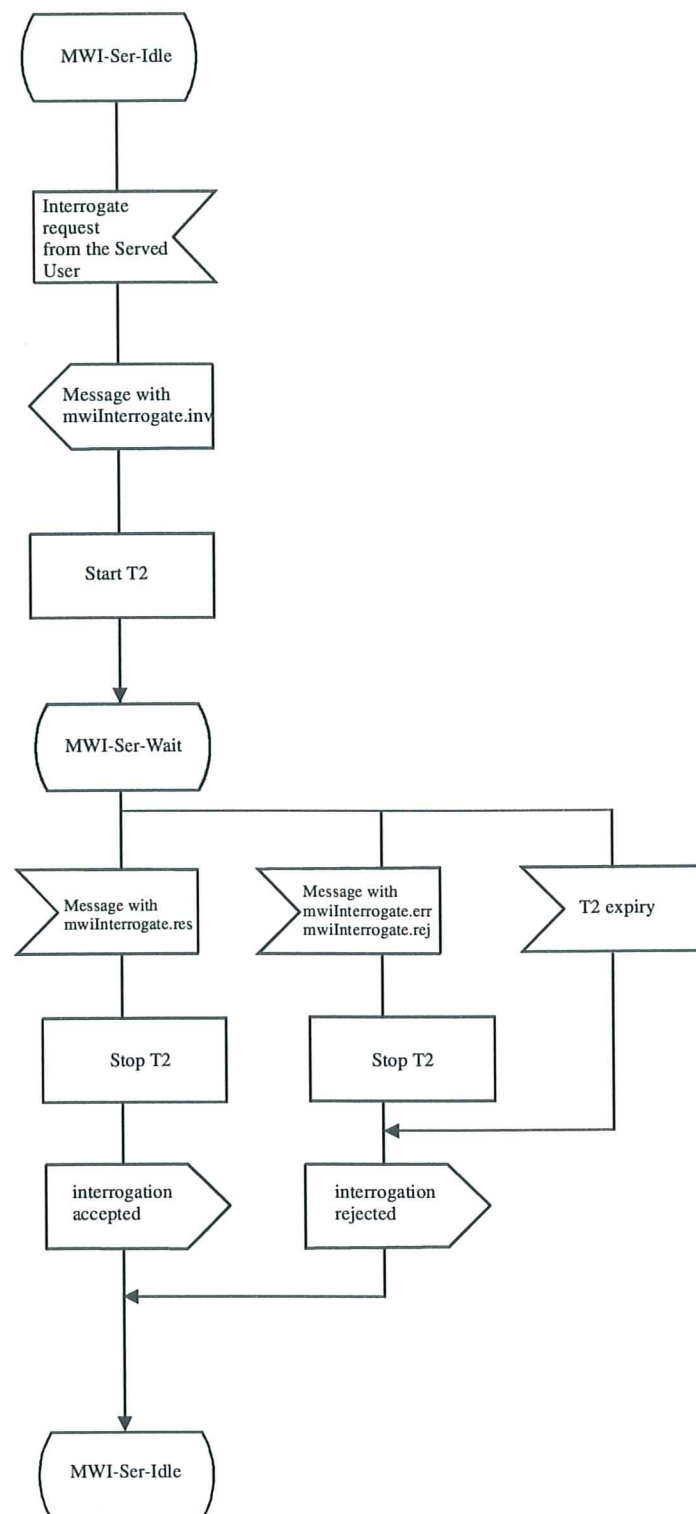


Figure C.4 - SDL representation of SS-MWI activation / deactivation at the Served User PINX



99-0175-A

Figure C.5 - SDL representation of SS-MWI interrogation at the Served User PINX

Annex D

(informative)

Imported ASN.1 definitions

This is an extract from module Addressing-Data-Elements in ISO/IEC 11582.

PartyNumber	::= CHOICE {	
	unknownPartyNumber	[0] IMPLICIT NumberDigits,
	publicPartyNumber	[1] IMPLICIT PublicPartyNumber,
	dataPartyNumber	[3] IMPLICIT NumberDigits,
	telexPartyNumber	[4] IMPLICIT NumberDigits,
	privatePartyNumber	[5] IMPLICIT PrivatePartyNumber,
	nationalStandardPartyNumber	[8] IMPLICIT NumberDigits }
NumberDigits	::= NumericString (SIZE (1..20))	
PrivatePartyNumber	::= SEQUENCE {	
	privateTypeOfNumber	PrivateTypeOfNumber,
	privateNumberDigits	NumberDigits }
PrivateTypeOfNumber	::= ENUMERATED {	
	unknown (0),	
	level2RegionalNumber (1),	
	level1RegionalNumber (2),	
	pISNpecificNumber (3),	
	localNumber (4),	
	abbreviatedNumber (6) }	
PublicPartyNumber	::= SEQUENCE {	
	publicTypeOfNumber	PublicTypeOfNumber,
	publicNumberDigits	NumberDigits }
PublicTypeOfNumber	::= ENUMERATED {	
	unknown (0),	
	internationalNumber (1),	
	nationalNumber (2),	
	networkSpecificNumber (3),	
	subscriberNumber (4),	
	abbreviatedNumber (6) }	

This is an extract from module Call-Diversion-Operations in ISO/IEC 13873.

BasicService	::= ENUMERATED {	
	allServices	(0),
	speech	(1),
	unrestrictedDigitalInformation	(2),
	audio3100Hz	(3),
	telephony	(32),
	teletex	(33),
	telefaxGroup4Class1	(34),
	videotextSyntaxBased	(35),
	videotelephony	(36) }

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Files can be downloaded from our FTP site, [ftp.ecma.ch](ftp://ftp.ecma.ch), logging in as **anonymous** and giving your E-mail address as **password**. This Standard is available from library **ECMA-ST** as a compacted, self-expanding file in MSWord 6.0 format (file E242-DOC.EXE) and as a compacted, self-expanding PostScript file (file E242-PSC.EXE). File E242-EXP.TXT gives a short presentation of the Standard.

The ECMA site can be reached also via a modem. The phone number is +41 22 735.33.29, modem settings are 8/n/1. Telnet (at [ftp.ecma.ch](ftp://ftp.ecma.ch)) can also be used.

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