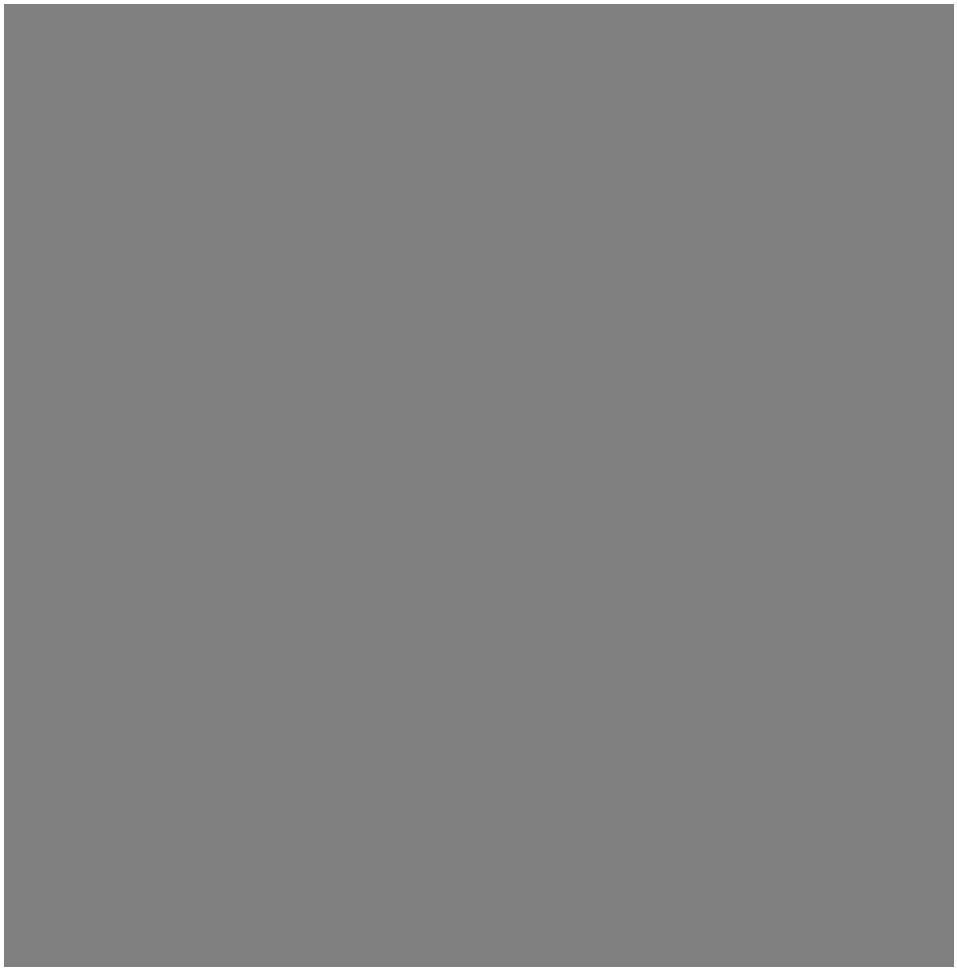
Network operations systems

TOPS
Voice service node

Operational measurements

Release BCS30 03 Status: Standard



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Contents

1. Introduction

General

This Practice describes the operational measurements (OMs) that are related to Traffic Operator Position System Voice Service Node (TOPS VSN) operation. The OM system collects operating data from TOPS VSN hardware and software sources.

Operational measurements provide valuable information about the performance and operational characteristics of the system. OM reports enable the operating company to evaluate:

(a) trends

(b) traffic balancing on existing equipment

(c) new equipment (extensions and reconfiguration) provisioning

(d) service performance

(e) end user reaction to the man-machine interface

(f) voice prompt wording

(g) retry count values for dialing, name recording, and speech recognition

Practice information

This Practice describes the OM groups that are specific to TOPS VSN. The following parts describe OM creation and collection in TOPS VSN equipment. For a description of OM creation and collection in the DMS-200 TOPS common equipment, read the following DMS-100 Family Practices:

297-1001-114	DMS-100 Operational Measurements (supplement)
297-1001-320	DMS-100 OM Reference Manual

Related practices

The following TOPS VSN practice provides additional OM-related information:

450-1301-310	System Administrative/Maintenance Operating Procedures

Abbreviations

A complete list of abbreviations listed in practice 450-1301-001 (TOPS VSN Index of Practices).

Change history

This section summarizes the important changes that affect this publication. They are arranged under the heading of the appropriate Batch Change Supplements (BCS) release.

BCS30

The presentation of this publication has been changed

The following changes to the TOPS VSN application were made by BCS30:

- implement billing acceptance for automated calls with DTMF signaling
- implement the TOPS VSN side of operator handoff call handling
- addition of an abbreviation list
- implement locality call processing support

2. OM operation

Basic TOPS VSN OM concepts

Each OM is a record of how often a particular event happens. Operational measurements are collected in registers, which are segments of Random Access Memory (RAM).

Registers

One register exists for each event. Each register is identified by an 8-character name. This name is fixed and cannot be changed by the user.

Groups

An OM group is a collection of OM registers. A register is unique to only one group, but groups can have up to 32 registers. Groups are identified by eight-character names and cannot be renamed by the user. The user cannot change a register from one group to another.

Keys

An OM group may be subdivided by keys. In groups with more than one key, the same OM register data is collected for each key. For example, an OM group which collects data for more than one DMS may have a separate key for each DMS. The key field is distinguished by a number, or by a unique name of up to nine characters. Opposite each key is listed all the registers defined for that particular OM group.

Classes

An OM class is an aggregation of OM groups used for reporting purposes. The components of an OM class define a report. The TOPS VSN OM class, called MMI_CLASS comprises four OM groups.

Collection intervals

OMs are collected at regular intervals. The time between collections is known as a collection interval. The collection interval for TOPS VSN is 60 minutes.

Collection

Each OM register has an active and a holding component. The active register collects and counts OMs actively. When the collection interval is complete, the active register is frozen and becomes a holding register. The second register takes over the counting and becomes the active register. Meanwhile, the

contents of the first (now the holding) register are written to disk; the register is then reset to zero.

Collection points

OMs are pegged in subsystem software. figure 2-2 illustrates major TOPS VSN software subsystems, from which OM data is taken. (OM names are given in rounded boxes.) Details of the registers for each OM group are listed in the remaining parts of this Practice.

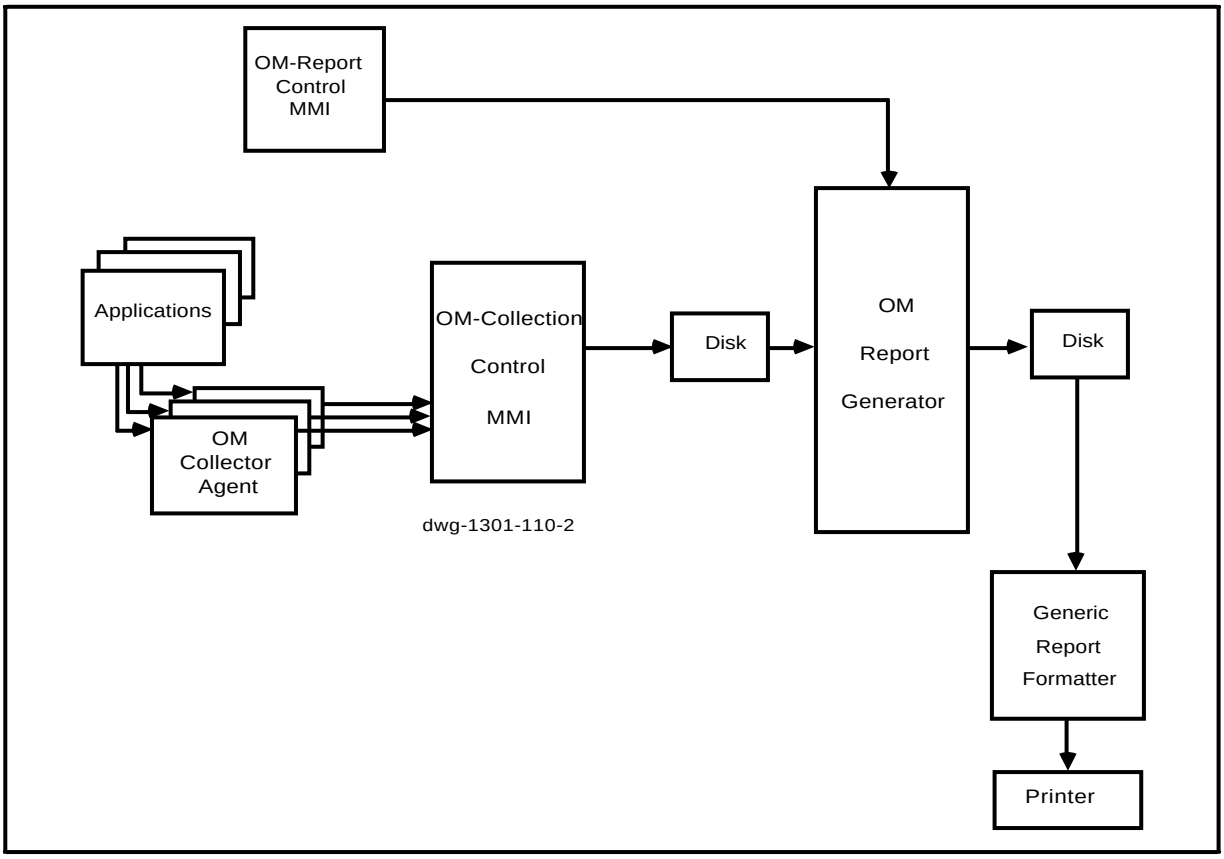
Accumulation

For the purpose of reporting or producing a trend study, data must be accumulated over longer periods than the basic collection period of active register counting. Accumulating registers, of which there are several types for various time periods (hourly, daily, weekly, and monthly), are used. The data accumulation process adds the contents of holding registers to an accumulation register just before the next active-to-holding register transfer. The accumulated data is not available until the end of the accumulating period.

OM collection and report generation

OMs are collected through a series of operations automated by the system. Once defined by an OM class, OM reports are produced automatically. An overview of OM collection and the report generation process is illustrated in figure 2-1 and described in the following paragraphs.

Figure 2-1
OM collection and report generator components

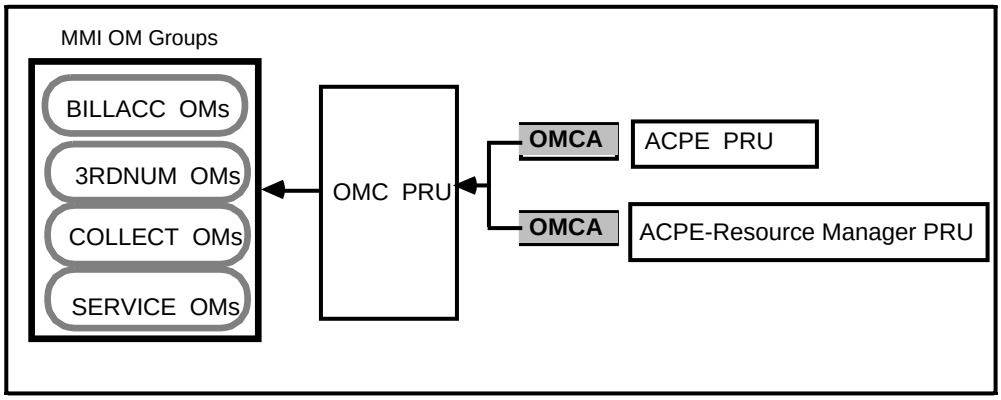


OM collection begins with a mechanism for collecting data from a number of PRU sources. The collection mechanism requires two software entities, the OM Collector Agent and the OM Collector.

(a) **OM collector agent (OMCA).** Each of the OM collection points shown in figure 2-2 is associated with an OMCA. One OMCA resides in each PRU that is contributing OM data. Each OMCA gathers the operating data from its own PRU. This data is held until the OMC collects it.

(b) **OM collector (OMC).** The OMC collects data from the OMCAs and stores it on the system disk. The collection interval, which is set by NT when the load is built, is one of 5, 15, 30, or 60 minutes. The setting for TOPS VSN is 60 minutes.

Figure 2-2
OM collection sources



The OMCA uses two registers; the holding register and the active register. It alternates between the two, switching its active or collecting register after each collection period. If the OMC is inactive, collection does not occur.

However, when the OMC is inactive, OM data continues to accumulate in the active registers. This accumulation may cause the registers to overflow and wraparound. When the OMC becomes active again, and the active register becomes the holding register, the accmuluated data may be channelled through the OM reporting process. When negative or unusually high values appear in OM reports, this is an indication that the OMC has been inactive. Verify this assumption by checking for appropriate log messages.

The subsequent set of operations formats data, creates readable reports, and provides both a storage and print mechanism for reports. This process requires the following entities, the OM report generator and the generic report formatter:

(a) **OM report generator (OMR).** The OMR retrieves measurement data from the system disk and assembles it into data files the generic report formatter is able to read. These parameters are read by the OMR from table editor tables. The table editor facility allows users access to the OM subsystem. The OMR is also responsible for invoking the generic report formatter, and is responsible for disk management.

(b) **Generic report formatter.** The report formatter produces readable reports from the data files it is sent by the OMR. The Formatter is responsible for sending the reports to the specified printer.

OM reports

A sample OM report is shown in figure 2-3. This diagram identifies the components of an OM report. They are: report type, report name, date, customer name, location, application name, class name, report start time, report end time, report frequency, collection interval, options if any, key names, and register names.

In order to generate and receive OM reports, the report must be a) defined as an OM class, and b) defined in the OMREPORT table. When the system is installed, these definitions are already configured for TOPS VSN. However, at

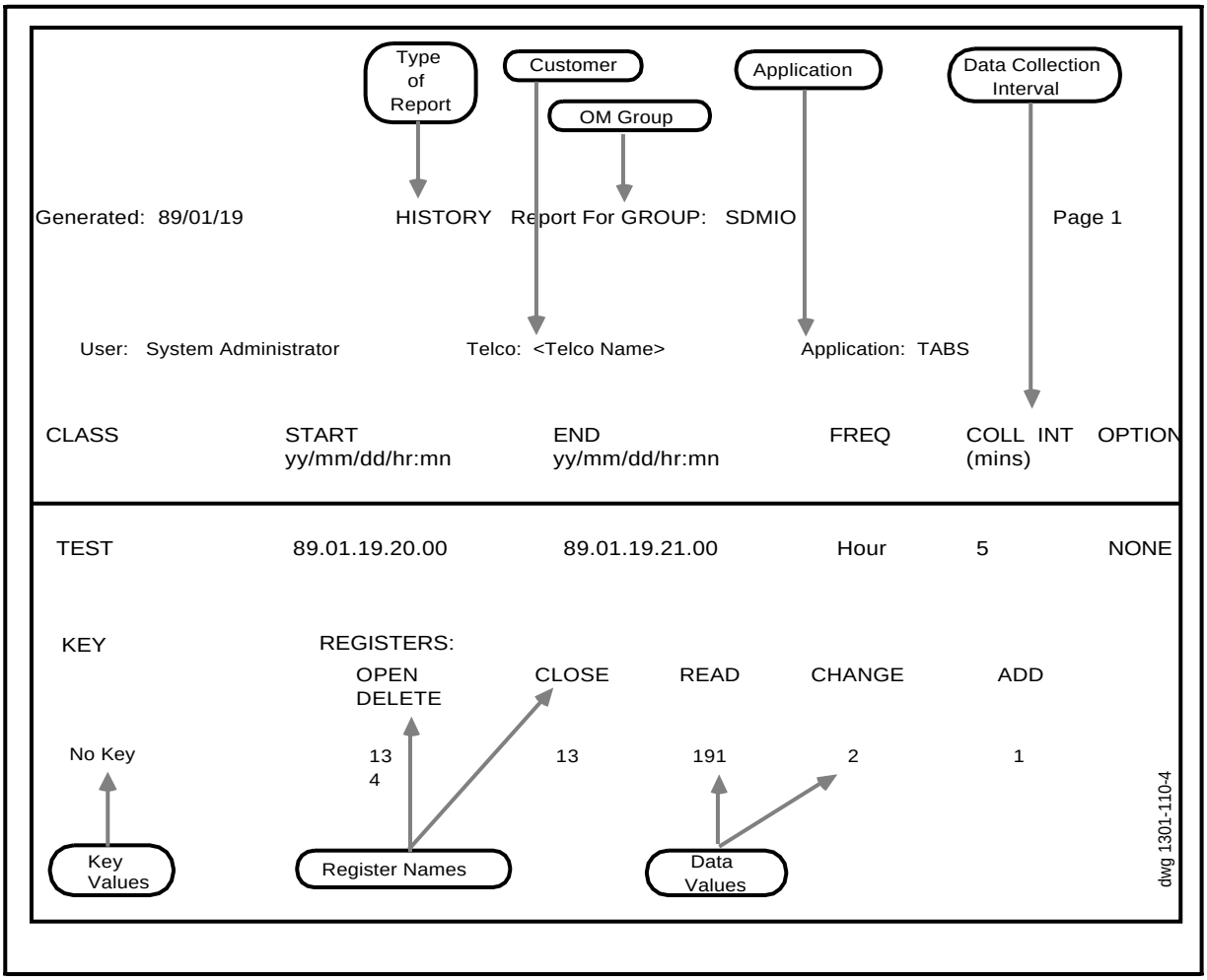
least one call must be received from the TOPS VSN in order for OM collection to start.

(a) **Report class definition.** The OM report class for TOPS VSN is defined and named by NT. The report class definitions specify the OM groups and registers to include in each report, as well as other OM report characteristics, such as report frequency and report type.

(b) **OMREPORT.** The OMREPORT table associates the class definitions tables with a userID. This information is used for the following purposes:

- to send the OM report to the printer (defined for the userID using the printer management facility of the TOPS VSN)
- to print customer information on the report header. figure 2-3 shows the format of an OM report.

Figure 2-3
Sample OM report format



OM class definition

The TOPS VSN system is delivered with predefined OM report parameters. These parameters define the OM reports produced. The values of the parameters listed in the paragraphs below may not be changed by the operating company. Report parameters may be viewed, however, using the table editor

facility available from the main menu. For more information see 450-1011-301 (System Administrative/ Maintenance Operating Procedures), section "Using SDM Tables", for information describing the use of the table editor.

Figure 2-4 identifies the parameters that are defined for each report.

Report class (name)

Each report class has a name and contains a defintion of one or more associated OM reports. For TOPS VSN, the report class name is MMI_CLASS. Under this name users find the definitions of the OM reports generated by TOPS VSN. Each report definition, of which there are four for TOPS VSN, is keyed to the class name. Each report is defined by type, start/end times, frequency, groups, registers and options.

Report types

There are three types of OM reports. They are:

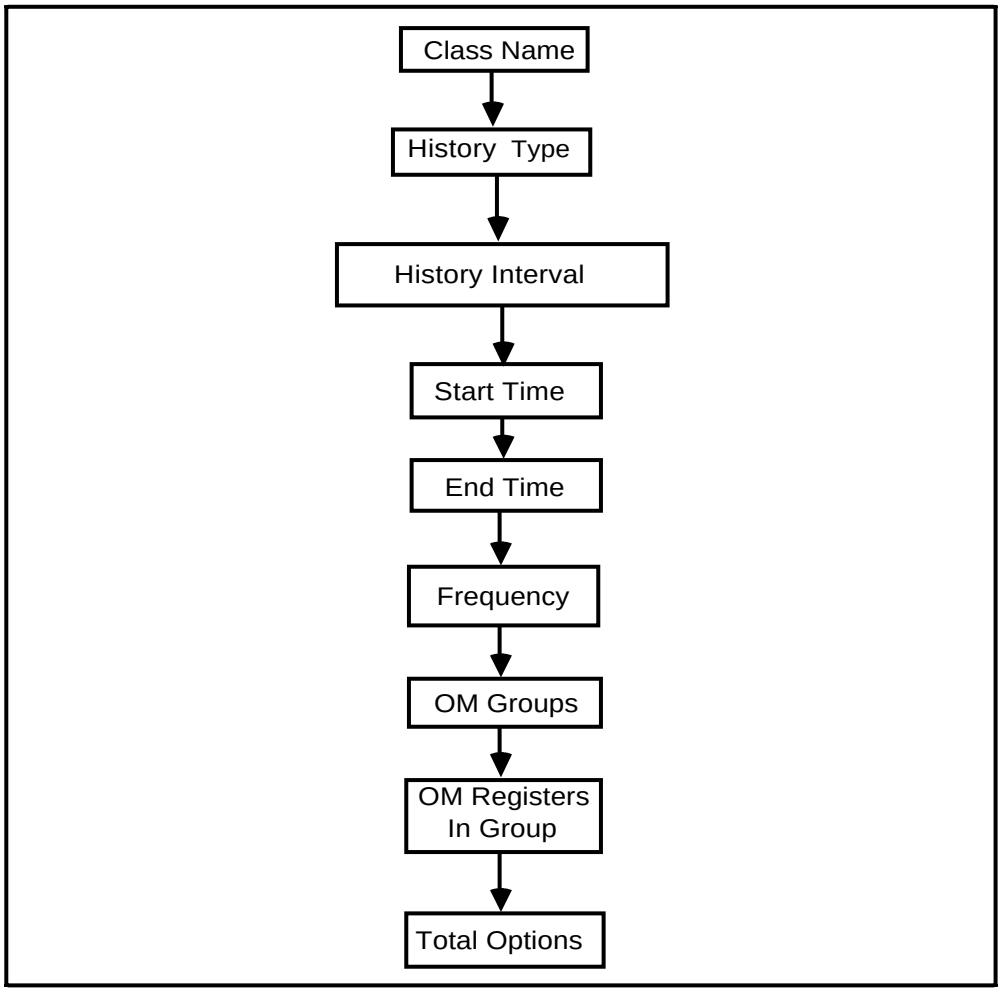
(a) **Accumulation Report.** These reports comprise all the raw OM data collected by the OMC for a specified number of collection intervals. The number of collection intervals spanned is called an accumulation interval. This type is not used for TOPS VSN.

(b) **History Report.** These reports collate and total OM data for history measurement intervals. A history measurement interval is a specified unit of time that is a multiple of the collection interval. Each report contains a series of history measurement totals. The number of history intervals reported depends on the length of time the report spans. This type is used for TOPS VSN.

(c) **Holding Report.** These reports are generated after each collection interval. The collection interval can be set to suit customer needs. This type is not used for TOPS VSN.

At the end of each reporting period, the OM data is translated into data files and stored on the system disk for access by the Generic Report Formatter.

Figure 2-4
Components of an OM report definition



Start time

The start time for each report is expressed in the form yymmdd hhmm. The range of dd values is 1 through 31 for all reports except weekly reports and daily reports. The range of dd values in weekly reports is 1 through 7, where 1 is Monday. Data entry is not required for daily reports.

When the start time of a report is defined as earlier than the current time, the first report is prepared from the present time. The actual start time is reported on the report header. Subsequent reports are prepared according to the schedule.

If the start time is defined without a year (yy) value, or if the end time is not specified, then only one report is prepared.

A default start time is acted on for hourly, daily, weekly, and monthly reports. The default values are discussed under the heading Report Frequencies.

End time

The end time for each report is expressed in the form yy/mm/dd hh:mm. The range of dd values is 1 through 31 for all reports except weekly and daily reports. The range of dd values in weekly reports is 1 through 7, where 1 is Monday. Data entry is not required for daily reports.

When the end time is defined without a value for the start time or for the year, then the start time is set the same as the end time and only one report is prepared.

A default end time is acted on for hourly, daily, weekly, and monthly reports. The default values are discussed in Report Frequencies.

Report frequencies

The five report frequencies are defined below. The daily frequency is used for all TOPS VSN OM reports.

(a) **Once.** This report is generated only once, at the end time. The full start date and time, and the end date and time, must be entered.

(b) **Hourly.** This report is generated every hour. It reports data from the start time in minutes to the end time in minutes every hour. When the start time or end time is not specified, the default value 00 minutes is used. When neither start nor end time is specified, a full hour of data is reported every hour.

(c) **Daily.** This report is generated every day. It reports data from the defined start time to the end time every day. The times are expressed in hours and minutes. When neither start time nor end time is specified, a 24-hour report is produced each day. The minimum daily report period is one hour.

(d) **Weekly.** This report is generated every week. It reports data from the defined start time to the end time every week. The times are expressed in days, hours and minutes, where day 1 is Monday. When neither the start time nor the end time specified, a report containing one weeks' data is produced each week. The minimum weekly report period is one day.

(e) **Monthly.** This report is generated every month. It reports data from the defined start time to the end time every month. The times are expressed in days, hours, and minutes, where day 1 is the first calender day of the month. When neither a start time nor an end time is specified, a report containing one month's data is produced each month. The minimum monthly report period is one day.

(f) **Hold.** This report is generated once, at the end of a report period if a full start time and full end time are defined, or when the report is disabled and no times have been defined. The data that is contained in this report is the same as an accumulation-type report that has no options defined and a frequency of once.

Report options

The "total" report option is a default setting for history reports. In TOPS VSN, the total option is responsible for producing the TOPS VSN summary reports and the totals report.

Report options can only be defined for history and accumulation reports. Options can not be specified for a holding report.

OM group

Each report class identifies a report. A report may contain data taken from a number of groups. When a report class is created or changed, the name of each OM group included in the report is specified.

OM registers

Each OM group specified in an OM class has registers. When select registers are specified for each group, unspecified registers are not included in the report. For TOPS VSN, all registers are defined by NT.

Printing irregularities

When there are more registers than can be accommodated on a single page, additional pages are output and the key designation is repeated.

When the report type is History, an additional column is displayed to the left of the KEY column. This column displays the time of the report for each set of data.

3. TOPS VSN OMs

There are four operational measurement groups reported for TOPS VSN. These are directly related to the user interface. They are:

NAMERCD

SERVICE

3RDNUM

BILLACC

Default settings delivered with the TOPS VSN system ensure that reports are generated for 3RDNUM, NAMERCD, BILLACC and SERVICE operational measurement groups on a daily basis. These defaults are defined in the table editor table MMI_CLASS.

A list of registers which belong to each OM group are described in the pages that follow. Accompanying each OM description are sample reports.

TOPS VSN OM reports are always history reports. History reports have three parts; the basic report, the summary report, and the totals report.

The basic report simply represents the counts for each register in the group by key. The summary report represents the same data in percentages using the counts of two registers. The two registers used to make the calculations are specified in brackets () on the report. The history report tabulates totals for values given in the basic report.

Summary reports contain two types of entries, main entries and supporting entries. Supporting entries are indented below the main entry and report percentages of the main entry, for example, if the main entry reports the percentage of automated calls, then supporting entries may report the percentage of automated calls which were a) collect, b) third number billing, c) calling card, and so on.

NAMERCD OM

The NAMERCD group tracks data related to collect and third number name recording. The keys for this OM group identify the switch from which the call originated. One key is used for each switch connected to the TOPS VSN. Each key name is made up of the first nine characters of the DMS CLLI field in table DATALINK_CONFIG.

A sample of the basic report part is illustrated in figure 3-1. A sample of the summary report part is illustrated in figure 3-2. The totals report is not illustrated. It uses the same format as the basic report.

Figure 3-1
Basic report sample for namercd OMs

Generated: 89/01/19 HISTORY Report For GROUP: NAMERCD Page :

User: System Admin Telco: TELCO Application: VSN

CLASS	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ	COLL INT	OPTION
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily	60	NONE

HIST INT	KEY	REGISTERS:							
60 min		NAMEREQ SUCCSEQ	SUBSEQAT NORESSEQ	SUCCESS1 2SOONSEQ	NORESP1 2LONGSEQ	TOOSOON1 MSERSEQ	TOOLONG1 ABDSEQ	MISCERR1 NAMEROP	ABANDON1
	DMS_XXX_W	4 0	4 0	4 0	0 0	0 0	0 0	0 0	0 0

Figure 3-2
Summary report sample for namercd OMs

Generated: 89/01/19 HISTORY Summary For GROUP: NAMERCD Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily

Operator transfer on retry exceeded (NAMEOP / NAMEREQ)	: 0.00%	Success on a subsequent attempt (SUCCSEQ / SUBSEQAT)	: 0.00%
Success on first attempt (SUCCESS1 / NAMEREQ)	: 0.00%	No response on a subsequent attempt (NORESSEQ / SUBSEQAT)	: 0.00%
No response on first attempt (NORESP1 / NAMEREQ)	: 0.00%	Spoke too soon error on a subsequent attempt (2SOONSEQ / SUBSEQAT)	: 0.00%
Spoke too soon error on first attempt (TOOSOON1 / NAMEREQ)	: 0.00%	Spoke too long error on a subsequent attempt (2LONGSEQ / SUBSEQAT)	: 0.00%
Spoke too long error on first attempt (TOOLONG1 / NAMEREQ)	: 0.00%	Miscellaneous error on a subsequent attempt (MSERRSEQ / SUBSEQAT)	: 0.00%
Miscellaneous error on first attempt (MISCERR1 / NAMEREQ)	: 0.00%	Call abandoned on a subsequent attempt (ABDSEQ / SUBSEQAT)	: 0.00%
Call abondoned on first attempt (ABANDON1 / NAMEREQ)	: 0.00%		

The following registers are provided in the OM group NAMERCD:

OM Group NAMERCD Register Name	Description
NAMEREQ	The total number of calls that needed to record the caller's name. This number is the number of first attempts at name recording. This number is incremented for the relevant key each time the following conditions are met: 1) the call needs verbal billing acceptance, and 2) the message delivered to the billed party includes the caller's name. The parameters Record_Name_Prison and Record_Name_Non_Prison.in table User Interaction determine if the caller's name is used

-continued-

OM Group NAMERCD Register Name	Description
SUBSEQAT	The total number of subsequent name recording attempts following a first attempt. This number is incremented for the relevant key each time name recording is attempted after the first attempt.
SUCCESS1	The number of successful recordings of names in the first attempt. This number is incremented for the relevant key each time the caller's name is recorded on the first attempt.
NORESP1	The number of times there was no response to the first time the prompt for the caller's name was made. This number is incremented for the relevant key each time the value for Name_Record_Wait_Time parameter in table User Interaction is reached during the first name recording attempt.
TOOSOON1	The number of times the caller spoke too soon during the first name recording attempt. This number is incremented for the relevant key each time the caller began speaking before the end of the question on the first name recording attempt. (The name is automatically accepted and recorded if either of the following parameters in table VSN Retry Counts has a value of zero: Name_Format_Error, or Name_Total_Retry.)
TOOLONG1	The number of times the caller spoke too long during the first name recording attempt. This number is incremented for the relevant key each time the value for the Name_Record_Wait_Time parameter in table User Interaction is reached before the caller is finished speaking. (The name is automatically accepted and recorded if either of the following parameters in table VSN Retry Counts has a value of zero: Name_Format_Error, or Name_Total_Retry.)
MISCERR1	The total number of errors made during the first attempt to record the name , other than the measurements that are discussed previously . This number is incremented for the relevant key, each time non-speech errors such as DTMF input are detected.
ABANDON1	The total number of calls abandoned by the caller on the first try. This number is incremented for the relevant key each time the caller hangs up during the first name recording attempt.
SUCCSEQ	The number of successful recordings of names in the second or later attempts.. This number is incremented for the relevant key each time the caller's name is recorded on a subsequent attempt. The number of attempts is determined by the following parameters in table VSN Retry Counts: Name_No_Response, Name_Format_Err, and Name_Total_Retry.

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OM Group NAMERCD Register Name	Description
NORESSEQ	The number of times there was no response to subsequent prompts for the caller's name. This number is incremented for the relevant key each time the value for Name_Record_Wait_Time parameter in table User Interaction is reached during the subsequent name recording attempts. The number of attempts is determined by the following parameters in table VSN Retry Counts: Name_No_Response, Name_Format_Err, and Name_Total_Retry.
2SOONSEQ	The number of times the caller spoke too soon during subsequent name recording attempts. This number is incremented for the relevant key each time the caller began speaking before the end of the question in subsequent name recording attempts. The number of attempts is determined by the following parameters in table VSN Retry Counts: Name_No_Response, Name_Format_Err, and Name_Total_Retry. (The name is automatically accepted and recorded if this is the last attempt allowed.)
2LONGSEQ	The number of times the caller spoke too long during subsequent name recording attempts. This number is incremented for the relevant key each time the value for the Name_Record_Wait_Time parameter in table User Interaction is reached before the caller is finished speaking during subsequent name recording attempts. The number of attempts is determined by the following parameters in table VSN Retry Counts: Name_No_Response, Name_Format_Err, and Name_Total_Retry. (The name is automatically accepted and recorded if this is the last attempt allowed.)
MSERRSEQ	The total number of errors made during the second or later attempts to record the name , other than the measurements that are discussed previously. This number is incremented for the relevant key each time non-speech errors such as DTMF input were detected. The number of attempts is determined by the table VSN Retry Counts parameters Name_No_Response, Name_Format_Err, and Name_Total_Retry.
ABDSEQ	The total number of caller hang-upsduring the second or more attempts to record a name . This number is incremented for the relevant key each time the caller hangs up during subsequent name recording attempts or when the call is routed to the operator because the retry count has been reached. (Calls abandoned while waiting for the operator are not counted.)

-continued-

OM Group NAMERCD Register Name	Description
NAMEOP	The number of calls routed to the operator by dialing zero (0) after an attempt at name recording. This number is incremented for the relevant key each time the caller dials zero (0) in response to the help prompt during name recording. If a subscriber flashes the switch hook during a collect only or prison call, this action also increments the OM count. This message is delivered when one of the following parameters in table VSN Retry Counts has been reached: Name_No_Response, Name_Format_Err, and Name_Total_Retry.
LOCFAILD	The number of calls that cannot be identified as locality calls. A probable cause is the inability of the ACPE to communicate with the locality database.

Service OM

The SERVICE OM group tracks data related to service. The keys for this OM group identify the switch from which the call originated. One key is used for each switch connected to the TOPS VSN. Each key name is made up of the first nine characters of the DMS CLLI field in table DATALINK_CONFIG.

A sample of the basic report part is illustrated in figure 3-3. A sample of the summary report part is illustrated in figure 3-4. The totals report is not illustrated. It uses the same format as the basic report.

Figure 3-3
Basic report sample for service OMs

Generated: 89/01/19 HISTORY Report For GROUP: SERVICE Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ	COLL INT	OPTION
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily	5	NONE

HIST INT	KEY	REGISTERS:							
60 min		TOTCAL	CALATMPT	COLLECT	THIRDNUM	CALLCARD	OVERSEAC	PRISON	AUTOMATE
		PARTAUTO	NOTAUTO	AUTOOPER	SSZEROOP	PRISONOP	ABANDON	ABDBONG	ABDSERS1
		ABDSERS2	ABDALTSS	ABDAFTSS	FAILURE	NOVCERES	NOCPERES	EXTDERR	ABEND
		THIRD12	7DGTBILL	SERVERR	HDTOTAL	HDCOLL	HDTHIRD	HDPRIS	ABDHAND
DMS_XXX_W		4	4	4	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0

Figure 3-4
Summary report sample for service OMs

Generated: 89/01/19 HISTORY Summary For GROUP: SERVICE Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily

Collect calls (COLLECT / CALATMPT)	: 0.00%	Calls abandoned (ABANDON / CALATMPT)	: 0.00%
Third party billing calls (THIRDNUM / CALATMPT)	: 0.00%	After bong, before first service selection (ABDBONG / ABANDON)	: 0.00%
Accessed via 1-2 (THIRD12 / THIRDNUM)	: 0.00%	Before second service selection (ABDSERS1 / ABANDON)	: 0.00%
Calling card calls (CALLCARD / CALATMPT)	: 0.00%	After second service selection (ABDSERS2 / ABANDON)	: 0.00%
Overseas collect calls (OVERSEAC / CALATMPT)	: 0.00%	During alternate billing (ABDALTSS / ABANDON)	: 0.00%
Prison call (PRISON / CALATMPT)	: 0.00%	Outside service selection (ABDAFTSS / ABANDON)	: 0.00%
Automated calls (AUTOMATE / CALATMPT)	: 0.00%	Call anomalies (FAILURE / TOTCALL)	: 0.00%
Partially automated calls (PARTAUTO / CALATMPT)	: 0.00%	No voice resource (NOVCERES / FAILURE)	: 0.00%
Non automated calls (NOTAUTO / CALATMPT)	: 0.00%	No available call resource (NOCPERES / FAILURE)	: 0.00%
Hookflash or no response (AUTOAPER / NOTAUTO)	: 0.00%	External errors (EXTDERR / FAILURE)	: 0.00%
Operator transfer due to user request (SSZEROOP / NOTAUTO)	: 0.00%	Internal errors (ABEND / FAILURE)	: 0.00%
Operator transfer-prison calls (PRISONOP / NOTAUTO)	0.00%		

The following registers are provided in the OM group SERVICE:

OM Group SERVICE Register Name	Description
TOTCALL	The total number of calls presented to the ACPE-RM. This number is pegged by the call distributor. This number is incremented for the relevant key each time the ACPE-RM receives a call from the DMS.
CALATMPT	The total number of calls attempted by TOPS VSN. This number is incremented for the relevant key each time the TOPS VSN attempts to process a call from the DMS, or performs alternate billing. (The difference between this register and the TOTCALL register is that alternate billing requests that are performed when the ACPE is up, are counted.
COLLECT	The number of collect calls received by the TOPS VSN. This number is incremented each time a collect call is received by the TOPS VSN for: collect only, prison, and 11 selection. This register does not peg overseas collect calls.
THIRDNUM	The number of third part billing calls received by the TOPS VSN. This number is incremented each time 12 is selected or each time 10 digits are dialed during service selection instead of 12.
CALLCARD	The number of calling card calls received by the TOPS VSN. This number is incremented for the relevant key each time a four-digit PIN or a 14-digit calling card number is entered during service selection.
OVERSEAC	The number of overseas calls for which the collect service was selected or restricted to. This number is incremented for the relevant key each time 11 is selected for an overseas call or if a call is restricted to collect and is an overseas or a prison call.
PRISON	The number of calls received from a prison by the TOPS VSN. This number is incremented for the relevant key each time a call with a prison screening code is received by the TOPS VSN regardless of whether the subscriber dials 0 for operator assistance.

-continued-

OM Group SERVICE Register Name	Description
AUTOMATE	The number of calls successfully automated by TOPS VSN without operator intervention. This number is incremented for the relevant key under the following conditions: the call is successfully completed, the call is floated, the call is terminated because a) the database query indicated that billing is denied for collect and third number calls, (If the caller accepts alternate billing, this call is logically completed and a new alternate billing call is initiated.) and for calling card calls, an invalid calling card number was entered more than once b) the call is terminated as a result of an office parameter setting, c) the call ended with a busy signal, treatment, or an appropriate hang-up response, d) the rety count has been reached and the caller is instructed to hang-up, or e) there is no answer, that is, the No_Far_End_Cut_Off parameter in table User Interaction was reached.
PARTAUTO	The number of calls which required operator assistance after the caller successfully selected a service using the automated service selection. This number is incremented for the relevant key under the following conditions: a) the caller wants to make an overseas collect call, b) the database query indicates that the call should be handled by an operator, c) the caller dialed zero (0) during name recording after a retry count is exceeded, d) the call is routed to an operator as a result of an office parameter, e) the call is routed to the operator during billing acceptance, or f) overseas prsion calls.
NOTAUTO	The number of calls which required operator intervention at the service selection stage. This number is incremented for the relevant key under the following conditions: a) a flash hook is detected before DTMF input, b) the no response retry count of the first service selection message is exceeded, c) zero (0) is dialed during service selection for prison calls, or d) zero (0) is dialed during service selection for non-prison calls.
AUTOOPER	The number of calls routed to the operator using hook flash before DTMF digits are received or when the no response retry count of the first service is reached. This number is incremented for the relevant key only when the call has been routed to the operator via hook flashing, and only before DTMF has been detected, or when the no response retry count has been reached.
SSZEROOP	The number of calls routed to the operator via "0" during service selection. This number is incremented for the relevant key each time the caller dials "0" during service selection and the call is routed to the operator. This number is not incremented for prison calls.

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OM Group SERVICE Register Name	Description
PRISONOP	The number of prison calls routed to operator via "0" after the first voice prompt. This number is incremented for the relevant key each time a prison call is routed to the operator after the first voice prompt by dialing "0".
ABANDON	The number of calls abandoned by the caller before reaching a busy, no answer or ringing. This number is incremented for the relevant key each time the caller hangs up during service selection, and name recording, or before reaching a busy, no answer, or ringing.
ABDBONG	The number of calls abandoned after the first bong tone but before the service selection prompt. This number is incremented for the relevant key each time the caller hung up during or after the first bong tone, but before the service selection message.
ABDSERS1	The number of calls abandoned after the first service selection prompt and before the next voice prompt. This number is incremented for the relevant key each time the caller hangs up during or after the first selection message but before the next voice prompt. The message can be either an error message or a service selection message.
ABDSERS2	The number of calls abandoned after the second service selection prompt. This number is incremented for the relevant key each time the caller hangs up during or after the second voice prompt.
ABDALTSS	The number of calls abandoned during service selection for alternate billing. This number is incremented for the relevant key each time the caller hangs up during the service selection for alternate billing.
ABDAFTSS	The number of calls abandoned after the service selection stage but before reaching a busy, treatment or ringing. This number is incremented for the relevant key each time the caller hangs up after making a service selection but before reaching a busy, treatment or ringing, for example, during name recording.
FAILURE	The number of calls abandoned or rejected because of no resources or a failure. This number is incremented for the relevant key each time a) there is no VI, T1, or ACPE available to handle the call, b) the same T1 or callID is assigned to a new call without terminating the previous call, c) an error is detected in the call information when a call is presented to the TOPS VSN, d) an internal error is detected, or e) the TOPS VSN is unexpectedly instructed by the DMS to end the call.

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OM Group SERVICE Register Name	Description
NOVCERES	The number of calls rejected because there are no voice resources available. This number is incremented for the relevant key each time the call is rejected before any user interaction because a needed resource is not available. The needed resource may be a T1 channel, a VI channel or an ACPE.
NOCPERES	The number of calls rejected because there are no call processing engines available to process the call. This number is incremented each time the ACPE-RM could not allocate an ACPE to handle the call.
EXTDERR	The number of calls aborted because of a data error received when a call is presented to TOPS VSN. This number is incremented each time a new call whose T1 channel or call identification is currently being used by another active call. The active call is terminated and the T1 channel is allocated to the new call.
ABEND	The number of calls abnormally ended. This number is incremented for the relevant key each time a call is terminated due to a) an error detected in the call information when the call is presented to TOPS VSN, b) an error detected within TOPS VSN entities, or c) unexpected instructions from the DMS to end the call.
THIRD12	The number of third party billing calls selected by dialing "12". This number is incremented for the relevant key each time the caller dials "12". The call must originate from a number valid for a third number billing.
7DGTERR	The number of times 7 digits are dialed instead of 10 in response to the service selection prompt. This number is incremented for the relevant key each time 7 digits are dialed after the service selection message is played.
SERVERR	The number of times invalid option codes are entered during service selection. This number is incremented for the relevant key each time an invalid one-digit or two-digit number is dialed during service selection.
AUTOCOLL	The total number of fully automated collect calls*
AUTOTHIR	The total number of fully automated third-party billingcalls*
AUTOCARD	The total number of fully automated credit card calls*
HDTOTAL	This is the total number of operator handoff calls.

* The total of the AUTOCALL,AUTITHIR,and AUTOCARD calls is equal to the value in register AUTOMATE.

The data in the following SERVICE group registers is based on the data in other registers described as follows:

Register Name	Data Calculation
TOTCALL	CALATMPT - number of alternate billing performed + NOCPERES
CALATMPT	COLLECT + THIRDNUM + CALLCARD + OVERSEAC + NOTAUTO + (ABANDON - ABDAFTSS) + NOVCERES AUTOMATE + PARTAUTO + NOTAUTO + ABANDON + NOVCERES + OVERSEAC
AUTOMATE	COLLECT + THIRDNUM + CALLCARD - ABDAFTSS - PARTAUTO (Collect Calls = COLLECT + SAMENUM in group THIRDNUM if parameter Collect_If_Same_Num = yes.
PARTAUTO	NAMEOP + RTYEXDOP + YESVFOP + NOVFOP + calls transferred to operator because of table parameters or database response
ABDAFTSS	ABDSEQ + ABANDON1 + ABDAFT12 + calls abandoned in calling card service
NOTAUTO	AUTOOPER + SSZEROOP + PRISONOP
ABANDON	ABDBONG + ABDSERS1 + ABDSERS2 + ABDALTSS + ABDAFTSS

3RDNUM OM

The THIRDNUM group tracks data specific to third number billing calls. The keys for this OM group identify the switch from which the call originated. One key is used for each switch connected to the TOPS VSN. Each key name is made up of the first nine characters of the DMS CLLI field in table DATALINK_CONFIG.

A sample of the basic report part is illustrated in figure 3-5. A sample of the summary report part is illustrated in figure 3-6. The totals report is not illustrated. It uses the same format as the basic report.

Figure 3-5
Basic report sample for 3rdnum OMs

Generated: 89/01/19 HISTORY Report For GROUP: 3RDNUM Page :

User: System Admin Telco: TELCO Application: VSN

CLASS	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ	COLL INT	OPTION
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily	60	NONE

HIST INT	KEY	REGISTERS:		
60 min		TOTTHIRD	SAMENUM	ABDAFT12
	DMS_XXX_W			
		0	0	0

Figure 3-6
Summary report sample for 3rdnum OMs

Generated: 89/01/19 HISTORY Summary For GROUP: 3RDNUM Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily

Third party number same as called number (SAMENUM / TOTTHIRD) : 0.00%

Calls abandoned before third party number entered (ABDAFT12 / TOTTHIRD) : 0.00%

The following registers are provided in the OM group 3RDNUM:

OM Group 3RDNUM Register Name	Description
TOTTHIRD	The total number of third number billing calls identified as such by the TOPS VSN. This number is incremented for the relevant key each time a caller dials the code 12 for third number billing,or a 10-digit number, during the service selection stage and the call is not restricted from third number billing.
SAMENUM	The number of times the call is converted to a collect call because the billed number is the same as the dialed number. This number is incremented for the relevant key each time the billed and called number are the same, and the Collect_If_Same_Num parameter in the User Interaction table is set to yes.
ABDAFT12	The number of times the caller hung up during the prompt for the 10-digit billling number. This number is incremented for the relevant key each time the caller hangs up during the billing number prompt but after selecting "12" for third number billing during service selection.

BILLACC OM

The BILLACC group tracks data related to collect and third number billling speech recognition. The keys for this OM group identify the switch from which the call originated. One key is used for each switch connected to the TOPS VSN. Each key name is made up of the first nine characters of the DMS CLLI field in table DATALINK_CONFIG.

A sample of the basic report part is illustrated in figure 3-7. A sample of the summary report part is illustrated in figure 3-8. The totals report is not illustrated. It uses the same format as the basic report.

Figure 3-7
Basic report sample for Billacc OMs

Generated: 89/01/19 HISTORY Report For GROUP: BILACC Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ	COLL INT	OPTION
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily	60	NONE

HIST INT	KEY	REGISTERS:							
60 min		TOTBILLA	SUBSEQAT	LNGGREET	ABDCLG	ABDBILBP	OHREJECT	RELSBILL	RTYEXDOP
		YESVFOP	NOVFOP	YES1ST	NO1ST	NORESP1	UNRECOG1	TOOSOON1	TOOLONG1
		MISCERR1	YESSEQ	NOSEQ	NORESSEQ	UNRECSEQ	2SOONSEQ	2LONGSEQ	MSERRSEQ
		DTMFACC	OPREQ	INVDTOP	NORESOP	BOTHONE	BOTHOP		
	DMS_XXX_W	4	4	4	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0		

dwg 1301-110-7

Figure 3-8
Summary report for Billacc OMs

Generated: 89/01/19 HISTORY Summary For GROUP: BILLACC Page :

User: System Admin Telco: TELCO Application: VSN

Class	START (yy/mm/dd/hr:mn)	END (yy/mm/dd/hr:mn)	FREQ
MMIOMS	89.01.19.20.00	89.01.20.20.00	Daily

Calling party abandon call before BA (ABDCLG / TOTBILLA)	: 0.00%	Customer greeting too long (LNGGREET / TOTBILLA)	: 0.00%
Billed party abandoned call before prompt (ABDBILBP / TOTBILLA)	: 0.00%	Operator transfer on retry exceeded (RTYEXDOP / TOTBILLA)	: 0.00%
Billing rejected by on hook (OHREJECT / TOTBILLA)	: 0.00%	Operator confirmation of acceptance request (YESVFOP / TOTBILLA)	: 0.00%
Billed party release due to retry exceeded (RELSBILL / TOTBILLA)	: 0.00%	Operator confirmation of rejection request (NOVFOP / TOTBILLA)	: 0.00%
"Yes" recognized on first attempt (YES1ST / TOTBILLA)	: 0.00%	"Yes" recognized on a subsequent attempt (YESSEQ / SUBSEQAT)	: 0.00%
"No" recognized on first attempt (NO1ST / TOTBILLA)	: 0.00%	"No" recognized on a subsequent attemtpt (NOSEQ / SUBSEQAT)	: 0.00%
No response on first attempt (NORESP1 / TOTBILLA)	: 0.00%	No response on a subsequent attempt (NORESSEQ / SUBSEQAT)	: 0.00%
Unrecognized speech on first attempt (UNRECOG1 / TOTBILLA)	: 0.00%	Unrecognized speech on a sub. attempt (UNRECSEQ / SUBSEQAT)	: 0.00%
Spoke too soon error on first attempt (TOOSOON1 / TOTBILLA)	: 0.00%	Spoke too soon on subsequent attempt (2SOONSEQ / SUBSEQAT)	: 0.00%
Spoke too long error on first attempt (TOOLONG1 / TOTBILLA)	: 0.00%	Spoke too long on subsequent attempt (2LONGSEQ / SUBSEQAT)	: 0.00%
Miscellaneous error on first attempt (MISCERR1 / TOTBILLA)	: 0.00%	Miscellaneous errors on subsequent attempt (MSERRSEQ / SUBSEQAT)	: 0.00%
Verbal billing verification rate ((YES1ST + NO1ST + YESSEQ + NOSEQ) / TOTBILLA)	: 0.00%		

The following registers are provided in the OM group BILLACC:

OM Group BILLAC Register Name	Description
TOTBILLA	The total number of calls that were successfully connected to the billed party to perform verbal billing acceptance. This number is incremented for the relevant key each time a connection is made to the billed party and that party has gone off-hook. If the connection is made but the billed party does not answer the phone, this number is not incremented.
SUBSEQAT	The total number of attempts made to recognize speech after the first attempt. This number is incremented for the relevant key each time a retry attempt is made. The number of retries is determined by the values for each of the following retry parameters: billing_no_response, billing_reject_error, or billing_total_retry.
LNGGREET	The number of times answering machine interaction is suspected. This number is incremented for the relevant key each time the value for the greeting length parameter is exceeded.
ABDCLG	The number of times the caller hangs up unexpectedly during billing verification. This number is incremented for the relevant key each time billing verification starts with the billed party answering the phone and ends with the caller hanging up, the call being routed to the operator or floated.
ABDBILBP	The number of times the billed party hangs up before the prompt for billing acceptance. This number is incremented for the relevant key each time the billed party hangs up before the billing acceptance prompt is played. (The call is counted as an automated call.)
OHREJECT	The number of times billing is denied because the billed party hangs up. This number is incremented for the relevant key each time the billed party goes on-hook. This number is not incremented when the billed party goes on hook to confirm one of the speech responses "yes" or "no".
RELSBILL	This register is not currently supported. If it were, it would count the number of times a billed party was released because the billed party greeting was too long. This number is incremented for the relevant key each time the following billing acceptance retry count values are reached: billing no response, billing reject error and billing total retry.
RTYEXDOP	The number of calls routed to operator because of too many errors. This number is incremented for the relevant key each time the billed party does not hang up to refuse the charges, and the value of one of the following parameters is reached: billing_no_response, billing_reject_error, or billing_total_retry.

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OM Group BILLAC Register Name	Description
YESVFOP	The number of calls routed to the operator during verification of a "yes" response. This number is incremented for the relevant key each time the billed party did not confirm billing acceptance by hanging up.
NOVFOP	The number of calls routed to the operator during verification of a "no" response. This number is incremented for the relevant key each time the billed party did not confirm billing rejection by hanging up.
YES1ST	The number of "yes" responses to the billing acceptance message. This number is incremented for the relevant key each time the billed party says "yes" to accept the charges the first time the billing acceptance message is played.
NO1ST	The number of "no" responses to the billing acceptance message. This number is incremented for the relevant key each time the billed party says "no" to reject charges the first time the billing acceptance message is played.
NORESP1	The number of times there was no response the first time the prompt for a "yes" or "no" reponse. This number is incremented for the relevant key each time the value no response wait time is reached during the first billing acceptance attempt.
UNRECOG1	The number of times unrecognized speech was detected during the first attempt to obtain a "yes" or "no" response for billing acceptance. This number is incremented for the relevant key each time unrecognized speech is detected.
TOOSOON1	The number of times the billed party spoke too soon during the first billing acceptance attempt. This number is incremented for the relevant key each time the billed party began speaking before the end of the question.
TOOLONG1	The number of times the billed party spoke too long during the first billing acceptance attempt. This number is incremented for the relevant key each time the response is longer than what is expected.
MISCERR1	The total number of errors made during the first billing acceptance attempt, other than the ones specified above. This number is incremented for the relevant key each time other errors such as DTMF input were detected instead of speech.
YESSEQ	The number of "yes" responses to the billing acceptance message. This number is incremented for the relevant key each time the billed party says "yes" to accept the charges after the billing acceptance message is played more than once.

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OM Group BILLAC Register Name	Description
NOSEQ	The number of "no" responses to the billing acceptance message. This number is incremented for the relevant key each time the billed party says "no" to reject charges after the billing acceptance message is played more than once.
NORESSEQ	The number of times there was no response to subsequent prompts for a "yes" or "no" response to billing acceptance. This number is incremented for the relevant key each time the value in parameter No_Response_Wait_Time is reached during the subsequent billing acceptance attempts.
UNRECSEQ	The number of times unrecognized speech was detected during subsequent attempts to obtain a "yes" or "no" response for billing acceptance. This number is incremented for the relevant key each time unrecognized speech is detected after the message has been played more than once.
2SOONSEQ	The number of times the (intended) billed party spoke too soon during subsequent billing acceptance attempts. This number is incremented for the relevant key each time the (intended) billed party began speaking before the end of the question after the billing acceptance message has been played more than once.
2LONGSEQ	The number of times the (intended) billed party spoke too long during subsequent billing acceptance attempts. This number is incremented for the relevant key each time a value for one of the following parameters has been reached: Billing_No_Response, Billing_Reject_Retry, or Billing_Total_Retry.
MSERRSEQ	The total number of errors made during subsequent billing acceptance attempts, other than the ones specified above. This number is incremented for the relevant key each time other errors such as DTMF input was detected instead of speech.
DTMFACC	The number of calls during which a billed party entered a 1 in response to the prompt requesting a DTMF entry. This count is pegged only if BILLING_ACCEPTANCE_VALIDATION is set to DTMF.
OPREQ	The number of calls during which an operator was requested after a DTMF billing acceptance request was entered. This count is pegged only if BILLING_ACCEPTANCE_VALIDATION is set to DTMF.
INVDTOP	The number of calls that were routed to an operator due to too many invalid DTMF responses. The call is routed to an operator when the retry limit BILLING_REJ_ERR is reached (table USER INTERACTION). This count is pegged only if BILLING_ACCEPTANCE_VALIDATION is set to DTMF.

-continued-

OM Group BILLAC Register Name	Description
NORESOP	The number of calls that were routed to an operator due to too many no responses. The call is routed to an operator when the retry limit BILLING_NO_RESPONSE is reached (table USER INTERACTION). This count is pegged only if BILLING_ACCEPTANCE_VALIDATION is set to DTMF.
BOTHONE	The number of 1's entered during an attempt at billing acceptance with the parameter BILLING_ACCEPTANCE_VALIDATION set to BOTH.
BOTHOP	The number of requests for operator were entered during an attempt at billing acceptance with the parameter BILLING_ACCEPTANCE_VALIDATION set to BOTH.

4. Abbreviations

ACPE	Application call processing engine
CLLI	Common language location identifier
DMS	Digital multiplex system
DTMF	Dual tone multifrequency
MMI	Man machine interface
OM	Operational measurement
OMC	OM collector
OMCA	OM collector agent
OMR	OM report generator
PIN	Personal identification number
PRU	Program resource unit
RAM	Random access memory
RM	Resource manager
SDM	Service data manager
TOPS	Traffic operator position system
VSN	Voice service node

Network operations systems

TOPS
Voice service node

Operational measurements

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