Bellcore

⊕ Bell Communications Research

TCM Overview

User Manual

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1.   General

> **NOTE** — For CSAS documents, any reference to
> "ZRxxxx" should be changed to "VMxxxx". Also, any
> reference to "RMxxxx" should be changed to "MMxxxx".

1.1   Document References

This document is one of a series of user manuals that describe the Bellcore CSAS
Communication Module (TCM). These documents are listed below.

Number	Title
252-573-260	TCM Online Message Directory
252-573-301	TCM Overview
252-573-302	TCM Route Administration (RA)
252-573-303	TCM Message Administration (MA)
252-573-304	TCM Network Administration (NA)
252-573-305	TCM Translation Administration (TA)
252-573-382	TCM Cron User Manual
252-551-703	TIRKS Interface Data Catalog
252-551-791	Planning Transition Guide for a SOP to TIRKS Interface

1.2   Introduction To TCM

TCM is one of a family of component systems and supporting modules that comprise TCM
provides the means for a component system residing *with* a TCM in one "IMS region" of a
host computer to communicate with a component in another external TCM system or
external non-TCM system in another "IMS region".

> **NOTE** — The two IMS regions may be in the same
> computer or in different computers. Inter-computer or
> inter-IMS communication is performed over the
> "Multiple Systems Coupling" (MSC) or the "Inter System
> Communication" (ISC) process, whichever is
> appropriate.

Each component residing with a TCM or each external non-TCM system is called an
"application". Each instance of a communication between applications is referred to as a
message. Between applications that reside in different systems, the message is placed in a
format called FCIF (Flexible Computer Interface Format). TCM transmits all messages to

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a remote application (either an external TCM system or an external non-TCM system) in FCIF. Messages received by TCM from a remote application must also be in FCIF with one exception. If the remote application (an external TCM system) and the local application (a TCM System) both reside in the same IMS control region, the remote application can elect to bypass its supporting TCM and send messages directly to the local receiving application's TCM. These messages can be in Mapped Data Area (MDA) or Fixed Fielded (DSECT) format.

TCM provides a number of special features:

- TCM automatically places the message into the FCIF format when it is to be sent to a remote application.

- TCM automatically converts a message received from a remote application in FCIF, MDA or DSECT format into the internal format required by the CSAS System application.

- TCM automatically determines the communication path over which to route the message.

- TCM defers (suspends) the processing of a message when the communication link for it is unavailable. TCM automatically resumes processing when the link is again available.

- TCM provides a tool, the TCM Cron, that enables users to schedule IMS transactions for automatic execution at regular intervals or on specific times, days and/or dates. Through a special interface, this facility is available to all users that share the IMS control region with TCM.

- TCM provides an online format by which logical interface paths (i.e., links) can be turned up or down. TCM also provides a batch/BMP run that can change the status of paths. By using the TCM Cron to schedule this run, messaging activity can be manipulated automatically at intervals specified by the user.

- TCM stores transmitted messages until the receiving application has positively acknowledged them. (Exceptions: In a TCM to TCM scenario, only the receiving TCM stores the message and processes the acknowledgment. With Scenario Type "N", no message is stored in TCM.)

- TCM ensures that related messages (i.e., relating to the same circuit order) are sent in proper sequence. It does this by "holding" the later message until the earlier message has been transmitted and positively acknowledged.

- TCM stores errors that occur during processing or are returned by the receiving application on negative acknowledgments.

- TCM generates exception notices for errors (i.e., negative acknowledgments and warnings) and routes them to printers specified by the telephone company.

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- TCM provides the telephone company with the means to modify message data (via the TPAM translator) before it is transmitted to the receiving application.

- TCM provides an online format by which messages can be corrected and resent, or deleted.

- TCM generates and stores statistics regarding the volume of messages handled by TCM and the current contents of the TCM databases, and provides an online format for displaying these statistics.

1.3   TCM System Chart

TCM is subdivided into five component parts. Because the TCM Cron does not directly interact with other TCM components, it does not appear in the TCM System Chart, opposite.

- Routing Administration Component (RA) including the TCM Parser and Mapper (TPAM)

- Message Administration Component (MA)

- Network Administration Component (NA)

- Translation Administration Component (TA)

- Transaction Scheduling Component (Cron)

Supporting these components are four TCM databases and one database common to all of the CSAS System:

- *TCM Transaction Log Database (VMMPTLDD)*
  This database is referred to as TLOG throughout the remainder of this document.

- TCM Deferred Message Queue Database (VMMPSQDP)
  This database is referred to as SENDQ throughout the remainder of this document.

- TCM Network SEC Database (VMMPSCDD)
  This database is referred to as the SEC database throughout the remainder of this document. The acronym SEC, which means "system entity code", uniquely identifies an external TCM system or external non-TCM system to TCM.

- TCM Administrative Applications Database (VMMPAADP)
  This database is referred to as ADMIN throughout the remainder of this document.

- Terminal Database (VMC1XXDD)

Figure 1-1. TCM System Chart

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Twelve batch/BMP runs support installation and on-going support activities in TCM.

Batch/BMP Runs	Reference
VMMPU01	BR 252-573-501
VMMPU02	BR 252-573-502
VMMPU03	BR 252-573-503
VMMPU04	BR 252-573-504
VMMPU05	BR 252-573-505
VMMPM01	BR 252-573-506
VMMPM02	BR 252-573-511
VMMPM03	BR 252-573-512
VMMPM04	BR 252-573-513
VMMPM05	BR 252-573-514
VMMPM06	BR 252-573-515
VMMPM07	BR 252-573-507

Five online formats support daily maintenance activities in TCM.

Online Formats	Reference
MMPMSG	BR 252-573-303
MMPNET	BR 252-573-304
MMPSTS	BR 252-573-304
MMPERR	BR 252-573-304
MMPTST	BR 252-573-303

1.4   Definitions

There are a number of important acronyms and other terms used in TCM:

- ACKNOWLEDGMENT
  A class 2 or class 5 message that is sent to a TCM to acknowledge receipt of a class 1, class 3 or class 4 application-to-application message and to let the TCM know whether or not the class 1, class 3 or class 4 message was acceptable. The acknowledgment is positive if the class 1, class 3 or class 4 message was acceptable. The acknowledgment is negative if the class 1, class 3 or class 4 message was unacceptable.

- AGGREGATE
  A grouping of data items. Each grouping is identified with a unique aggregate name.

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- APPLICATION
  A component residing with a TCM or an external non-TCM system.

- FCIF
  The external interface data format structure and syntax that must be used to pass messages between applications with the exception that the two applications and their supporting TCMs all reside in the same IMS control region. In this scenario, the sending application can use its TCM to send an FCIF message or elect to bypass its TCM and directly send an MDA or DSECT message to the receiving application's TCM. FCIF stands for "Flexible Computer Interface Format."

- HMDA
  The internal TPAM data format. The literal meaning of HMDA is "Hierarchical Map Data Area".

- MAPPING
  The process of placing data into a pre-determined format such as FCIF or MDA. Mapping is performed by the TPAM Mapper.

- DSECT
  A fixed fielded data format used internally by CSAS components or the remote application components.

- MDA
  A data format used internally by CSAS components or the remote application components. MDA stands for "Mapped Data Area".

- MIC
  A special "message interface controller" process within TCM that handles the finding, retrieving, and storing of messages.

- PARSING
  The process of interpreting data received in a message and placing it into the internal HMDA format required by TPAM. Parsing is performed by the TPAM Parsing.

- SCENARIO TYPE
  The specific situation under which a message is received by the TCM or is transmitted from the TCM.

- SEC
  The "System Entity Code" that uniquely identifies an operating system such as the CSAS System.

- SOP
  A system called a "Service Order Processor".

- TPAM
  A special procedure that parses, translates, and maps data in messages processed by TCM. The literal meaning of TPAM is "TCM Parsing and Mapper".

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- TRANSLATING
  The process of changing, adding or deleting data names or data values in messages
  processed by the TCM. Translations are performed by the TPAM Translator.

- TQS
  The CSAS Query System. Please see BR 252-541-230 for complete information about
  TQS.

1.5   Screens

The main TCM screens can be accessed by a TCM menu screen. This screen is accessed
by typing /FOR RTCM or /FOR TCM or by selecting TCM from the CSAS menu screen.
Below is an example of the RTCM screen.

```
            CSAS TCM COMPONENT
       CSAS COMMUNICATION MODULE SCREENS        03/08/93 14:43:47
                    PAGE 01 OF 01
 _ MMPMSG  MESSAGE ADMINISTRATION
 _ MMPSTS  NETWORK ADMINISTRATION - MESSAGE VOLUMES
 _ MMPNET  NETWORK ADMINISTRATION - INTERFACE DEFINITION
 _ MMPERR  NETWORK ADMINISTRATION - ERROR EXCEPTION LIST
 _ MMPTST  TEST MESSAGE GENERATOR




 _ CSAS   RETURN TO CSAS MAIN MENU (IF AVAILABLE)
```

Figure 1-2. TCM Menu Screen

From this menu, the desired TCM format can be selected by typing an 's' in front of the
format name and pressing enter.

1.6   Security

TCM uses the CSAS Generic Security System (S1). This system provides a single online
display that allows an Administrator to create and update security for all participating
CSAS component systems.

Security is provided at the logical level, with LTERMS or user ID being grouped by the
Administrator. A GROUP is the basic unit to which security is assigned. Each individual
LTERM or user ID has the privileges assigned to its respective GROUP. Privileges are

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assigned to a GROUP through GRIDS. GRIDS are two dimensional arrays (e.g., USER ID by function key and command word) whose intersection values define security privileges. Copies of GRIDS are added to GROUPS and updated by the Administrator.

All terminals or user IDs used to access an individual component system should be assigned the privilege to Signon to that component system. The ability to Signon as an Administrator should be reserved for the TCM System Administrator. Please consult with your Security Administrator for additional information.

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2. Database Descriptions

2.1 General

TCM contains four primary (in boldface below) and five secondary index databases. TCM also uses one database common to the entire CSAS System.

- **TLOG Database** (VMMPTLDD), the TCM Transaction Log Database

- TLOG Activity # Secondary Index (VMMPTLP1)

- TLOG Error Code Secondary Index (VMMPTLP2)

- TLOG PATHID Specific, Activity # Secondary Index (VMMPTLP3)

- **SENDQ Database** (VMMPSQDP), the TCM Deferred Message Queue Database

- SENDQ Activity # Secondary Index (VMMPSQP1)

- **SEC Database** (VMMPSCDD), the TCM Network (SEC) Database

- SEC Link Name Secondary Index (VMMPSQP1)

- **ADMIN Database** (VMMPAADP), the TCM Administrative Applications Database.

- Terminal Database (VMC1XXDD)

The following sections describes the main contents of each primary database and secondary index from a user's viewpoint.

2.2 TLOG Database (VMMPTLDD)

This database is used to log messages when the message:

- must be retained pending an acknowledgment from the target application

- has caused a negative acknowledgment (error) to be returned by the target application

- message has caused a TCM/TPAM processing error

- must be held until an earlier related message (i.e., relating to the same circuit order) has been transmitted and acknowledged.

Whenever an input message must be logged, a record for it is built and placed in the database. If multiple target applications are specified in the input message, a record will be built and placed in the database for each individual target. The record is retained in this database until an acknowledgment is received from the target application. If the acknowledgment is positive, the record is automatically deleted from the database. (This is true only if the message is in the "pending acknowledgment" status, not if in error or

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"held".) The record may also be deleted via Format MMPMSG, of the Message Administration (MA) component of TCM.

During the period of time that the record resides in TLOG the record may be updated several times. The record:

- will be updated with one or more output message segments that are generated from the input message stored in the record

- may be updated with error code and error text if errors occur during TCM/TPAM processing

- may be updated with errors that are received on negative acknowledgments from the target application.

The internal structure of each message record appears in the following figure, which shows the five segment types into which the record data is organized for each message processed by TCM.

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Figure 2-1. The TLOG Database

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The 01 segment is considered the root segment. It defines the entire message record.

Associated with the root segment are one or two 02 segments. One 02 segment is for the input message. One 02 segment is for the output message that may be generated from the input message.

Optionally associated with the root segment is one 05 segment. This 05 segment contains the data for an application header which may be contained in the input message processed by TCM. This application header data is routed back to the application system from which the input message originated.

Associated with each 02 segment are one or more 03 segments that contain the message text (field name and field value combinations) and optionally one or more 04 segments that contain the errors associated with the message (if any exist).

2.2.1   01 Segment (root)

This segment contains the key that defines and uniquely identifies the message record. This key consists of:

- *Source SEC*
  This is the SEC (system entity code) of the application that originated the message. On the MMPMSG screen (MA component) this data is referred to as SOURCE SEC. In the TCM input header it is identified by the field TSYS (transmitting system).

- *Timestamp*
  This is the date (CCYYDDD) and time (HHMMSSTHssss) that the input message was received by TCM. On the MMPMSG screen this key data is referred to as the TIME STAMP displayed as (YYDDDHHMMSSTHssss). In the TCM input header it is identified by the field TMST.

> **NOTE** — This applies only for the case of an input header received by the receiving TCM in a TCM to TCM scenario.

> **NOTE** — When provided in the input TCM message header, the TMST value can have either the short format (YYDDDHHMMSSTH) or the long format (CCYYDDDHHMMSSTHssss). The short format is the original format that TCM supports. The long format is used when the external sending or receiving system interfacing with TCM is enhanced to support the TCM turn of the century feature. In the latter case, the system entity code of the external system must exist in the TCM Y2000 EXTSYS TTS table.

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The 01 segment also contains all of the data that was received in the TCM input header. This includes:

- *Activity Number*
  This is the field that is used for application oriented grouping of related In the TCM input header it is identified by the field ACNO.

- *Message Status Indicator*
  Twelve status codes are valid:

CODE IN TLOG	STATUS FIELD ON MMPMSG SCREEN
D	MSG DEFERRED
Q	MSG ACKNOWLEDGED-POSITIVE
W	MSG ACKNOWLEDGED-NEGATIVE
R	MSG RETURNED
K	MSG PENDING ACK
H	MSG IS HELD
E	TCM ERROR
G	TCM TPAM ERROR
P	TCM PARSE ERROR
T	TCM TRANS ERROR
M	TCM MAPPING ERR
A	APPLICATION ERR

The user should note that the status code for the input portion of the message record is contained in the 01 segment while the status code for the output portion of the message record is contained in that individual output's 02 segment.

- *Target SEC*
  This is the SEC (system entity code) of the target application which is to receive the message when the scenario is TCM to TCM Receiving (R) or non-TCM to TCM (Z). In the TCM input header it is identified by the field RSYS.

- *PATHID (path ID)*
  This is the code that identifies the category of messages that are being sent between two application systems. In the TCM input header it is identified by the field PATHID.

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- *Interface scenario indicator*
  This code identifies the direction of transmission of a message relative to TCM.
  Acceptable values are:

VALUE	DEFINITION OF VALUE
S	TCM to TCM (sending)
R	TCM to TCM (receiving)
A	TCM to non-TCM
Z	non-TCM to TCM
I	intra-TCM
N	TCM (sending) to non-TCM (no database safestore)
D	application (bypass sending TCM) to TCM (receiving)

  In the TCM input header it is identified by the field SCTYPE.

- *HOLD flag*
  This field is used to invoke the TCM hold process that guarantees that related
  messages are delivered in sequence to the target application. In the TCM input header,
  it is identified by the field HLDFLG. Valid values are Y (yes) or N (no).

- *RESEND flag*
  This field is used to invoke the TCM resend process. Valid values are Y (yes), N (no),
  or R (return to sender). In the TCM input header it is identified by the field RSFLG.

- *RESEND time key*
  In a TCM-to TCM scenario with a Resend flag of Y, the timestamp value of a specific
  class 1 message which the message is to replace. In the TCM input header, it is
  identified by the field RTMST.

  > **NOTE** — When provided in the TCM message header,
  > the RTMST value can have either the long format or the
  > short format. Refer to the note in timestamp.

- *Error LTERM name*
  This is the name of the printer to which error and warning exception notices are to be
  sent in lieu of the primary LTERM specified in the SEC database for the interface path
  under which this message was processed. In the TCM input header it is identified by
  the field ELTERM.

- *Positive acknowledgment LTERM*
  This is the name of the printer to which positive acknowledgment notices are to be
  sent. In the TCM input header it is identified by the field PLTERM.

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- *Correction LTERM*
  This is the name of the online terminal that has locked up the message record (via Format MMPMSG). The presence of a value in this field in TLOG creates the "lock".

- *Target SECs 1 through 10*
  These are the SECs (system entity codes) of the one to ten target applications that are to receive the message when the scenario is TCM to TCM Sending (S) or TCM to non-TCM (A). In the TCM input header these fields are identified as RSYS1 through RSYS10 (receiving systems 1 through 10).

- *Supplemental identification codes 1 through 5*
  These fields are optional. In the TCM input header these fields are identified as SUPID1 through SUPID5.

- *Error Acknowledgment PATHID*
  This is the name of the TCM PATHID to which an exception notice in FCIF will be routed for errors and warnings detected by the TCM and/or the receiving application to the external non-TCM application that originated the message. In the TCM input header it is identified by the field EPATHID.

- *Positive Acknowledgment PATHID*
  This is the name of the TCM PATHID to which a positive acknowledgment in FCIF will be routed to the external non-TCM application that originated the message. In the TCM input header it is identified by the field PPATHID.

- *Defer Time*
  An optional time (CCYYDDDHHMM) at which TCM is to process a message for either a CSAS component or non-CSAS subsystem. In the TCM input header it is identified by the field DFTM.

  > **NOTE —** When provided in the TCM message header, the DFTM value can have either the long format (CCYYDDDHHMM) or the short format (YYDDDHHMM). Refer to the note in timestamp.

- *Application Header Indicator*
  Valid values are Y (yes) or N (no). This field will be populated appropriately depending on the presence or absence of an application header (05 segment in TLOG).

2.2.2   02 Segment

The 02 segments divide the message record into an input message section and an output message section. The data contained in each 02 segment is as follows:

- *TPAM Message Sequence Number*
  The sequence number identifies the 02 segment. The 02 segment for the input message

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is given a number of "00" (zero,zero). The 02 segment for the output message is given a number of "01" (zero, one). The 02 segment for the SKIP Section is given a hexidecimal number of "00" (two bytes of hexidecimal zero).

- *IMS TRANCODE*
  If the 02 segment is for the input message, the IMS TRANCODE field will be blank. If the 02 segment is for the output message, it will contain a valid IMS TRANCODE of the target application for that output message. If the 02 segment is for the SKIP Section, it will contain the SKIP Section's name.

- *TPAM MAP name*
  This is the name of the "Message Format Descriptor" (MFD) that may have been used by TPAM to parse the input or map the output message data. The name of the MFD that TPAM uses is obtained from the SEC database, based on the interface path that was used to process the message. This field will be blank if the 02 segment is for the SKIP Section.

- *TPAM Message Status Indicator*
  Valid status codes are identical to those used in the 01 segment. The code contained in the 02 segment indicates the status of the output portion of the message record. In contrast, the status code contained in the 01 segment indicates the status of the input portion of the message record. This field is not used for the SKIP Section.

2.2.3   03 Segment

This segment contains the field names and field values that constitute the message text.

- The input message section contains a copy of the entire input message.

- The output message section contains the data section of the output message (field names [if FCIF or MDA format] and field values [if DSECT format]).

- The skip section contains a copy of the skip section text.

2.2.4   04 Segment

This segment contains errors that may have occurred while processing the associated input or output message, or which may have been returned on a negative acknowledgment.

The data in the 04 segment includes:

- Error Data Sequence Number

- Error Code

- Source SEC (TSYS)

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- Timestamp

- TPAM MSG Sequence number and IMS TRANCODE from the associated 02 segment

- Offset position of the field in error

- The number of the aggregate that contains the error. (Aggregates are numbered serially from top to bottom and left to right as they appear in the record, starting with "01".)

- Name of the field in error

- Error text

- User Data

2.2.5   05 Segment

This segment contains the data for an application header that may be contained in the input message processed by TCM.

2.3   TLOG Activity # Secondary Index (VMMPTLP1)

The entries in this index are automatically created, updated, and deleted whenever the corresponding message records in the TLOG database are created, updated, and deleted. This index enables retrieval of message records across all path IDs for a given activity number.

2.4   TLOG Error Code Secondary Index (VMMPTLP2)

The entries in this index are automatically created, updated, and deleted whenever the corresponding message records in the TLOG database are created, updated, and deleted. This index enables retrieval of message records for a given error code.

2.5   TLOG PATHID Specific Activity # Secondary Index (VMMPTLP3)

The entries in this index are automatically created, updated and deleted whenever the corresponding message records in the TLOG database are created, updated and deleted. This index enables retrieval of message records by specific path ID for a given activity number.

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2.6   SENDQ Database (VMMPSQDP)

This database is used to log messages whose processing must be deferred either at the user's request or because the communication link that will be used to deliver them is unavailable or due to the link queue count reaching the limit set on the TTS table, "TCM USER CONTROL." This is done as part of the RA (Routing Administration) process.

Messages are removed from the SENDQ database in one of two ways:

- At regular intervals (determined by the telephone company), a BMP run, VMMPM01, triggers a process that checks the status and deferred message counters for each link in the SEC database. If deferred messages exist on a link that is now available, those messages are re-submitted to RA (Routing Administration) for processing. The RA process, in turn, removes the message record from the SENDQ database.

- Format MMPMSG may be used to display (header fields only), but not correct, messages that are logged in the SENDQ database. If a deferred message is not a class 2 message (an acknowledgment notice being routed via EPATHID or PPATHID to the external non-TCM application that originated the message), then MMPMSG can MOVE the message from SENDQ to TLOG. This action automatically changes the message's status from "MSG IS DEFERRED" to "TCM ERROR". This movement also enables the user to correct the message and, if necessary, to resubmit (RESEND) the message to RA for processing.

The internal structure of each deferred message record is diagramed below. The figure shows the three segment types into which the record data is organized.

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Figure 2-2. The SENDQ Database

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The 01 segment is considered the root segment. It defines the entire deferred message record.

Associated with the root segment are one or more 02 segments that contain the message text. The message text consists of field name and field value combinations (pairs) arranged into groupings called aggregates.

Optionally associated with the root segment is one 03 segment. This 03 segment contains the data for an application header which may be contained in the input message processed by TCM. This application header data may be optionally routed back to the application system from which the input message originated.

2.6.1   01 Segment (root)

This segment contains the key that defines and uniquely identifies the deferred message record. This key consists of:

- *Target SEC (RSYS)*

- *PATHID (path ID)*

- *Link Name*
  If a "TCM (sending) to TCM (S)" or a "TCM to non-TCM (A)" or a "TCM (sending) to SOAC or PAWS (N)" scenario message is to be transmitted over an MSC (Multiple Systems Coupling) or ISC (Inter-System Communication) link, the name of the link (i.e., MSC name for MSC or LTERM name for ISC) appears in the LINK-NAME field. Otherwise, this field is blank. For a "TCM to TCM (receiving, R)" or a "non-TCM to TCM (Z)" or an "application (bypassing the sending TCM) to TCM (receiving, D)" scenario message, this field will contain the value of the source SEC (TSYS) from the input TCM header.

- *Deferred Time*
  This is the date (CCYYDDD) and time (HHMM) for which the message has been deferred.

- *Timestamp*

The 01 segment also contains all of the data that was received in the input message header. This includes:

- Activity #

- Source SEC (TSYS)

- Message Status Indicator

- Interface Scenario Indicator

- HOLD flag

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- RESEND flag

- RESEND time key

- Error LTERM name

- Positive acknowledgment LTERM

- Correction LTERM

- Target SECS 1 through 10

- Supplemental Identification codes 1 through 5

- Error Acknowledgment PATHID

- Positive Acknowledgment PATHID

- Application Header Indicator (03 segment in SENDQ)

Except as noted, the definitions of the above fields are identical to those for the TLOG database.

2.6.2   02 Segment

This segment contains the field names and field values that constitute the message text.

2.6.3   03 SEGMENT

This segment contains the data for an application header that may be contained in the input message processor by TCM.

2.7   SENDQ Activity # Secondary Index (VMMPSQP1)

The entries in this index are automatically created and deleted whenever the corresponding deferred message records in the SENDQ database are created and deleted.

The purpose of this index is to retrieve deferred message records for a given activity number.

2.8   SEC Database (VMMPSCDD)

This database is used to store information about the various operating systems with which the TCM communicates. Each of these operations systems is identified by a unique "System Entity Code" (SEC).

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> **NOTE —** The structure of the system entity code is
> defined in the Common Language Standard 255.

A record is created in this database for each SEC with which the TCM must communicate. The record also contains information about the one or more communication paths to and from that SEC and whether they are presently available.

The internal structure of each SEC record is appears in the following figure, which shows the four segment types into which the record data is organized..

Secondary Index
VMMPSCP1
KEY:
•LINKNAME

Primary
Key:
• SEC ID
• SELECTION CODE

SEC N

SEC 2

SEC 1

TO
PATH
SEGMENTS

PATH N

PATH 2

02   PATH 1
SEGMENTS   LINK   STATIS-
            DATA   TICS

TO 03 and 04
SEGMENTS

KEY:
•PATHID
•SCENARIO TYPE

IMS TRANCODE
TPAM FORMAT
OUTPUT CODE
SYSPLEX DATA

LTERM

DATA

03 SEGMENT
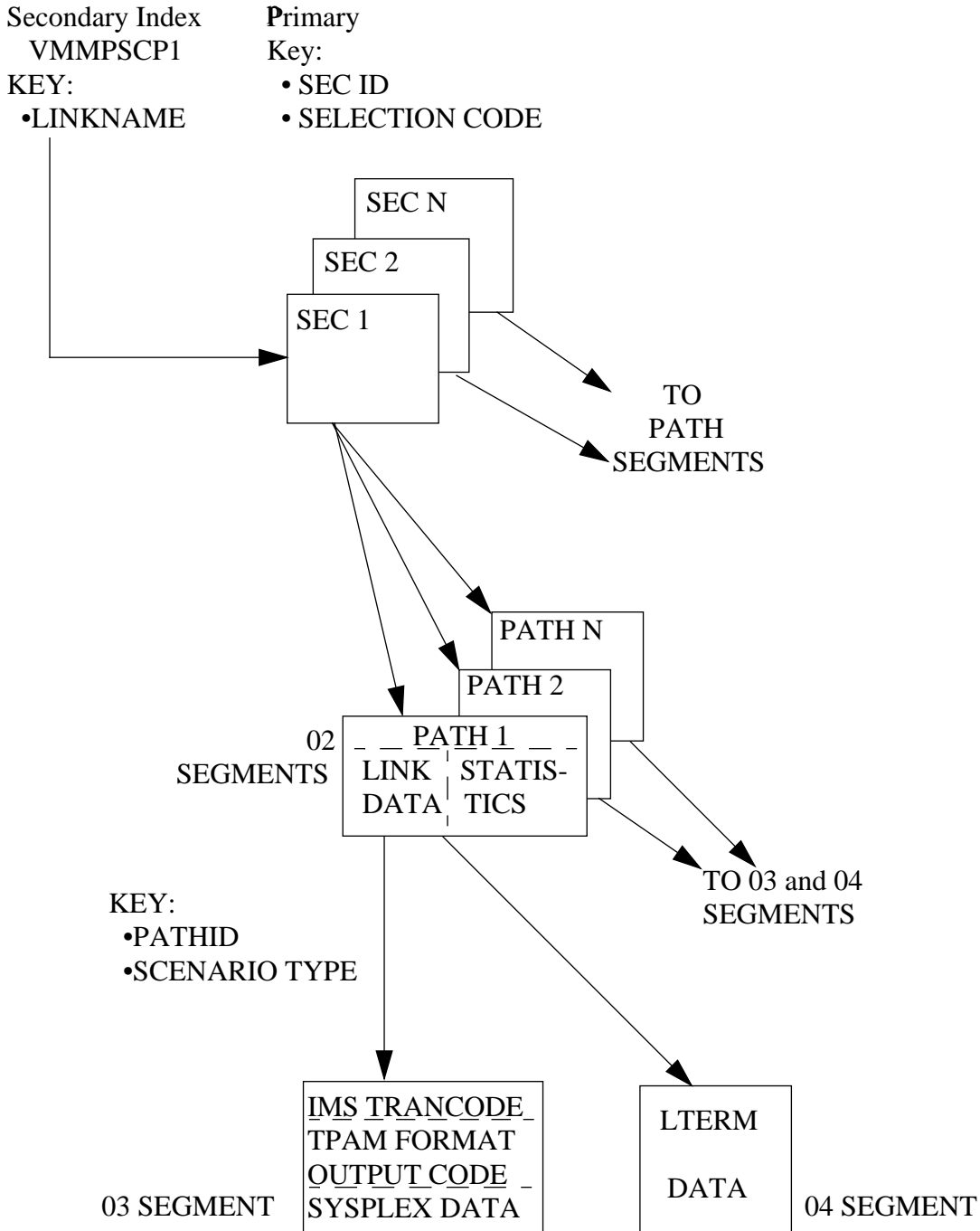
04 SEGMENT

Figure 2-3. The SEC Database

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The 01 segment is considered the root segment. It defines the entire SEC record.

Associated with the root segment are one or more 02 segments. Each 02 segment contains information about a single communication path to and/or from that SEC.

Associated with each 02 segment is one 03 and one 04 segment each of which contains additional path-related information.

2.8.1   01 Segment (root)

This segment contains the key that defines the SEC record. This key consists of:

- *SEC*
  This is the System Entity Code of the application with which the CSAS System (via TCM) must communicate. That system may be an external TCM system or it may be an external non-TCM system.

- *Selection Code*
  This field uniquely maps a TCM/IMS transaction code into a value from 01 through 15. The record with selection code 00 (also called the "control record") will contain information associated with the SEC and all the interface paths, but will contain no statistics counts, except for the defer counter. The other records (with selection codes not equal to 00) will contain only the statistics counts for all interface paths. A TTS table, the TCM SCHEDULE table, which appears below, has been defined to map the TCM IMS transaction codes to selection codes.

```
COMMAND       *** CSAS-TTS DATA SCREEN ***            /FOR
 TABLE NAME: TCM SCHEDULE    TABLE KEY:          ADMIN AREA:
 TABLE RECORD KEY:                  # OF RECORDS: 0001
 NOTE: TCM SCHEDULE TABLE              REL/LEV: 78.1    MOD: N
   FIELD    FIELD
   NAME    VALUE
   NBRTRAN  15*
   TRANCD1  VMMPCC1 *
   TRANCD2  VMMPCC2 *
   TRANCD3  VMMPCC3 *
   TRANCD4  VMMPCC1A*
   TRANCD5  VMMPCC1B*
   TRANCD6  VMMPCC1C*
   TRANCD7  VMMPCC1D*
   TRANCD8  VMMPD  *
   TRANCD9  VMMPM  *
   TRANCD10 VMMPCC2A*
   TRANCD11 VMMPCC2B*
   TRANCD12 VMMPCC2C*
   TRANCD13 VMMPCC1E*
   TRANCD14 VMMPCC1F*
```

Figure 2-4. TTS Table: TCM Schedule

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```
COMMAND       *** CSAS-TTS DATA SCREEN ***          /FOR




TABLE NAME:  TCM SCHEDULE     TABLE KEY:          ADMIN AREA:
TABLE RECORD KEY:                # OF RECORDS: 0001
NOTE: TCM SCHEDULE TABLE            REL/LEV: 78.1    MOD: N
  FIELD    FIELD
  NAME     VALUE
  TRANCD15 VMMPCC  *
```

Figure 2-5. TTS Table: TCM Schedule, continued

The Network Database record with the selection code 00 with all the SEC and interface path information will be inserted via the Network Administration (NA) format MMPNET. (The selection code field will not appear on the screen.) The records with selection codes other than 00 will be inserted dynamically by TCM when statistics counts have to be updated (if they don't already exist). To display the statistics for a particular path (via format MMPSTS), the individual statistics in the particular path segments for records with selection codes 01 through 15 will be added together.

Other information in the 01 segment includes:

- *SEC Description (DESCRP)*
  This free-format description is limited to 40 characters.

- *TCM/Non-TCM Indicator (SEC TYPE)*
  Indicator "T" means that the SEC record is for an external TCM system. Indicator "N" means that the SEC record is for an external non-TCM system. Indicator "S" means that the SEC record is for a FACS (SOAC) System.

- *Release Number*
  If the SEC is an external TCM system (indicator of "T"), the release number identifies the version of project line software under which it is operating.

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- *MAY-I Indicators*
  MAY-I indicators in the 01 segment tell whether the SEC is accepting or is not accepting messages on any path. There are two indicators. One is for communication *from* the SEC and the other is for communication *to the SEC*. An indicator of Y (yes) means that the SEC is accepting messages. An indicator of N (no) means that the SEC is not accepting messages.

2.8.2   02 Segment (path)

This segment contains the key that defines a communication path to the SEC. This key consists of:

- *PATHID*
  This is the code that identifies the category of messages that are being sent between two application systems.

- *Scenario Type*
  Valid values are:

VALUE	DEFINITION OF VALUE
S	TCM to TCM (sending)
R	TCM to TCM (receiving)
A	TCM to non-TCM
Z	non-TCM to TCM
I	intra-TCM
N	TCM (sending) to non-TCM (no database safestore)
D	application (bypass sending TCM) to TCM (receiving)

The data contained in the 02 segment includes:

- *Link Type*
  A value of "M" in this field means that the communication path is an MSC (Multiple Systems Coupling) link. The name of the MSC link must be provided in the LINK NAME field. A value of "I" in this field means that the communication path is an ISC (Inter-System Communication) link. The name of the ISC LTERM must be provided in the LINK NAME field. A value of "L" in this field means that the communication path is an LU6.2 (APPC) link. The name of the link descriptor must be provided in the LINK NAME field. A "blank" in the LINK TYPE field means that the communication path is within the IMS region and no special LINK NAME is required.

- *LINK NAME*
  If "LINK TYPE" is other than "blank", the name (MSC name, LU6.2, or ISC LTERM name) of the physical link must be provided in this field.

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- *Message Class Indicator*
  Class "1" is an application-to-application message.
  Class "2" is an FCIF acknowledgment message.
  Class "3" is an application-to-application DSECT or MDA grouped message.
  Class "4" is an application-to-application message where only the "ROUTCTL" is message switched.
  Class "5" is a DSECT acknowledgment message.

  > **NOTE** — Class 3 and Class 4 messages are very similar to Class 1 messages. All 3 classes are application-to-application messages that are usually processed in identical fashion. Class 5 messages are similar to Class 2 messages. Both of these are acknowledgments and are usually processed in a similar fashion.

- *CAN-I Indicator*
  This indicator tells whether the physical link that this path uses is available or unavailable. An indicator of Y (yes) means that the link is available. An indicator of N (no) means that the link is not working.

- *MAY-I Indicator*
  This indicator tells whether the application is accepting or not accepting messages over this path. This is independent of whether or not the physical link is working. An indicator of Y (yes) means that the application is accepting messages over this path. An indicator of N (no) means that the application is not accepting messages over this path.

- *Input Map ID for TPAM Parser*
  This is the name of the "Message Format Descriptor" (MFD) that TPAM must use to interpret the data it receives from a CSAS application, or directly from an external TCM System that elects to bypass its own supporting TCM.

- *Translation Rule ID*
  This is the name of the "Translation Rule Set" that TPAM must use to change data it has received.

- *Dequeue Quantity*
  At regular intervals during the day (set by the telephone company) BMP run VMMPM01 will trigger a process that performs automatic link verification and, if necessary, will request RA (routing administration) to retrieve and process deferred messages from the SENDQ database. The maximum number of messages to be processed during each of these dequeue sessions is set by the telephone company (via the MMPNET screen) and stored in the Dequeue Quantity field. By default is it 50.

- *Current Status of messages on TLOG and SENDQ databases*
  Current status statistics are stored in fields as follows:

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— today's date (the date format is year/day-of-year/hours/minutes/seconds/ tenths-of-a-second)

— number of messages currently in SENDQ (DEFERRED status)

— number of messages currently with a HOLD status

— number of messages currently with an AWAITING ACKNOWLEDGEMENT status

— number of messages currently with a TCM ERROR status

— number of messages currently with a PARSER ERROR status

— number of messages currently with a MAPPER ERROR and/or a TPAM ERROR status

— number of messages currently with a TRANSLATION ERROR status

— number of messages currently with an APPLICATION ERROR status

— number of messages currently with a RETURNED status.

- *Total Message Volumes for Today and Yesterday*
  The cumulative number of messages handled by TCM during both the current day (today) and the previous day for which TCM processed messages (yesterday) is stored in fields as follows:

  — number of messages input to TCM (today)

  — number of messages input to TCM (yesterday)

  — number of messages delivered by TCM (today)

  — number of messages delivered by TCM (yesterday)

  — number of messages deferred by TCM (today)

  — number of messages deferred by TCM (yesterday)

  — number of messages held by TCM (today)

  — number of messages held by TCM (yesterday)

  — number of messages acknowledged (today)

  — number of messages acknowledged (yesterday)

  — number of messages with a RESEND FLAG = Y (today)

  — number of messages with a RESEND FLAG = Y (yesterday)

  — number of messages resent via format MMPMSG (today)

  — number of messages resent via format MMPMSG (yesterday)

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     — number of messages given a TCM ERROR status (today)

     — number of messages given a TCM ERROR status (yesterday)

     — number of messages given a PARSER ERROR status (today)

     — number of messages given a PARSER ERROR status (yesterday)

     — number of messages given a MAPPER ERROR and/or TPAM ERROR status (today)

     — number of messages given a MAPPER ERROR and/or TPAM ERROR status (yesterday)

     — number of messages given a TRANSLATION ERROR status (today)

     — number of messages given a TRANSLATION ERROR status (yesterday)

     — number of messages given an APPLICATION ERROR status (today)

     — number of messages given an APPLICATION ERROR status (yesterday)

     — number of messages given an APPLICATION WARNING status (today)

     — number of messages given an APPLICATION WARNING status (yesterday)

     — number of messages Returned To MYSEC (today)

     — number of messages Returned To MYSEC (yesterday)

     — number of messages Returned By MYSEC (today)

     — number of messages Returned By MYSEC (yesterday)

- *TCM Error LDEST and Application Error LDEST*
  These two fields are used to populate to the LDEST field of a negative acknowledgment. They are usually used in only SOAC interfaces.

- *Error Universe Flag*
  This flag is used in the RA process to indicate that all error acknowledgments should be changed to warning acknowledgments for this path.

- *Warning Universe Flag*
  This flag is used in the RA process to indicate that all warning acknowledgments should be changed to error acknowledgments for this path.

- *Error List Present Flag*
  This flag is used in the RA process to indicate that an Error Exception List record exists on the ADMIN database for this path.

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2.8.3   03 Segment (IMSTC)

This segment contains additional path information as follows:

- *IMS Transaction Code (IMS TRANCODE)*
  This code identifies the transaction within the application that is to receive the message.

- *Output Map ID for TPAM Mapper*
  This is the name of the "Message Format Descriptor (MFD)" that the TPAM Mapper must use to place the message data into the internal format required by the CSAS application.

- *IMS Control Region Names*
  Up to ten (10) names are saved here. If TCM is processing in a SYSPLEX environment, then any IMS control region that had a problem would be listed here.

2.8.4   04 Segment (LTERM)

This segment contains the LTERM name of the printers to which exception notices may be sent. These names are provided by the telephone company via the MMPNET screen. Any LTERM names provided in these fields are automatically checked against IMS for validity.

- Primary LTERM

- Secondary LTERM

- Remote Notification LTERM

2.9   SEC Link Name Secondary Index (VMMPSQP1)

The entries in this index are automatically created and deleted whenever physical links are added, changed, or removed from path segments in the SEC database.

The purpose of this index is to locate all path segments that use a given link.

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2.10   ADMIN Database (VMMPAADP)

This root only database is used to store the Error Exception List records and TCM Test Generator message records.

Figure 2-6. The ADMIN Database

Table 2-1. ADMIN Database Record Type Codes

RECORD TYPE	APPLICATION
E	Error Exception List Process
T	TCM Test Generator

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2.10.1   Error Exception List Records

This segment contains the key that uniquely identifies an Error Exception List. This key consists of the following:

- *Record Prefix*
  This field allows the database to be logically divided by record type. The record type for an Error Exception List record is an "E".

- *Target SEC (RSYS)*
  This is the SEC of the target application which is to receive the message when the scenario is TCM to TCM Receiving (R) or non-TCM to TCM (Z) or Application (bypassing sending TCM) to TCM receiving (D). It is identified by the RSYS field in the TCM input header.

- *PATHID (Path Identifier)*
  This is the code that identifies the category of messages that are being sent between two application systems. It is identified by the PATHID field in the TCM input header.

- *Scenario Type*
  Valid values for this application are:

Table 2-2. Valid Error Exception List Scenario Types

VALUE	DEFINITION OF VALUE
R	TCM to TCM (receiving)
Z	non-TCM to TCM
D	Application (bypass sending TCM) to TCM (receiving)

2.10.2   TCM Test Generator Message Records

This segment contains the key that uniquely identifies a TCM Test Generator Message record. This key consists of the following:

- *Record Prefix*
  This field allows the database to be logically divided by record type. The record type for a TCM Test Generator message record is a "T".

- *Test Message ID*
  This field is the user created test message identifier.

Page Number
This field is the page number of the test message.

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2.10.3   TCM Database Inconsistency Report (MMPDBI)

```
* CSAS-TCM: DATABASE INCONSISTENCY REPORT (MMPDBI) *        PAGE   1
                       DATE 01/10/96
   SOURCE SEC         TIME STAMP          TIME 15:23:07

MYSEC             = ZA1SEC
LTERM             = X993B012
MODULE            =VMMPFDC
FUNCTION          =GE
DATABASE          =VMMPSCDD
STATUS CODE       =XX
SEG LEVEL         =01
FIRST SSA         =SCDDSEG1* -(SCDDKEY1 = 00)
SECOND SSA        =
THIRD SSA         =
IDAREA            =CLEARVU 00CLEARVIEW SEC RECORD
```

Figure 2-7. Format MMPDBI

2.11   Terminal Database (VMC1XXDD)

This database, often referred to as TERM DB (the terminal database), is used by TCM but is not part of TCM. It provides work areas for requesting CRT display terminals.

Format MMPMSG (in the Message Administration component of TCM) uses this database to store message records it retrieves from the TLOG database. These records are large and cannot be displayed on a single screen page. The TERM DB provides a convenient work area from which to display the data a page at a time.

The TERM DB also provides a convenient work area in which to update the data a page at a time. This is done with the SAVE (PF7/19) function key. After all updates are completed, the TLOG database is updated by replacing the original message record with the updated version from the TERM DB. This is done with the UPDATE (PF5/17) function key.

Whenever a message record is placed in the TERM DB, a "lock" is placed on the record in TLOG. The "lock" consists of the terminal's LTERM ID being placed in the Correction LTERM field in the header segment of the message record in TLOG. As long as that LTERM ID is in the record no other user can retrieve the record. This protects the record from being retrieved and updated by another user while the first update is still in progress. The "lock" is removed as soon as the record is returned from the TERM DB to TLOG.

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3.   Overall TCM Operation

Routing Administration (RA) is the core of TCM. It performs the primary function of TCM. This function is the routing of messages between one CSAS System subsystem and either another CSAS System subsystem or a non-CSAS System subsystem.

The Message Administration (MA), Network Administration (NA), and Translation Administration (TA) components of TCM support RA.

3.1   Preliminary Procedures

Several tasks must be performed before TCM can begin operation.

3.1.1   The TCM USER CONTROL TTS Table

The TTS Table known as "TCM USER CONTROL" appears below.

```
COMMAND        *** CSAS-TTS DATA SCREEN ***           /FOR


TABLE NAME: TCM USER CONTROL  TABLE KEY:           ADMIN AREA:
TABLE RECORD KEY:              # OF RECORDS: 0001
NOTE: TCM USER CONTROL TABLE           REL/LEV:      MOD: Y
 FIELD   FIELD
 NAME    VALUE
 MYSEC   VMITSSEC*
 TSALTERM PY507B00*
 IN BUF  1000*
 OUT BUF  1000*
 #P BUF  1000*
 UNIV BUF 200*
 PRFON    *
 PRFPGMS                          *
 PRFCMD1                          *
 PRFCMD2                          *
 PRFCMD3                          *
 PRFCMD4                          *
 PRFCMD5                          *
 PRFRSYS      *
 PRFTSYS      *
TTS206I FIND COMPLETED   CONTINUED ON NEXT PAGE
```

Figure 3-1. TTS Table: TCM User Control - Page 1

```
COMMAND       *** CSAS-TTS DATA SCREEN ***          /FOR


TABLE NAME: TCM USER CONTROL  TABLE KEY:          ADMIN AREA:
TABLE RECORD KEY:               # OF RECORDS: 0001
NOTE: TCM USER CONTROL TABLE         REL/LEV:    MOD: Y
 FIELD   FIELD
 NAME    VALUE
 PRFPATH      *
 PRFSCTYP *
 PRFTMST          *
 PRFACNO           *
 REMABEND *
 SEARDEST                    *
 LINKQCTL      *
 LINKQCTM  *
 LINKQCTI  *
 SYSPLEX *




TTS210I FIND COMPLETED
```

Figure 3-2. TTS Table: TCM User Control - Page 2

NOTE — SYSPLEX set to N is only used in a SYSPLEX
datasharing environment.

The TCM USER CONTROL table must be created and populated. The first five fields are
required.

MYSEC
This field specifies the system entity code (SEC) of the CSAS System in which the TCM
and TTS components reside.

- *TSALTERM (TCM SYSTEM ADMINISTRATOR'S PRINTER LTERM)*
  This is the default LTERM to which exception notices may be sent.

- *IN BUF*
  Buffer areas are used by RA to store input messages during processing. The size of the
  buffer area must be specified (in kilobytes) by the telephone company in the IN BUF
  field in the TTS table. The recommended value is 1000 (1000 kilobytes).

- *OUT BUF*
  Buffer areas are used by RA to store output messages during processing. The size of

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the buffer area must be specified (in kilobytes) by the telephone company in the OUT
BUF field in the TTS table. The recommended value is 1000 (1000 kilobytes).

- *#P BUF*
  This field is used for the TPAM internal buffer during TCM processing, specifically
  during parsing, translation and mapping. The recommended value is 1000 (1000
  kilobytes).

- *UNIV BUF*
  This field specifies the Universal Area Buffer size which is used to store universal
  variables during translation processing. The recommended value is 200 (200,000
  bytes).

- *PRFON*
  This flag specifies whether PRF debugging is on (Y) or off (N) during TCM
  processing for some background (i.e., non-IMS format invoked) programs.

> **NOTE —** To perform a DLOG/PTRACE of TCM, the
> user must enter COMMAND on the *TCM USER
> CONTROL* TTS Table. If the client has PWFI Message
> Regions turned on, "O=SC=1" must be added for tracing
> to work.

- *PRFPGMS*
  This field specifies which TCM programs should be traced by the PRF debugging
  during TCM processing. Only the VMMPAC and VMMPAD programs are currently
  supported.

- *PRFCMD1*
  This field specifies line 1 of PRF debugging commands to be executed during TCM
  processing.

- *PRFCMD2*
  This field specifies line 2 of PRF debugging commands to be executed during TCM
  processing.

- *PRFCMD3*
  This field specifies line 3 of PRF debugging commands to be executed during TCM
  processing.

- *PRFCMD4*
  This field specifies line 4 of PRF debugging commands to be executed during TCM
  processing.

- *PRFCMD5*
  This field specifies line 5 of PRF debugging commands to be executed during TCM
  processing.

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- *PRFRSYS*
  This field specifies a receiving system by which to restrict the PRF debugging executed during TCM processing.

- *PRFTSYS*
  This field specifies a transmitting system by which to restrict the PRF debugging executed during TCM processing.

- *PRFPATH*
  This field specifies a path name by which to restrict the PRF debugging which is executed during TCM processing.

- *PRFSCTYP*
  This field specifies a scenario type by which to restrict PRF debugging which is executed during TCM processing.

- *PRFTMST*
  This field specifies a timestamp by which to restrict the PRF debugging which is executed during TCM processing.

- *PRFACNO*
  This field specifies an activity number by which to restrict the PRF debugging which is executed during TCM processing.

- *REMABEND*
  Flag to remove U38xx abends. "N" or blank will process abends as they are now. "Y" will remove all U38xx abends from TCM online software. TCM batch or BMP runs are not affected by this feature.

- *SEARDEST*
  Destination for server error analysis report. This field must contain a valid LTERM, dataset or PRF dataset member if REMABEND is "Y".

- *LINKQCTL*
  This field specifies the maximum number of messages on queue for any one LU6.2 link in this IMS control region, before the VMMPNP transaction starts to defer the data to the SENDQ (VMMPSQDP) database for the paths using this link.

- *LINKQCTM*
  This field specifies the maximum number of messages on queue for any one MSC (Multiple System Coupling) link in this IMS control region, before the VMMPNP transaction starts to defer the data to the SENDQ (VMMPSQDP) database for the paths using this link.

- *LINKQCTI*
  This field specifies the maximum number of messages on queue for any one ISC (Inter System Coupling) link, before the VMMPNP transaction starts to defer the data to the SENDQ (VMMPSQDP) database for the paths using this link.

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- *SYSPLEX*
  This flag will tell TCM to process all outgoing data leaving over an MSC, ISC, or LU6.2 link, in a SYSPLEX datasharing environment.

3.1.2   SEC Database

This database must be created and populated with the following data:

- *SEC Data*
  A SEC segment must be created in this database for every external TCM system and/or external non-TCM system that this TCM must communicate with. A SEC segment must also be created for the host system. Each external TCM system and/or external non-TCM system is identified with a unique "System Entity Code (SEC)". The SEC that TCM is part of is referred to as MYSEC. MYSEC must be identified in TCM USER CONTROL table. Other information that must be specified in the SEC segment includes:

  — Whether the record is for an external TCM system or an external non-TCM system. If for an external TCM system, the SEC must also include the release number of the project line that the TCM resides in.

  — Whether or not communication to and from the SEC is turned on or off (via the MAY-I indicators).

- *Path Data*
  A path segment must be created for every communication path that will exist to and from each SEC in the database. Each such path must be identified by a PATHID and Scenario Type. Other information that must be specified in the path segment includes:

  — Whether or not the physical link is an MSC (Multiple Systems Coupling) type, and if so, its name. If the link is an ISC ("Inter-System Communication") type, the path segment must include the LTERM name. If the link is an LU6.2 type, the path segment must include the descriptor name.

  — Whether the path is for an application-to-application message (class 1) or for an acknowledgment message (class 2).

  — Whether the physical link is available or not available (via the CAN-I indicator).

    > **NOTE —** When the path segment is initially created, the physical link indicator (CAN-I) is automatically set to available "Y". All subsequent changes are made by the automatic "link verification" process. The user cannot specify or change the indicator via the MMPNET screen.

  — Whether or not the application is accepting messages via the MAY-I indicator. (Default value is Y.)

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— The name (MAP ID) of the input "Message Format Descriptor (MFD)" that the TPAM Parser must use to interpret the data it receives from a CSAS System application or from a remote system application that elects to bypass its own supporting TCM. Not applicable for class 2 (acknowledgment) messages.

— The name of the "translation rule set" that the TPAM Translator must use to change data it has received. Not applicable for class 2 (acknowledgment) messages.

— The maximum quantity of deferred messages that the client company wishes to process each time that BMP run VMMPM01 triggers the dequeue process at regular intervals during the day. (Default value is 50.)

— The TRANCODE that tells IMS which transaction is to receive the message within the CSAS application, or non-CSAS systems.

— The name (MAP ID) of the output "Message Format Descriptor (MFD)" that the TPAM Mapper must use to place the message data into the internal format required by the CSAS application. Applicable for Class 5 (acknowledgment) messages. (Not applicable for class 2 acknowledgment messages.)

— The primary, secondary, and remote notification LTERM names of the printers to which exception notices may be sent. (Not applicable for class 2 acknowledgment messages.)

3.1.3 Translation Rules

Translation rules are not a requirement for the operation of TCM. They are needed only when the telephone company decides it is more efficient or expedient to use the TPAM Translator to make data changes than to make a more difficult change in an external non-TCM system reformatter. Translation rules are also useful for resolving release level differences.

When rules are required, the tools of the TA (Translation Administration) component of TCM must be used to generate them and make them available to the TPAM Translator.

If the rules require data to be stored in TTS tables, those tables must also be created.

3.1.4 The TCM EXT PATHID TTS Table

The TCM EXT PATHID TTS table is displayed below.

The TCM EXT PATHID TTS table has the purpose of finding a required PATHID when translating a *C1 header into a *ROUTCTL header. PATHID's are defined by TCM local applications (e.g. CSAS) and must not be randomly chosen. The SEC and PATHID that occupies this TTS table must match the one built on the TCM Network Administration screen (MMPNET). Currently there is no validation done for fields on this TTS table.

```
COMMAND      *** CSAS-TTS DATA SCREEN ***         /FOR


 TABLE NAME: TCM EXT PATHID   TABLE KEY:        ADMIN AREA:
 TABLE RECORD KEY:            # OF RECORDS: 0000
 NOTE: TCM NON-STANDARD HEADER PATHIDS     REL/LEV:     MOD:
  FIELD   FIELD
  NAME    VALUE
  TSYS       *
  PATHID     *
```

Figure 3-3. TTS Table: TCM EXT PATHID

The table key will be the name of the TSYS (Transmitting System) name in the original message. This table will not have a seed record included in its delivery.

The TCM EXT PATHID table has two fields.

- TSYS

  This field is the Transmitting System Entity Code (SEC), also called the Target SEC. This is the key field.

- PATHID

  This is the code that identifies the category of messages that are being sent between two application systems.

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3.1.5   The TCM MMPPLEX TTS Screen

The TCM MMPPLEX TTS screen is displayed below.

```
* CSAS-TCM: SYSPLEX ADMINISTRATION (MMPPLEX) *          /FOR
SEC:            PATHID:           SCENARIO TYPE:



  SYSTEM 1 :
  SYSTEM 2 :
  SYSTEM 3 :
  SYSTEM 4 :
  SYSTEM 5 :
  SYSTEM 6 :
  SYSTEM 7 :
  SYSTEM 8 :
  SYSTEM 9 :
  SYSTEM 10:




  1/13 FIND   3/15 MMPNET   5/17 UPDATE   8/20 REFRESH   11/23 HELP
```

Figure 3-4. TTS Table: TCM MMPPLEX

The TCM MMPPLEX Table enables users to see the current state of the path with a link problem. The SEC is of the external system receiving data. The path is defined on the MMPNET screen. The fields shown on this screen are control region names which are having link problems for the PATHID referenced on the MMPNET format.

3.1.5.1   Function Keys for MMPPLEX

PF1/13 (FIND)	FIND by SEC, PATH and SCENARIO TYPE.
PF3/15 (SWITCH)	SWITCH to format MMPNET, using SEC, PATHID and SCENARIO TYPE.
PF5/17 (UPDATE)	Update control region name list.
PF8/20 (REFRESH)	Refresh the MMPPLEX screen.
PF11/23 (HELP)	HELP on each field by the cursor position.

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3.1.6 TCM Year 2000 External Systems TTS Table

A TTS table, TCM Y2000 EXTSYS, indicates that an external system is enhanced and ready to accept the expanded TCM timestamp-related fields.

The table record key of the TCM Y2000 EXTSYS TTS table will be the external system's System Entity Code (SEC). The only field in the table will be the same as the table record key:

Field Identifier:	EXTSYS
Format:	Up to 8 characters
Validations:	None
Pre-Populated	No

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The TCM Year 2000 External Systems TTS data screen is shown below:

```
COMMAND        *** CSAS-TTS DATA SCREEN ***         /FOR



TABLE NAME: TCM Y2000 EXTSYS  TABLE KEY:          ADMIN AREA:
TABLE RECORD KEY: SOACSEC        # OF RECORDS: 0007
NOTE: EXTERNAL SYSTEMS WITH YEAR 2000 CHANGES  REL/LEV: 98.1.1.1  MOD: N
 FIELD   FIELD
 NAME    VALUE
 EXTSYS  SOACSEC *




TTS210I FIND COMPLETED
```

Figure 3-5. The TCM Year 2000 External System TTS Table

3.2   Routing Administration Process

3.2.1   Message Routing

The RA component has the task of processing messages. This includes:

- *Class 1, class3, or class 4 application-to-application messages*
  These messages contain information that one operating system wishes to send to
  another operating system. The RA component receives the message from the
  transmitting system (TSYS), processes it, and sends it to the receiving system (RSYS).
  RA also stores a copy of the message in its TLOG database pending the receipt of a
  positive acknowledgment from the receiving system. (Exception: In a TCM-
  (sending)-to-TCM scenario, only the receiving TCM stores the message and processes
  the acknowledgment.)

- *Class 2 and class 5 application-to-TCM acknowledgment messages*
  These messages inform the RA component that the receiving system has received the
  message and is satisfied with it (positive acknowledgment or warning) or has received
  the message and is not satisfied with it (negative acknowledgment). A positive
  acknowledgment (or warning) causes the copy of the message that was retained in the
  TLOG database to be deleted. In addition, if a copy of the message was being viewed
  by an LTERM (via MMPMSG), then the copy of the message in the TERM DB
  (VMC1XXDD) will also be deleted. It also causes RA to look for and process the next

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related (by activity number) HELD message, if one exists. A negative acknowledgment causes one or more errors to be logged against the message already stored in the TLOG database. The message continues to be retained in TLOG until corrected and resent by format MMPMSG (in the Message Administration (MA) component) or until deleted by that format.

- *Class 2 TCM-to-application acknowledgment messages*
  These messages are optional, and may be used to inform a transmitting external non-TCM or TCM supported system/application that TCM has received a Class 2 application-to-TCM acknowledgment message (either positive or negative) from a receiving application. This acknowledgment is in response to a Class 1 message originally sent by the transmitting non-TCM system/application. In addition, it may also be used to inform a transmitting TCM application that TCM has received a Class 2 application-to-TCM acknowledgment message from a receiving non-TCM application. Whether this type of message (TCM to application acknowledgment) is sent at all depends upon the presence of the fields PPATHID and/or EPATHID in the original Class 1 message. Positive acknowledgments are routed via the PPATHID path, if not blank. Negative acknowledgments (and warnings) are routed via the EPATHID path, if not blank. This feature is of particular interest to TCMs that communicate with SOAC. SOAC uses the TCM ERROR LDEST and APP ERROR LDEST fields (of MMPNET) to specify its own internal destination (a SOAC application) of negative acknowledgments of its Class 1 messages. Negative acknowledgments of SOAC's Class 1 messages take the form of Class 2 TCM to application messages. Therefore, it follows that SOAC users must supply an EPATHID, or they will not be notified of errors that occurred during processing of their Class 1 messages.

- *HELD Class 1 or class 3 messages*
  These are previously received messages that have been stored in TCM's TLOG database with a status of HOLD. They are being held to ensure that related messages (i.e., relating to the same circuit order) are sent in proper sequence. The RA component automatically resumes processing on held messages when the earlier related messages have been transmitted and positively acknowledged.

- *DEFERRED Class 1 or class 3 messages*
  These are previously received messages that have been stored in TCM's SENDQ database with a status of DEFERRED. The suspension of processing is due to the unavailability of a communication path, the user's request to defer processing until a specified time, or the existence of previously deferred messages on that path. The RA component automatically resumes processing (at regular intervals during the day) when the path is again available. This is called the "dequeue" process. It is "triggered" by BMP run VMMPM01.

- *DEFERRED Class 2 Messages*
  These messages acknowledge (positive or negative acknowledgment) the receipt of class 1 or class 3 application to application messages that included PPATHID/

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EPATHID fields in their TCM input headers. DEFERRED Class 2 messages are exception notice messages that RA had previously tried to deliver, but which were stored in TCM's SENDQ database with a status of DEFERRED. The processing may have been suspended because of the unavailability of a communications path or to the existence of previously deferred messages already on that path. The RA component automatically resumes processing at regular intervals when the path is again available. DEFERRED Class 2 messages are processed in the same manner as DEFERRED Class 1 or class 3 messages.

- *Corrected Class 1 or class 3 Messages*
  Class 1 or class 3 messages that are found to contain errors are retained in TCM's TLOG database until corrected. Corrections may be made with Format MMPMSG in the Message Administration (MA) component of TCM. The RA component resumes processing of the message when it is resubmitted to RA via the RESEND (PF9/21) function key of Format MMPMSG.

The RA process requires that all application-to-application messages and all application-to-TCM acknowledgment messages (from either an external TCM system or an external non-TCM system) be submitted to it on the IMS message queue.

HELD and corrected Class 1 messages are retrieved directly from the TLOG database by RA. DEFERRED Class 1 and Class 2 messages are retrieved from the SENDQ database.

3.2.2   Message Header Requirements

Each message that is submitted to TCM for processing must be prepended with a "header".

> **NOTE** — In the CSAS System, the header is automatically generated by the application that submits the message.

Please refer to the Routing Administration (RA), BR 252-573-302 for detailed information on the contents of the message header for a particular field.

3.2.3   Message Processing Steps for Class 1 or Class 3 Messages

When RA receives the message it performs the following steps:

1. Header Processing
   The message header (in FCIF) is read and validated. Default values are provided for the HOLD (HLDFLG=Y) and RESEND (RSFLG=N) flags and the DEFER TIME (short format: DFTM=000000000, or long format: DFTM=00000000000), if none were provided by the message originator. A time stamp is also added to the header to help in uniquely identifying the message.

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> **NOTE —** In the case of SCENARIO TYPE = R, the
> timestamp is generated by the sending TCM.

2. RESEND Processing

   If the RESEND flag is on, the earlier copy of the message is deleted from TLOG if the current message contains a value for the TMST field in the TCM input header. Otherwise all messages with the same source SEC (TSYS) and activity number (ACNO) as the current message will be deleted from TLOG.

3. HOLD Processing

   If the HOLD flag is on, a check is made to determine if the new message must be held until one or more related messages (received earlier) are processed and positively acknowledged. If holding is necessary, the message header and text is stored in the TLOG database with a status of HOLD. If the HOLD flag is off, no check is made and the message is not held.

4. DEFER Processing

   The SEC database is checked to determine if the necessary communication channels are open for delivery of the message. All checking is done in the record for the remote SEC. This involves checking the MAY-I indicator in the SEC segment and both the CAN-I and MAY-I indicators in the path segment. If any of the indicators is set to N (no), the message must be deferred. If the indicators are set to Y (yes), the SENDQ database is checked to determine if previously deferred messages for that communication channel still exist. If they do, the new message must be deferred in order to preserve sequentiality of the message delivery. If deferral is necessary, the message header and text are stored in the SENDQ database.

5. Message Processing and Logging

   • The input message text is converted into TPAM's internal data format. The conversion is handled entirely by the TPAM Parser if the input message is in the FCIF format. (In the case of multi-section FCIF messages, TCM offers a facility for bypassing TPAM processing of part of the message. If the ROUTCTL field SKIP is present in the input message, then TPAM will bypass processing of this FCIF section and resume processing with the next non-skip section. This skip section will be transmitted "unparsed" to the receiving application.) If, however, the input message is in the CSAS System internal format, (scenario type S or N) or in the remote sending application's internal format (scenario type = D), the conversion requires the use of a special "Message Format Descriptor (MFD)" to interpret the data. The name of this input MFD is obtained from the SEC database.

   • Changes to field names and/or field values in the message data are made by the TPAM Translator, if required. The changes are required only if a "translation rule set" ID is found in the SEC database for the communication path that the message is using. The "rule ID" tells the Translator which "rule set" out of a library of "rule sets" to retrieve and execute for this message.

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- The message text (in TPAM's internal format) is converted into an output format suitable for the output message. The conversion is handled entirely by the TPAM Mapper if the message is to be placed into the FCIF format for transmittal to an external TCM system or to an external non-TCM system. If, however, the message is to be placed into the CSAS internal format, the conversion requires the use of a special "Message Format Descriptor (MFD)" to interpret the data. The name of this output MFD is obtained from the SEC database.

- With only two exceptions, the message is logged in the TLOG database and retained until a positive acknowledgment is returned by the receiving system. The one exception is when the message is being sent to another TCM (scenario type = S). In that instance, the logging will be performed by the TCM at the receiving remote application. The other exception is scenario type=N, for data bound for a non-TCM system, which is not required to acknowledge the data. There is no database safestore for these messages. Both the input and output message texts are logged in the same message record. Also logged is the input message header, and the input application header, if present.

- An output message header is created by RA in the FCIF format and combined with the output text to form the output message.

- The communication path to be used to transmit the message to the receiving system is retrieved from the SEC database. If the receiving system is the CSAS System associated with the TCM, the message will be placed on the IMS message queue. If the receiving system is another TCM or a non-TCM system, the message may also be placed on the IMS message queue or may alternately be placed on a physical MSC (Multiple Systems Coupling) or ISC (Inter-System Communication) link.

3.2.4   Acknowledgment Processing Steps

1. Header Processing
   The acknowledgment header (in FCIF) is read and validated.

2. Text Processing
   The acknowledgment text is read and converted into TPAM's internal data format. If the acknowledgment is an application error or a warning, the error exception process may optionally be invoked. The error exception process will check if the acknowledgment process should be changed from the application error acknowledgment process to the warning acknowledgment (a type of positive acknowledgment) or the warning acknowledgment process to the application error acknowledgment process (a negative acknowledgment). The test is then analyzed to determine if a positive or negative acknowledgment has been received. Negative acknowledgments cause the initiation of error processing. For positive acknowledgments, the following steps are performed:

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- *Class 1 Message Deletion*
  If the acknowledgment is positive, with or without a warning, the class 1 message to which it refers is deleted from the TLOG database. In addition, if a copy of the message was being viewed by an LTERM (via MMPMSG), the copy of the message in the TERM DB (VMC1XXDD) will also be deleted.

- *Exception Notice Printing*
  If a warning accompanied the acknowledgment, the LTERM name of the printer on which it is printed is selected by the "error processing" logic. Otherwise, a positive acknowledgment notice is routed in FCIF format to the system originating the class 1 message if the PPATHID field was specified, or else a positive acknowledgment notice is printed if the PLTERM field was specified.

- *HELD Message Check*
  A check is made in the TLOG database to see if any related class 1 messages (messages having the same activity number) exist in a HOLD status. If they do, the next message in sequence is submitted to RA for processing.

3.2.5   Error Processing Steps

Six types of errors can be encountered during RA processing.

- TCM header validation errors

- TPAM parsing errors

- TPAM translation errors

- TPAM mapping errors

- TPAM general errors

- Application errors from a negative acknowledgment

When these errors occur, the error processing is initialized. The error processing steps are described in the RA User Manual and are the same for all six types.

3.2.6   RA User Manual

For additional details about the error processing steps and overall Routing Administration process, refer to BR 252-573-302.

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3.3   Network Administration Process

The NA component has the task of creating and maintaining reference data for RA, sending deferred message dequeue requests to RA, and monitoring message volumes being handled by RA.

3.3.1   Creation & Maintenance of Reference Data

The NA component creates and maintains all reference data for RA in the SEC database (VMMPSCDD) via online format MMPNET.

A record is created in this database for every operating system with which the TCM will be communicating. The key to each record is the "System Entity Code (SEC)" of each of those systems.

Within each SEC record a "path" segment is defined for every possible combination of PATHID and scenario type (SCTYPE) that may appear in the header portion of messages processed by RA. PATHIDs are mnemonic codes that specify the category of messages that are being sent between application systems. SCENARIO TYPE is a TCM code that defines the direction the message is being sent and the type of systems involved, that is, TCM versus non-TCM system.

The reference data contained in these path segments are essential to the processing of messages by RA. This data includes:

- *LINK TYPE and LINK NAME*
  This reference data defines the type of physical communication link over which the message is to be transmitted and the specific name of that link so that IMS can recognize it.

- *IMS TRANCODE*
  This reference data defines the name of the exact transaction within a TCM or non-TCM application that is to receive the message.

- *TPAM FORMAT IN or TPAM FORMAT OUT*
  This reference data defines the "Message Format Descriptors (MFDs)" by which the TPAM (TCM Parser and Mapper) component of RA interprets the data in a message from a CSAS application or by which TPAM is able to place a message into the internal format of a CSAS application.

- *RULE ID*
  This reference data defines the name of the set of translation rules that TPAM must use to change data in messages that use this path segment.

Other reference data contained in the SEC records include external TCM system release levels, LTERMs to which exception notices may be sent, MAY-I indicators that tell whether or not the CSAS System application or the distant CSAS System or non-CSAS

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System application is up or down to messages on either all paths or on a specific path, and a CAN-I indicator that tells whether or not the physical link is up or down.

The need to make changes to the reference data in the SEC database is expected to come from verbal requests, exception notices, and message volume statistics.

3.3.2   Deferred Message Dequeue Requests

At regular intervals during the day a BMP run, VMMPM01, triggers the automatic link verification and deferred message dequeue process.

The link verification portion of the process compares the CAN-I indicator status of each physical link with the actual status of that link in IMS. If the actual status is different, the CAN-I status is updated to agree with IMS.

The dequeue portion of the process determines when deferred messages should be removed from the SENDQ data base by cross-checking the CAN-I and MAY-I indicators with the number of messages in the SENDQ database. If, in a given path, all indicators are up and the number of messages in SENDQ is greater than zero, a dequeue request is sent to RA. Included in the request is the maximum number of messages that should be dequeued for this path at this time. The maximum number (DEQUEUE COUNT) is reference data in the path segment of the SEC database.

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3.3.3 Message Volume Monitoring

The Network Administrator can monitor the status of the TCM processes via the statistics that RA enters into the SEC database each time it processes a message. These statistics show the current status of the TLOG and SENDQ databases, the total volume of messages processed for the current day (today), and the total volume of messages processed for the previous day that TCM processed messages (yesterday). These statistics can be displayed at any time by Format MMPSTS, pictured below.

```
* CSAS-TCM: NETWORK MSG VOLUMES (MMPSTS) *   /FOR        PAGE  1
SEC:        PATHID:      SCENARIO TYPE:  96.010 DATE 01/10/96
            CURRENT MESSAGE STATUS        TIME 15:22:46
DEFERRED:         TCM :         TRNSLTN:
HELD  :         PARSE:         APPLCTN:
PEND ACK:        MAP :         RETURND:


TOTAL MESSAGE VOLUMES    YESTERDAY        TODAY
         INPUT:
       DELIVERED:
        DEFERRED:
          HELD:
     ACKNOWLEDGED:
   RESENT TO MYSEC:
   RESENT BY MYSEC:
      TCM ERRORS:
     PARSER ERRORS:
     MAPPER ERRORS:
   TRANSLATION ERRORS:
   APPLICATION ERRORS:
  APPLICATION WARNINGS:
   RETURNED TO MYSEC:
   RETURNED BY MYSEC:
```

Figure 3-6. Format MMPSTS

FIND							RFSH	MMPNET		HELP	PRNT
PF1							PF8	PF9	PF10		PF12
PF13							PF20	PF21	PF22		

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3.3.4 Other Network Administration Screens

The other Network Administration screens, Formats MMPNET, MMPPLEX and
MMPERR appear in the following figures.

```
 * CSAS-TCM: NETWORK ADMINISTRATION (MMPNET) *    /FOR       PAGE  1
 SEC:       PATHID:     SCENARIO TYPE:  96.226 DATE 08/13/96
                              TIME 22:19:04
 ********** SEC  INFORMATION **********
 SEC TYPE:  APPL HEADER:  RELEASE LEVEL:
 LINK STATUS   (TO) MAY-I:    (FROM) MAY-I:
 PROCESSING LEVEL  RESEND:        HOLD:
 DESCRP:
 STATISTICS:
 ********* PATH  INFORMATION *********
                  (MYSEC)
  MESSAGE CLASS:          RULE ID:
    LINK TYPE:        LINK NAME:
 LINK STATUS MAY-I:     LINK STATUS CAN-I:
   DEQUEUE COUNT:          INPUT MFD:
    TRANCODE:         OUTPUT MFD:
  TCM ERROR LDEST:      APP ERROR LDEST:
             DEF OFFSET:
  *** LTERMS FOR EXCEPTION NOTICES ***
  PRIMARY:       SECONDARY:       REMOTE NOTIFICATION:


 1/13 FIND  2/14 NEXT PATH  3/15 MMPPLEX  4/16 ADD  5/17 UPDATE 6/18 NEXT SEC
 7/19 MMPERR 8/20 REFRESH   9/21 MMPSTS 10/22 DELETE      11/23 HELP
```

Figure 3-7. Format MMPNET

FIND	FWD	MMPPLEX	ADD	UPD	NEXT	MMPERR	RFSH	MMPSTS	DELT	HELP	PRNT
PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12
PF13	PF14	PF15	PF16	PF17	PF18	PF19	PF20	PF21	PF22	PF23	

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```
CSAS-TCM: SYSPLEX ADMINISTRATION (MMPPLEX) *          /FOR
SEC:       PATHID:      SCENARIO TYPE:



  SYSTEM 1 :
  SYSTEM 2 :
  SYSTEM 3 :
  SYSTEM 4 :
  SYSTEM 5 :
  SYSTEM 6 :
  SYSTEM 7 :
  SYSTEM 8 :
  SYSTEM 9 :
  SYSTEM 10:
```

Figure 3-8. Format MMPPLEX

FIND	Switch to MMPNET	UPDATE		RFSH		HELP	
PF1	PF3	PF5		PF8		PF11	
PF13	PF15	PF17		PF20		PF23	

Complete information on Network Administration and detailed instructions on the use of formats MMPSTS, MMPNET, and MMPERR (see Section 3.4.2) are found in BR 252-573-304, TCM Network Administration.

3.4   Message Administration Process

The MA component has the task of correcting or deleting messages logged in the TLOG database that RA either is unable to deliver because of errors encountered during RA processing or cannot get a positive acknowledgment for because of application errors. Complete information on Message Administration is found in BR 252-573-303, TCM Message Administration.

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3.4.1 Exception Notice Analysis

The MA component's task begins when an exception notice is received. This notice informs the user about an error or warning that occurred either during RA processing or during the receiving system's check of the class 1 message. The person or persons responsible for MA will need to analyze these notices to determine the best solutions to resolving the errors. The best solution is one that will keep the errors from recurring in the future. The more immediate solution, however, is to fix the messages logged in TCM and send them on their way.

3.4.2 Error Exception List Processing

Format MMPERR, which appears below, allows a user to optionally treat application error acknowledgments as warnings, and application warning acknowledgments as errors.

```
* CSAS-TCM: NETWORK EXCEPTION LIST (MMPERR) *          /FOR
 SEC:       PATHID:    SCENARIO TYPE:   96.010 DATE 01/10/96
                         TIME 09:11:45
  _ TREAT ALL ERRORS AS WARNINGS     _ TREAT ALL WARNINGS AS ERRORS
  NOTE: THE ABOVE 2 FLAGS WILL FORCE THE OVERRIDE OF THE TABLE BELOW
 ACT ERROR   ACT ERROR  ACT ERROR   ACT ERROR   ACT ERROR
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
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 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------
 - --------  - --------  - --------  - --------  - --------

 1/13 FIND      4/16 ADD     5/17 UPDATE    7/19 MMPNET
 8/20 REFRESH   10/22 DELETE   11/23 HELP
```

Figure 3-9. Format MMPERR

FIND			ADD	UPD		MMPNET	RFSH		DELT	HELP	PRNT
PF1			PF4	PF5		PF7	PF8	PF9		PF11	PF12

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PF13			PF16	PF17		PF19	PF20	PF21		PF23	

3.4.3   Message Correction and Resend

Format MMPMSG, which appears in the following figure, allows the user to find and display any input or output message logged in the TLOG database. Special function keys and command words exist to display the entire contents of a message on an aggregate by aggregate basis. Other command words exist to display all errors within a single message one at a time or a single type of error in many messages throughout the database.

```
 * CSAS-TCM: MESSAGE ADMINISTRATION (MMPMSG) *    /FOR    PAGE   1
COMMAND =>                    96.010 DATE 01/10/96
ACNO            I/O   MSG STATUS       TIME 18:18:01
ERROR CODE      OUTPUT MSG KEY       SEARCH AGR NAME
SOURCE(TSYS)      TIME STAMP          TMST(END)
TARGET(RSYS)      PATHID      SCTYPE
ERROR
NOTE :
```

Figure 3-10. Format MMPMSG

FIND	FWD	BACK		UPD	NEXT	SAVE	RFSH	RSND	DELT	HELP	PRNT
PF1	PF2	PF3		PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12
PF13	PF14	PF15		PF17	PF18	PF19	PF20	PF21	PF22	PF23	

Complete information on Format MMPMSG is found in BR 252-573-303, TCM Message Administration.

The user can correct a message in TLOG by overtyping the data displayed on the screen. After the corrected message is returned to the TLOG database, the user can resubmit it to RA for processing. This is done with the RESEND (PF9/21) function key.

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3.4.4   Message Deletion

The message can be deleted, if this is the best solution to resolving the error. It is assumed that this will only be done if the transmitting system is willing and able to resubmit the message or if the receiving system no longer needs it.

3.4.5   Message Dequeueing

On occasion the MA user may wish to move a DEFERRED class 1 message from the SENDQ data base to the TLOG database. This can be done with a special MOVE command word on the MMPMSG screen.

3.5   Test Message Generation and Send

Format MMPTST, which appears in the following figure, allows the user the opportunity to formulate test messages to be sent to an application. A case where such a procedure is desired is where the sending or receiving external system is not yet installed, or is unavailable for testing.

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Special command words exist to copy a message; to insert, remove, and renumber pages of a message; to inspect the TCM FCIF syntax of a message and to expand timestamp-related fields from the short to the long format.

```
COMMAND:        CSAS-TCM: TEST MESSAGE GENERATOR(MMPTST)     /FOR

  TEST MESSAGE ID:        IMS TRANCODE:        PAGE NUMBER:















  1/13 FIND     2/14 FORWARD   3/15 BACK     4/16 ADD     5/17 UPDATE
  8/20 REFRESH  9/21 SEND    10/22 DELETE   11/23 HELP    12/24 PRINT
```
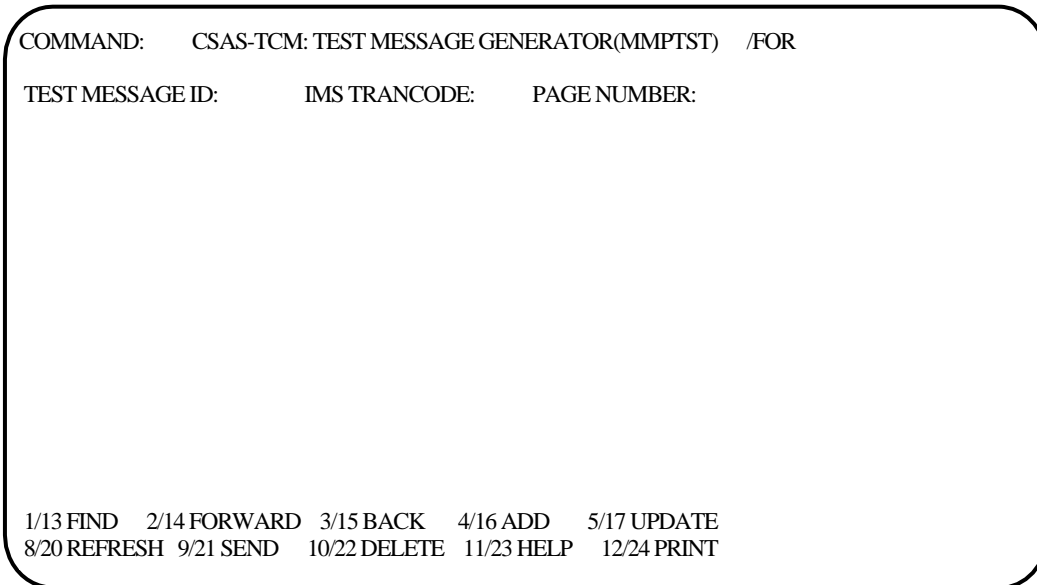
Figure 3-11. Format MMPTST

FIND	FWD	BACK	ADD	UPD			RFSH	SND	DELT	HELP	PRNT
PF1	PF2	PF3	PF4	PF5			PF8	PF9	PF10	PF11	PF12
PF13	PF14	PF15	PF16	PF17			PF20	PF21	PF22	PF23	PF24

Complete documentation on Format MMPTST is provided in BR 252-573-303.

3.5.1   Test Message Additions

Test messages can be added to the ADMIN database (VMMPAADP) over a series of pages that can be sent to the local TCM via the SEND (PF9/21) function key. The messages must be in FCIF format.

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3.5.2 Message Deletions

Test messages or timestamp messages can be removed from the ADMIN database via the DELETE (PF10/22) function key and/or DELETE command word. The bulk delete feature is used specifically for deleting up to 100 time stamp messages at one time.

3.5.3 Test Message Updates

A test message can be updated providing it is in FCIF and contains no hexadecimal data representations.

3.6 Translation Administration Process

Complete information on Translation Administration is located in BR 252-573-305, the TCM Translation Administration User Manual. The following material offers highlights of the TA process.

The TA component, in conjunction with the RA and NA components, provides the telephone company with a means to change data names and/or data values in messages that are sent from one application to another via TCM. The breakdown of tasks between the three TCM components is as follows:

- *TA Component*

    — Create the rule.

    — Name the rule.

    — Compile and load the rule into a partitioned data set (PDS).

- *NA Component*

    — Enter the rule ID in the SEC database.

- *RA Component*

    — Determine if translation is required by seeking a rule ID in the SEC database.

    — Use the TPAM Translator to extract the rule from the PDS and execute it.

3.6.1 Creating The Rule

Translation rules are created only when the telephone company determines that the use of the TPAM Translator is the most expedient and/or efficient way of changing data values and/or data names in messages that are sent from one application to another via TCM.

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> **NOTE —** The use of the TPAM Translator is not a replacement for an external non-TCM reformatter. However, the creation of translation rules may be the fastest and easiest way to care for release level differences between external TCM systems, version differences between external non-TCM reformatters, and any other small changes that may arise from time to time.

The syntax of a rule can be generalized as follows:

target operator source

3.6.1.1 Replacement Rule (RP)

For "replacement rules", the target is replaced by a user-supplied value. "Target" is a temporary data field name or an application data field name. "Operator" is always "RP" for replacement. "Source" may be one of two things:

- If "source" is enclosed in single quotes, it is treated as a literal field value. In this case, the "target" is set equal to that field value.

- If "source" is not enclosed in single quotes, it is treated as a field name in the input data. In this case, the value assigned to the "source" field name in the input data is reassigned to the "target" field name.

Example 1:

input data: WRO=WG005
translation rule: WRO RP 'WG001';
output data: WRO=WG001

This action is effectively a data value change.

Example 2:

input data: SSB=WG004
translation rule: WRO RP SSB;
output data: WRO=WG004

This action is effectively a data name change.

3.6.1.2 Table Look-up Rule (TB)

For table look-up rules: "Target" is a temporary data field name or an application data field name; "Operator" is always "TB" for table look-up; "Source" is actually four subfields delimited by commas. They are:

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— TTS Table Descriptor Name (TNAME) [Required]

— TTS Table Key (TKEY) [Optional]

— TTS Table Record Key (SKEY) [Optional]

— TTS Field Name (FID) [Required]

If FID is enclosed in single quotes, it is directly used to access the TTS table. In this case, the "target" is set equal to the field value extracted from the TTS table.

If FID is not enclosed in single quotes, it is treated as a field name in the input data. In this case, the value assigned to that field name in the input data is used as the FID to access the TTS table. The "target" is then set equal to the field value extracted from the TTS table.

Example 1:

> input data: ODOC=ABC
> translation rule: ODOC TB TNAME,TKEY,SKEY,'DOC';
> table look-up: FGH (using DOC as the FID)
> output data: ODOC=FGH

This action is effectively a data value change for ODOC that is dependent on the value of DOC in the TTS table.

Example 2:

> input data: DOC=ABC
> input data: ODOC=MNO
> translation rule: ODOC TB TNAME,TKEY,SKEY,DOC;
> table look-up: XYZ (using ABC as the FID)
> output data: ODOC=XYZ

This action is effectively a data value change for ODOC that is dependent on the value of DOC in the input data.

> **NOTE —** For the table look-up (TB) translation rule it is required that the data return length of the TTS table descriptor be large enough to include the data field which is targeted for retrieval; otherwise blank character(s) will be retrieved as default. Therefore, only DSECT and PASSBACK-type TTS tables can be used for this translation rule. VALIDATE-type TTS tables cannot be used for retrieval purposes since the data return length is zero, as specified in the TTS table descriptor.

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3.6.1.3   Aggregate Rule (AG)

For aggregate rules: "Target" is the name of the aggregate for which a given set of rules will apply; "Operator" is always AG for aggregate; "Source" is not applicable for this rule.

This rule defines the beginning of a set of rules which will be applied to the named aggregate. Previously a set of rules for a given aggregate was indicated by the presence of the aggregate name only followed by a semicolon. This is now a required rule to indicate the beginning of a set of rules for a given aggregate. The occurrence of another aggregate rule command or an end of file condition denotes the end of a set of rules to be applied to the aggregate specified in the previous aggregate rule command.

Example:

        translation rule: ORDR AG;

This defines the beginning of a set of rules to be applied against the ORDR aggregate.

3.6.1.4   Deletion of data Fields Rule (DL)

"Target" is not applicable for this rule. "Operator" is always "DL" for deleting data fields. "Source" is a list of data field names that are to be deleted from the aggregate being processed.

This rule is used for deleting data fields from the aggregate being processed.

Example:

        translation rule: DL CKV1, CKV2;

This causes the fields CKV1 and CKV2 to be deleted from the input message.

3.6.1.5   Manipulating Data Strings Rule (STR)

"Target" is a temporary data field name or an application data field name. "Operator" is always "STR" for string manipulations. "Source" will depend on the type of string manipulation being performed.

There are four basic types of string manipulations:

1. ".CON." - *data string concatenation*
    This translation rule allows you to concatenate up to a maximum of nine data strings. A data string can be either a data field name whose data field value is concatenated or a literal value enclosed in single quotes.

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Example:

input data:	CKTTYP=S
input data:	ADMIN=LS
translation rule:	CLO STR.CON.,CKTTYP,ADMIN;
output data:	CLO=SLS

2. ".SEL." - *data substring selection*
This translation rule allows you to select a set of characters from a value assigned to a data field and assign it to another data field. The source will include the data string to select from, the selecting start position, and the selection length. The selection operands can be either data field names or literal values enclosed in single quotes.

Example:

input data:	CKTID=01/FXNT/201/885/7451
translation rule:	SVCCDE STR.SEL.,CKTID,'4','2';
output data:	SVCCDE=FX

3. ".INS." - *data substring insertion*
This translation rule allows you to insert a set of characters into the value for a data field. The source will include an optional data string in which to insert (default is data value assigned to target field), the inserting position and the data string to be inserted. These fields can be either data field names or literal values enclosed in single quotes.

Example:

input data:	ROID=01/PLNT/201127001/NJ
translation rule:	ROID STR .INS.,,'14',' ';
output data:	ROID=01/PLNT/201127 001/NJ

4. ".REM." - *data string removal*
This translation rule allows you to remove (delete) a set of characters from the value assigned to a data field. The source will include the removal starting position and the removal length. These fields can be either data field names or literal values enclosed in single quotes.

Example:

input data:	CKTID=03/TLNT/123456/014/NJ
translation rule:	CKTID STR .REM.,'15','1';
output data:	CKTID=03/TLNT/123456014/NJ

3.6.1.6   Conditional Test Rule (TEST)

"Target" is a temporary conditional field name. "Operator" is always "TEST" for conditional tests. "Source" is a logic expression.

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This translation rule can be used to control the conditional execution of a set of rules. It causes the target field name to be assigned the logic true value "T" or the logic false value "F".

Example:

> input data: RO=ABC123
> input data: CRO=XYZ789
> translation rule: @CVAR TEST RO,.EQ.,CRO;
> output data: @CVAR=F

3.6.1.7   Rules for Conditionally Executing a Block of Rules (IF and END)

"Target" is the rule block label. "Operator" appears within a group of statements where "IF" defines the beginning of a conditional block of rules and "END" defines the end of a conditional block of rules. "Source" is a logic expression.

In this conditional block of rules, all the rules will be executed only if the source gives the true logic value ("T") for the IF expression. The END rule will terminate the execution of the block of rules for conditional execution. These two rules should always come in a pair and they should both use the same rule block label.

Example:

> input data: OSIDOB=072584
> translation system variable: DATE=073084
> translation rules: BLK1 IF OSIDOB,.%LT.,%DATE;
>   OSIDDJ1 RP 'A01';
> $BLK1 END;
> output data: OSIDDJ1=A01

3.6.1.8   Preview Block Rules (SPV and EPV)

Preview allows the user to look forward down the Aggregate Path to a lower level Aggregate and to obtain data from the lower level Aggregate for use at the higher level Aggregate.

The Preview Block contains the name of the Aggregate to be Previewed, a list of the Aggregates that lie on the Path between the higher level Aggregate and the lower level Source Aggregate and an indication as to whether or not each Aggregate on the list is required.

"Target" is the Source Aggregate. "Operator" appears within a group of statements that begin with "SPV" (Start Preview) and the name of the Aggregate that is being Previewed

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followed by "EPV" (End Preview) and the name of the Aggregate that is being previewed. "Source" is an optional listing of the Path from the current Aggregate to the Source Aggregate together with flags to indicate whether or not each of the Aggregates on the Path is required or optional. These flags (Presence Flags), concatenated to the front of an Aggregate Name, are either an asterisk ("*") to indicate that the Aggregate is required on the Path to the Source Aggregate or a question mark ("?") to indicate that the Aggregate is optional.

Example of a Preview Rule:

```
ORDR AG;
!TESTLGS RP 'N';
CIRSEG SPV ?CCR;
!CONT RP 'Y';
!CKTID45 STR.SEL.,CKTID,'4','3';
$BLK1 IF !CKTID45.,EQ.,'PLN';
!TESTLGS RP 'Y';
!CONT RP 'N';
$BLK1 END;
CIRSEG EPV;
$BLK2 IF !TESTLGS,.EQ.,'Y';
TRO RP 'R01';
$BLK2 END;
```

3.6.1.9   Comments (*)

Comments may be specified by placing an asterisk (*) in the first column of the translation rule set source. All characters specified in columns two through seventy are part of the comment and appear on output reports. Comments may not be continued except by placing another asterisk in column one of the next line.

3.6.2   Naming The Rule

Individual rules are not named. However, a set of rules that are to be applied to a given category of messages must be given a rule set ID. The maximum size of the rule set ID is eight (8) alphanumeric characters. It must be unique within a TCM.

3.6.3   Compiling and Loading The Rule

The person who creates a rule set in source code must place it into a partitioned data set (PDS). Batch run VMMPM02 in the TA component is then used to compile the translation

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rules, turn them into object code, and place them into a PDS known to IMS, such as PGMLIB. The run book for VMMPM02 is BR 252-573-511.

3.6.4   Entering The Rule ID In The SEC Database

Format MMPNET must be used to enter rule set IDs into the appropriate path segments in the SEC database. It is important for the creator of the rule set to define exactly what message categories it is to be used for. Category, in this case, means the SEC from which the message to be translated is being received (TSYS) or to which it is being sent (RSYSn), the PATHID in the message header, and the SCENARIO TYPE under which the message is being processed (all in the message header).

3.6.5   Determining The Translation Requirement

The RA component determines if translation is necessary by checking the SEC database for the existence of a rule ID in the path segment used in the message routing process. If a rule ID exists, the TPAM Translator is called into action.

3.6.6   Extracting And Executing The Rule

The TPAM Translator uses the rule ID to find and extract the rule set from the PDS where the object code for it was stored (e.g., PGMLIB). This is done by a special RAM (rules access method) process that also loads the extracted object code into core for execution.

Rule execution is handled jointly by the TPAM translation controller and executor processes.

The controller makes sure that the translations are performed while traversing through the input aggregates in a top-down, left-to-right fashion until the TPAM input data is exhausted.

The executor determines the data name and data value changes that each rule calls for and places those changes in a special "supplementary" storage area.

The application of the changes in the "supplementary" record to the input data to produce an output message is then performed by the TPAM Mapper.

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4. Exhibits

This section presents some TCM online formats that have not appeared earlier in this document.

```
   * CSAS-TCM: MESSAGE DISPLAY (MMPMF) *        PAGE   1
                     DATE 01/10/96
 SOURCE SEC          TIME STAMP          TIME 15:23:07
```

Figure 4-1. Format MMPMF

This screen is accessed from Format MMPMSG be executing the DISPLAY command word. This screen displays the header and text data of retrieved messages in their original FCIF or MDA (Mapped Data Area) form.

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For complete information about this screen, please refer to BR 252-573-303, TCM Message Administration.

```
 * CSAS-TCM: MESSAGE FORMAT DESCRIPTOR DISPLAY (MMPMM)   PAGE   1
                       DATE 01/10/96
    MFD NAME        AGGREGATE        TIME 15:23:22
 NAME    LTH  JUS FILL TRUN    NAME    LTH  JUS FILL TRUN
```

Figure 4-2. Format MMPMM

This screen is accessed via the MFD command from Format MMPMSG. It displays the attributes of each field in a message's MFD (field length, justification, fill, and truncation).

For complete information about this screen, please refer to BR 252-573-303, TCM
Message Administration.

```
* CSAS-TCM: TRANSLATION RULES DISPLAY (MMPML) *    PAGE  1
                    DATE 01/10/96
 RULE SET ID =       AGGREGATE =        TIME 15:23:38
TARGET  OPR ----------------------OPERANDS--------------------------
```

Figure 4-3. Format MMPML

This screen is accessed by executing the RULE command from Format MMPMSG. It
displays each rule in a translation rule set.

For complete information about this screen, please refer to BR 252-573-303. For complete information about translation rules, please refer to BR 252-573-305.

```
 * CSAS-TCM: ACTIVITY # SELECTION (MMPMS) *   /FOR    PAGE
                   96.010 DATE 01/10/96
    ACTIVITY #                  TIME 13:56:04
 I/O TSYS    TIME STAMP    STATUS   I/O MSGKEY  ERR CODE  ERR CODE
```
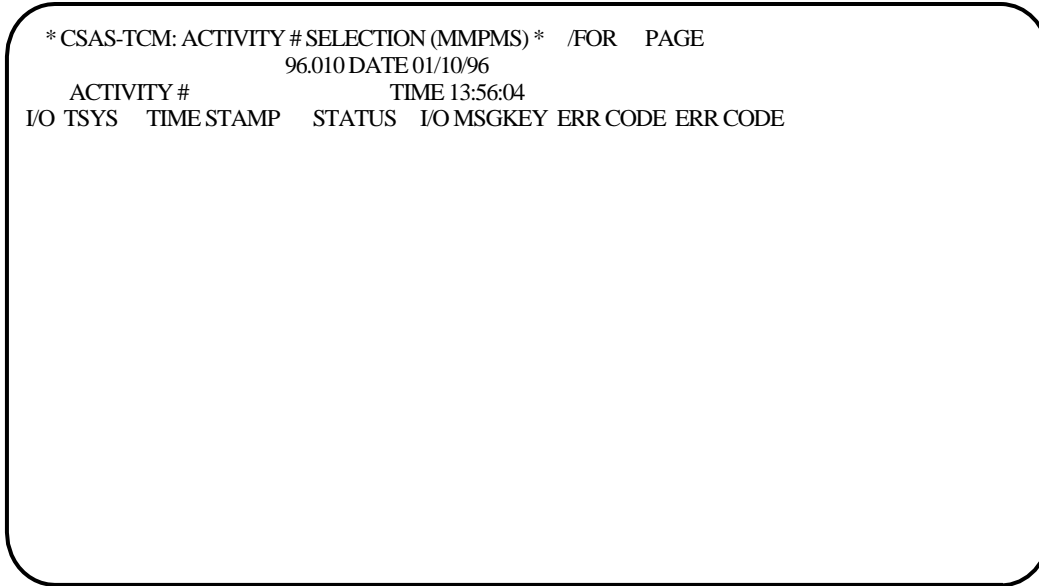
Figure 4-4. Format MMPMS

FIND	FWD	BACK		MOVE				RSND	DELT	HELP	PRNT
PF1	PF2	PF3		PF5				PF9	PF10	PF11	PF12
PF13	PF14	PF15		PF17				PF21	PF22	PF23	

This screen is accessed by executing the SCAN command from Format MMPMSG. It is used to find and display a list of all message records that contain a given activity number or error code.

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For complete information about this screen, please refer to BR 252-573-303, TCM Message Administration.

```
* CSAS-TCM: ERROR CODE SELECTION (MMPME) *    /FOR    PAGE
                    96.010 DATE 01/10/96
    ERR CODE                    TIME 13:57:30
 I/O TSYS    TIME STAMP    STATUS   I/O MSGKEY    ACTIVITY #
```
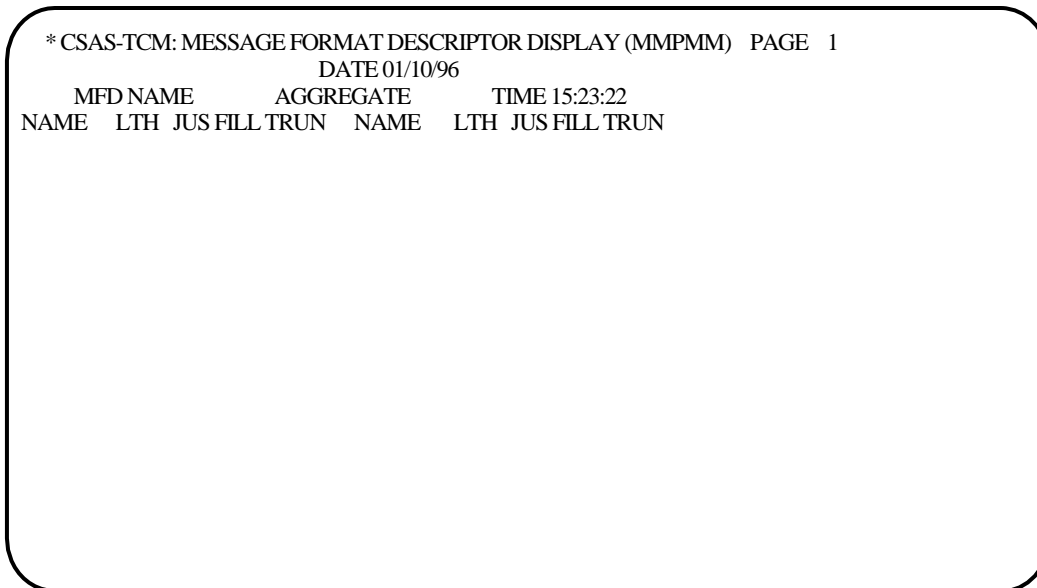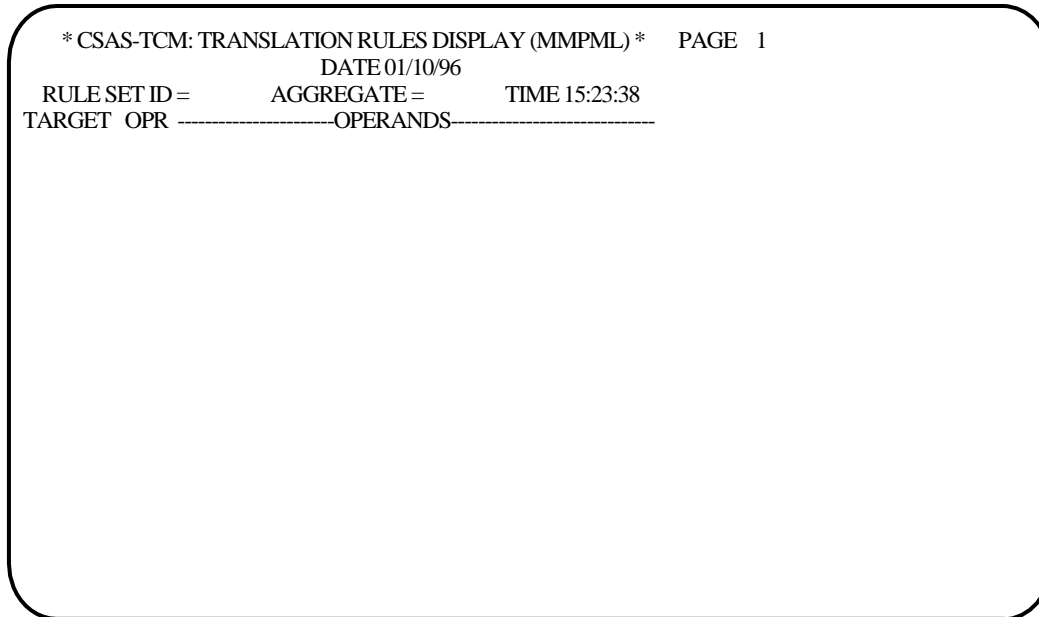
Figure 4-5. Format MMPME

FIND	FWD	BACK						RSND	DELT	HELP	PRNT
PF1	PF2	PF3						PF9	PF10	PF11	PF12
PF13	PF14	PF15						PF21	PF22	PF23	

This screen is accessed by executing the SCAN command from Format MMPMSG. It displays a list of all message records that contain a given error code.

For complete information about this screen, please refer to BR 252-573-303, TCM
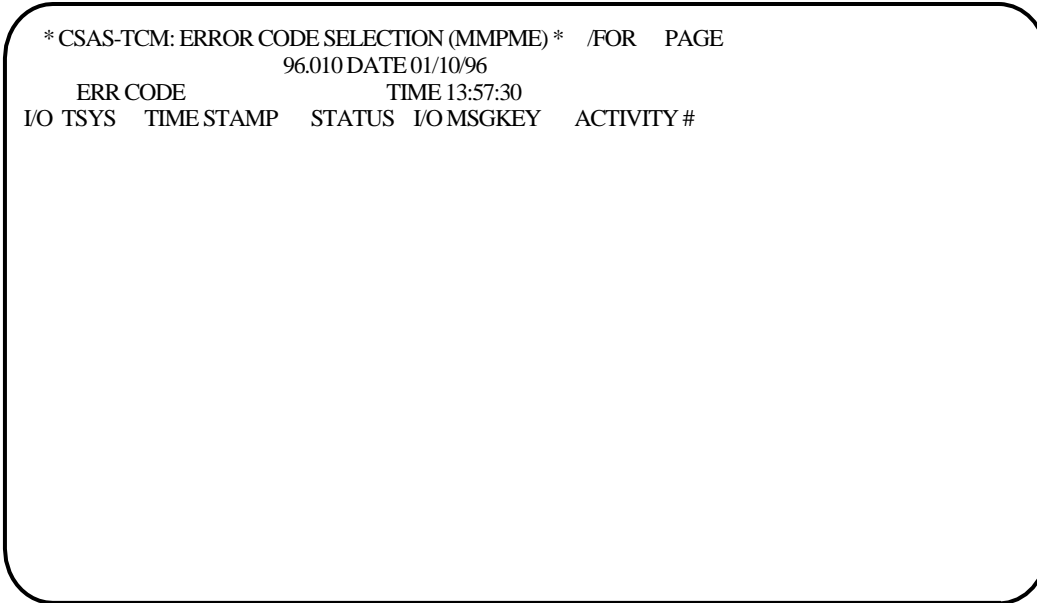Message Administration.

```
COMMAND:      CSAS-TCM: TEST MESSAGE GENERATOR(MMPTSS)    /FOR

TEST MESSAGE ID:                    PAGE NUMBER:












   1/13 FIND   2/14 FORWARD  3/15 BACK   8/20 REFRESH   10/22 DELETE
```

Figure 4-6. Format MMPTSS

FIND	FWD	BACK				RFSH		DELT		
PF1	PF2	PF3				PF8		PF10		
PF13	PF14	PF15				PF20		PF22		

This screen is accessed by typing /FOR MMPTSS on a blank screen and pressing the
ENTER key. For additional information about this screen, please refer to BR-252-551-303,
TCM Message Administration.