AT&T

AT&T PRACTICES
AT&T 231-390-176, Issue 8

1A ESS^{TM} Switch
Simplified Message Service Interface
Feature Document

AT&T 231-390-176

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1. Overview

Definition

1.01 The Simplified Message Service Interface (SMSI) feature provides
     centralized and personalized intraoffice telephone answering and
message service capabilities for Centrex and plain old telephone service
(POTS) customers.

1.02 This practice is reissued to add information concerning the RSSMWI
     enhancement.

1.03 This practice does not contain admonishments.

1.04 AT&T welcomes your comments on this practice. Your comments will aid us
     in improving the quality and usefulness of AT&T documentation. Please use
the Feedback Form provided in this practice [mail in or fax (1-708-224-7180)]
or call the AT&T Documentation Preparation Group at (708)224-7053.

1.05 Additional copies of this practice, associated appendixes, and all
    referenced practices may be ordered from the AT&T Customer Information
Center. One of the following methods should be used:

  (a) AT&T Employees: AT&T employees should mail Form IND 1-80.80, available
      from the AT&T Customer Information Center, to:

    AT&T Customer Information Center
    Attention: Order Entry Department
    2855 N. Franklin Road
    P.O. Box 19901
    Indianapolis, IN 46219-1999

        or

    Call 800-432-6600.

      ==> NOTE:
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  (b) Local Exchange Carrier (LEC): Orders should be processed through your
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    P.O. Box 20046
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1.06 Every effort was made to ensure that the information in this practice was
    complete and accurate at the time of printing. However, information is
subject to change.

1.07 Part 7 lists the abbreviations and acronyms with applicable terms used in
    this practice. 1.08 This practice is issued by:

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AT&T Network Software Center
2600 Warrenville Road
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Background

1.09 The SMSI feature provides intraoffice message service capabilities for
    two types of telephone customers as follows:

  (a) A SMSI customer (ao known as Voice Mail Provider (VMP)) establishes a
      message service center (MSC) that has one or more attendant positions
      to provide personalized answering and message services for clients.

==> NOTE:
    Use of the word "attendant" in this document implies either a
    telephone device (for example, an attendant

        console) or a computerized answering device [for
        example, AT&T's Audio Information Exchange (AUDIX)1.

 (b) A SMSI client uses (or subscribes to) answering and message services
     provided by a SMSI customer. A SMSI client can be provided an optional
     audible message waiting indicator (MWI) to indicate that the client has
     a message waiting at the MSC. A SMSI client can ao be provided an
     optional visual MWI or SMWI under the following conditions:

        o The message service system (MSS), intelligent simplex peripheral
          interface (ISPI), and individual calling line identification service
          unit (ISU) hardware is loaded and/or installed in the central
          office.

        o All MSS MWI central office associated parameters are set.

        o The SMSI fast feature bit is set in the central office.

        o The visual message waiting indicator (VMWI) or SMWI is assigned to
          the subscriber's line.

==> NOTE 1:
    The VMWI for SMSI is only available for 1AE9.10, 1AE10.06, and later
    generic programs.

==> NOTE 2:
    The SMWI option is only available for 1AE10.11, 1AE11.05, and later
    generic programs.

==> NOTE 3:
    The VMWI Queue is used to hold VMWI activation and deactivation requests
    for client lines that cannot be signaled by the 1A ESS Switch because they
    are in the off-hook state. In the 1AE10.10, 1AE1 1.03, and later PPUs, the
    VMWI Queue was made engineerable in size, and traffic measurements are
    provided to monitor its use. Offices having the optional VMWI for SMSI may
    benefit from this enhancement. A parameter run is required to change the
    queue size and/or build the traffic counts. Refer to Part 6 A(1) for more
    information on the VMWI Queue.

1.10 A data link between the 1A ESS Switch and a MSC is used to send call
     information to the MSC. Call information allows a MSC attendant to
efficiently handle each call on a personalized basis. Service requests to
activate and deactivate audible and/or visual MWIs for client Directory
Numbers (DNs) are received from the MSC via the data link.

Economic Worth

1.11 The SMSI feature provides benefits for telephone companies, SMSI
     customers, and clients.

1.12 Benefits for telephone companies include the following:

(a) Attracts new SMSI customers and clients.

(b) Generates revenues by billing for the SMSI feature.

(c) Generates additional revenues as a result of increased usage of custom calling features (for example, call forwarding) by clients.

1.13 Benefits for SMSI customers include the following:

  (a) Capability to provide centralized and personalized intraoffice message services for both Centrex and POTS clients

  (b) Capability to display/print call information that is received from the 1A ESS Switch for each call to the MSC

  (c) Capability to request activation/deactivation of audible and/or visual MWIs for client DNs that have the optional audible and/or visual MWI

  (d) Choice of a variety of vendor equipment alternatives for the customer-provided MSC equipment

  (e) Capability to tailor the customer- provided MSC equipment to satisfy unique customer needs.

1.14 Benefits for SMSI clients include the following:

  (a) Centralized and personalized call coverage for direct cal and calls that are forwarded to a MSC

  (b) Capability to direct dial a MSC to receive and/or leave messages

  (c) Choice of one or more of the following features to forward cal to a MSC:

    o Call Forwarding Busy Line (CFBL)

    o Call Forwarding Don't Answer (CFDA)

    o Call Forwarding Variable (CFV) a Make-Busy and/or Night Transfer Services.

  (d) Capability to provide an optional audible and/or visual MWI.

1.15 The SMSI feature is similar to the MSS feature. The MSS feature provides additional capabilities and options for customers and clients. For detailed MSS feature information, refer to Part 6 A(1). The SMSI feature is available for customers and clients that do not require the additional capabilities and options of the MSS feature.

Availability

1.16 The SMSI feature is available in the 1AE7 and later generic programs.

1.17 The optional Simplified Message Service Privacy Control (SMSPC) feature is available in the 1AE8A.09 and later 1AE8A PPUs and in the 1AE9.05 and later generic programs.

1.18 The optional VMWI for SMSI is available in the 1AE9.10, 1AE10.06, and
     later generic programs. The VMWI for SMSI requires MSS, ISPI, and ISU to
be loaded/installed in the central office, and all MSS and VMWI parameters to
be set.

1.19 The optional VMWI Queue enhancement is available in the 1AE10.10,
     1AE11.03, and later generic programs. This enhancement only applies when
the central office has VMWI for SMSI.

1.20 The SMWI option is available in the 1AE10.11, 1AE11.05, and later
     generic programs. SMWI applies only to offices with the optional VMWI for
SMWI.

1.21 The per I/O channel traffic measurements enhancement is available in the
     1AE10.11, 1AE11.05, and later generic programs.

1.22 The SMSI Privacy Control/VMS Interaction enhancement is available in the
     1AE10.12, 1AE11.06, and later generic programs.

1.23 RSSMWI (Audible Message Waiting Indicator for Individual RSS Lines)
     enhancement, is available as of 1AE10.13 and 1AE11.07 and later generic
updates. This enhancement does not allow Visual or Simultaneous MWI.

Feature Groups

1.24 No feature group is required for the SMSI feature and the SMSPC feature
     option. The SMSI feature and the SMSPC feature option are custom features
provided in the base generic program. These features are "fast features" that
are controlled (that is, turned on or off) via set cards. The SMSPC feature
requires the SMSI feature to be turned on.

Feature Assignment

1.25 The SMSI feature is assigned for a SMSI customer on a per-multiline hunt
     group (MLHG) basis.

1.26 The SMSPC feature option is implemented on a per-office basis; however, a
     SMSPC "override" option is available for use only in the SMSI message
desk Centrex common block.

1.27 The audible visual MWI, VMWI, and SMWI options are available for SMSI
     client stations on a per-line basis.

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2. User Perspective

User Profile

2.01 The SMSI feature is designed for Centrex and POTS customers and clients
     that require centralized and personalized intraoffice message service
capabilities. POTS customers must be assigned to a MLHG, not an individual
line.

Customer Premises Equipment

A. Message Service Center Equipment

2.02 A SMSI customer establishes a MSC that contains one or more attendant
      positions and a message service (MS) controller. Each attendant position
requires answering equipment and can be equipped with a display/print device
to display call information. A MS controller is required for the data link
between the 1A ESS Switch and the MSC.

2.03 Attendant answering equipment can be a standard telephone set, a key
      telephone set, an attendant console, or other similar equipment that is
served by telephone office lines.

  ==> NOTE:
      Attendant equipment served by telephone office trunks cannot be used.
      For example, 51A Customer Premises System (CPS) attendant consoles
      cannot be used because they are served by telephone office trunks.

2.04 A display/print device can be any type of device capable of receiving
      and displaying/printing call information. The display/print equipment
must be compatible with the MS controller.

2.05 The MS controller processes call information (received via the data link
      from the 1A ESS Switch) and distributes the call information to the
display/print device associated with the attendant position that answers the
call. The MS controller is ao used to send MWI activation/deactivation
requests to the 1A ESS switch. The MS controller can be any type of computing
equipment that is compatible with the 1A ESS Switch I/O channel interface. The
MS controller must use the same signaling, control, and data communications
protocol as the 1A ESS Switch I/O channel. The I/O channel uses a standard
Electronic Industries Association (EIA) RS232 asynchronous ASCII interface.

2.06 The MS controller may ao serve other customer requirements. For
      example, a MS controller may ao serve as a message management system.
A controller such as the controller used for AT&T's Advanced Communications
Package - Customer Message Center System (ACP-CMCS) can be used as a MS
controller. For information concerning ACP-CMCS, refer to Part 6 A(2).

  ==> NOTE:
      Although the MS controller and other MSC equipment is customer provided
      equipment, the telephone company may provide equipment
      recommendations.

B. Client Equipment

2.07 A client can use any type telephone set (for example, standard telephone
      set, key telephone set). A client DN requires one or more features
assigned that can forward cal to a MSC. The features that can be used to
forward cal to a MSC are CFBL, CFDA, CFV, Make-Busy, and Night Transfer
Services. For detailed information regarding these features, refer to Part 6
A(3) through A(S).

2.08 No special equipment is required for the optional audible MWI. The
      client telephone set must be able to receive audible tones from the 1A
ESS Switch.

2.09 VMWI and SMWI require an optional client-provided device containing an
      illuminating lamp that is controlled by signa received via the client
line from the 1A ESS Switch.

Feature Description

2.10 One or more attendants at the MSC answer and handle client cal using
customer-provided equipment. Attendant

equipment operations depend on the customer-provided MSC equipment. The MSC
equipment should be capable of sending MWI activation/deactivation requests
via the data link to the 1A ESS Switch. Procedures for handling cal are
established by the SMSI customer.

2.11 When a direct dialed or forwarded client call is completed to a MSC
attendant, call information is delivered to the answering attendant
position as follows:

  (a) For a direct dialed call, the call information Includes the calling DN
      and an indication that the call is a direct dialed call.

  (b) For a forwarded call, the call information includes the called (client)
      DN, an indication of the type of call forwarding, and may or may not
      include the calling DN.

2.12 Delivery of the calling DN for a direct dialed call or a forwarded call
depends on whether or not the DN is an intraoffice DN and whether or
not the optional SMSPC feature is provided for the office.

2.13 Without the optional SMSPC feature, the following conditions apply to
the delivery of the calling DN:

  (a) Only an intraoffice DN can be delivered as a calling DN for either a
      direct dialed call or a forwarded call. No DN served by another switch
      [with or without Integrated Services User Part (ISUP) and Local Area
      Signaling Services (LASS)] can be delivered as the calling DN.

  (b) Any intraoffice DN can be delivered as the calling DN for either a
      direct dialed call or a forwarded call, regardless of whether or not it
      is marked for privacy (that is, LASS privacy is ignored).

2.14 The SMSPC feature (fast feature 34) was released in the 1AE8A.09 and
1AE9.05 generic point issues. The SMSPC feature ensures that customers
with nonpublished telephone numbers calling into a MSC do not have their DNs
delivered to the MSC. (The MSC is the facility where the "message desks' is
located.) 2.15 The message desk DN for SMSI is assigned to a MLHG. This MLHG
can be assigned to a Centrex station. SMSPC is now available for use with or
without Centrex. Both offerings of SMSPC (with or without Centrex) are
explained below:

  (a) With Centrex-SMSPC should restrict the delivery of the calling DN
      unless it is within the message desk master Centrex, or if the message
      desk override option bit SMPO is set in the message desk Centrex common
      block. The following describes which types of cal SMSPC
      allows/disallows to be delivered. Telephone subscribers who pay for
      services such as nonpublished and unlisted numbers are paying to have
      their DNs not printed in the telephone directory and/or unavailable for
      the telephone operator. However, these DNs can be displayed on such
      devices as individual calling line identification (ICLID), delivered to
      the SMSI Message Center, etc. The call scenarios apply to both direct
      cal and call forwarded calls.

            (1) If calling DN is non-Centrex and the SMSI multiline hunt group

DN is Centrex, do not deliver the calling DN.

(2) If calling DN is non-Centrex and the SMSI multiline hunt group DN is non-Centrex, deliver the calling DN.

(3) If calling DN is Centrex and the SMSI multiline hunt group DN is non-Centrex, deliver the calling DN.

(4) If calling DN is Centrex and the SMSI multiline hunt group DN is Centrex, deliver the calling DN only if the Centrex numbers of both DNs are in the same master Centrex.

(5) If the SMSPC override bit (SMPO) is set to 1 in the message desk Centrex common block, deliver the calling DN for all cal.

(b) Without Centrex-the SMSI Privacy Control/ VMS Interaction

enhancement provides the capability for the SMSPC feature to interact with a VMS defined in a POTS MLHG. The option to block calling party numbers (CPNs) delivered to message desks defined in a non-Centrex MLHG will be provided on a per MLHG basis. The following describes which types of cal SMSPC allows/disallows to be delivered with this enhancement.

(1) If calling DN is non-Centrex and the SMSI multiline hunt group DN is non-Centrex, the CPN is delivered only if the POTS MLHG Privacy Control Bit (PSVII) is 0 in the SMSI MLHG common block.

(2) If calling DN is Centrex and the SMSI multiline hunt group DN is non-Centrex, the CPN is delivered only if the POTS MLHG Privacy Control Bit (PSVII) is 0 in the SMSI MLHG common block.

(c) SMSPC Calling Party Number Delivery Option

An enhancement has been provided to SMSPC which allows a central office to choose between two versions of SMSPC: one version allows delivery of the Calling Party Number (CPN) during all direct cal to the message desk, ao known as Voice Mail Provider (VMP). The other version, however, blocks the CPN for direct cal but with some exceptions. How the central office chooses between the two versions is by setting or not setting an Office Option bit: word 10, bit 20 in the Office Option Table. For example. if it is decided to use the version of SMSPC which does not block the CPN for direct cal (i.e., all direct calls are delivered to the message desk), then bit 20 of word 10 must be set equal to 1. If, however, the CPN is to be blocked for most direct cal, then bit 20 is not set (i.e., bit 20 must = 0). This means that SMSPC will be configured as discussed in parts "a" and "b" above.

The following call scenarios describe SMSPC with bit 20 set equal to 1. This description only applies to call- forwarded cal since all direct cal result in the CPN being delivered.

==> NOTE:
        The called DN, in these scenarios, is the SMSI client who

subscribes to the VMP's services.

(1) If CPN is non-Centrex and the called DN is Centrex, do not
deliver the CPN;

(2) If CPN is non-Centrex and the called DN is non-Centrex, do not
deliver the CPN

(3) If CPN is Centrex and the called DN is non-Centrex, do not
deliver the CPN;

(4) If CPN is Centrex and the called DN is Centrex, deliver the CPN
only if the Centrex group numbers are assigned to the same
Master Centrex complex, or, if the SMSPC Override bit (SMPO) is
set equal to 1 in the CPN's Centrex common block, then deliver
the CPN.

2.16 Generally, clients call the MSC to retrieve messages although other
arrangements are possible. For example, a MSC attendant can call a
client to deliver a message. Usual methods for a client to retrieve messages
are as follows:

(a) If a client is not provided the optional audible or visual MWI, the
client can periodically call the MSC to inquire about messages.

(b) If a client is provided the optional audible MWI, when a message is
received for that client, the MSC sends a request to the 1A ESS Switch
to activate the audible MWI for that client DN. The audible MWI is
stutter dial tone provided by the 1A ESS Switch whenever the client
line goes off-hook to originate a call. This indicates to the client
that a message is waiting at the MSC. Stutter dial tone is 2 seconds of

interrupted dial tone (that is, 100 ms on, 100 ms off). If stutter dial
tone times out (after approximately 2 seconds) and if no d-digits have
been received, regular dial tone is provided. Stutter dial tone is
provided each time the client line goes off-hook until the audible MWI
for that client DN is deactivated.

(c) After a client retrieves a message, the MSC sends a request to the 1A
ESS Switch to deactivate the audible MWI for that client DN.

(d) The RSSMWI enhancement provides audible MWI for individual RSS lines
and RSS lines assigned to a Multiline Hunt Group or Centrex.

(e) The audible MWI requires no special client equipment.

(f) A client can initiate an MWI deactivation request by dialing an
assigned MWI deactivation access code (if so provided); initiating an
MWI activation request is not permitted.

(g) If a client is provided the optional VMWI, when a message is received
for that client, the 1A ESS switch sends the appropriate control signal
to the client-provided equipment via the client line. A control signal
can be sent only when the client line is in an on- hook state. If a
request is received and the client line is in the on-hook state, the 1A

ESS Switch sends the control signal immediately. If the client line is in the off-hook state, the request is put in the VMWI Queue for up to 2-1/2 hours waiting for the client line to go to the on-hook state. The 1A ESS Switch executes the request when on-hook is detected during the 2-1/2 hour time period. If on-hook is not detected during the 2-1/2 hour time period, the request is removed from queue and lost.

2.17 If a client has the optional SMWI feature, the line receives both audible MWI and VMWI treatment. SMWI requires the same client-provided equipment as VMWI. When an activation/deactivation request is received for SMWI, the audible portion is processed immediately. If the line is in the on-hook state, the VMWI control signal is ao sent immediately. If the line is off-hook, the VMWI portion of the request is queued for up to 2-1/2 hours. See paragraph 2.16 for more information on VMWI.

Input/Output Channel Message Formats

2.18 Messages sent via the data link between an I/O channel at the 1A ESS switch and the MS controller at a MSC include call information messages, audible and visual MWI activation/deactivation messages, and MWI error messages. Each type of message has a unique format.

A. Call Information Message Format

2.19 The format of a call information message sent to the MSC is as follows:

  (a) Two bytes, containing a carriage return (octal 015) and line feed (octal 012), indicate the beginning of the message.

  (b) Two bytes, containing the characters "MD", indicate the message is a MSC message.

  (c) Three bytes, containing a 3~-digit decimal number, identify the MSC associated with the call.

  (d) Four bytes, containing a 4<l-digit decimal number, identify the MSC attendant position associated with the call.

  (e) One byte, containing an alphabetic character, indicates the type of call as follows:

        o The character "A" indicates that the call is either a CFV, Make-Busy, or Night Transfer call.

        o The character "B" indicates that the call is a CFBL call.

        o The character "D" indicates that the call is a direct dialed call.

        o The character "N" indicates that the call is a CFDA call.

  (f) A variable number of bytes, containing a decimal number, identifies the called (client) DN for a call that is forwarded to the MSC.

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    ==> NOTE:
            If for any reason the called DN is not available, this field will

be empty or filled with zeroes.

(g) A space follows the last byte of the called DN to indicate the end of the called DN field.

==> NOTE:
    A space is provided whether or not a called DN is contained in the called DN field.

(h) A variable number of bytes, containing a decimal number, identifies the calling DN.

==> NOTE:
    If for any reason the calling DN is not available, this field will be empty or filled with zeroes.

(i) A space follows the last byte of the calling DN to indicate the end of the calling DN field.

==> NOTE:
    A space is provided whether or not a called DN is contained in the calling DN field.

(j) Two bytes, containing a carriage return (octal 015) and line feed (octal 012), indicate the end of the message.

(k) End of Message <EM> character (octal 31) is not to be used if customized channel is configured for half duplex (HDX). The <EM> character is used for full duplex (FDX) only.

==> NOTE:
    If the customized I/O channel is configured for half duplex, whether an I/O frame (J5A006A) or an I/O processor (J5AOO6C or J5A006D) is used, and the output message (central office to customer) ends with an <EM> character, base level maintenance (BLM) reports will occur. These BLMs will cause the custom channel specified to be taken out-of- service until the BLM report has completed. During this time, no SMSI message will be sent to the MSC. This problem does not occur on FDX channe. Furthermore, there may be seemingly random fill characters generated by the I/O supervisory programs between messages.

B. Audible, Visual, and Simultaneous Message Waiting Indicator Message Formats

2.2O The formats of the audible, visual, and simultaneous MWI activation and deactivation request messages sent to the 1A ESS Switch are as follows:

(a) The activation request message format is "OP:MWI dd...d!". Item "dd...d" represents the client 7-digit DN, which must be specified in the request message.

(b) The deactivation request message format is "RMV:MWI dd.. .d!". Item "dd...d" represents the client 7-digit DN, which must be specified in the request message.

==> NOTE:
    No acknowledgement message is returned to the MSC in response to a successful audible, visual, or simultaneous MWI request message. If a MWI request message is not successful, a MWI error message is returned to the MSC.

C. Message Waiting Indicator Error Message Format

2.21 An unsuccessful MWI request can be due to either an error in the request
      message (invalid DN) or a blocked condition (lack of resources) in the
1A ESS Switch. The nature of the error is indicated in a MWI (System Catalog)
error message sent to the MSC. The error message format is as follows:

   (a) Two bytes, containing a carriage return (octal 015) and line feed
       (octal 012), indicate the beginning of the message.

   (b) Three bytes, containing the characters "MWI", indicate the message is a
       MWI message.

   (c) A variable number of bytes, containing a decimal number, indicates the
       client DN specified in the MWI request message received from the MSC.

   (d) A space follows the last byte of the DN to indicate the end of the DN
       field.

   (e) Three bytes, containing either the characters "INV" or "BLK", indicate
       the MWI error condition as follows:

           (1) The characters "INV" indicate either an invalid DN was specified
               in the MWI request message or the DN specified is not provided the
               optional message waiting indicator. An example is OP:MWI 0!, where
               OP:MWI is used by an SMSI message center to request activation of
               a message waiting indicator on the specified DN. In this example,
               the DN is shown as zero (0). Such a message will result in an INV
               acknowledgement at the customer premise equipment.

         ==> NOTE:
                       The Input/Output Processor (10P) pol for I/O channel work
                       every 50 milliseconds. Because of this, it is required that
                       the inter-message delay time (the time between the "eot"
                       character and the first character of the next message, "O"
                       or "R") be 50 milliseconds. If the 1A Switch experiences Base
                       Level Maintenance reports due to input buffer overflow, it
                       is recommended that the inter-message delay time be
                       increased to 100 msec.

           (2) The characters "BLK" indicate that the MWI request was blocked
               because resources were not available in the 1A ESS Switch. An
               example would be no temporary recent change registers available to
               provide audible MWI.

           (3) See Table 2-8 in the document referenced in Part 6 B(5) for
               additional information on other input acknowledgements (for
               example, ?A, ?C, ?1, ?P).

   (f) Two bytes, containing a carriage return (octal 015) and line feed
       (octal 012), indicate the end of the MWI error message.

   (g) End of Message <EM> character (octal 31) is not to be used if
       customized channel is configured for HDX. The <EM> character is used
       for FDX only.

==> NOTE:
   If the customized I/O channel is configured for half duplex, whether an
   I/O frame (J5AOO6A) or an I/O processor (J5AOO6C or J5AOO6D) is used,
   and the output message (central office to customer) ends with an <EM>
   character, BLM reports will occur. These BLMs will cause the custom
   channel specified to be taken out-of-service until the BLM report has
   completed. During this time, no SMSI message will be sent to the MSC.
   This problem does not occur on FDX channe. Furthermore, there may be
   seemingly random fill characters generated by the I/O supervisory
   programs between messages.

D. Customized I/0 Channel Error Report (CERF)

2.22 The customized I/O CERF enhancement provides a mechanism to report to the
   1A craft when an erroneous input message is being sent from a remote
customer premise device over a customized I/O channel. This enhancement was
introduced in the 1AE9.07 and 1AE1O.01 generic program. An example is the
following:

OP-MWI 5551212!

The message verb OP-MWI is incorrect. The correct format is OP:MWI 5551212!.
The OP:MWI message is used by an SMSI Message Center to request the activation
of message waiting indicator on a specified DN. The CERF feature parses the
incoming message's verb for proper format. If an error exists, then the 1A ESS
Switch will cause a report message to be printed at the next quarter-hour
report:

REPT:CUSTOMIZED INPUT MESSAGE FAILURES

Interactions

2.23 If a call is forwarded from the called DN to a secondary answering point
   and is then forwarded from the secondary answering point to a MSC, the
DN delivered to the MSC as the called DN depends on the secondary answering
point arrangement as follows:

  (a) If the secondary answering point forwards cal to a MSC via CFBL,
      CFDA, CFV, Make-Busy, and/or Night Transfer, the secondary answering
      point DN (not the originally called DN) is delivered to the MSC as the
      called DN.

  (b) If the secondary answering point forwards cal to a MSC via a series
      completion arrangement, the originally called DN is sent to the MSC for
      display as the called DN. In this case, a call is forwarded to the MSC
      only when all lines hunted in the series completion arrangement for the
      secondary answering point are busy.

  ==> NOTE:
     This enhancement is initially available in the 1AE8A.04 generic
     program.

Compatibility

2.24 Automatic calling line identification is not compatible with the SMSI

feature.

Operational Limitations

2.25 Calling DNs are identified only for intraoffice cal completed to a
     MSC. Calling DNs are not identified for interoffice cal completed to
a MSC.

2.26 Cal forwarded from a station served by another switch to the 1A ESS
     Switch are treated as if they are interoffice direct dial cal to the
1A ESS Switch. Therefore, neither the calling DN nor the called DN served by
another switch are identified for cal that are completed to a MSC.

2.27 An intraoffice DN that forwards cal to a MSC is identified as the
     called DN, even if multiple forwarding occurred. For example, if a call
to a dialed DN is forwarded to a client DN that forwards the call to a MSC,
the client DN that forwards the call to the MSC is identified as the called
DN.

   ==> NOTE:
     One exception is if the client DN is part of a series completion
     arrangement that forwards cal to a MSC. With a series completion
     arrangement, a call is forwarded to a MSC only if all lines hunted are
     busy. In this case, the original called DN is identified as the called
     DN. (Refer to the description of interactions.)

Planning

2.28 A SMSI customer needs to determine the equipment required for the MSC.
     The telephone company may provide information and recommendations for
customer-provided equipment for a MSC.

Restriction Capability

2.29 The SMSI feature is assigned/unassigned by the telephone company for a
     SMSI customer on a per-MLHG basis using the RC:MLHG: recent change
message. For detailed information regarding the RC:MLHG: message, refer to
Part 6 A(6).

2.30 The SMSPC override option is assigned/unassigned by the telephone
     company in the Centrex common block using the RC:CTXCB: recent change
message. For detailed information regarding the RC:CTXCB: message, refer to
Part 6 A(7).

2.31 The SMSPC POTS MLHG Privacy Control option is assigned/unassigned by the
     telephone company for a POTS customer (i.e., for a VMP assignment to a
POTS MLHG) on a per-MLHG basis using the RC:MLHG: recent change message. For
detailed information regarding the RC:MLHG: message, refer to Part 6 A(6).

2.32 The audible MWI, VMWI, and SMWI are assigned/unassigned by the telephone
     company for a client on a per-line basis using the RC:LINE: recent
change message. For detailed information regarding the RC:LINE: message,
refer to Part 6 A(6).

2.33 The following pertains to RSSMWI:

(1) SMSI offices without MSS-audible message waiting indicator provided for individual RSS lines only. For RSS lines in a MLHG, MWI must be assigned to each line.

(2) SMSI offices with MSS loaded- audible message waiting indicator is provided for individual RSS lines. Group MWI provided for MLHGs containing RSS lines.

(3) MSS offices without SMSI - same as (2).

3. Engineering

3.01 The Central Office Equipment Engineering System (COEES) Information System Engineering Document, Index 40, should be used to manually order and engineer the 1A ESS Switch for the SMSI feature. The standard recommended automated procedure is COEES-M0 (Mechanized Ordering).

Hardware

3.02 No special or unique hardware is required for the SMSI feature. Appropriate hardware must be installed in order to provide VMWI. [For detailed information, refer to Part 6 8(7).] Each message desk center (MDC) requires an I/O channel assignment on either an 10P frame or an I/O frame. An 10P frame is recommended for the SMSI feature because full duplex channe are more reliable for I/O messages. For detailed information regarding 10P and I/O frames, refer to Part 6 A(8) and A(9).

Software

A. Base Generic Program

3.03 Approximately 500 words are required in fixed program store (base generic) for the SMSI feature and 250 words for the audible message waiting indicator (AMWI). For detailed information regarding AMWI, refer to Part 6 A(1).

3.04 Approximately 60 words are required in fixed program store (base generic) for the SMSPC feature.

B. Parameter/Call Store Areas

  ==> NOTE:
     For detailed parameter and call store information, refer to Part 6 8(1) and 8(2).

3.05 The SMSI feature is a custom feature that is activated using set card "FF005" to set switch 005 in the FEAT SWITCHES parameter word.

3.06 The SMSPC feature is a custom feature that is activated using set card "FF034" to set switch 034 in the FEAT SWITCHES parameter word.

3.07 The software requirements for an I/O channel depend on whether an 10P frame or an I/O frame is used. For detailed information regarding I/O channel requirements, see CIS COEES Information

System (CIS) Indexes 40 and 47.

C. Translations

  ==> NOTE:
    For detailed translation information, refer to Part 6 B(3) and B(4).

3.08 Each MSC requires a MLHG common block. A MLHG common block for a MSC
    requires a minimum of nine words. Word 8 contains the MSC identification
(bit positions 9 through 14) and the associated I/O channel identification
(bit positions 0 through 8).

3.09 The audible, visual or simultaneous MWI option for a client line
    requires a 1-bit field in word 1 (bit position 23) of the line equipment
number (LEN) and remote equipment number (REN) translators. For the
originating abbreviated class code expansion table, this same field is
contained in word 0.

3.10 The SMSPC override option for a message desk requires a 1-bit field in
    word 25 (bit position 22) of the respective Centrex common block (the
message desk's or the CPN's).

3.11 The SMSPC POTS MLHG Privacy
    Control option requires a 1-bit field in
word 19 (bit position 20) of the non-Centrex
SMSI MLHG common block to which the VMP
is assigned.

3.12 Feature installers should be aware of the
    originating LEN ABB code (defines
certain features against a line) of 16 which
should be assigned a major class of 25
(decimal)/3i (octal). Refer to word 64 of the
abbreviated class code expansion table in Part
6B(4).

Real Time

3.13 A call completed to a MDC using the SMSI feature requires:

  (a) 1000 cycles-for each call message moving across the I/O channe

  (b) 500 cycles-for each OP:MWJ and RMV:MWJ message moving across the I/O
    channel

  (c) 100 cycles-for each application of stutter dial tone.

Output Message Register Versus Output Message Buffer

3.14 With the release of the 1AE8A.06 generic point issue, customized I/O
    channels were Introduced. One of the reasons for having such channels is
to protect sensitive data from loss by maintenance actions and/or shortage of
output message registers (OMRs). From a physical standpoint, these channels are
FDX channels; therefore, they must be assigned to an I/O processor frame.
However, in the case of SMSI (MSS not included), customized I/O channel
service is available in both the HDX (that is, if the central office uses an
I/O frame or if it has an I/O processor configured for HDX) and FDX modes.

A. 0utput Message Registers

3.15 The 0MR is a 64-word memory block used as an intermediate storage area
     prior to sending an output message. It contains the data plus control
information for output messages. In the 1A ESS Switch, two methods are
provided to send output messages on a customized I/O channel. The first is the
PRINT macro and the second is the IOMSG SEND macro. The PRINT macro is used to
send SMSI messages to the voice messaging system (VMS) in the 1AE8A.06, 1AE8A,
and later generic programs. As a result, the OMR is used to deliver output
messages to the customized channel. These output messages consist of both the
standardized customer message (that is, the SMSI protocol) and return
acknowledgements (that is, ?A, ?C, ?P, etc.). The latter are known as System
Catalog messages which are discussed in the I/O manua. For detailed
information regarding I/O messages, refer to Part 6 B(5) and B(6). Both INV
and BK are in reference to the MWI error message discussed in paragraph 2.20.
For detailed information regarding I/O messages, refer to Part 6 B(5) and
B(6).

3.16 Use of the OMR in the 1 AE9 and later generic programs is limited as
     follows:

  (a) If the customized I/O channel is assigned and equipped to an I/O frame
     (J5A006A)

  (b) If the customized I/O channel is assigned and equipped to I/O processor
     frame (J5A006C or J5A006D) and is configured in the

     HDX mode

  (c) If the customized I/O channel is assigned to an I/O frame or I/O
     processor and is operating in the HDX or FDX mode, all System Catalog
     messages will use the OMR.

  ==> NOTE:
     No I/O channel, noncustomized or customized, is assigned its own OMR.
     The central office is engineered to have a pool of OMRs. The OMR is
     assigned to a channel when an 0MR becomes available. Hence, a VMS may
     experience a delay in message delivery to itself from the 1A ESS Switch
     if awaiting an SMSI protocol message in the 1AE8A.06 and later 1AE8A
     PPUs. Furthermore, there may be a delay in the delivery of return
     acknowledgements in the 1AE8A.06, 1AE9, and later generic programs.

B. Output Message Buffer

3.17 The output message buffer (OMB) saves client output messages awaiting
     transmission. One OMB is assigned to each customized I/O channel
(channe 24 through 95). The OMB is a circular data structure; the number of
messages that can be saved depends on the buffer size and the message length.
The default size of an OMB is dependent upon the OMB's customized I/O channel
speed [for example, at 1200 baud, the OMB's size for the channel specified is
64 words (decimal)]. The size of the OMB can be changed by means of the COMB
set card. Refer to Part6 B(1).

3.18 The OMB was introduced in the 1 AE8A.06 PPU as a data structure to be
     used by the customized I/O channel Centrex Electronic Keying feature. At
that time, the SMSI feature was deployed and it was utilizing the 1A PRINT
macro. The SMSI was engineered as a fast feature (FF005) to be used in the

interim until MSS could be deployed in the 1AE9 generic program; any use of the OMBs for SMSI was delayed. However, the central offices with SMSI have decided to use and expand their SMSI services.

3.19 Even through the SMSI feature is not using the OMB in the 1AE8A generic programs, whenever a new parameter is loaded (1AE8A.06 and later generic programs), OMBs are assigned to each customized I/O channel. However, a size value for a given OMB will be indicated in parameters only if the customized I/O channel to which the OMB is assigned is Indeed equipped and operational. Again, the customized channel's OMB is not used prior to the 1AE9 PPU if the customized I/O channel feature is SMSI.

Channel Memos Block

3.20 A channel memory block (CMB) is associated with each assigned I/O channel (channe 0 through 95). The CMB is a 44-word memory block which contains the memory area needed for processing an I/O message. Words 0 through 35 of the CMB represent the input channel block (ICB). This area of memory is used by those customized I/O channe which do not have a private input buffer (for example, the ISPI feature uses a private input buffer). Words 34 through 44 are used for output data information. The address of the OMB assigned to the customized I/O channel used by a feature (such as SMSI or MSS) is stored in word 36 of the CMIB.

Enhanced Input/Output Subsystem

3.21 The I/O subsystem was modified to allow the new features (ISPI, Pay Per View, MSS, etc.) and other similar features (SMSI) to directly interface with the I/O channel, thus bypassing the normal I/O translation functions. In the 1 AE9.01 PPU, this enhancement to the I/O subsystem was introduced [refer to Part 6 A(9)]. As a result, improvements and/or additions have been made. A brief summary follows:

  (a) Provides the use of OMBs to all customized I/O channel features (for example, SMSI, MSS, etc.). Therefore, SMSI will not use the OMR and have to be concerned about a shortage of OMRs.

    ==> NOTE:
       OMRs are still used for System Catalog messages (for example, ?A, ?C, ?P, etc.).

  (b) Protects the customer's messages (for example, MD messages being routed to the VMS) from being erased due to reinitializing the TTY I/O buffer using the MCC key, SCC console or TTY input message.

  (c) Provides the ability to overwrite the size of the OMB by means of the COMB set card.

  (d) Allows the number of I/O channe to be limited to 95.

  (e) The channel speed per customized I/O channel for a fully I/O processor community is 2400 baud. For more detai, see paragraph 4.03.

3.22 In the FDX and HDX modes, the characteristics of data transfer are as follows:

(a) Full Duplex (19,200 bps): The maximum data transfer for each microprocessor community (including the growth communities) is as follows:

> (1) 2400 bps per I/O channel when all eight I/O channe in a given community are operational.

> (2) 4800 bps per I/O channel when only four I/O channe in a given community are operational.

> (3) 9600 bps per I/O channel when only two I/O channe in a given community are operational.

(b) Halt Duplex (38,400 bps): The maximum data transfer for each microprocessor community (including the growth communities) is as follows:

> (1) 4800 bps per I/O channel when all eight I/O channe in a given community are assigned and operational.

> (2) 9600 bps per I/O channel when only four I/O channe in a given community are assigned and operational.

> (3) 19,200 bps per I/O channel when only two I/O channe in a given community are assigned and operational.

3.23 Customer I/O Channe (C, 24 through 95) have backup capability.
Features such as MSS/ISVM and SMSI can and do use backup Cs. The Primary and Backup CIOC Enhancement, available in the 1AE10.12, 1AE11.06 and later PPUs, provide improved implementation for primary and backup CIOCs. This enhancement increases the reliability of the MSS especially when used with Interswitch Voice Messaging (ISVM). Refer to Part 6 A(9), issue 5; ao, Informational BWM 92-0222.

4. Implementation

Feature Implementation

4.01 Parameters must be updated to activate (turn on) the SMSI and SMSPC custom features as follows:

  (a) To activate the SMSI feature, switch 005 in the FEAT SWITCHES parameter word must be set using set card FF005 (that is, FF005 = 1).

  (b) To activate the SMSPC feature, switch 034 in the FEAT SWITCHES parameter word must be set using set card FF034 (that is, FF034 = 1).

  ==> NOTE:
    The SMSPC feature requires that the SMSI feature be activated.

4.02 To activate the per I/O channel traffic measurements enhancement, set card IOTRAF must be input.

Input/Output Channel Assignment

4.03 An I/O channel on either an 10P frame or I/O frame must be equipped and assigned for each MDC. For detailed information, refer to CIS Indexes 40 and 47 and Part 6 A(8) and A(9).

Message Service Center Assignment

4.04 A MLHG common block is required for each SMSI customer MSC. For detailed
     information regarding MLHGs, refer to Part 6 A(10). A MLHG common block
is built using the RC:MLHG: recent change message. For detailed MLHG recent
change messages and keywords, refer to Part 6 A(6). The two keywords used to
identify the MDC and associated I/O channel for a SMSI customer are as
follows:

  (a) Keyword MSGDSK aa identifies the MDC, where item aa is- value with a
      range of 1 through 63.

  (b) Keyword IOCHAN bb identifies the I/O channel, where item "bb" is a
      value with a range of 24 through 95.

  ==> NOTE:
     The MLHG common block data is verified using the VFY-CSTG input
     message. The data is contained in a TR15 output message. Refer to Part
     6 B(5) and B(6).

Message Waiting Indicator Assignment

4.05 The optional audible MWI, VMWI, or SMWI is assigned for a client line
     using the RC:LINE: recent change message. For detailed line recent change
messages and keywords, refer to Part 6 A(6). Keyword MWI assigns the audible
MWI for a client line, keyword VMWI assigns the VMWI for a client line, and
keyword SMWI assigns the SMWI for a client line.

  ==> NOTE:
     Line data is verified using the VFY-LEN input message. The data is
     contained in a TR03 output message. Refer to Part 6 [3(5) and [3(6).

SMSI Privacy Control Override Assignment

4.06 The optional SMSPC override is assigned for a Centrex group using the
     RC:CTXCB: recent change message. For detailed RC:CTXCB: recent change
messages and keywords, refer to Part 6 A(7). Keyword SMPO assigns the
SMSPC override for a Centrex group.

  ==> NOTE:
     Centrex common block data is verified using the VFY-CSTG-35 input
     message. The data is contained in a TRI 7 output message. Refer to Part
     6 [3(5) and [3(6).

SMSI Privacy Control for POTS MLHG Assignment

4.07 The optional SMSPC POTS MLHG option is assigned for an SMSI POTS MLHG
     using the RC:MLHG: recent change message. For detailed RC:MLHG: recent
change messages and keywords, refer to Part 6 A(6). Keyword PSVII assigns the
SMSPC POTS MLHG option for a POTS MLHG (the MLHG to which the VMP is
assigned).

4.08 The SMSPC CPN Delivery Option (for the delivery of all direct cal to
     the message desk) is assigned by setting bit 20 equal to 1 in word 10 of
the Office Option Table.

5. Administration

Measurements

5.01 One office count is provided for the SMSI feature in PPU 1AE8A.08 and
    later 1AE8A generic program point issues and in the 1 AE9.03 and later
generic programs. The type measurement code (TMC) 005, office count number
(EGO) 408 is a peg count of SMSI call terminations. This count is available on
the hourly (H and C), selected quarter hour

(DAI 5), and special studies (SI, 52, and S3) traffic schedules.

5.02 Standard measurements available for any MLHG are available for a MLHG
    used for the SMSI feature.

  ==> NOTE:
    For detailed traffic measurement
    information, refer to Part 6 A(1 1).

5.03 For central offices, with the optional VMWI for SMSI, the VMWI Queue
    enhancement (available only in 1AEIO.10, 1 AEI 1.03, and later PPUs)
provides three counts to monitor use of the VMWI Queue. A parameter run with
set card VMWIQB = 1 is required to build the counts. The TMC 175, with its
associated office counts EGO 000 (peg count), EGO 001 (overflow count), and
EGO 002 (usage count) are available for the VMWI Queue enhancement. These
counts are available on the H, C, DAIS, SI, and S2 traffic schedules. Refer to
Part 6 A(1) for detailed information on the VMWI Queue enhancement.

5.04 Optional per input/output channel traffic measurements are provided on a
    per-office basis for MSS and SMSI. Traffic count data for the H
(hourly), C (continuous), DA 15 (selected quarter hour), S1, 52, and S3
(special studies) traffic schedules are provided for the per I/O channel
traffic measurements for MSS and SMSI in the 1AE10.1 1 and 1AE1 1.05 and later
PPUs. A parameter run with set card IOTRAF is required to build these counts.
There are six implemented and two spare counts per channel. The assigned TMC
is 176 and the EGOs associated with TMC 176 are shown in Table A.

Automatic Message Accounting

5.05 No special or unique automatic message accounting (AMA) records are
    generated for the SMSI feature. An AMA record is made for each direct or
forwarded billable call that is completed to a MSC. An AMA record is made for
each billable call that is originated from a MSC.

  ==> NOTE:
    For detailed AMA information, refer to Part 6 A(12) and A(13).

6. Supplementary Information

Glossary

6.01 Terms frequently used in this practice are as follows:

Audible Message Waiting Indicator (MWI) - An audible MWI is an optional
service available for each SMSI client line. The audible MWI is stutter dial

tone provided by the 1A ESS Switch. It is activated for a client line when the MSC has a message for that client.

Message Service Center (MSC)-A MSC is a customer facility that is equipped with one or more attendant positions and other equipment necessary to provide centralized and personalized telephone answering and message services for clients.

Simplified Message Service Interface (SMSI) client-A SMSI client is a telephone customer who either uses or subscribes to message services provided by a SMSI customer.

Simultaneous Message Waiting Indicator (SMWI) -A SMWI is an optional service available for each SMSI client line available in 1AE10.1 1, 1AE1 1.05 and later generic programs that have the VMWI for SMSI loaded. SMWI is a per line option that provides a client line with simultaneous audible MWI and VMWI treatment.

SMSI customer-A SMSI customer is a telephone customer who establishes a MSC to provide message services for clients.

Visual Message Waiting Indicator (VMWI)-A VMWI is an optional service available for 1AE9.10, 1AE1O.06, and later generic programs that have MSS, ISPI, and ISU hardware loaded and/or installed in the central office and all the MSS VMWI central office parameters set. The VMWI is an illuminated lamp activated by the 1A ESS Switch indicating the MSC has a message for the client.

References

A. AT&T Practices

  (1) 231-390-170 - Message Service System Feature Document

  (2) 533-6OO-5O5 - Advanced Communications Package - Customer Message Center System

  (3) 231-090-175 - Call Forwarding Busy Line/Call Forwarding Don't Answer Feature Document

  (4) 231-O90-O74 - Call Forwarding Variable Feature Document

  (5) 231-O90-186 - Night Service Feature Document

  (6) 231-318-325 - ACT, CFV, DNRNGE, LINE, MLHG, MOVE, MPTY, OBS, SCLIST, SLE, SIMFAC, TNESN, TWOPTY - Line Recent Change Formats

  (7) 231-318-355 - CTXCB, CTXDI, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS - Centrex-CO/ESSX- 1 Recent Change Formats

  (8) 231-361-100 - I/O, IOP, and TUC Equipment Growth Task Oriented Practice

  (9) 231-302-305 - Enhanced Input/Output Subsystem Implementation Procedures for Customer Channel (24 Through 95) (1AE9 and Later Generic Programs)

(10) 231-O90-180 - Multiline Groups - Hunting and Nonhunting Capabilities Feature Document

   (11) 231-090-207 - Traffic Measurements Feature

   (12) 231-390-063 - Automatic Message Accounting Feature (Single Entries)

   (13) 231-390-069 - Automatic Message Accounting Standard Entries and Multientry Teleprocessing System.

B. Other Documentation

   (1) Parameter Guide PG-1A

   (2) Office Parameter Specification PA-6AOO1

   (3) Translation Guide TG-1A

   (4) Translation Output Configuration PA-6A002

   (5) Input Message Manual IM-6AOO1

   (6) Output Message Manual OM-6AO01

   (7) COEES Index 40

   (8) COEES Index 47

7. Abbreviations and Acronyms

A

ACP-CMCS
   Advanced Communications Package - Customer Message Center System

AMA
   Automatic Message Accounting

AMWI
   Audible Message Waiting Indicator

B

BLM
   Base Level Maintenance

C

CERF
   Customized I/O Channel Error Report

CFBL
   Call Forwarding Busy Line

CFDA

Call Forwarding Don't Answer

CFV
  Call Forwarding Variable

CIS
  COEES Information System

CMB
  Channel Memory Block

COEES
  Central Office Equipment Engineering System

CPS
  Customer Premises System

D

DN
  Directory Number

E

EGO
  Office Count Number

EIA
  Electronic Industries Association

F

FDX
  Full Duplex

H

HDX
  Half Duplex

I

ICB
  Input Channel Block

ISPI
  Intelligent Simplex Peripheral Interface

ISU
  Individual Calling Line Identification Service Unit

ISUP
  Integrated Services User Part

L

LASS
  Local Area Signaling Services

LEC
  Local Exchange Carrier

LEN
  Line Equipment Number

M

MDC
  Message Desk Center

MLHG
  Multiline Hunt Group

MS
  Message Service

MSC
  Message Service Center

MSS
  Message Service System

MWI
  Message Waiting Indicator

O

OMB
  Output Message Buffer

OMR
  Output Message Register

P

POTS
  Plain Old Telephone Service

PPU
  Periodic Partial Updates

R

REN
  Remote Equipment Number

RSSMWI
  Audible Message Waiting Indicator for Individual RSS Lines

S

SMSI
  Simplified Message Service Interface

SMSPC
  Simplified Message Service Privacy Control

SMWI
  Simultaneous Message Waiting indicator

T

TIRM
  Technical Information Resource Management

TMC
  Type Measurement Code

V

VMS
  Voice Messaging System

VMWI
  Visual Message Waiting Indicator

VQSE
  VMWI Engineering Queue Size Enhancement

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Table A. EGO Values for the Per I/O Channel Traffic Counts

                    Traffic Counts

I/O Channel	A*	B+	C++	D***	E**	F+++	Unassigned
24	000	001	002	003	004	005	006, 007
25	008	009	010	011	012	013	014, 015
26	016	017	018	019	020	021	022, 023
27	024	025	026	027	028	029	030, 031
28	032	033	034	035	036	037	038, 039
29	040	041	042	043	044	045	046, 047
30	048	049	050	051	052	053	054, 055
31	056	057	058	059	060	061	062, 063
32	064	065	066	067	068	069	070, 071
33	072	073	074	075	076	077	078, 079
34	080	081	082	083	084	085	086, 087
35	088	089	090	091	092	093	094, 095
36	096	097	098	099	100	101	102, 103
37	104	105	106	107	108	109	110, 111
38	112	113	114	115	116	117	118, 119
39	120	121	122	123	124	125	126, 127
40	128	129	130	131	132	133	134, 135
41	136	137	138	139	140	141	142, 143
42	144	145	146	147	148	149	150, 151
43	152	153	154	155	156	157	158, 159
44	160	161	162	163	164	165	166, 167
45	168	169	170	171	172	173	174, 175
46	176	177	178	179	180	181	182, 183
47	184	185	186	187	186	189	190, 191
48	192	193	194	195	196	197	198, 199
49	200	201	202	203	204	205	206, 207

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50      208 209 210 211 212 213 214, 215
51      216 217 218 219 220 221 222, 223
52      224 225 226 227 228 229 230, 231
53      232 233 234 235 236 237 238, 239
54      240 241 242 243 244 245 246, 247
55      248 249 250 251 252 253 254, 255
56      256 257 258 259 260 261 262, 263
57      264 265 266 267 268 269 270, 271
58      272 273 274 275 276 277 278, 279
59      280 281 282 283 284 285 286, 287
60      288 289 290 291 292 293 294, 295
61      296 297 298 299 300 301 302, 303
62      304 305 306 307 308 309 310, 311
63      312 313 314 315 316 317 318, 319
64      320 321 322 323 324 325 326, 327
65      328 329 330 331 332 333 334, 335
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Table A. EGO Values for the Per I/O Channel Traffic Counts (Cont'd)

Traffic Counts

```
I/O Channel  A*   B+   C++  D***  E**  F+++  Unassigned

66      336 337 338 339 340 341 342, 343
67      344 345 346 347 348 349 350, 351
68      352 353 354 355 356 357 358, 359
69      360 361 362 363 364 365 366, 367
70      368 369 370 371 372 373 374, 375
71      376 377 378 379 380 381 382, 383
72      384 385 386 387 386 389 390, 391
73      392 393 394 395 396 397 398, 399
74      400 401 402 403 404 405 406, 407
75      408 409 410 411 412 413 414, 415
76      416 417 418 419 420 421 422, 423
77      424 425 426 427 428 429 430, 431
78      432 433 434 435 436 437 438, 439
79      440 441 442 443 444 445 446, 447
80      448 449 450 451 452 453 454, 455
81      456 457 458 459 460 461 462, 463
82      464 465 466 467 468 469 470, 471
83      472 473 474 475 476 477 478, 479
84      480 481 482 483 484 485 486, 487
85      486 489 490 491 492 493 494, 495
86      496 497 498 499 500 501 502, 503
87      504 505 506 507 508 509 510, 511
86      512 513 514 515 516 517 518, 519
89      520 521 522 523 524 525 526, 527
90      528 529 530 531 532 533 534, 535
91      536 537 538 539 540 541 542, 543
92      544 545 546 547 548 549 550, 551
93      552 553 554 555 556 557 558, 559
94      560 561 562 563 564 565 566, 567
95      568 569 570 571 572 573 574, 575
```

*   Number of OP:MWI messages received over the customized I/O channel (if used for MSS and/or SMSI)

+   Number of RMV:MWI messages received over the customized I/O channel (if used for MSS and/or SMSI)

++ Number of "MD..." (call information) messages sent to an MSC over the customized I/O channel (if used for MSS and/or SMSI)

*** Number of 0MB overflows which occur when attempting to send an "MD" message to an MSC over the customized I/O channel (if used for MSS and/or SMSI)

** Number of MWI requests which result in an invalid (INV) error return message being sent to an MSC over the customized I/O channel (if used for MSS and/or 5151)

+++ Number of MWI requests which result in a blocked (BLK) error return message being sent to an MSC over the customized I/O channel (if used for MSS and/or SMSI).