Critical Release Notice

Publication number: 297-2281-310
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The content of this customer NTP supports the SN06 (DMS) and ISN06 (TDM) software releases.

Bookmarks used in this NTP highlight the changes between the baseline NTP and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the baseline NTP remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to new or modified content for the baseline NTP that is valid through the current release.

Red: Applies to new or modified content for NA017/ISN04 (TDM) that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS)/ISN05 (TDM) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS)/ISN06 (TDM) that is valid through the current release.

Attention!
Adobe® Acrobat® Reader™ 5.0 is required to view bookmarks in color.

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DMS-100 Family

TOPS MP

Force Management Guide

TPC006 and up   Standard 14.01   September 1996

northern telecom

DMS-100 Family

TOPS MP

Force Management Guide

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September 1996

TPC006 Standard 14.01

- added chapter about QMS CASE feature, which provides enhanced operator capabilities
- added information about the Make busy/calls withhold feature
- added information about the customizable logo feature

October 1995

TPC004 Standard 13.04 added a paragraph to the Number of operators section in the first chapter, What is force management ?

June 1995

TPC004 Standard 13.01 release removed references to Table OFCENG parameters TOPS_NUM_STUDY_REG and TOPS_NUM_TRAFFIC_OFFICES

December 1994

TPC003 Standard 12.02 release

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TPC003 Preliminary 12.01 release for VO

March 1994

BCS 35 Standard 11.03 updated queue record format in table 7-9

March 1993

BCS 35 Standard 11.02 clarified information on keystrokes for cross-team routing and on screen displays

March 1993

BCS 35 Standard 11.01

- updated with feature AF2964, QMS: MIS Interface
- deleted information about delay call database

March 1993

BCS 34 Standard 10.02

- added further information to glossary terms affected by QMS in BCS34

- added further details to QMS information throughout the book

July 1992

BCS 34 Standard 10.01 updated with features AF2875, AF2876, AF2877, AF2965, AF4168, AF4170; PRSDOC BK01701; and PRSs BR27511, UX100659

October 1991

BCS 33 Standard 09.01

- updated with feature AF3191, OPP Base TOPS Changes
- added information on enhanced SA/IC queueing and MFADS field
- corrected text throughout and revised for clarity

March 1991

BCS32 Standard 08.01 updated with BCS32 features

March 1991

BCS31 Standard 07.02 reissued document to add Enhanced MFADS

September 1990

BCS31 Standard 07.01 updated with BCS31 features

Contents

About this document

When to use this document

This document defines force management, describes the typical force management office configuration, and explains how the DMS distributes calls. It also explains force management measurements, features, positions, reports, and forms.

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

This document is written for all DMS-100 Family offices. More than one version of this document may exist. To determine whether you have the latest version of this document and how documentation for your product is organized, check the release information in *DMS-100 Family Guide to Northern Telecom Publications*, 297-1001-001.

References in this document

The following documents are referred to in this document:

- *Bellcore Format Automatic Message Accounting Reference Guide*, 297–1001–830
- *North American DMS-100 Translations Guide, 297–xxxx–855*
- *North American DMS–100 Office Parameters Reference Manual, 297–xxxx–855*

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

>BSY LINK

Variables

Variables are shown in lowercase letters:

>BSY LINK ps_link

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the screen display and are shown in a different type:

```
Any active calls may be lost
Please confirm ("YES" or "NO"):
```

What is force management?

In a call distribution system, the operators who handle calls make up the work force. The term "force management" refers to the functions and responsibilities of managing an operator work force. Effective force management ensures that enough operators are available to handle call traffic for every quarter hour of every day throughout the year. In addition, force management involves monitoring the quality of service provided, including the speed with which calls are answered.

The Traffic Operator Position System Multipurpose (TOPS MP) uses an electronic call processor with internal counting and scanning abilities. This provides the force management statistics that a force supervisor uses to determine how many operators are needed and to monitor the quality of service.

Force management statistics are sent to a teletypewriter (TTY) or an off-board computer. They include information such as the number of calls handled for a given period of time, the types of calls received, and the usage measurements expressed in hundred call seconds (CCS). These statistics are explained in this guide.

An operator work force may be organized into single or multiple offices (known as "single-traffic" and "multitraffic" offices). The configuration depends on the size of the operator work force and the geographic distribution of the operating company's serving area. The office organization is based strictly on the operating company's decisions, not on any requirements imposed by TOPS MP software. The configuration of the office, however, may cause slight differences in the TOPS MP functions available. Throughout this document, any feature available only in a certain configuration is noted; otherwise, features are available in both single-traffic and multitraffic office configurations. For further information on office configurations, see the following chapter, "Work force office configurations."

The force management hierarchy

At the top of the hierarchy, a force supervisor is responsible for high-level decision making and control of the software features that affect the

TOPS MP work force as a whole. The force supervisor typically does not focus on the performance of individual operators, but instead monitors the relative performance of teams of operators grouped in separate traffic offices. These traffic offices may be geographically distant from the central Digital Multiplex System (DMS) office. The TOPS MP system supports up to 30 traffic offices.

At the level below force supervisor is the in-charge (IC) manager of each individual traffic office. A specific traffic office may contain any number of operators, but usually contains about 30. The size of the traffic office is determined by the type of calls handled, the complexity of the operator's job, the amount of assistance normally required from management, and the administrative costs. The IC manager is responsible for the efficiency of one particular group of operators and has control of features that affect that particular office. Therefore, IC managers are concerned with information about individual operators. The IC manager uses a TOPS MP IC position to help operators requiring assistance, to monitor and page operators, and to see the status of the traffic office displayed in real time. Each TOPS MP traffic office supports one IC position.

Between the IC manager and the operators there may be a number of service assistants, whose main task is to assist operators as needed. Service assistants use TOPS MP service assistance (SA) positions to help operators handle calls and to monitor and page operators. Assistance positions also reflect certain events taking place in the traffic office (for example, calls being deflected or the calls-waiting value exceeding a specified threshold). There can be up to 126 assistance positions in a TOPS MP system. The effective limit is determined by the telephone administration through an office parameter.

The force management objective

The basic objective of force management is to provide subscribers with consistently prompt operator service by managing the following factors:

- offered load
- number of operators
- speed of answer
- average work time

Offered load

Offered load is the number of people waiting for operator service at a given time. Offered load is always tied to a specific time.

Calls occupy operators for an interval of time, making them unavailable to handle new calls. This busy time, called "work volume," is the number of incoming calls (the offered load) multiplied by the time taken to handle each call.

In the TOPS automatic call distribution (ACD) environment, work volume is accumulated in seconds and usually expressed in hundred call seconds (CCS). For example, one half-hour period is 18 CCS. There are 30 minutes in one half hour and 60 seconds in each minute. Multiplying 30 by 60 results in 1800 seconds. Dividing that product by 100 produces 18 CCS per half hour.

In the TOPS Queue Management System (QMS) environment, work volume is measured in tenths of seconds and reported in seconds.

Number of operators

The number of operators needed depends on two factors:

- the amount of operator time required to handle the work volume
- the amount of additional operator time, known as "ready-to-serve time," required to answer calls as quickly as planned

In monitoring office traffic, the IC manager must consider the relationship between CPU occupancy (the number of operators logged on to the switch), and CPU capacity. During high CPU occupancy, operators may be unable to log on to the switch because operator activities are considered administrative tasks and call processing activities have a higher priority.

Speed of answer

Speed of answer (ANS) is the average number of seconds subscribers must wait for the operator to answer. The operating company’s general goal of a consistently prompt ANS must be translated into precise objectives for discrete time periods, such as quarter hours and half hours. For example, an aimed-for ANS might be an average of 2.1 seconds.

> ***Note:*** When the system is overloaded (meaning a five-percent increase in the offered load), the average speed of answer should not exceed 10 seconds.

Average work time

Average work time (AWT) is the average time it takes an operator to process one call. AWT has a direct effect on the cost of handling customer calls, and it also helps determine the required number of operators.

The shorter the AWT, the more often each operator becomes available to handle a new call. For example, to handle a given offered load (such as 500 work-volume CCS), an AWT of 65 seconds requires one more operator than an AWT of 40 seconds (assuming the ANS objectives are the same).

Work force office configurations

A force administration system is made up of a DMS switch and all the positions it serves. Within that system, a traffic office is a group of related operator positions for which separate administrative data is provided.

An entire work force contained in one location constitutes a single-traffic office. A work force divided into geographically separate groups constitutes a multitraffic office. This chapter describes the equipment used in each type of office configuration.

Note 1: An operating company that has the Queue Management System (QMS) in addition to TOPS automatic call distribution (ACD) will have a QMFADS TTY in addition to the MFADS TTY and a QFADS TTY in addition to the FADS TTY.

Note 2: Any team that has QMS will have a QFADS TTY instead of a FADS TTY and a QTADS TTY instead of the TADS TTY. (There is no QSADS TTY.) These devices are physically identical to their non-QMS counterparts, but they are designated by different names in datafill. Their software is similar, but the commands differ from non-QMS ACD commands. For more information about QMS devices, refer to the chapter "QMS TTY commands, queries, and reports" later in this document.

Single-traffic office configuration

In a single-traffic office configuration, operators and force administration personnel are all located in the same group or office. Refer to the following figure for an illustration.

The minimal equipment normally found in a single-traffic office in a TOPS ACD environment includes the following:

- in-charge (IC) position
- service assistance (SA) positions
- operator positions
- system administration data system teletypewriter (SADS TTY)

Other optional equipment may be found in a single-traffic office, depending on the services the office provides. For specific information on the kinds of equipment available, refer to the table "Equipment found in both single- and multitraffic office systems" in the "Equipment" section of this chapter.

Sample single-traffic office configuration

IC position, SADS
(IC manager with force management capabilities)

(clerk). . . . . .(clerk)

SA positions
(Service assistants with delegated force management functions)

Operator positions
(operators)

Note 1: The number of clerks required depends on work load.
Note 2: Up to 126 SA/IC positions can be datafilled for the traffic office. (The system maximum is 126 SA/IC positions, so if 126 are datafilled for one traffic office, none can be datafilled for any other traffic office.)
Note 3: Up to 1023 operator positions can be datafilled in Table TOPSPOS, depending on how heavily the DMS is loaded.

Multitraffic office configuration

In a multitraffic office configuration, the operator work force is divided administratively into different groups or offices, and these offices are generally located in different geographical areas. Each individual office is referred to as a "traffic office." The following figure illustrates a sample configuration for a multitraffic office.

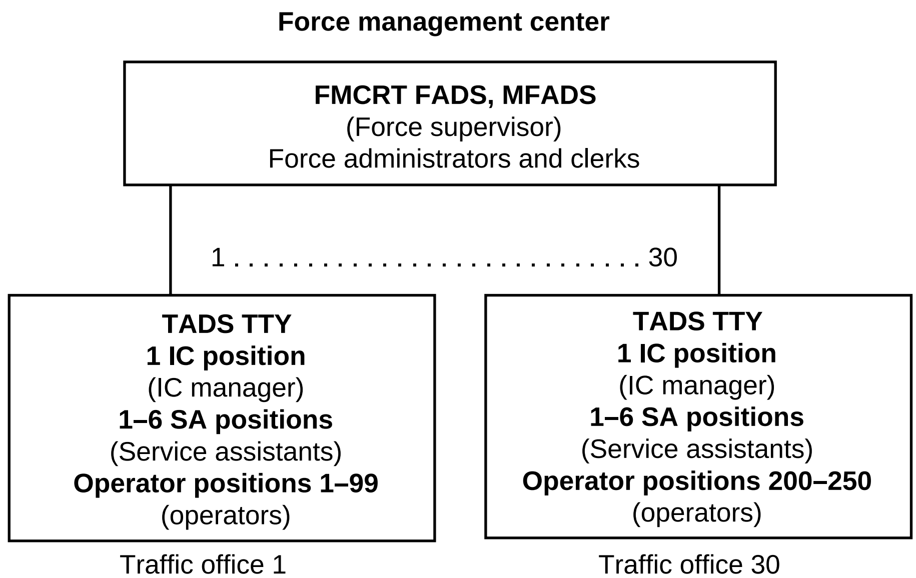
The minimal equipment normally found in a multitraffic office in a TOPS ACD environment includes the following:

- force management cathode-ray tube (FMCRT)
- IC position
- SA positions
- operator positions
- force administration data system teletypewriter (FADS TTY)

- traffic administration data system teletypewriter (TADS TTY)

Other types of equipment may be located in the multitraffic office, such as the mechanized force administration data system (MFADS), which is discussed in the "Mechanized force administration data system" chapter later in this document.

Sample configuration of a multitraffic office



Note 1: A force management center can cover up to 30 traffic offices. In this example, operator positions 100 through 199 are accounted for in traffic offices 2 through 29.

Note 2: Up to 126 SA/IC positions can be datafilled for the traffic office. (The system maximum is 126 SA/IC positions, so if 126 are datafilled for one traffic office, none can be datafilled for any other traffic office.)

Note 3: The number of force clerks per traffic office depends on work load.

Note 4: Up to 1023 operator positions can be datafilled in Table TOPSPOS, depending on how heavily the DMS is loaded.

There are some functional differences between single-traffic and multitraffic offices, depending on the office configuration. For example, in a multitraffic office, the force supervisor must be able to poll each individual office; this capability is not required in a single-traffic office. In a multitraffic configuration, statistics must be attributed to a given traffic office. Such differences are indicated in this document where appropriate.

Equipment

The next table describes the equipment found in both single-and multitraffic office configurations in a TOPS ACD environment.

Equipment found in both single- and multitraffic office systems

Equipment	Definition
Operator position	A cathode-ray tube (crt) and keyboard located in the traffic office and used by the operator to handle calls
SA position	A crt and keyboard at which the service assistant can be reached for help and which can be used to monitor operators, page, place outgoing calls, and perform administrative searches
IC position	A crt and keyboard located in the traffic office (usually near the SADS TTY or, in a multitraffic office, near the TADS TTY) and used by the IC manager. The IC position displays office statistics and can receive assistance requests. The IC manager can use it to monitor operators, page, place outgoing calls, and perform administrative searches.
Autoquote (AQ) TTY	A teletypewriter located on the premises of a hotel or attended pay station (APS). As soon as a guest's call terminates, all call details are directly transmitted to the AQ TTY. There can be only one receive-only TTY per hotel and a maximum of 512 per TOPS MP.
Voicequote (VQ) TTY	A teletypewriter located in the hotel billing information center (HOBIC). If there is no AQ TTY on the premises, the operator telephones the hotel or APS as soon as the guest's call terminates and verbally quotes the call details, including billing information. A TOPS MP configuration may contain one or two VQ TTYs.
Record (REC) TTY	A receive-only TTY located in the HOBIC. It receives a duplicate copy of messages sent to AQ and VQ TTYs and charge-adjust messages sent to the HADS TTY. It also receives all other charge-adjust messages. The TTY alarm messages and measurements are not duplicated on the REC TTY.

The next table lists additional equipment found in a single-traffic office in a TOPS ACD environment.

Additional equipment found in a single-traffic office configuration

Equipment	Definition
SADS TTY	A teletypewriter used by the IC manager to activate and deactivate force management features and to print information about the system. The SADS TTY has the combined facilities of the TADS and FADS TTYs, which are used in multitraffic offices.
Hotel administration data system (HADS) TTY	A send/receive teletypewriter located in the HOBIC. The operator uses this device to enter TOPS MP billing information to be sent to the AQ, VQ, and REC TTY. HOBIC personnel also use it to place an AQ, VQ, and REC TTY in or out of service. In addition, the HADS TTY receives TTY service alarm messages, HOBIC operational measurement information, and hotel charge-adjust (credit) messages generated by TOPS MP operators.

The next table lists additional equipment found in a multitraffic office in a TOPS ACD environment.

Additional equipment found in a multitraffic office configuration

Equipment	Definition
FMCRT	A specially configured TOPS MP position that is located in the force management center and used to display force management statistics
FADS TTY	A teletypewriter located in the force management center that is used to activate and deactivate force management features and to print information about the system and the various traffic offices. The FADS TTY manages the system as a whole. Every 30 minutes (or 15 minutes, if requested), it provides hardcopy reports of system-wide performance. Summaries are also provided on a 6-hour and 24-hour basis. The FADS TTY allows the force supervisor to display and modify system information without having to refer to individual operators. The force supervisor can also use it to • obtain information about call queue threshold tables used by the TOPS MP call distribution system • control the way these queue thresholds are selected • control the number and type of periodic management reports printed • obtain information on the number of operators assigned to the study register data system • change the number of registers allocated to a particular traffic office • control call transfers

—continued—

Additional equipment found in a multitraffic office configuration (continued)

Equipment	Definition
TADS TTY	A teletypewriter used in individual traffic offices to activate and deactivate force management features and to print system information for specific traffic offices. There is one TADS TTY per traffic office. The TADS TTY provides periodic statistical reports for the same sample periods as the FADS, but it provides data for only one traffic office. Through the TADS TTY, operators are given controlled traffic call sets and assigned to the study register system.
Force management center (FMC)	A centralized location staffed with people who carry out administration tasks for the entire operator work force (not for individual traffic offices)
—end—	

The keyboard send/receive SADS, TADS, and FADS TTYs are equipped with a standard QWERTY keyboard. They are used to enter commands or queries into the DMS, which then uses the printer to confirm these entries or to provide the requested information. The DMS sends measurement statistics to the TTY at the rate of 300 baud. The TTYs have impact printers that send messages to the DMS at a speed of 300 baud.

Office provisioning

The following table provides a list of all of the equipment that can be found in each office type.

Equipment provisioning

Single	Multi	Equipment	Requirement
√	√	Operator position	1023 per TOPS MP host (varies depending on real-time considerations)
√	√	SA position	0 to 125 per office
√	√	IC position	0 to1 per office
√	√	AQ TTY	1 per hotel, maximum of 512 per TOPS MP host
√	√	VQ TTY	2 (includes optional backup TTY)
—continued—			

Equipment provisioning (continued)

Single	Multi	Equipment	Requirement
√	√	REC TTY	2 (includes optional backup TTY)
√	√	HADS TTY	1 per TOPS MP host
	√	TADS TTY	1 per office, maximum of 30 per TOPS MP host
	√	FADS TTY	1 per TOPS MP host
√		SADS TTY	1 per TOPS MP host
	√	FMCRT	1 per TOPS MP host
√	√	MFADS	1 per TOPS MP host
√	√	NOTIS	1 per TOPS MP host

—end—

Enhanced MFADS impact on office configurations

If the enhanced MFADS feature is implemented, it is compatible with current MFADS configuration guidelines and does not add any new requirements. However, the following restrictions and limitations apply to operator centralization office configurations:

- In operator centralization configurations, the enhanced MFADS feature is installed only in the host.
- Both the host and the remotes for operator centralization configurations should be upgraded to BCS31 or later. If the enhanced MFADS feature is installed in a host without a corresponding upgrade of the remotes, queue measurements will be accurate, but service measurements will be unpredictable and unreliable.
- Only the host in operator centralization configurations has access to the new parameters added by the enhanced MFADS feature.

Understanding how the DMS switch distributes calls

This chapter explains how the DMS switch distributes calls to operator positions. The first section describes the TOPS automatic call distribution (ACD) system. Subsequent sections explain how calls-waiting (CW) queues are serviced and how CW queue thresholds are set; features affecting call distribution are also identified.

A section at the end of this chapter explains how the DMS switch distributes calls using the Queue Management System (QMS).

TOPS ACD call distribution

TOPS MP uses queues to manage calls requiring operator assistance. Two queues are used for position management, and nine are used to distribute incoming calls. Incoming calls are generally placed in queue and distributed on a first-in, first-out (FIFO) basis. They are routed to any occupied but idle operator position. The two position management queues are referred to as "idle position queues." They allow the DMS switch to route an incoming call to the most idle TOPS MP operator position.

The nine queues for distributing incoming calls are classified as CW queues and are separated into the following four categories:

- general (GEN)
- transfer 1 (XFR1)
- transfer 2 (XFR2)
- directory assistance (DA), also called transfer 3 (XFR3)

Note: The terms "transfer 3," "XFR3," and "DA" are used interchangeably throughout this document. They all mean the same thing. Most of the customer data tables refer to this queue as XFR3; however, TTY periodic reports list statistics for the XFR3 queue as DA statistics. The XFR3 queue is generally used for DA call management in offices that are not DA-only offices.

No restrictions prevent the operating company from queuing non-DA calls in the DA queue or from queuing DA calls in non-DA queues (GEN, XFR1, or XFR2); however, unless the office is strictly a DA-only office, force management (FM) statistics will be skewed.

Idle position queues

TOPS MP maintains two queues to track all operator positions with available loops. (A loop is one of two lines that connect calls to a TOPS MP position.) One queue tracks the number of positions that have both loop1 and loop2 available. The other queue tracks the number of positions that have only one loop available. When possible, incoming calls are routed to positions that have both loops available (except for centralized automatic message accounting [CAMA] calls, which are routed to positions with only one loop available).

TOPS MP searches the queues for the most idle position and connects the call to that position. If no position has a loop available, the TOPS system places the call in one of the CW queues.

There can be only one DA or intercept call at a position. If a position is occupied with a DA or intercept call, only a toll and assist (TA) call can be presented on the idle loop.

Calls-waiting queues

When the DMS switch detects a trunk seizure on a trunk carrying operator traffic, it searches the idle position queue for an idle operator position to which to connect the call. When an available position is found, the DMS switch selects a 3-port conference circuit and connects the call and operator position to that port. If no operator position is found, the DMS switch time-stamps the call and places it in the CW queue. When a call is placed in the CW queue, ringing is applied, and the call waits in the queue until an operator is available.

Recalls (calls that have already received operator service but require additional operator service) are handled before any other calls in the queue. Calls being handled for the first time are referred to as initial position seizures (IPS).

When an operator position becomes available, the DMS switch searches the CW queue and connects a call to the idle position. Recalls receive first priority (oldest recall first). Nonrecalls receive second priority (oldest call first).

When the call reaches an operator position, a call arrival tone alerts the operator and the call information is displayed on the operator position screen. The operator uses the information displayed, along with information provided by the subscriber, to process the call.

Once the connection between the incoming and outgoing trunks is made, the operator either releases the call or places it on hold. If the operator places the call on hold, the 3-port conference circuit remains connected to the position until the operator releases the position by pressing the **POS RLS** key. When the operator releases the call, the 3-port conference circuit is freed for another call.

When the call is completed (both the calling and called parties go on-hook), the system generates an automatic message accounting (AMA) record for billing. For complete details on billing, refer to *Bellcore Format Automatic Message Accounting Reference Guide*, 297-1001-830.

Conditions that affect call distribution

The DMS switch distributes calls evenly across all positions so that no position is overburdened. Calls are distributed across traffic offices as well. Separate locations and administrative entities do not affect the way calls are distributed. Certain operating conditions, including the following, do affect the distribution of calls:

- CAMA calls arrive at operator positions only if the calling number is not available to the DMS-100, so that the operator can request the calling number from the subscriber and enter it for billing purposes. The operator does not complete the call; it is completed automatically after the numbers have been entered.
- System-returned calls (recalls, such as coin notify, coin overtime, noncoin notify) are distributed on a FIFO basis before any calls are distributed and thus facilitate operator recall at the prescribed time.
- When an operator selects **{Request CAMA}** from the functions menu, the longest-waiting CAMA call is routed to that operator position.

Calls-waiting queue servicing

The nine CW queues in a TOPS MP office are divided into two priority levels, and all calls within a priority level are serviced on a FIFO basis.

The queues are as follows:

- First priority—recall
  - — GEN
  - — XFR1
  - — XFR2
  - — DA

- Second priority—nonrecall
  - CAMA
  - GEN
  - XFR1
  - XFR2
  - DA

The recall category consists of call types that have been previously connected to an operator but require additional assistance. For example, a transferred call from a GEN operator to a transfer (XFR1 or XFR2) operator is a transfer recall. An operator-handled call on which the subscriber flashes to reconnect to an operator is a general recall if the call was not originally floated as a transfer call.

> ***Note:*** The terms "nontransfer" and "general" are used interchangeably within TOPS MP. They mean that the operator receives both general and CAMA calls.

The nonrecall category consists of newly originated call service types that have not yet received operator assistance. This category includes calls requiring general operator assistance, CAMA calls, and calls routed directly to XFR1 or XFR2 operators.

Within these two priority levels, calls are separated into the transfer types defined in the following table.

Transfer types

Type	Explanation
GEN	Calls requiring none of the special abilities of XFR1 or XFR2 operators are placed in the GEN portion of the CW queue.
XFR1	Calls requiring the special abilities of XFR1 operators are placed in the XFR1 portion of the CW queue.
XFR2	Calls requiring the special abilities of XFR2 operators are placed into the XFR2 portion of the CW queue.

—continued—

Transfer types (continued)

Type	Explanation
CAMA— *nonrecall priority only*	Calls requiring CAMA billing are placed into the CAMA queue. CAMA and remote CAMA (RCAMA) calls must both be classified as requiring nontransfer service. When a nontransfer call is placed into the CW queue, its call origination is checked. If its call origination is CAMA or RCAMA, the call is placed into the CAMA queue.
DA	Calls that require the special services supplied by operators with DA capability are placed into the DA portion of the queue.
—end—	

Remote CAMA (RCAMA) calls can recall; CAMA calls cannot. RCAMA calls are remote calls that go to an operator at a host switch for operator number identification. When the number is entered by the operator, the call is released from the position and the number is verified by the remote switch. If the number is invalid, the call recalls to an operator. This type of RCAMA recall does not occur frequently enough to justify a CAMA recall queue.

Each operator position, operator, and call has an associated toll and assist service (TASERV) or a directory assistance service (DASERV). Other service options that can be datafilled are intercept service (INTCSERV), ALL, or NONE. Calls are stamped with the service type based on their call-origination type. The service types that the operator and position can handle are defined in datafill. A call is placed in a queue that is appropriate for its service type.

Each operator position is defined in Table TOPSPOS to provide a service type (TASERV, DASERV, INTCSERV, ALL, or NONE) and is assigned to process calls from one or more of the CW queues. For further details on datafilling operator positions, refer to *Translations Guide*.

If an office provides both TA and DA service, the operating company should allow only one service type on each queue. This enables separate force management statistics to be kept for each service type, since these statistics are based on queue and not on service type. This configuration is also necessary for the assignable grade-of-service feature.

Calls are never stamped based on queue placement unless a TA call is transferred to a DA operator. When the operator transfers a call to a DA operator using the key sequence **OGT** + XFR DA number + **Start**, the service type is still automatically set to DA. Therefore, the DA service screen is presented at the DA position.

Enqueueing calls

Calls that have already received operator service but that require additional service are placed in one of the recall queues, depending on the transfer type of the call. When a new call arrives, it is placed in one of the nonrecall queues (GEN, XFR1, XFR2, CAMA, or DA), also depending on the transfer type of the call.

Dequeuing calls

Within each priority level, calls are processed on a FIFO basis, depending on the type of call the available operator can handle. For example, when a position that can service all types of calls (GEN, XFR1, XFR2, and DA) becomes available, the DMS switch checks the recall queues to determine which call from which queue should be serviced first. If more than one recall queue contains a call, the DMS switch distributes the oldest calls waiting in the four queues.

When no recalls are enqueued, the DMS switch continues its search of the nonrecall queue priority for a call to distribute to the idle position. When more than one nonrecall queue contains calls, the oldest call waiting in the nonrecall queue is serviced first.

Since not all positions provide all types of service, the DMS switch processes the oldest call within the recall queues that matches both the service type (XFR1, XFR2, GEN, or DA) of an available position and the call types that the operator at that position can receive. After recalls are processed, the first call distributed is the oldest call waiting in the nonrecall queue that matches both the service type of an available position and the types of calls the operator can receive.

Queue thresholds

The office parameter TOPS_CALLS_WAITING_Q_SIZE in Table OFCENG limits the total number of calls that can be queued in TOPS MP. If this limit is exceeded, the call is deflected for treatment.

There are also dynamically changing thresholds associated with the queuing of calls. These thresholds are controlled by the system-wide average work time (AWT) for the last 15-minute period, the number of occupied positions (with headsets seated), and the number of calls currently queued. Queue thresholds for Tables QT0–QT5 may also be controlled manually from the FADS TTY.

Thresholds for calls waiting

If the call-arrival rate exceeds the operator capacity, calls accumulate in the CW queue. As the queue becomes longer, the amount of time an incoming call waits to obtain an operator increases. Queue thresholds provide a way to limit this wait time to a maximum value for each transfer type. It is important to limit this time, since a subscriber who has been waiting in the CW queue for a long time is likely to terminate the call and try again. When a subscriber redials, the call is placed at the end of the queue.

Every fifteen minutes TOPS MP selects a dynamically changing maximum wait time for each transfer type. Alternatively, a manager may enter commands at the TTY to manually select one of the six tables used to determine the queue threshold for a transfer type.

To implement queue thresholds, a force supervisor must estimate the amount of time a call remains in its queue before being connected to an operator. The time a call spends in its CW queue depends on the average speed of answer for calls, the capacity of the operator work force to handle calls of that transfer type, and the number of calls queued ahead of that call.

Using statistics from the optional mechanized force administration data system (MFADS), TOPS MP calculates the average work time (AWT) used in setting TOPS thresholds. The work volume is divided by the number of initial position seizures (IPS) for each queue. The IPS and call-busy work volume (CBWV) are pegged based on the destination queue type for transfers. This method results in a reduction in the IPS and CBWV for the first queue type and an increase in measurements for the second queue type.

The optional enhanced MFADS feature provides more detailed statistics. If enhanced MFADS is implemented with the parameter TOPS_PEG_MODE in Table OFCENG set to PS, position seizure measurements are used in the threshold AWT calculations instead of IPS measurements only. (Position seizure [PS] measurements include initial position seizures, transfer position seizures [TPS] and recall position seizures [RPS] measurements. As such, total PS equals IPS + TPS + RPS.) Since PS measurements include total activity for the nonrecall and recall queues of each queue type, the resulting AWTs reflect an average for the physical nonrecall and recall queues and reflect the traffic through each queue type.

The factors defined in the following table determine the queue threshold for a given queue.

Factors that determine queue thresholds

Factor	Explanation
Average speed of answer (ANS)	The average amount of time a call waits in the CW queue. It is assumed to remain constant. The most common values for ANS are 2.1, 3.5, and 5.0 seconds. There are three sets of queue threshold tables based on these values. Refer to the data schema section of the *Translations Guide* for a complete description of these tables. Note that the CWOFF and CWON threshold values vary with the ANS objective; the DEFLECT threshold value, however, does not.
Number of calls in the CW queue	Number updated by the queued-call counter with every transaction to continually reflect the actual number of calls waiting for position attachment. New calls placed in the queue increase the counter one by one. Queued calls that are served decrease the counter one by one.
Number of occupied positions available to service calls	Number obtained from the same scan program that accumulates force management measurements. This value is updated every ten seconds.
AWT	Average amount of time it takes an operator to handle a call. This value is calculated for each transfer type and printed as the AWT value in the force management reports.

The operator capacity for each call transfer type is determined by the number of positions available to service that transfer type and the amount of time it takes to service a call of that type. For example, if ten operators are able to handle calls from the general queues and each general call requires approximately 30 seconds of operator service time, these ten operators are collectively capable of servicing 20 general calls each minute. When the twenty-first call is enqueued in the general queue, that call waits approximately one minute before an operator is available to provide service.

The operator capacity is inversely proportional to the AWT. As the amount of time it takes operators to service calls decreases, operator capacity increases because the same number of operators are capable of handling more calls. As the AWT increases the operator capacity decreases. This is shown in the following calculations:

$$\frac{\text{10 positions each receiving 1 call}}{\text{System AWT of 0.5 min}} = \text{20 calls per minute}$$

$$\frac{\text{10 positions each receiving 1 call}}{\text{System AWT of 0.25 min}} = \text{40 calls per minute}$$

The number of operator positions available to service calls also contributes to the operator capacity. The operator capacity is proportional to the number of positions. As the number of positions increases, the operator capacity increases. As the number of positions decreases, the operator capacity decreases. This is shown in the following calculations:

$$\frac{\text{10 positions each receiving 1 call}}{\text{System AWT of 0.5 min}} = \text{20 calls per minute}$$

$$\frac{\text{20 positions each receiving 1 call}}{\text{System AWT of 0.5 min}} = \text{40 calls per minute}$$

As the operator capacity changes, the number of calls that can be placed in the queue and still be serviced within a specified time limit changes. To accommodate fluctuating operator capacity, TOPS MP provides six data tables that are used to limit queue size. When a TOPS MP call is placed in the CW queue, the queue’s AWT for the previous 15-minute period is used as an index into the QTTIDX Table, which in turn indexes the queue threshold (QT) table that should be used for that service type and for that period of time. The DMS switch dynamically selects the appropriate queuing threshold table every 15 minutes, based on the AWT of the service type for the previous 15-minute period. The number of positions occupied and able to handle that call type then determines the thresholding limitations within the queue threshold table (QT0 through QT5) selected by the DMS switch.

Note 1: For a given ANS objective (2.1, 3.5, or 5.0 seconds), a set of 18 tables is available for the six queuing threshold tables. Each of the 18 tables has a different AWT, ranging from 15 to 100 seconds in 5-second increments. Operating companies first decide which of the three sets of data tables should be used, based on the desired ANS, then determine which six of the 18 data tables available in that set should be datafilled in the six tables in their switch. It is recommended that the sixth table have the AWT equal to 100.

Note 2: The three sets of 18 data tables are listed and described in the data schema section of the *Translations Guide.* Preprinted forms, containing the appropriate values for each ANS and AWT are also available in the data schema section of the *Translations Guide.* These forms contain the values in the tables provided for an ANS of 2.1 seconds.

The number of occupied positions is used as the index into the QT table selected by the DMS switch. The index (field OPRANGE) is a numeric range of occupied positions. The reason for these varied ranges is that when there are fewer positions, adding one or two more positions has a much greater effect on the operator force capacity. For example, adding two operators to an existing force of two doubles the operator capacity. Adding two operators to a force of 100 increases the operator force capacity by only two percent.

In addition to the OPRANGE index field, each entry in a QT table contains the CWON, CWOFF, and DEFLECT fields, explained in the following table, "Fields in QT tables."

Of the queuing tables listed in the data schema section of the *Translations Guide,* six are selected and their values datafilled in the QT0 through QT5 data tables. The thresholds of these tables can be altered if necessary using table control. For example, assume that the system ANS is 2.1 seconds and the AWT for nontransfer calls is 40 seconds. This AWT indexes the QTTIDX table at value 40.

Note: The AWT the DMS switch selects to index in Table QTTIDX is based on the AWT of the previous 15 minutes; that is, the DMS switch selects an AWT that is closest to the AWT of the previous 15 minutes. Assuming that AWTs 10, 20, and 40 are datafilled in Table QTTIDX, and the previous 15-minute AWT is 14, the DMS switch rounds that AWT to 10 and indexes Table QTTIDX with an AWT of 10 seconds. Similarly, based on the datafill in Table QTTIDX, an AWT of 16 seconds would be rounded to 20, an AWT of 29 would be rounded to 20, and an AWT of 31 would be rounded to 40.

For a team of 20 operators capable of handling nontransfer calls (with 19 through 20 as the range of occupied positions), the DMS switch turns on the

CW indicator when two nontransfer calls are in queue. It erases the CW indicator when only one nontransfer call is left in the queue, and it deflects the sixteenth nontransfer call from the queue and turns on the CD indicator until there are fewer than 15 nontransfer calls in the queue. The CW indicator is based on the assumption that callers are likely to wait for approximately 30 seconds before disconnecting.

Fields in QT tables

Field	Explanation
CWON (calls waiting on)	When the number of calls in the queue is greater than or equal to the value of this field, the CW indicator (`CW`, `CW1`, `CW2`, or `CW3`, depending on the transfer type) is displayed on all administrative position screens (force management cathode-ray tube [FMCRT], in-charge [IC], service assistance [SA]). CW is displayed on the operator position screens of all operators with that transfer type in their combined transfer profile. For example, if the CWON threshold is exceeded for the transfer 1 queues (XFR1 recalls and XFR1 initial position seizures), `CW1` is displayed on the FMCRT, IC, and SA position screens, and `CW1` is displayed on the screens of all operators who have XFR1 in their combined transfer profile. This CW message indicates that the CW queue is becoming full and additional operators may be needed. The Sonalert sounds at the IC position (single-traffic) or at the FMCRT (multitraffic) to indicate that calls are being placed in the CW queue and operators should try to handle them as quickly as possible.
CWOFF (calls waiting off)	When the number of calls in the CW queue falls to the value in this field (having previously exceeded the CWON value), the `CW`, `CW1`, `CW2`, or `CW3` indicator no longer displays on the administrative and operator position screens.
DEFLECT	When the number of calls in the CW queue is greater than or equal to the value of this field, all new calls are deflected and not added to the queue. The CD indicator (`CD`, `CD1`, `CD2`, or `CD3`, depending on the transfer type) appears on all administrative position screens, and the Sonalert sounds at the IC position (single-traffic) or at the FMCRT(multitraffic) as an indication that calls are being deflected. ***Note:*** Recalls are never deflected.

If the enhanced MFADS feature is implemented, the telephone company must reevaluate the datafill in Tables QTTIDX and QT0 through QT5 according to projected AWTs whenever parameter TOPS_PEG_MODE in Table OFCENG is changed.

This is because the datafill of the queue threshold tables (QTTIDX and QT0 through QT5) is determined by anticipated AWTs (5-second intervals). These AWTs are specific to a telephone company's traffic patterns. When parameter TOPS_PEG_MODE is changed, the resulting changes in AWTs may require changes in the datafill of these tables.

For example, if the current AWT of a queue type is 24 seconds, and the AWT is reduced to 21 seconds, table changes are not required because the change is within the original 5-second interval. However, if the AWT is reduced to 19 seconds, table changes should be evaluated.

Thresholds for calls deflect

Queue thresholds determine whether a new call turns on a call-waiting lamp, turns off a call-waiting lamp, or queues or deflects a call. These determinations are based on the number of calls enqueued, the number of positions that can service that type of call, how long it takes to service calls of that type, average answer time, and deflection threshold in seconds.

When a call is enqueued, the following factors determine whether the call should be deflected or placed in the CW queue:

- The current AWT for the transfer type of the call is used as the index into Table QTTIDX. The nontransfer AWT includes work-time contributions for GEN calls, GEN recalls, and CAMA calls. The XFR1 AWT includes work-time contributions from XFR1 calls and XFR1 recalls. The XFR2 AWT includes work-time contributions from XFR2 calls and XFR2 recalls. The DA AWT includes work-time contributions from DA calls and DA recalls.
- The sum of all positions capable of handling that call type (regardless of whether the positions also handle other call types) is used as an index into the QT table to obtain the threshold values.
- The sum of the number of calls in the appropriate call and recall queues, plus the call to be queued, is compared to the deflect threshold to determine whether the call should be queued or deflected. If the call is deflected, the `CD`, `CD1`, `CD2`, or `CD3` (for DA calls) indicator displays at all administrative position screens.

Calls can also be deflected when an overflow condition happens and all queuing resources are in use; that is, the number of calls enqueued exceeds the value set in Table OFCENG parameter TOPS_CALLS_WAITING_Q_SIZE.

Note: For specific queue thresholds, refer to the queue length threshold tables in the Appendix. Tables are provided for an ANS of 2.1 with AWTs of 15 through 100 seconds and for an ANS of 5.0 with AWTs of 20 and 100 seconds.

Considerations for offices with combined transfer positions

In offices with positions that have combined transfer profiles, an incoming call might be placed in a CW queue when it should have been deflected. For this reason, it is advisable to limit the number of operators capable of handling more than one transfer type.

Consider the following example. The AWT for all transfer types is the same and the operator force is composed of the following:

- ten GEN operators
- five XFR1 operators
- five operators who can handle both GEN and XFR1 calls

For any group of 20 calls handled at one time, the incoming traffic mix that can be handled by these 20 operators can vary from 10 GEN calls and 10 transfer calls to 15 GEN calls and 5 transfer calls.

The five combined transfer positions are counted for both GEN and XFR1 queue thresholding position counts. A total of 15 is used as the index in the QT table for GEN thresholds, and a total of 10 is used as the index in the QT table for XFR1 thresholds. Under these conditions, it is possible for an incoming call to be placed in the CW queue when it should have been deflected.

Features affecting TOPS ACD call distribution

TOPS ACD call distribution is affected by the CAMA-preferred feature and the assignable grade of service feature.

CAMA-preferred feature

The optionally available CAMA-preferred feature enables TOPS MP to provide preferred-answer service to CAMA and RCAMA calls. When this feature is activated, CAMA calls are given preferred-answer service by modifying the call distribution method. When CAMA calls arrive in the queue, they are time-stamped as usual, but their effective waiting time is increased by a weighting factor specified by parameter TOPS_AGS in Table OFCVAR. Within the CW queue, the oldest recall is served first. The nonrecall calls are served based on the elapsed time of the oldest call in the XFR1, XFR2, DA, and general queues, compared to the artificially weighted elapsed time of the oldest call in the CAMA queue.

The CAMA queue is artificially weighted according to the value datafilled in Table OFCVAR parameter TOPS_AGS. The following formula is used:

$$\text{Weighted CAMA time} = \text{Elapsed CAMA time} \times \frac{\text{TOPS\_AGS}}{10}$$

TOPS_AGS is set to ten times the desired ratio between the average answer time for CAMA calls compared to the average answer time for XFR1, XFR2, DA, and GEN calls. For example, the default value for TOPS_AGS is 10. The computed ratio is 10/10, or 1, so CAMA calls are not weighted. If the value datafilled for TOPS_AGS is 20, the computed ratio is 20/10, or 2, so the elapsed time for a CAMA call is multiplied by 2 before being compared to the elapsed times for other calls in the nonrecall queue.

When no recalls are enqueued, the XFR1, XFR2, DA, and GEN queues are checked for the oldest entry time, and the entry time is subtracted from the time the check was made. This value is then compared with the weighted age of the CAMA call. Based on this comparison, the oldest call is served first.

> ***Note:*** If the TOPS_AGS parameter in Table OFCVAR is set to 10 (the default value), CAMA calls are not artificially weighted. GEN, XFR1, XFR2, CAMA, or DA calls are served equally on a FIFO basis and on the basis of the call service type and the services that the available positions can handle.

When the operator selects **{Request CAMA}** from the functions menu to request a CAMA call, the DMS switch presents the oldest CAMA call (if one is in the CAMA queue) to the operator.

Assignable grade of service feature—artificial aging

TOPS MP uses the GEN, XFR1, XFR2, and DA queues to segregate waiting calls. The operating company uses Tables TOPSPOS and OPRDAT to specify the queues from which an operator can select calls. When an operator becomes available, the DMS switch scans that operator's designated queues for a waiting call, starting with all the recall queues and then scanning all the nonrecall queues. The call that has been waiting the longest is always selected first, regardless of queue type.

Every TOPS MP call is stamped with an arrival time as soon as it appears at the DMS switch. If no operators are available, the call waits in a queue, growing older, or aging. When an operator becomes available, the DMS switch examines the first call in each queue that fits the operator's profile.

The system subtracts the call-arrival time from the current time to determine the age of each call, and the oldest call is sent to the operator first.

Each queue has an aging factor assigned to it in Table TOPSQAGE. This factor artificially ages the calls in each queue. The operating company can use Table TOPSQAGE to assign a higher priority to some queues, making it appear to the DMS switch that a call has been waiting in queue longer than it actually has.

The aging factor is an integer between 10 and 80. Dividing the aging factor by 10 provides the effective call age. Therefore, a queue with an aging factor of 10 ages calls at their actual rate. The artificial age for any queue can be from one to eight times the actual age, and it can be adjusted by increments of one-tenth the actual duration of time.

The following example illustrates how artificial aging is determined:

- The XFR1 queue has an aging factor of 10.
- The GEN queue has an aging factor of 25.
- Call 1 has been waiting in the XFR1 queue for two minutes (actual time).
- Call 2 has been waiting in the GEN queue for one minute (actual time).

The DMS switch reacts as follows:

- Call 1 is effectively two minutes old [(10 x 2 minutes) / 10 = 2 minutes].
- Call 2 is effectively two and one-half minutes old [(25 x 1 minute) / 10 = 2.5 minutes].

If an operator position becomes available at this time, it is assigned call 2, the call from the GEN queue.

> ***Note:*** Offices that use assignable grade of service should not mix calls of different service types in the same queue. This practice would render artificial aging useless because calls are aged based on queue, not type of service.

TOPS call queue assignment with QMS

Adding QMS to a TOPS office expands the number of available call queues to 255 and improves the operating company's ability to segregate traffic across these call queues. Office datafill in a group of DMS tables makes it possible to exploit the expanded number of call queues available in TOPS QMS.

Call queue assignment happens in three phases:

1. TOPS uses one of two tables to derive an initial call type for queueing purposes.
2. TOPS uses a series of tables to sequentially refine the call type for queueing purposes associated with a call.
3. TOPS maps the call type for queueing purposes into the call queue and service values understood by the QMS call and agent manager (CAM) for final call queue assignment.

Phase 1: initial call type assignment

Because TOPS QMS can coexist with non-TOPS QMS, the first step of call queue assignment is to determine whether this call should go to QMS at all. To allow for gradual transition to TOPS QMS, Table TOPSTOPT allows operating companies to turn on QMS on a trunk group basis. Specifying QMSCAM in the ACD field for a given trunk causes operator-handled calls arriving over that trunk to be handled by QMS. Specifying TOPSACD, or not datafilling a trunk at all in Table TOPSTOPT, causes the operator-handled calls on that trunk to be handled as in non-QMS ACD.

Each call that arrives in a TOPS office is first checked against Table TOPSTOPT to see whether it should go to QMS. If it is determined that the call is non-QMS, the initial call origination type is determined from Table TOPS, and the other three existing mechanisms for call queue assignment in non-QMS ACD are used. If the call is marked as QMS, the initial call type for queueing is derived from Table QMSTOPS.

Table TOPS is used to derive call queue and class of service for traffic designated as non-QMS in Table TOPSTOPT. Table TOPS provides only four queues for non-QMS calls in the TOPS environment. Table TOPS is a fixed table, meaning that it has a fixed number of tuples with fixed indices. The only change to Table TOPS made by this feature is to extend the number of spare call origination types, effectively enlarging the table. This change increases the flexibility of QMS by providing a larger range of initial call types for queueing.

Operator-handled calls that have been marked for QMS in Table TOPSTOPT encounter the first phase of call queue assignment in Table QMSTOPS. Table QMSTOPS is indexed by the same range of call origination types that are used as indices to Table TOPS. Therefore, Table QMSTOPS is a fixed table, like Table TOPS. Unlike Table TOPS, however, Table QMSTOPS does not map call origination type directly to a call queue. Instead, for each call origination type, Table QMSTOPS provides a new call type for queueing. The tables in QMS call type for queueing refinement are all based on the range of call type for queueing values. The range of call type for queueing values is defined in Table CT4QNAMS, which associates each external, symbolic name with an internal integer index. Table QMSTOPS is used to provide an initial call type for queueing value for each call. This initial call type for queueing is the starting point for the second phase of call queue assignment: the refinement of call types for queueing.

Table QMSTOPS assigns initial call type for queueing values for each call origination type. The range of allowable values for call types for queueing is defined in Table CT4QNAMS, which allows an alphabetic name (a string range) to be associated with an internal integer value. An optional eight-character display for presentation to the operator may be datafilled against each call type for queueing. Existing TOPS call origination displays continue to be provided in QMS TOPS, because of their indispensability for operator training. Redundant displays for call types for queueing would like prove confusing for the operator, so it is recommended that only unique QMS-related displays be datafilled.

For more information about datafilling these tables, refer to *Translations Guide.*

Phase 2: refinement of call type for queueing

In phase 2, the call type for queueing assigned in phase 1 may be refined by successively comparing the characteristics of the call against datafillable queueing criteria. This refining phase allows the office to divide incoming traffic into separately manageable categories based on different call attributes, according to its office-specific criteria.

After passing through all the criteria of call type for queueing refinement, a given call may have had its call type for queueing changed several times, or it may still have its initial call type for queueing. In either case, the call type for queueing associated with the call at the completion of phase 2 of call queue assignment is the call type for queueing that determines the call queue and service to be assigned to the call in phase 3.

Each office using QMS may have a different mix of categories that are optimal for the traffic in that office, just as each office has different translations datafill for the traffic in that office. To allow for the expected variation in the ways different offices wish to use QMS, call type for queueing refinement is designed to be as flexible as possible. The order in which the tables are scanned, as well as the criteria applied, helps provide flexibility.

TOPS QMS provides the following criteria, each with its corresponding table:

- class of service (Table CT4QCLAS)
- restricted billing index (Table CT4QREST)

- inter-LATA carrier (Table CT4QCAR)
- prefix call type (Table CT4QPFXT)
- dialed digits (Table CT4QCLD)
- originating location (Table CT4QORIG)
- time of day (Table CT4QTIME)
- partially automated service (Table CT4QAUTO)
- language (Table CT4QLANG)

The class of service criterion is used to modify the call type for queueing purposes by class of service information associated with the calling number. For example, a call may be designated as coin, hotel, station, or restricted. If this information is missing or incomplete, the call is designated as unknown class.

TOPS software provides for 100 different varieties of restricted telephones. Often these telephones require special treatment, which might involve a different queue. If a match is found in Table CT4QREST, this table overrides any previous determination of call type for queueing.

Inter-LATA carrier processing can have a significant impact on call queueing. An operating company may choose to provide operator services on a per carrier basis through a TOPS software package called TOPS inter-LATA carrier service (TICS). If TICS is in the office, this table allows all calls for a particular carrier to be routed to a particular call type for queueing, which may then map to a call queue number staffed by operators dedicated to the particular carrier.

The prefix dialing of a call is used as a criterion in Table CT4QPFXT. This table allows the operating company to refine the call type for queueing by the prefix type of call: operator assisted (OA) or direct dialed (DD). This information is not available based upon dialed digits, because the prefix information is taken off at an end office. It is, however, available from signaling. This differentiation is useful when offices have positions with different capabilities. For example, a TOPS basic position can process a call dialed 1+555–1212, but it cannot process a call dialed 0+555–1212, because that requires alternate billing capabilities it does not have. The operating company, therefore, might wish to route 1+555–1212 calls to a different queue from 0+555–1212 calls. Used in combination, Tables CT4QPFXT and CXT4QCLAS can provide queue selection capabilities similar to those provided for TOPS ACD by Table BPQUEUE.

QMS TOPS can also route traffic based on the dialed (or called) digits entered by the subscriber. Because the range of possible called digits is quite large, data store and run-time efficiency are potential problems. To provide maximum flexibility without sacrificing efficiency, a two-step process segregates calls by dialed digit. The first step associates groups of called digits with symbolic names in Table TQCLDDIG. The symbolic names are used as a criterion for traffic segregation in Table CT4QCLD. An operating company might use the dialed digits criterion to streamline its work force by folding its business office functions into the operator service center. Or an operating company might prototype new services, such as weather forecasts, hotel and restaurant guide, or operator-assisted yellow pages, on the basis of the dialed number, routing these calls to a special team of operators.

The originating location criterion of a call can be used to segregate traffic with Table CT4QORIG. This table can be used to provide local knowledge operators for DA calls, by routing 411 calls that originate from particular areas to operators who are knowledgeable about those areas. Another use for this table is to route traffic from disabled subscribers to special groups of operators with the enhanced training or equipment needed to best serve these subscribers. This table can also be used to segregate traffic based on predominant language needs of different locations. If a group of dialing numbers or a trunk group is known to be populated by a group of subscribers who predominantly speak a given language, for example, this origination criterion may be used to select a call type for queueing staffed primarily by operators who speak that language. Just as with the dialed digits feature, TOPS uses a two-step process to provide maximum flexibility without sacrificing efficiency. The first step associates groups of originating digits with symbolic names, in a table called TQORGDIG. Then, once an originating location is determined for the call, Table CT4QORIG is referenced. This table matches old call type for queueing values against the criterion to yield new call type for queueing values.

The time of day criterion allows for the dynamic segregation of traffic on the basis of time of day. A set of tables allow differently treated times of day to be specified for each day of the week and for holidays. When a call arrives, the current date and time are translated through these tables into a value. Table CT4QTIME allows any type of traffic to be diverted to a new call type for queueing based on the value determined upon call arrival. This feature can be used to consolidate several different types of traffic into a smaller number of call types for queueing at known low-traffic periods of the day or night, providing savings in staffing requirements for low traffic periods. For example, all coin and hotel traffic could be routed to a particular team at night, and the other teams could be staffed with operators not yet trained for coin or hotel. Used with host/remote networking by queue type, TOPS QMS expands the capabilities of operator centralization by allowing any type of traffic to be routed to other switches in the operator centralization network by any of the call type refinement criteria.

It may be advisable for an office to segregate traffic that has already received automated service. An example of a partially automated call is a calling card call that initially routes to MCCS or ACCS, but for which the subscriber does not enter the calling card number. When this happens, TOPS tries to connect the call to an operator. Special groups of operators could be used to handle different types of partially automated calls. This segregation would allow the operating company to have a large group of operators who do not need to serve partially automated calls and thus do not require the special training for handling these calls. Table CT4QAUTO allows all the automated services TOPS provides (ACTS, ACCS, MCCS, AABS, ADACC, and ADAS) to be used as a criterion for queueing.

Table TOPSLANG is used to define a language attribute for TOPS calls. A language value is assigned to a call either through operator keying action or by an automated service. Once a language is assigned to a call, it may be used as a criterion for queueing in Table CT4QLANG. Since language is not assigned until the call has been to an operator or an automated service, this table is useful only for those two types of calls.

Phase 3: final call queue assignment

The refinement phase ends when the characteristics of the call have been applied to all the call type for queueing tables in the appropriate order. The call type for queueing associated with the call following the call type for queueing refinement phase may be the same as the initial call type assigned in phase 1, or it may have changed several times in phase 2. In either case, the refined call type is used in phase 3 as the basis for the assignment of the QMS queue number in Table TQMSFCQA. The final call type for queueing is used as an index to this table, which returns a numeric value that can be identified by the CAM component of QMS.

An important consequence of converting a TOPS office to TOPS QMS is that the default priorities associated with recalls in the non-QMS environment must be datafilled in TOPS QMS, through Table TQMSFCQA. This table provides much greater flexibility in handling recall priorities, but it requires explicit specification for each potential type of recall.

Afterward, the call routes to an operator who serves that call queue. When that operator releases the call, it may recall to TOPS, requiring further operator assistance. For example, on a DA call a subscriber may remain off-hook following an automated recording unit announcement to return to a live operator. In the ACD system, calls that recall to the system are serviced before calls that have not yet been to an operator. In QMS, relative priorities are expressed on the basis of call queues, so a method is provided to allow recalls to route to different call queues. For traffic that recalls to the operator, once a recall has been refined by the call type for queueing tables, a different call queue may be associated with the final call type for queueing.

Note: TOPS QMS does not affect the queueing of assistance and in-charge positions. Queueing associated with assistance and in-charge positions remains unchanged.

Thresholds for calls deflect in QMS

The deflection of calls in QMS is controlled through the QMS Call Queue Definition Table, Table QMSCQDEF. The datafill in this table determines whether, and at what point, calls will be deflected. Three fields are involved: ALLOWDEF, CQCDTIME, and MINODEFL.

Field ALLOWDEF indicates whether calls marked for this call queue should be deflected if the predicted wait for a given call exceeds a threshold. If ALLOWDEF is set to Y (for yes), the deflect threshold must be specified in field CQCDTIME.

Field CQCDTIME indicates the point at which calls are deflected from queue (expressed in tenths of seconds within a range of 0 to 32766). If the predicted wait time for newly arriving calls exceeds the CQCDTIME value, then new calls are deflected from the queue until the predicted wait time drops below this threshold.

The predicted wait time is determined by monitoring the rate at which calls are being served from the given queue (for the preceding 60 seconds, updated every 10 seconds), along with the number of calls in queue. For example, if 120 calls were served in the previous 60 seconds (that is, calls are being served at the rate of two calls per second), and the queue holds 29 calls, then the projected wait time for a newly arriving call is (29 + 1)/2, or 15 seconds. Calls served includes both calls presented to an operator and calls abandoned. If no calls have been served for a given call queue in the preceding 60 seconds, then the QMS CAM is unable to predict the wait time of an arriving call. In this case, the QMS CAM does not deflect calls from the queue until a call is served (and the 60-second tally is updated to reflect it), and a valid predicted wait time is obtained. For example, if calls in TOPS call queue 1 are being served at the rate of two calls per second, and 124 calls are in the queue when a new call arrives, the new call will be deflected, since the projected wait time (124 / 2 = 62 seconds) exceeds the CQCDTIME value (60.0 seconds).

Note: There is an exception to this procedure if, in its message to the QMS CAM requesting an agent for the call, the application explicitly indicates that a call should not be deflected. In this case, the QMS CAM tries to place the call in the call queue regardless of the CQCDTIME threshold.

Field MINODEFL specifies a minimum number of calls in queue below which calls should not be deflected. The range, expressed in tenths of seconds, is 0 to 32,766. For example, if the MINODEFL field is set to 5, and TOPS call queue 0 contains four calls, a call that arrives when no agent is free is placed in queue even if the predicted wait time exceeds the CQCDTIME threshold. If five calls were already in the queue when the new call arrived, then the threshold would apply. This mechanism prevents calls from being prematurely deflected from call queues with very low or erratic throughput.

Standalone TOPS MP with QMS

The TOPS call-processing application performs five functions associated with queueing TOPS positions and calls:

- defining and undefining positions to the CAM
- making positions available and unavailable
- assigning a call queue to each call that arrives at TOPS
- requesting and canceling positions
- requesting a CAMA call from the QMS CAM for an operator who presses the REQUEST CAMA key

When an operator logs in at a position, TOPS defines that position to the QMS CAM. Defining the position tells the CAM which call queues the position can serve while that operator is logged in. It also identifies the queue to which the position belongs when it is idle. TOPS call processing also undefines positions from the QMS CAM during operator logout. This tells the QMS CAM to cancel any data associated with the position.

TOPS call processing tells the QMS CAM whether a position is available or unavailable to accept calls. An available position becomes unavailable to serve calls when made busy by an operator using the **Make Busy** key, or when a call arrives at the position. An unavailable position becomes available when made available by an operator using the **Make Busy** key, or when an operator at the position releases a call.

Each call that arrives at TOPS is assigned to a call queue based on varying criteria specified by the operating company. When an operator position is required for a call, TOPS call processing asks the CAM for an operator position capable of serving the particular call queue assigned to the call.

TOPS call processing determines whether an operator position is required for a call. If a position is required, TOPS asks the CAM for a position capable of serving the call queue assigned to the call. TOPS call processing can also cancel a previous request for an operator. (This would occur if a calling party went on-hook while waiting for an operator.)

When an operator presses the **Request CAMA** key at a position, TOPS call processing requests a CAMA call from the CAM. In response to a request for a CAMA call, the CAM searches the CAMA call queue for a call. If it finds one, it dequeues the CAMA call and informs TOPS call processing of the action taken. It also informs TOPS call processing if there is no call in the CAMA queue.

Operator profiles

TOPS QMS provides the ability to create call queue, controlled traffic, and service profiles for operators through the use of profile tables. Call queue profiles allow an operating company to specify the call queues an operator can serve by associating a particular call queue profile with an operator number.

Controlled traffic profiles allow an operating company to specify the types of calls an operator can serve. They are used mainly for operator training.

Service profiles allow an operating company to associate a list of service names with a service profile number. The service profiles are then associated with operators and positions to indicate their service-handling capabilities. During login and datafill, TOPS software checks to ensure that the service profiles match the equipment and operator profiles.

> ***Note:*** When an operating company adds operator IDs to accommodate QMS, it is crucial that the database vendor be given the correct updated lists of operator and position IDs, so that the vendor can assign permissions appropriately.

Senior operators

Using TOPS MP with QMS allows an operating company to create a new class of operators called senior operators, who can assist other operators (even completing their calls) as their primary task and serve subscriber-initiated operator traffic as their secondary task. Unlike service assistants, senior operators can serve subscriber-initiated traffic and complete the calls to which they provide assistance. They cannot, however, monitor and page other operators as service assistants can. The following table summarizes the major differences between the capabilities of senior operators and those of service assistants.

Capabilities of senior operators versus service assistants

Capability	Senior operator	Service assistant
Use QMS queueing	Yes	No
Call completion for assistance calls	Yes	No

Capabilities of senior operators versus service assistants (continued)

Capability	Senior operator	Service assistant
Serve non-assistant traffic	Yes	No
Receive directed calls	No	Yes
Paging capability	No	Yes
Monitor capability	No	Yes
—end—		

Coexistence of TOPS ACD and QMS

Because QMS may need to be introduced into a traffic office gradually, it is designed to coexist with the current automatic call distribution (ACD) system. A gradual transition may be made from TOPS ACD to QMS on a position and a trunk group basis.

Datafill in Table TOPSPOS specifies the type of queueing to be used by each position. Datafill in Table TOPSTOPT specifies the type of queueing to be used by each trunk group. This allows for the gradual transition of operator positions from TOPS ACD to QMS, on a position-by-position and trunk-group-by-trunk-group basis.

> ***Note:*** In order to be used in QMS, positions must be defined on a QMS team.

Host/remote networking by queue type renamed the datafill for TOPS ACD queues from GEN, XFR1, XFR2, and DA to CQ0, CQ1, CQ2, and CQ3. For offices where TOPS ACD and QMS coexist, the operating company must reserve the first four call queues (CQ0 through CQ3) for TOPS ACD. In this situation, TOPS QMS may use call queues beginning with CQ4.

> ***Note:*** Routing to an alternate host is not without risk. It may cause an already overloaded network to be further overloaded by trying to route a call first to the primary host then to an alternate host, creating twice the work and messaging. The decision to route a call to an alternate host is generally a good one if the alternate host is available. However, if the alternate host is unavailable for some reason, twice the messaging is used for same result (a call routed to treatment). For example, using an alternate host would have adverse effects during a nationwide or region-wide traffic overload such as Christmas. In this case the extra messaging would serve only to further degrade performance on an already overloaded network.

Force management measurement definitions

This chapter defines the force management measurements and statistics printed by the DMS and explains how they are derived. Measurements and statistics available under the Queue Management System (QMS) are described at the end of the chapter.

The DMS accumulates the following force management (FM) measurements for the TOPS MP system in software registers:

- initial position seizures (IPS)
- calls waiting (CW)
- occupied positions (POS OCC)
- work volume (WV)
  - — call-busy work volume (CBWV)
  - — noncall work volume (NCWV)
- idle time (IDLT)

These terms are defined in the following pages. The DMS provides these measurements in one of two ways:

- peg counts (for example, IPS)
- usage count
  - — real time (for example, WV, IDLT)
  - — ten-second scan (for example, POS OCC, CW)

When the optional enhanced mechanized force administration data system (MFADS) is in effect, the following measurements are also accumulated:

- position seizures (PS)
  - — transfer position seizures (TPS)
  - — recall position seizures (RPS)
- nonqueue work volume (NQWV)

- service initiation and service work volume (SI and SWV)
  - toll and assist (TA)
  - directory assistance (DA)
  - intercept (INTC)

The basic FM measurements consist of one peg count register and four usage count registers. A peg count register counts the occurrences of a defined event such as IPS. One usage count measures WV and is accumulated in real time. Another measures IDLT and is also accumulated in real time. The other two usage counts provide the number of calls waiting in the queue and the number of occupied positions in that state; they are accumulated in 10-second scans. All three usage measurements represent accumulations of the times a defined condition existed.

When a scan point is sampled, the condition that exists is assumed to remain constant throughout the full 10-second scan interval. If the scan program observes a busy condition when sampling a scan point, the usage register is increased by one, which represents a full ten seconds of busy usage. If after 30 minutes the scan register has increased 180 times, the equipment under observation has been busy for the full half hour (180 x 10 = 1800 seconds = 30 minutes).

Because the usage registers are increased on the basis of a 10-second scan program, the contents of the registers are accumulated in 10 call seconds (XCS). One XCS represents an amount of time equal to 10 seconds. Thus a half-hourly usage register accumulation of 121 equals 121 XCS, 12 hundred call seconds (CCS), or 1210 seconds.

Enhanced MFADS measurements

Implementing the optional enhanced MFADS feature affects FM measurements. This feature collects data based on an expanded range of PS. In addition to collecting data based on IPS, the enhanced MFADS feature also includes data for TPS and RPS. These data are collected along with IPS-based data collection. The information is stored in two separate databases. The enhanced MFADS feature provides various mechanisms to select the type of calculations that will be performed. In addition, the screen data summary displays and the printed report data can be manipulated to reflect either IPS- or PS-based statistics.

The following summary identifies the changes:

1 Call-based PS pegging is replaced with measurements for all position seizures. Seizure-based pegging expands the data about each queue that is available to the MFADS interface. Also, PS and WV measurements are applied to the source queue type rather than to the destination queue. This change improves the PS and WV measurements for calls transferred by operators.

2 A set of measurements for services such as DA are introduced to measure more accurately the work performed by operators providing multiple services.

3 NCWV and IDLT are reported separately for each traffic office queue type. These data are provided partially in MFADS. This change allows the telephone company to generate statistics for each traffic office queue type.

4 A new WV measurement, nonqueue work volume (NQWV), is added for each traffic office. This measurement identifies operator position WV not attributable to an operator or queue (that is, when the operator's headset is seated but the operator is not logged into any queue).

5 System calls waiting are presented for each queue type. MFADS provides a system total for the nontransfer (non-XFR) queues, and separate totals for transfer 1 (XFR1), transfer 2 (XFR2), and DA; enhanced MFADS allows telephone company calculation of average speed of answer (ANS) for all queue types.

6 The improvements in PS and WV measurements may be applied to existing force management reports.

Enhanced MFADS PS and WV measurements may be either restricted to this feature or extended on a limited basis to other TOPS features.

The parameter TOPS_PEG_MODE in Table OFCENG defines the scope of enhanced MFADS measurements. If this parameter is set to IPS, this feature is independent of other TOPS features except for the FORMAT field discussed in the chapter "Mechanized force administration data system" later in this document.

If this parameter is set to PS, enhanced MFADS measurements are applied to queue thresholds, operational measurements, operator feedback registers, operator study registers, and the data present in the MFADS interface when the MFADS FORMAT field is set to FORMAT1 (or FORMAT1A), disabling FORMAT2 enhanced MFADS reports. They are also applied to reports from the force administration data system (FADS), the system administration data system (SADS), and the traffic administration data system (TADS).

The effect of this option is that IPS-based measurements are replaced with PS measurements, because of the internal database structures. Force management maintains several measurement databases. The primary database contains data used in queue control, TOPS reports, and the current MFADS interface. This database is replicated for 15-minute, 30-minute, 6-hour, and other periodic reports.

Enhanced MFADS implements a separate database that is duplicated only for 15- and 30-minute reports. When TOPS_PEG_MODE is set to IPS, new measurements are placed in the enhanced MFADS database and pegging of the primary database is unchanged (that is, it is IPS-based).

If TOPS_PEG_MODE in Table OFCENG is set to PS, pegging of the primary database is PS-based. That is, the database IPS fields for each queue type contain the sum of initial position seizures, plus transfer position seizures, plus recall position seizures (IPS + TPS + RPS). This pegging occurs when the enhanced MFADS database is pegged and is source queue based.

Since the data collected represents measurements for each seizure, the values in the IPS fields increase, and the calculation of average work time (AWT) decreases. This reflects per-seizure statistics, rather than per-call data.

For example, assume there is a single queue type with 50 recalls, 100 IPS, and 1500 seconds of CBWV. The IPS-based AWT (ignoring NCWV) for this queue is 15 seconds. If PS measurements replace IPS measurements, 150 PS is recorded for the queue type. This reduces the AWT to ten seconds, the average work time required to support each PS for the queue type.

In addition to changing the pegging procedures for the primary database, the parameter TOPS_PEG_MODE in Table OFCENG also controls the pegging of PS for operational measurements and the operator feedback registers. If TOPS_PEG_MODE is set to PS, the pegging of IPS in registers IPSZ and IPSZ2 of group TOPSPSZ is based on queue type measurements. If this parameter is set to IPS, operations measurements do not change.

Similarly, when TOPS_PEG_MODE is set to PS, the data presented at an operator's position represent PS, rather than IPS measurements. (The data displayed are based on PS, but the screen display column titles continue to indicate IPS.) If this parameter is set to IPS, the screen displays indicate the current IPS measurements.

> ***Note:*** The STATSPAC feature is implemented in a separate database and is not affected by the TOPS_PEG_MODE parameter in Table OFCENG.

Position seizures

Force management currently measures operator position seizures from the perspective of a call. That is, rather than pegging the individual seizures that occur when a call passes through multiple queues (transfers and recalls), the first seizure only is pegged. That seizure is called the initial position seizure (IPS). IPS measurements are maintained currently for all active queue types on a per-traffic office basis.

IPS is a peg count of all subscriber- or outside operator-originated calls successfully reaching a TOPS MP operator position. Position reseizures (system-generated recalls such as notify and coin overtime) and operator-originated calls (delay calls such as subsequent attempts) are not included in the IPS count.

Each call is pegged only once. Because each call is pegged just before it is released from a position, it is pegged according to the transfer mark assigned to it when it is released. The pegging procedure depends on whether the operator transfers the call or directs a recall to a specific queue.

For example, if a call arrives at an operator position as a general (GEN) call and the operator presses **OGT** + 1 or 2 + **Start** to transfer the call to an XFR1 or XFR2 position, the IPS is pegged as either an XFR1 or an XFR2 call, depending on which key was pressed. If the operator does not transfer the call to another position before releasing it, the IPS is pegged as a GEN call. If the incoming call is routed directly to a transfer operator, who releases the call without transferring it again, the IPS is pegged as either a XFR1 or XFR2 call, as appropriate.

The value for system-generated recall and operator-generated delay call IPS is incremented and shown in the call type, study register, and STATSPAC report summaries if RECALL and DELAY have been assigned in Table CLASSNAM. The recall and delay call IPS values are not included in system totals displayed on the FM and traffic office (TO) reports. FM and TO reports are discussed in later chapters.

There are limitations to FM measurements for IPS-only statistics. First, PS work volumes are assigned to the destination queue type rather than the source queue type for transfers. Second, IPS-based pegging does not measure all position seizures. Since calls may pass through more than one queue, PS-based statistics provide a better indication of customer wait times and team performance.

Implementing the enhanced MFADS feature removes the limitations of IPS-only pegging by providing PS and WV data for each queue used by a TOPS call. The PS and WV measurements are applied to the source queue type rather than the destination queue. These measurements are still generated when an operator releases a call. On a per-traffic office basis, three types of PS and WV measurements are collected for each queue type (GEN, XFR1, XFR2, DA, and centralized automatic message accounting [CAMA]).

The following table describes the three types of position seizures.

Types of position seizures

Type	Description
IPS	If the position seizure is the first for the call, an IPS and CBWV are pegged for the traffic office queue types.
TPS	If the position seizure is the result of an operator transfer, a TPS and CBWV are pegged for the traffic office queue types except CAMA.
RPS	If the position seizure is the result of a system recall, an RPS and CBWV are pegged for the traffic office queue types except CAMA.

Note: Total PS equals IPS + TPS + RPS.

In addition to the improvements in the transfer seizures pegging, the PS-based measurements of this feature also provide advantages for calculating MFADS statistics.

For example, current IPS-based measurements calculate AWT for a total call. Since calls can pass through several queues, AWT calculations based on individual seizures provide a better indication of team performance. The PS measurements of the enhanced MFADS application extends AWT calculations to the PS level for each queue type.

Since IPS calculations are provided by enhanced MFADS, the telephone company has the option of continuing with IPS-based AWTs, if desired. This is done by setting the Table OFCENG parameter to IPS. An IPS parameter setting makes the enhanced MFADS feature independent of other TOPS features. If this parameter is set to PS, enhanced MFADS measurements are applied to queue thresholding, reports (FADS, TADS, and SADS), operational measurements (OM), the operator feedback registers, the operator study registers, and the data presented to the MFADS interface.

In addition, the CBWV measurements allow the direct calculation of the average occupied positions (AOP) from the data provided to the MFADS interface. Specifically, AOP can be calculated for each of the traffic office queue types. This formula is CBWV + NCWV + IDLT, divided by the MFADS period.

Using MFADS calculations, force management does not distribute the operator’s AOP over the queue types served. (The AOP is derived from XCS occupancy scans; when an operator serves multiple queues, the operator is included in the AOP calculation of the highest numbered queue type served by the operator.)

With enhanced MFADS, the multiqueue operator’s time is distributed over all queue types served by the operator. The resulting calculations identify the AOP for each queue type in each traffic office.

In order to perform the new AOP calculations, NCWV and IDLT must be reported for each of the traffic office queue types.

> ***Note:*** Force management collects NCWV and IDLT in team and system pegging registers. These registers are used in the calculation of the system and team AWTs presented in the FADS, TADS, and SADS FM reports. Force management prorates the team NCWV and IDLT times over the queue types supported by the various teams. These per queue NCWV and IDLT measurements are presented to the MFADS interface. Since the per queue allocation of NCWV and IDLT is subject to rounding, the AWTs displayed in FADS, TADS, and SADS reports and the AWTs calculated for MFADS reports may not be identical.

Calls waiting

Calls waiting (CW) is a usage measurement of the queued call counter. The DMS scans the queues every ten seconds to determine the number of calls waiting for an operator. The queued call counter is updated with every transaction to reflect additions to and subtractions from the queue of calls waiting for position attachment. Using MFADS calculations, system totals are provided for nontransfer queues (CAMA and GEN) and separate totals are provided for XFR1, XFR2, and DA queues.

Implementing the enhanced MFADS feature provides telephone company calculation of ANS for all queue types (CAMA, GEN, XFR1, XFR2, and DA) rather than system totals for nontransfer queues (CAMA and GEN) and separate totals for XFR1, XFR2, and DA queues. Since traffic offices share queues, ANS calculation on a per-traffic office basis is not meaningful. The calls-waiting measurements presented to the MFADS interfaces are the sums of the calls waiting for the nonrecall and recall queues of each queue type.

Occupied positions

Occupied positions (POS OCC) is a usage measurement of all occupied operator positions. The DMS scans the position state counters every ten seconds and records the number of occupied operator positions.

A position is defined as occupied when a headset is plugged into the position headset jack. There are two exceptions:

- The operator position is in training mode.
- The operator position is listed as OD (out-of-order). A position is listed as OD under the following conditions:
  - — The position is in either a maintenance or a system-busy state. This occurs when the DMS recognizes that a position is faulty and removes it from service.
  - — The position is in a man-busy state. This occurs when the position is manually removed from service by entering the BSY command from the MAP and from the terminal position controller administration and maintenance interface (TAMI).

Work volume

Work volume (WV) is a usage measurement of all occupied operator positions that are handling a call (CBWV) or are unavailable to handle a new call (NCWV). WV is measured in seconds (real time) and is accumulated for all positions. This statistic excludes IDLT. Using MFADS, work volume is divided into CBWV and NCWV.

If the enhanced MFADS feature is implemented, a third WV category, NQWV, is added. In addition, enhanced MFADS allows the telephone company to generate separate statistics for NCWV.

Work volume is explained in the following paragraphs.

Call-busy work volume

Call-busy work volume (CBWV) is the total amount of time an operator spends actively handling a call. CBWV is pegged against the transfer type of the call (non-XFR, XFR1, or XFR2). Non-XFR CBWV includes CBWV for both general and CAMA calls.

Note 1: Position seizures are not pegged for delay calls. However, the CBWV associated with a delay call is pegged against the position's current queue type. In addition, SI and SWV are pegged for the current service type of the loop accessed by the delay call.

Note 2: Non-XFR is synonymous with GEN. CAMA calls are also considered general calls.

Noncall work volume

Noncall work volume (NCWV) is the total amount of time an operator is not actively handling a call but is unavailable to accept a new call. For example, an operator is unavailable to accept calls while in make-busy mode. NCWV is included in the system totals. For operators handling only nontransfer calls (GEN and CAMA), the complete NCWV is included in the non-XFR totals. For information about NCWV accumulated by operators whose profiles include transfer calls, refer to the "Call transfer statistics" section in the "Force management features" chapter later in this document.

> ***Note:*** Delay call and recall WV are pegged against CBWV and included in the system (SYST), non-CAMA (NCAMA), and CAMA WV totals of the FM and TO reports. (Current WV is derived from CBWV + NCWV.) Work volume for delay calls and recalls is generated and used to calculate AWT in the call type and study register summaries. This AWT appears in the call type summaries only when DELAY or RECALL or both are assigned in Table CLASSNAM. These calls always generate WV, regardless of whether they appear in the call type or study register summaries.

When the enhanced MFADS feature is implemented, NCWV is presented as a separate field for each traffic office queue type except CAMA (GEN, XFR1, XFR2, and DA). This change extends the generation of TO statistics to individual queue types and provides the telephone company with the option of generating separate CBWV- and NCWV-based statistics.

Nonqueue work volume

When the operator inserts a headset into a position, force management begins collecting WV for that position. If the operator subsequently logs on, this WV is applied as noncall WV for the queue types served by the operator.

If the operator does not log on during the FM measurement period, however, this WV cannot be applied to queues (because there is no operator queue profile). When this occurs, the enhanced MFADS feature accumulates this WV on a per-team basis as NQWV.

Identifying work volume in reports

Without the NQWV calculations added in, the WV in hundred call seconds (WV-CCS) printed in the FM and TO reports is the total of CBWV and NCWV. In the system section of the report, the WV-CCS is the total of all CBWV and NCWV. In the XFR section, the WV-CCS is the total of the CBWV and NCWV for each transfer type.

When NQWV data are accumulated, these data are presented in the new MFADS traffic office extended measurement reports. Traffic office reports contain a series of queue WV, SWV, and NQWV reports. NQWV is presented in the extended measurement traffic office report and is associated with the measurement type of the data in the report. (The measurement type is always identified as MO.) The NQWV field contains the NQWV for the traffic office in the current MFADS period and is used in total work volume calculations.

Generating WV

The following conditions generate WV:

- NCWV is generated when an operator connects a headset at a position. NCWV continues to be generated until the operator logs on and presses the **Start** key to access the toll and assist screen. If the operator logs on but does not press the **Start** key, NCWV is still generated. If the operator disconnects the headset before logging on, the system stops accumulating NCWV.
- If the operator does not log on during the current FM period, this WV accumulates on a per-team basis as NQWV.
- CBWV is generated when a call is presented to an operator. When an operator releases a call from the position, the system stops accumulating CBWV.
- If the operator selects **{Make Busy}** from the functions menu to stop call arrivals without a call active at the position, the system starts generating NCWV. If the operator presses the **Start** key to return to the toll and assist screen, the operator is returned to the idle state and the system stops generating NCWV.
- CBWV is generated when an operator is handling a call. If the operator selects **{Make Busy}** from the functions menu while handling a call, CBWV continues to accumulate until the call is released. Once the call is released, NCWV begins accumulating. The operator then must press the **Start** key to return the position to the idle state and stop generating NCWV.
- CBWV is generated differently for calls placed on temporary hold and those placed on permanent hold:
  - When an operator places a call on temporary hold, CBWV is accumulated for the call.
  - When an operator places a call on temporary hold and then handles a second call, the system stops accumulating CBWV on the held call and starts accumulating CBWV on the second call. When the operator releases the second call, the system starts accumulating CBWV on the first call placed on temporary hold.

— When an operator places a call on permanent hold by pressing **St Tmg** + **Hold** + **Pos Rls**, CBWV stops accumulating, IDLT starts accumulating, and the operator is available to handle a new call. When the permanently held call is reaccessed, the system again starts accumulating CBWV on the call.

— When an operator places a call on permanent hold and a new call arrives, the system starts accumulating CBWV on the new call until it is released.

- CBWV is accumulated while an operator is handling a call. When an operator disconnects the headset before releasing a call, the system stops accumulating CBWV. When an operator reconnects the headset to complete this call, the system begins accumulating NCWV. The system stops accumulating NCWV and starts accumulating CBWV when the operator logs on to complete the call. CBWV stops accumulating when the call is released. If the operator disconnects the headset before logging on, the system stops accumulating NCWV.
- CBWV is generated when an operator handles a delay call. With regard to work volume, delay calls are treated the same as calls that originate from a subscriber.

Idle time

Idle time (IDLT) is the amount of time an operator spends at the position waiting for a call to arrive. Pegging IDLT improves the accuracy of the AOP and percent occupancy (%OCC) statistics.

Pegging IDLT in addition to CBWV and NCWV accounts for all the time an operator spends logged on to a position. Unless the enhanced MFADS feature is implemented, IDLT is not included in the WV-CCS totals in the FM and TO periodic reports and is used solely to compute %OCC and AOP.

If enhanced MFADS is implemented, MFADS reports include IDLT time as a separate field for each traffic office queue type report (GEN, XFR1, XFR2, and DA) except CAMA.

Service initiation and work volume

The enhanced MFADS feature introduces a set of FM measurements called "service measurements" for operators providing multiple services. Service measurements support data collection for TA, DA, and INTC calls.

For each service, two events are monitored: the number of SI and the number of SWV. These measurements are maintained and reported by enhanced MFADS on a per-team basis for each traffic office.

When enhanced MFADS is not implemented, multiple instances of the same service in a single PS are reflected in the AWT as the total services times for a single SI. When enhanced MFADS is implemented, the AWT can be calculated for each service.

Service AWTs reflect the average time required to perform a service. These calculations should not be confused with queue type AWTs. Queue type AWTs indicate the average time required to support an operator session (PS-based) or call (IPS-based). The primary distinction between service and queue measurements is that service measurements span queues (that is, they are not unique to a queue type) and can change within an operator session.

Service initiation and completion are defined as follows:

- A service starts when a call is connected to an operator position or when the operator initiates or reinitiates a service using one of the following key sequences:

  SVCS + 0 + **Start** or **SVCS** + 1 + **Start** or **GEN AMA**

- A service ends when a position is released or when the operator initiates a new service using a service start key sequence.

Consistent service measurements are produced when an operator changes services within a session and when service changes result from transfers or system recalls.

Service changes from multiservice operators

Within a session, a multiservice operator can switch between services by using one of the service start key sequences. SI and SWV measurements are generated by this sequence. The SI and SWV measurements are pegged by service type and operator team (traffic office).

When an operator position is first seized, FM begins accumulating WV for the service implied by the seizure. This action continues until the operator either switches services, reinitiates the same service, or releases the position.

Service changes from transfers and recalls

When service changes result from transfers (GEN queue operator transfers a call to a DA operator) and recalls, service measurements are very similar to queue measurements. For example, the first operator accumulates SWV for the service indicated by the start services key sequence. When the session is released, an SI and SWV are pegged by the service type and that operator’s team.

When TOPS initiates the session for the second operator in a different team, SWV begins accumulating for the service type indicated by the start services key sequence. When the operator releases the session, an SI and SWV are pegged by the service type and that operator’s team.

Force management data manipulation (derived measurements)

The data accumulated in the software registers by the DMS are used to calculate the ANS, AWT, AOP, board hours (BDH), and %OCC. These values print in the FM and TO periodic reports and at the FADS teletypewriter (TTY). For complete details on the TO and FM periodic reports, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

The following table defines the terms used in FM measurements. The subsequent sections of this chapter provide the formulas used to derive these measurements.

Definitions of FM measurements

Term	Definition
Average speed of answer (ANS)	The number of seconds the average call waits to reach an operator.
Average work time (AWT)	The time in seconds required to handle the average call.
Average occupied positions (AOP)	The average number of occupied positions in a fifteen- or thirty-minute period.
Board hours (BDH)	The total number of hours operators spend logged on and accumulating work volume.
Percent occupancy (%OCC)	The amount of time (expressed in a percentage) that logged-on operators are not available to handle new calls.

How ANS is derived

Average speed of answer (ANS) is the number of seconds that the average call waits to reach an operator. Since queues are shared by traffic offices, ANS is valid only at the system level. The ANS can be generated for each queue type and as a system total.

Using MFADS calculations, ANS relies on IPS instead of PS measurements. In this case, ANS is calculated by dividing the XCS calls waiting (multiplied by ten) by an adjusted IPS value. An adjusted IPS is necessary to prevent artificially low ANS values from appearing when scans are missed under heavy CPU load. An adjusted IPS is derived by multiplying IPS by the ratio of the actual scans (multiplied by ten) to the MFADS period.

The following formula is currently used to calculate ANS:

$$\frac{\text{Calls waiting XCS / 10}}{\text{Adjusted IPS}} \quad \text{where adjusted IPS} = \frac{\text{Actual scans}}{\text{Expected scans}} \times \text{IPS}$$

Example:

$$\frac{87(\text{XCS}) / 10}{402} = 2.2 \text{ (seconds)}$$

Using MFADS calculations, ANS is calculated internally by the DMS for each TO and FM periodic report. The ANS value in the SYST row of the TO and FM reports is derived from the sum of the CW-CCS and IPS data for all queues (including XFR1, XFR2, and DA, if active). CAMA calls are subtracted out of these data and displayed in the NCAMA row, and the CAMA row shows data for CAMA calls only.

Implementing the enhanced MFADS feature allows ANS calculations based on PS instead of IPS. If IPS measurements are used, ANS reflects the average time a call waits in queues. If PS measurements are used, ANS indicates the average time a customer waits in a queue for each seizure.

The enhanced MFADS feature provides ANS calculation for all queue types (CAMA, GEN, XFR1, XFR2, and DA) rather than system totals for nontransfer queues (CAMA and GEN) and separate totals for XFR1, XFR2, and DA queues.

How AWT is derived

Average work time (AWT) is the length of time, in seconds, used to handle the average call (including all operator-unavailable time).

The general equation for AWT calculation is to divide the work volume by the number of seizures. Currently, only IPS is a part of the formula, as follows:

$$\frac{\text{Work volume seconds}}{\text{IPS}}$$

Example:

$$\frac{16,920}{402} = 42.1 \text{ (seconds)}$$

If enhanced MFADS is implemented, the number of seizures can be based on IPS, or total position seizures (IPS + TPS + RPS). If IPS measurements are used, AWT is the average work time per call. If PS totals are used, AWT is the average work time per PS.

AWT is calculated internally by the DMS for each TO and FM periodic report. The AWT can be calculated for each traffic office queue type, for each traffic office, for the system, and for each system-level queue type.

How AOP is derived

Average occupied positions is the average number of operators occupying positions over a 15- or 30-minute period. AOP is calculated internally by the DMS for each TO and FM periodic report by dividing the sum of the respective work volume (CBWV + NCWV + IDLT) by the actual number of seconds in the MFADS period. The following formula is used to calculate AOP:

$$\frac{\text{CBWV + NCWV + IDLT}}{\text{Number of seconds in the period}} = \text{AOP}$$

Example:

$$\frac{34{,}500 + 460 + 4140}{1800} = 21.7 \text{ (average number of operators)}$$

This statistic is calculated and printed on the FM 15-minute and FM 30-minute reports. The AOP can be calculated for each traffic office queue type, for each traffic office, for the system, and for each system-level queue type.

> ***Note:*** This method of AOP calculation introduces a small error for operator sessions spanning MFADS periods. CBWV is pegged when an operator releases a call. If a session starts in one period and ends in the next, CBWV for the session is pegged in the second period. The error introduced is the difference between CBWV "carry-in" and "carry-out" relative to adjacent periods.

How BDH is derived

Board hours is the total number of hours that operators spend logged on. The BDH value, reported only in the 6- and 24-hour TO and FM reports, is calculated internally by TOPS MP, using the following formula:

$$\frac{\text{CBWV} + \text{NCWV} + \text{IDLT}}{3600} = \text{Board hours}$$

Example:

$$\frac{34{,}500 + 460 + 4140}{3600} = 10.8 \text{ (board hours)}$$

How %OCC is derived

Percent occupancy is the ratio of operator time spent handling calls (CBWV or NCWV) to the total time operators are assigned to TOPS MP positions for handling calls. The percent occupancy of the operator team is the position occupancy measurement given as a percentage. The following formula is used to calculate %OCC:

$$\frac{\text{CBWV} + \text{NCWV}}{\text{CBWV} + \text{NCWV} + \text{IDLT}} \times 100$$

Example:

$$\frac{48{,}600 + 648}{48{,}600 + 648 + 5832} \times 100 = 89\% \text{ OCC}$$

This statistic is calculated and printed on all TO and FM periodic reports. It can be calculated for each traffic office queue type, for each traffic office, for the system, and for each system-level queue type.

Calls-waiting registers contain data measured in XCS. The CW-XCS value is converted to CCS for use in the TO and FM periodic reports. Work volume is accumulated in seconds and converted to CCS values for use in the periodic reports. The DMS uses the XCS value for CW and the real time value (seconds) for WV when calculating %OCC, ANS, and AWT. The DMS then rounds WV and CW register values to the nearest integer CCS value and prints the CCS values on the periodic reports.

The DMS rounds XCS to CCS for the values in the FM15 and FM30 periodic reports. The XCS values are divided by ten, then rounded to the nearest integer CCS value. The values for CW-CCS and ANS might differ because of the rounding. For instance, if CW-XCS is equal to 4 XCS, this CW-XCS value is used to calculate ANS. An ANS value is provided on the report, but the CW-CCS value on the report is 0 CW-CCS, 4/10 = 0.4. When 0.4 is rounded off, the CW-CCS value equals zero even though the value used to calculate ANS is still 4 XCS.

The DMS rounds seconds to CCS values for the FM15 and FM30 registers. Rounding seconds to CCS values is done for WV. To calculate the CCS value from seconds, divide the seconds value by 100 and round to the nearest integer value as shown above.

FM and TO periodic reports

The force management data described in the previous pages is printed at a TTY in the form of periodic reports. These reports are described in the chapter "ACD TTY commands, queries, and reports" later in this document.

Four FM periodic reports provide statistics for single-traffic or multitraffic offices. The FM periodic reports defined in the following table are printed at the SADS or FADS TTY.

Force management periodic reports

Report	Definition
FM15	Provides a 15-minute accumulation of FM statistics. If requested, it is printed on the hour, half hour, and quarter hour.
FM30	Provides a 30-minute accumulation of FM statistics and is printed automatically on the hour and half hour.
FM6HR	Provides a 6-hour accumulation of FM statistics in addition to a summary of IPS and AWT by call type; it is printed automatically every 6 hours following the start of day.
FM24HR	Provides a 24-hour accumulation of FM statistics in addition to a summary of IPS and AWT by call type. It is printed automatically every day immediately after the start of day.

In a multitraffic office, four additional periodic reports are printed at the TADS TTY within each individual TO provide system data for that traffic office. These reports are defined in the following table.

Traffic office periodic reports

Report	Definition
TO15	Provides a 15-minute accumulation of TO statistics for the traffic office, as well as overall system statistics. If requested, it is printed on the hour, quarter hour, half hour, and three-quarters hour.
TO30	Provides a 30-minute accumulation of FM statistics for a specific traffic office. This report also includes overall system statistics. It is printed automatically on the hour and half hour.
TO6HR	Provides a 6-hour accumulation of FM statistics for a particular traffic office, overall system statistics, and a summary of IPS and AWT by call type. It is printed automatically every six hours following the start of day.
TO24HR	Provides a 24-hour accumulation of FM statistics in addition to a summary of IPS and AWT by call type. It is printed automatically every day immediately after the start of day.

Note: The start of day is set in Table OFCVAR, parameter TOPS_START_OF_DAY as 600 (6:00 A.M.) or 0 (12:00 midnight).

The basic FM measurement registers are redundant. There are two sets of accumulating registers and three sets of holding registers. The first set of accumulating registers overwrites into the holding registers at 900 seconds (15 minutes) into the clock hour. The FM15 report prints if requested. The accumulating function is transferred to the second set of accumulating registers.

Data in the first set of accumulating registers are frozen until 1800 seconds (30 minutes) into the clock hour, when these registers empty out to zero and begin to accumulate for the next 15-minute period. Data from the second set of accumulating registers are overwritten into the holding registers. The FM15 (if requested) and FM30 reports print.

Data in the second set of accumulating registers are frozen until 2700 seconds (45 minutes) into the clock hour. This process of alternating accumulating registers every fifteen minutes, then overwriting into the holding registers, continues throughout the day, printing FM15, FM30, FM6HR, and FM24HR reports as appropriate.

The periodic reports are generated automatically by the DMS at specified times, with the exception of the FM15 and TO15, which require manual initiation of their printing through a TTY command. For further details, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

The FM30 periodic reports print automatically every 30 minutes, on the hour and half hour. If 15-minute reports have been requested, four FM periodic reports print at the FADS TTY at the system start-of-day. These are the 15- and 30- minute reports and the 6- and 24-hour summaries.

Under the following conditions, the four FM periodic reports would take more than 15 minutes to print:

- All transfer types (XFR1, XFR2, and DA) are active.
- Table CLASSNAM is datafilled with the maximum of 15 entries.
- More than seven traffic offices are datafilled.
- The printer speed is 300 baud.

If these conditions exist, it is recommended that the optional 15-minute reports not be requested at TOPS MP start-of-day, or that the 1200 baud capability be used for the FADS.

Information contained in the FM and TO periodic reports

All of the periodic reports contain the FM statistics listed in the following table.

Force management statistics

Statistic	Explanation
IPS	Initial position seizures
WV-CCS	Work volume CCS
ANS	Average speed of answer
CW-CCS	Calls-waiting CCS
AWT	Average work time
AOP	Average occupied positions
%OCC	Percent occupancy
XFR OUT	Calls transferred to a transfer operator (appears only if the call transfer feature is active in the office)
%XFR	Percentage of transfer calls in relation to nontransfer calls (appears only if the call transfer feature is active in the office)

Note: AOP is converted to board hours (BDH) in the FM6HR, FM24HR, TO6HR, and TO24HR reports.

The following statistics apply to the optional enhanced MFADS feature:

- RPS—Recall position seizures (if TOPS_PEG_MODE is set to PS)
- TPS—Transfer position seizures (if TOPS_PEG_MODE is set to PS)
- PS—Position seizures (IPS + RPS + TPS)

All of the periodic reports start with a header that specifies the type of report, the time period covered, the date, and the actual number of scans made by the DMS during the time period. For illustrations of the FM and the TO periodic reports, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Refer to the tables in the "Work volume value in the periodic reports" section later in this chapter for details on what appears on the periodic reports for a single-traffic and multitraffic office and how the information is calculated. Refer to the table in the "Impact of enhanced MFADS on FM statistics" section later in this chapter for enhanced MFADS calculations for each traffic office queue type, for each traffic office, for the system, and for each system-level queue type.

The individual traffic office FM statistics are defined and derived in exactly the same way as those for the entire TOPS MP:

- The same scan rate applies.
- The same measurement definitions apply.
- The same mathematics are used to obtain calculated values.
- The same rounding of XCS to CCS applies.

WV-CCS and AOP are rounded when printed in the periodic reports. AOP is rounded to the nearest one-tenth of a position by traffic office and by TOPS MP. For this reason, the sum of WV-CCS, AOP, or ANS for each traffic office may differ slightly from the number shown for the entire TOPS MP. This is not a mistake; the design provides the most accurate data for both the individual traffic office and the total TOPS MP.

How the information in the periodic reports is derived

The tables in the "Work volume value in the periodic reports" section list all of the fields in the FM and TO periodic reports for both single-traffic and multitraffic offices, and provide information on how the value in each field is calculated. If enhanced MFADS is implemented, the field values may be computed differently. The table in the "Impact of enhanced MFADS on FM statistics" section lists the enhanced MFADS calculations for each traffic office queue type, for each traffic office, for the system, and for each system-level queue type.

Initial position seizures value in the periodic reports

Currently, neither the SYST IPS total nor the CAMA/ non-CAMA system IPS totals in the periodic reports include recalls or delay calls. Within the 6- and 24-hour call type summaries, recalls and delay calls do appear and are pegged for the IPS count if datafilled in Table CLASSNAM. If delay and recall are datafilled in Table CLASSNAM, the delay and recall entries appear in the call type and study data summaries and are pegged. When call type summaries (with recalls and delay calls included in call type summary totals) are manually calculated and compared with the system IPS total (in which recalls and delay calls are not included), the total call type summaries equal more than the system IPS values.

Work volume value in the periodic reports

Work volume is generated when an occupied position is handling a call (CBWV) or is otherwise unavailable to handle a new call (NCWV). CBWV is pegged against particular call types and is included in the SYST WV-CCS. CBWV is also included as part of the non-CAMA and CAMA totals. For operators who can handle only nontransfer (general and CAMA) calls, NCWV is pegged against nontransfer totals, and the system total, but is not included in the non-CAMA or CAMA totals. Refer to "Call transfer statistics" in this document for information about WV statistics generated when operators are capable of handling transfer calls. SYST total WV includes CBWV and NCWV. Non-CAMA and CAMA totals include only CBWV.

Because CBWV is generated for all calls, delay call and recall WV are also included in the CBWV generated for SYST, non-CAMA, and CAMA WV-CCS. The call type AWT and WV totals do not necessarily include all call types, especially delay and recall calls.

Manually calculating the AWT totals and WV totals can show a difference between the call type and the system totals as follows:

- Call type WV/AWT includes only CBWV for the call types datafilled in Table CLASSNAM.
- The system total WV includes NCWV and CBWV for all call types (including delay and recall WV).
- The non-CAMA and CAMA totals include only CBWV for all call types (including delay and recall WV).

Manually calculating all call type WV would include CBWV only for those call types and could show a difference between non-CAMA and CAMA WV (which also includes delay and recall WV) and the manually calculated call type WV (if it does not include delay and recall WV). The calculated AWT and %OCC values may differ, because the WV value is used in calculating these statistics. See the following tables on calculating field values for the current MFADS periodic reports for single-traffic and multitraffic offices.

Calculating field values for the current MFADS periodic reports, single-traffic office (FORMAT1/FORMAT1A)

Item	System portion of the FM periodic report	Non-XFR portion of the FM periodic report	XFR1 portion of the FM periodic report
IPS	Item 1	Item 2	Item 3
	All calls marked as any transfer type at the time the IPS was pegged.	Any call marked as non-XFR at the time the IPS was pegged.	Any call marked as XFR1 at the time the IPS was pegged.
WV-CCS	Item 4	Item 5	Item 6
	WV (CBWV + NCWV in CCS) accumulated by all operators.	CBWV (tallied in CCS when calls marked as non-XFR had their WV pegged) + NCWV in proportion to the percentage of time operators spent handling non-XFR calls versus other XFR call types in their combined profile.	CBWV (tallied in CCS when calls marked as XFR1 have their WV pegged) + NCWV in proportion to the percentage of time operators spent handling XFR1 calls versus other XFR call types in their combined profile.
ANS	Item 7	Item 8	Item 9
	Item 10 / Item 1 (Adjusted for actual number of scans in the period.)	Item 11 / Item 2 (Adjusted for actual number of scans in the period.)	Item 12 / Item 3 (Adjusted for actual number of scans in the period.)
CW-CCS	Item 10	Item 11	Item 12
	Calls-waiting seconds for any call waiting in any queue for operator answer (converted to CCS).	Calls-waiting seconds for any call waiting in the non-XFR queue for operator answer (converted to CCS).	Calls-waiting seconds for any call waiting in the XFR1 queue for operator answer (converted to CCS).
AWT	Item 13	Item 14	Item 15
	Item 4 / Item 1	Item 5/Item 2	Item 6 / Item 3

—continued—

Calculating field values for the current MFADS periodic reports, single-traffic office (FORMAT1/FORMAT1A) (continued)

Item	System portion of the FM periodic report	Non-XFR portion of the FM periodic report	XFR1 portion of the FM periodic report
AOP	Item 16	Item 17	Item 18
	Occupied position time accumulated by all operators (CBWV + NCWV + IDLT) divided by the number of seconds in the period.	Occupied position time accumulated by operators (CBWV + NCWV + IDLT) handling calls from the non-XFR queue divided by the number of seconds in the period.	Occupied position time accumulated by operators (CBWV + NCWV + IDLT) handling calls from the XFR1 queue, divided by the number of seconds in the period.
%OCC	Item 19	Item 20	Item 21
	Using the WV and IDLT statistics (in seconds) for the entire system: [(CBWV+NCWV)/ (CBVW+NCWV+IDLT)] X 100	Using the WV and IDLT statistics (in seconds) for non-XFR positions. [(CBWV+NCWV)/ (CBVW+NCWV+IDLT)] X 100	Using the WV and IDLT statistics (in seconds) for XFR1 positions. [(CBWV+NCWV)/ (CBVW+NCWV+IDLT)] X 100
XFR OUT	Item 22	Item 23	Item 24
	N/A	N/A	Calls transferred to XFR1 operators.
%XFR	Item 25	Item 26	Item 27
	N/A	N/A	Item 24 / Item 2

—end—

Note: FM statistics for XFR2 and DA are calculated in the same manner as those for XFR1, as shown in the previous table.

Calculating field values for the current MFADS periodic reports, multitraffic office (FORMAT1/FORMAT1A)

System-wide portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
IPS	Item 1	Item 2
	Sum of TO IPS in Item 2.	Any call marked as any transfer type when an IPS is pegged. Provided for each traffic office.

Calculating field values for the current MFADS periodic reports, multitraffic office (FORMAT1/FORMAT1A) (continued)

System-wide portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
WV-CCS	Item 3	Item 4
	Sum of TO WV seconds in Item 4 (in CCS).	WV (CBWV + NCWV in CCS) accumulated by all operators in each TO.
ANS	Item 5	Item 6
	Item 7 / Item 1	N/A
CW-CCS	Item 7	Item 8
	Calls-waiting seconds for any call waiting in any queue for operator answer (in CCS).	N/A
AWT	Item 9	Item 10
	Item 3 / Item 1	Item 4 / Item 2
AOP	Item 11	Item 12
	Sum of TO AOP in Item 12.	Occupied position time for all queues, divided by the number of seconds in the period: (CBWV + NCWV + IDLT) / Seconds in the period Provided for each TO.
%OCC	Item 13	Item 14
	Using the WV and IDLT statistics (in seconds) for the entire system: [(CBWV+NCWV)/(CBVW+NCWV + IDLT)] X 100	Using the sum of the WV and IDLT statistics (in seconds) for all queues for each TO: [(CBWV+NCWV)/(CBVW+NCWV + IDLT)] X 100

Non-XFR portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
IPS	Item 1	Item 2

—continued—

Calculating field values for the current MFADS periodic reports, multitraffic office (FORMAT1/FORMAT1A) (continued)

Non-XFR portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
	Sum of TO IPS in Item 2.	Calls marked as non-XFR at the time an IPS is pegged.
WV-CCS	Item 3	Item 4
	Sum of TO WV seconds in Item 4 (in CCS).	CBWV (tallied when calls marked as non-XFR have their WV pegged) + NCWV in proportion to the percentage of time operators spent handling non-XFR calls versus other XFR call types in their combined profile. Provided for each TO (in CCS).
ANS	Item 5	Item 6
	Item 7/ Item 1	N/A
CW-CCS	Item 7	Item 8
	Calls-waiting seconds for calls waiting in the non-XFR queue for answer (in CCS).	N/A
AWT	Item 9	Item 10
	Item 3 / Item 1	Item 4 / Item 2
AOP	Item 11	Item 12
	Sum of TO AOP in Item 12.	Average number of positions occupied while serving the non-XFR queue, using the WV and IDLT accumulated against that queue. (CBWV + NCWV + IDLT) / Seconds in the period Provided for each TO.

—continued—

Calculating field values for the current MFADS periodic reports, multitraffic office (FORMAT1/FORMAT1A) (continued)

Non-XFR portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
%OCC	Item 13	Item 14
	Using the WV and IDLT statistics (in seconds) for non-XFR positions: [(CBWV+NCWV)/ (CBVW+NCWV+IDLT)] X 100	N/A

XFR1, XFR2, (and DA, if applicable), portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
IPS	Item 1	Item 2
	Sum of TO IPS in Item 2.	Calls marked as XFR1 or XFR2 at the time an IPS is pegged.
WV-CCS	Item 3	Item 4
	Sum of TO WV seconds in Item 4 (in CCS).	CBWV (tallied when calls marked as XFR1 or XFR2 have their WV pegged) + NCWV for each operator in proportion to the number of transfer types in the combined profile. Provided for each TO (in CCS).
ANS	Item 5	Item 6
	Item 7 / Item 1 (Adjusted for actual number of scans in the period.)	N/A
CW-CCS	Item 7	Item 8
	Call waiting seconds for any call waiting in the XFR1 or XFR2 queue for answer (in CCS).	N/A
AWT	Item 9	Item 10
	Item 3 / Item 1	Item 4 / Item 2

—continued—

Calculating field values for the current MFADS periodic reports, multitraffic office (FORMAT1/FORMAT1A) (continued)

XFR1, XFR2, (and DA, if applicable), portion of the periodic report		
Item	**System data**	**Traffic office (TO) data**
AOP	Item 11	Item 12
	Sum of TO AOP in Item 12.	Average number of positions occupied while serving the XFR1 or XFR2 queue, using the WV and IDLT accumulated against that queue. (CBWV + NCWV + IDLT) / Seconds in the period Provided for each TO.
%OCC	Item 13	Item 14
	Using the WV and IDLT statistics (in seconds) XFR1 or XFR2 positions: [(CBWV+NCWV)/(CBVW+NCWV+IDLT)]X100	N/A
XFR OUT	Item 15	Item 16
	Sum of TO data in Item 16.	Number of calls transferred to XFR1 or XFR2 operators. Provided for each TO.
%XFR	Item 17	Item 18
	Item 15 divided by the sum of the non-XFR IPS.	N/A

—end—

Impact of enhanced MFADS on FM statistics

Enhanced MFADS affects the generation of FM statistics because measurements can be IPS-based or PS-based. In addition, four levels of statistics can be generated for these data:

- statistics by queue type, for each traffic office
- traffic office totals
- system totals

- system totals according to queue type

The enhanced MFADS feature calculates the data and configures it based on calculations for each level. Either IPS- or PS-based measurements can be used in the calculations, depending on whether parameter TOPS_PEG_MODE in Table OFCENG is set to IPS or PS.

Enhanced MFADS calculations are illustrated in the following table, except for system totals per queue type. These statistics can be generated by adding the measurements for each queue type (over all traffic offices), and applying the equations listed under per queue type statistics.

Calculating field values for the enhanced MFADS periodic reports (FORMAT2)

Item	Per queue type, per traffic office	Per traffic office	System
WV	(1Q)	(1T)	(1S)
	CBWV + NCWV	Sum of (1Q) over all queue types	Sum of (1Q) over all traffic offices
AOP	(2Q)	(2T)	(2S)
	(CBWV + NCWV + IDLT) / MFADS period	Sum of (2Q) over all queue types	Sum of (2Q) over all traffic offices
BDH	(3Q)	(3T)	(3S)
	(CBWV + NCWV + IDLT) / 3600	Sum of (3Q) over all queue types	Sum of (3Q) over all traffic offices
%OCC	(4Q)	(4T)	(4S)
	WV / (WV + IDLT)	(1T) / ([1T] + team IDLT)	(1S) / ([1S)]+ system IDLT)

—continued—

Calculating field values for the enhanced MFADS periodic reports (FORMAT2) (continued)

Item	Per queue type, per traffic office	Per traffic office	System
AWT	(5Q)	(5T)	(5S)
	WV / Either adjusted IPS or PS	(1T) / sum of team IPS or PS	(1S) / sum of system IPS or PS
ANS	(6Q)	(6T)	(6S) per queue
	(CW x 10) / Either adjusted IPS or PS	N/A	(System CW x 10) / Either adjusted IPS or PS
		—end—	

QMS measurements

TOPS QMS provides basic force management statistics produced by the DMS for monitoring the performance of QMS. This feature collects measurements against four different criteria:

- traffic office
- TOPS QMS queue
- TOPS QMS service
- TOPS QMS force management call class

Note: If the optional QMS MIS interface is used, the measurements defining real time and period in this chapter may be presented in any format provided by an external vendor's reporting software package.

Traffic office measurements

With this feature, each team datafilled in the DMS has measurements pegged against it. These measurements are printed at three FM devices: the QMFADS TTY, the QFADS TTY, and the QTADS TTY. These devices are similar to the corresponding devices described in Chapters 7 and 8: MFADS, FADS, AND TADS. When used with QMS, they are designated QMFADS, QFADS, and QTADS.

The following measurements are reported:

- initial position seizures (IPS): the number of calls initially routed to operators in a particular team

- recall position seizures (RPS): the number of recalls routed to operators in a particular team
- transfer position seizures (TPS): the number of transfer calls routed to operators in a particular team
- call-busy work volume (CBWV): the amount of call work volume generated by operators in a particular team
- noncall work volume (NCWV): the amount of time operators in a particular team spent in a made-busy or calls-withheld state
- idle time (IDLT): the amount of time operators in a particular team spent not made busy or calls withheld, but with no call at the position
- average work time (AWT): the amount of call-busy work volume generated by operators in a particular team divided by the number of total position seizures generated by calls routed to operators in that team. The formula for this calculation is CBWV / (IPS + RPS + TPS).
- average occupied positions (AOP): the average number of operators at position in a particular team during a period
- percent occupancy (%OCC): the percentage of time that operators on a team were unable to accept new calls

The QMFADS report includes the base measurements needed for AWT, AOP, and %OCC calculations: AOP idle time (AOPIDLT) and AOP work volume (AOPWV). The actual AWT, AOP, and %OCC calculations are not printed at the QMFADS TTY.

Queue measurements

All QMS call queues can have measurements pegged against them. These measurements are printed at QMFADS, QFADS, and QTADS devices. The following measurements are included:

- the number of IPS made by calls assigned to each queue

  Note: A call may be assigned to a queue type without actually being queued. If a TOPS call arrives when there are idle operators capable of servicing the call, the call is immediately routed to an operator position without being queued. However, even when this happens, the system internally tracks which queue the call would have been placed in if no idle operators had been available.

- the number of RPS made by calls assigned to each queue
- the number of TPS made by calls assigned to each queue
- the amount of CBWV accumulated by calls assigned to each queue

Note: While a call is at a position, CBWV is generated against the queue from which it came to that position. For instance, assume that a call is initially assigned to queue 1 and then receives operator service for 30 seconds. Then the call is released from position and is assigned to queue 2. The call then reaccesses a position for 30 seconds and is released. The time the call spent at position after being assigned to queue 2 is pegged against the work volume for queue 2. CBWV is always pegged against the last queue to which a call was assigned before it accessed or reaccessed the position.

- AWT (the CBWV associated with the queue, divided by the total position seizures associated with the queue)
- CW (the total amount of time calls spent waiting in each queue)
- average answer (ANS): the average amount of time it took for an operator to answer a call from a particular queue

The ANS time calculation is not sent to the QMFADS device. Instead the QMFADS TTY receives the base measurements that can be used to make the calculation.

Service measurements

The service measurements feature pegs three measurements against up to 16 services and prints them at the QMFADS, QFADS, and QTADS devices. TOPS QMS services are datafilled in Table TQMSSERV. The three measurements are defined in the following list:

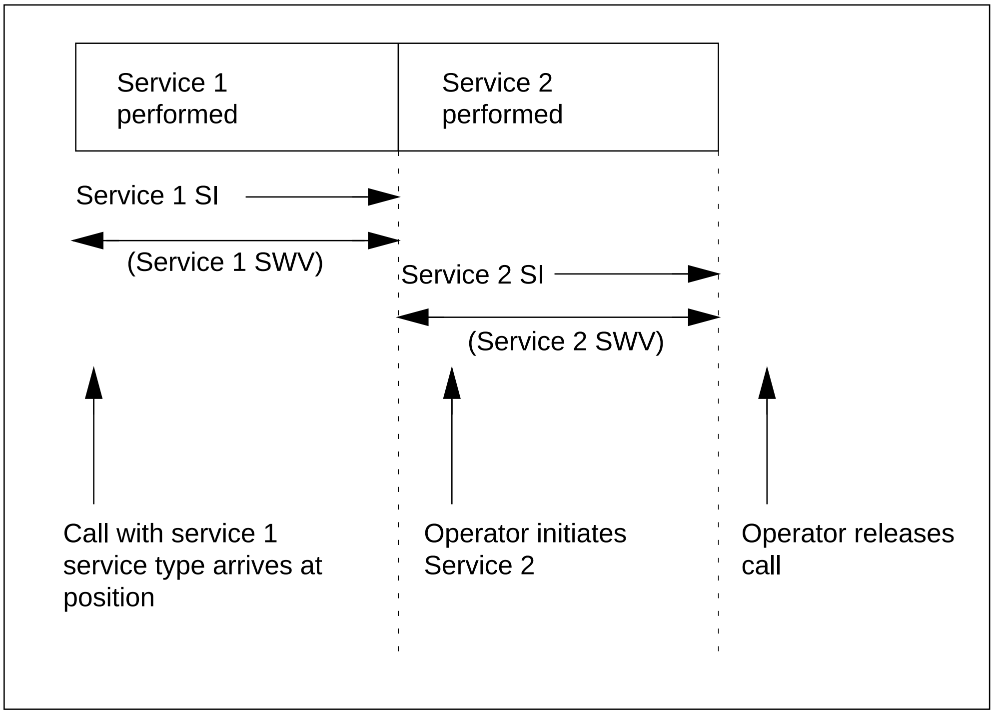
- service initiations (SI): the number of times a particular service was provided
- service work volume (SWV): the amount of work time generated by calls receiving a particular service
- service average work time (SAWT): the average work time generated by each service initiation. The formula for this calculation is SWV/SI.

SWV begins accumulating when a call is connected to an operator position or the operator keys to initiate a new service. Work volume for a particular service is accumulated until the call is released from position or the operator keys to initiate a new service. Both SWV and SI are pegged when the call with the particular service leaves the position or a new service is initiated by the operator.

Note: SWV for a call includes only that portion of the call that received a particular service. For instance, if a call with a base service of DA was at position and the operator keyed for call completion, changing the base service type to TA, only the DA portion of the call would be pegged against the DA-based service.

The following figure shows an example of how multiple services are pegged.

Pegging multiple services



Call class measurements

This feature also prints the following measurements for up to 15 operating company-defined QMS FM call classes at QFADS and QTADS devices. QMS FM call classes are defined in Table TQCLSDEF.

- IPS: the number of initial position seizures generated by each QMS FM call class
- RPS: the number of recall position seizures generated by calls of each QMS FM call class
- TPS: the number of transfer position seizures generated by calls of each QMS FM call class
- CBWV: the amount of call work volume
- AWT: the average work time generated by a call belonging to a particular call class

TOPS QMS may have up to 2047 distinct force management call types. However, reporting the IPS, RPS, TPS, CBWV, and AWT for all 2047 possible call types every 15 minutes would require enormous bandwidth and would take far too long to print. Therefore, in order to conserve bandwidth, this feature provides a mechanism to reduce the call types down to 15 distinct call classes. A sixteenth call class, UNDEFINED, is reserved for calls not associated with a class.

Reducing the number of call types involves two steps:

1 naming QMS force management call classes (in Table TQCLSNAM)

2 mapping QMS force management call types into QMS force management call classes (in Table TQCLSDEF)

For information about datafilling these tables, see *Translations Guide*.

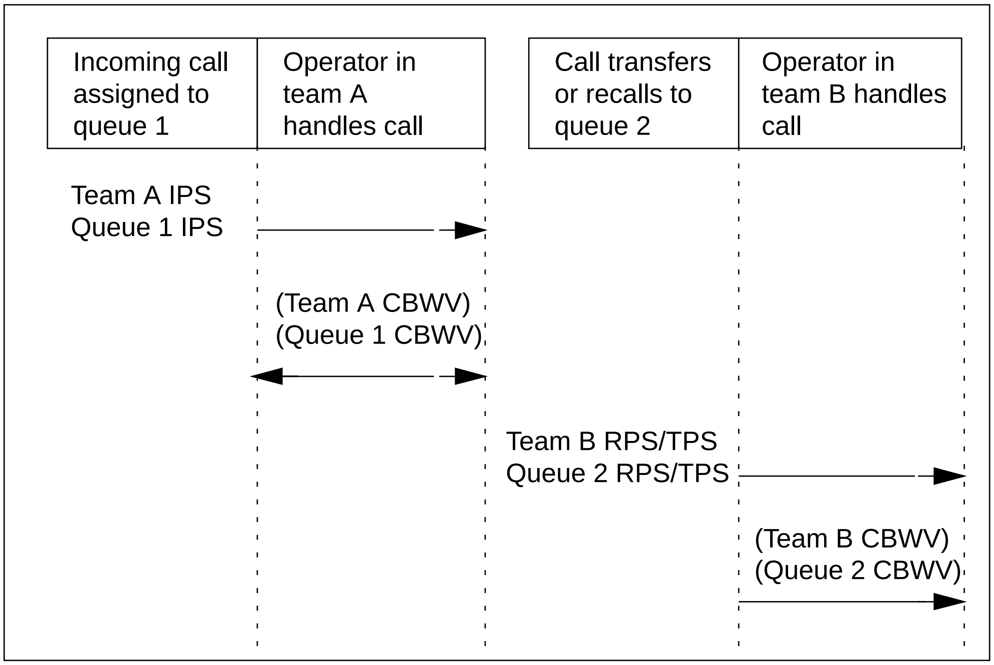
Position seizures, work volume, and AWT

TOPS QMS calculates AWT by dividing the amount of call busy work volume by the total number of position seizures: CBWV / (IPS+RPS+TPS). In contrast, non-QMS TOPS calculates AWT by dividing the total work volume (that is, the call busy work volume plus non call work volume) by only the number of IPS. The QMS method of calculating AWT provides a significantly smaller AWT than the non-QMS method provides.

Note: In non-QMS systems, switches equipped with enhanced MFADS also have the option of calculating AWT by the CBWV / (IPS+RPS+TPS) method. (STATSPAC is not available with QMS.)

More than one position seizure may be associated with each call. Different position seizures associated with the same call may be associated with different traffic offices and different queues. For example, a call is assigned to queue 1. The call is serviced for 30 seconds by an operator in team A and released from the position. The call is then assigned to queue 2 and recalls to an operator in team B. The operator in team B services the call for 20 seconds and then releases it. The following figure shows the sequence of events.

Multiple position seizures



With QMS, the 30 seconds the call spent being serviced by the operator in team A after being assigned to queue 1 would be pegged against the work volume for team A and queue 1. In addition, since team A was the first queue to which the call was assigned, an IPS would be pegged against team A and queue 1.

The 20 seconds the call spent being serviced by the operator in team B after being assigned to queue 2 would be pegged against the work volume of team B and queue 2. Since the call was transferred or recalled to queue 2 and then serviced by team B, a TPS or RPS would be pegged against team B and queue 2.

The following figure provides a sample AWT calculation using two teams and two queues.

Sample AWT calculation

$$\frac{\text{Team A CBWV}}{\text{Team A IPS + Team A RPS + Team A TPS}} = \frac{\text{30 seconds}}{1 + 0 + 0} = \text{30 seconds}$$

$$\frac{\text{Team B CBWV}}{\text{Team B IPS + Team B RPS + Team B TPS}} = \frac{\text{20 seconds}}{0 + 1 + 0} = \text{20 seconds}$$

$$\frac{\text{Queue 1 CBWV}}{\text{Queue 1 IPS + Queue 1 RPS + Queue 1 TPS}} = \frac{\text{30 seconds}}{1 + 0 + 0} = \text{30 seconds}$$

$$\frac{\text{Queue 2 CBWV}}{\text{Queue 2 IPS + Queue 2 RPS + Queue 2 TPS}} = \frac{\text{20 seconds}}{0 + 1 + 0} = \text{20 seconds}$$

Note: The basic QMS statistics feature does not use NCWV to figure AWT.

Service initiation and service work volume

A service initiation is pegged whenever one of the following events happens:

- A position seizure (IPS, RPS, or TPS) occurs.
- An operator successfully initiates a new service for a call already at a position.

Pegging position seizures and work volume

If a call extends over the bounds of a 15-minute report period, the associated WV and often the associated position seizure are pegged during the terminating report period, even though the call arrived during the previous report period. The AWT calculations also use data that is pegged during this period.

IDLT and NCWV generated by an operator are pegged at the end of the idle period or the position busy period, respectively. Therefore, if a period of continuous idle time spans more than one accumulation period, all the idle time generated is pegged against the last period. Similarly, a continuous period of NCWV accumulation is all pegged against the period in which the accumulation terminates.

Calculating AOP and %OCC

With QMS basic statistics, AOP is calculated by summing up the total WV and IDLT generated by operators at position during a measuring period and then dividing by the measuring time.

%OCC is calculated by dividing the total WV by the sum of the total WV and the total IDLT.

Because CBWV, NCWV, and IDLT are pegged at the end of the call work period, non-call work period, or idle period, respectively, large time accumulations may be pegged during a single QMS force management period. For example, if an operator is idle for 20 minutes and receives a call three minutes into a particular QMS force management period, all 20 minutes of idle time are pegged against that period and no idle time is pegged against the previous period. This type of pegging can lead to large discrepancies in AOP and %OCC calculations.

Therefore, at the end of each 15-minute period, QMS force management calculates the total WV and IDLT generated by each team during the period, even if operators are still in the middle of a work period or idle period. This measurement is used solely for measuring AOP and %OCC. These special WV and IDLT measurements are referred to as average occupied position work volume (AOPWV) and average occupied position idle time (AOPIDLT), respectively. This data does not usually equal the WV and IDLT data output by QFADS and QTADS reports. It is printed as special AOP- and %OCC-specific WV and IDLT fields in the QMFADS reports.

The NCWV, CBWV, and IDLT fields printed by QMFADS, QFADS, and QTADS devices should not be used to calculate AOP and %OCC. Such a calculation would not necessarily yield the correct result.

Pegging units and rounding

IDLT, NCWV, and CBWV are pegged in units of tenths of seconds, but before the totals are printed they are rounded to the nearest second. CW time is also pegged in tenths of seconds and rounded to seconds before being output.

AWT and average answer are calculated from the CBWV and CW before the CBWV and CW are rounded to the nearest second. Therefore, it is possible, especially when few calls are processed in a report period, for the output AWT not to equal the result of the output CBWV divided by the total position seizures. For instance, if one call arrived at a position during a period and remained at the position for 18.6 seconds, the AWT for the period would be 18.6, even though the CBWV output for the period was 19.

QMS basic statistics calculations

The following table provides the calculations behind the basic QMS force management statistics.

QMS basic statistics calculations

Item	Calculation
WV	CBWV + NCWV
AOP	(AOPWV + AOPIDLT) / QMS FM PERIOD
%OCC	AOPWV / (AOPWV + AOPIDLT)
AWT	CBWV / (IPS + RPS + TPS)
ANS	CW / (IPS + RPS + TPS)

Force management features

This chapter describes the following force management (FM) features, which can be activated and deactivated by issuing commands at a teletypewriter (TTY):

- operator feedback system
- operator study data system
- call transfer
- controlled traffic
- broadcast messages
- password administration
- time and charges and hotel TTY state control group

Note: The force management features described in this chapter apply to the TOPS ACD system. The Queue Management System (QMS) does not support time and charges or hotel TTY state control group features. In the case of operator feedback, operator study data, broadcast messages, and password administration, the QMS software is similar, but the commands differ. QMS commands are discussed in the chapter "QMS TTY commands, queries, and reports" later in this document. In QMS, call transfer and controlled traffic are handled through the MAP (Maintenance and Administrative Position). QMS does not support STATSPAC.

Operator feedback

TOPS MP has an online individual operator feedback system. A pair of software registers are provided in DMS memory for each operator. Software registers are associated with operators and operator positions through Table TOPSPOS and Table OPRDAT.

The DMS switch associates the pair of feedback registers corresponding to the logged-on operator number to the position at which the operator is logged on. One register accumulates position seizure information; a second register accumulates work volume usage for that position; and another register accumulates idle time.

When the optional feature enhanced mechanized force administration data system (enhanced MFADS) is implemented, the registers collect either initial position seizures (IPS), transfer position seizures (TPS), and recall position seizures (RPS) information, or IPS information only. This option is based on the decision to datafill TOPS_PEG_MODE in Table OFCENG with either IPS or position seizures (PS).

> ***Note:*** Whenever this chapter refers to "IPS (or PS)," read IPS if your operating company uses the optional MFADS feature. Read "PS" if you use the optional enhanced MFADS feature.

Each operator is identified to the DMS switch by an operator logon procedure. When an operator leaves the position (unplugs the headset), the DMS switch ceases to accumulate position seizures information and work volume.

When an operator returns to any position, the logon process is repeated and the DMS switch reconnects those feedback registers to the logged-on position. In this way, the registers accumulate the operator’s total-day IPS (or PS) and work volume. The accumulation is based on a correlation of the numbered registers with various positions at which the operator has worked throughout the day.

The DMS switch automatically initializes all individual operator feedback registers daily, at the system start-of-day.

An operator can request feedback data on the screen, erase the data from the screen, print the data at the system administration data system (SADS) or traffic administration data system (TADS) TTY, and zero out the feedback registers. This can be done only if the position is in the make-busy state (that is the mainstream activities screen displays), the operator is identified by the logon procedure, and there is no call at the position.

The softkeys defined in the following table provide these capabilities and are normally available to an operator who is logged on and in make-busy mode at an operator position.

TOPS MP softkeys

Key name	Purpose
{Show Stats}	Request feedback data on the operator position screen. When this softkey is pressed, the feedback data display in the auxiliary information window of the screen
{Erase Stats}	Erase feedback data from the operator position screen.
{Print Stats}	From the operator position, request a hardcopy of feedback data printed at the SADS or TADS TTY. (This request resets the operator's feedback registers to zero if Table OFCVAR parameter TOPS_ZERO_FB_REG is set to Y and the in-charge [IC] manager has not entered the FIXXX input command at the SADS or TADS TTY).
{Reset Stats}	Reset feedback registers to zero. Sets feedback registers to zero only if Table OFCVAR parameter TOPS_ZERO_FB_REG is set to Y and the IC manager has not entered the FIXXX command at the SADS or TADS TTY.

The feedback data consist of the operator's accumulation of IPS (or PS) and the calculated average work time (AWT) value for the operator. The system AWT can also be displayed if Table OFCVAR parameter TOPS_DISPLAY_AWT is set to Y.

The DMS switch calculates AWT whenever an onscreen display or TTY feedback is requested for an operator. The calculation is shown rounded to the nearest whole number and is taken from the operator's register contents.

TTY commands

The operator feedback feature is administered through three TTY commands, which are defined in the following table.

Operator feedback TTY commands

Command	Purpose
FD	Prints the feedback data for a specific operator
FI	Prevents an operator from zeroing out the feedback registers
FZ	Allows an operator to zero out the feedback registers

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Operator feedback guidelines

This section provides guidelines for interpreting operator feedback data.

Statistical reliability of average work time

An individual operator's AWT is affected by the type of calls routed to the operator position. The distribution of calls by type is entirely beyond the operator's control, except for when the operator selects **{Request CAMA}** from the functions menu to take centralized automatic message accounting (CAMA) calls.

Specifically, the following factors influence the AWT:

- length of time an operator has been accumulating feedback data
- percent occupancy

  Note 1: In a short period of time, the operator can receive a disproportionate number of short or long work time calls.

  Note 2: Percent occupancy (%OCC) of each operator rises as the team size increases.

Since the distribution of service times varies significantly from installation to installation, this chapter does not specify, for all TOPS MP, the number of hours of IPS (or PS) that are sufficient to provide statistically reliable WT for the individual operator. This variance has a critical impact on the statistical reliability of AWT.

The system AWT shown on the operator feedback output report (if Table OFCVAR parameter TOPS_DISPLAY_AWT is set to Y) is subject to less variation in reliability, since all calls handled in the TOPS MP are included in the calculation of AWT. The hours worked by an operator may not coincide with those used as the base for the calculation of the system AWT (from the system start-of-day each day to the time a request is made for a printout of the data). The extent to which call mix varies throughout the day, and the variation of individual call type holding times according to the time of day, influence the validity of comparisons between an individual operator's AWT and the corresponding system AWT.

Trending operator feedback data

By trending feedback data, operators and managers can compare the operator's current performance with the following:

- operator's own previous performance
- objectives resulting from joint target-setting sessions with the manager
- average performance of the group

Comparisons between individual operator and system AWT should be made with the following considerations:

- statistical considerations discussed in the previous section, "Statistical reliability of average work time"
- change in the mix of calls throughout the day (can have significant impact on AWT comparisons and should be made for similar time periods)

The system and traffic office AWT for a time period similar to that worked by an operator can be derived from several sources:

- FM6-HR periodic reports
- operator feedback message, including the optionally available system AWT in the feedback message
- manual calculation

  Note: The operator feedback message value is calculated using data continuously calculated from the start-of-day, and it may not always provide as accurate a comparison as the other sources listed here.

If manual calculation is used to derive the office (or system) AWT for the same period as that worked by an operator, add the work volume hundred call seconds (WV-CCS) and the IPS (or PS) for the appropriate half-hours, and divide the sum of work volume (multiplied by 100) by the sum of IPS (or PS). The operator productivity ratio (OPR) emphasizes self-competition and provides a reliable standard by which improvements can be recognized. It is calculated using the following formula:

$$\frac{\text{Operator (or system) AWT}}{\text{Individual operator AWT}} = \text{OPR}$$

Example:

43 / 38 = 1.13

The following figures show an example of a form that could be used for recording operator feedback data. Either operator AWT or OPR can be trended on the scaled reverse side of the form. This can be done on a monthly or weekly basis, as appropriate.

A monthly or weekly weighted AWT is derived from several total-day operator feedback accumulations, as shown in the following example:

Example:

IPS		AWT		WV seconds
480	/	36	=	17,280
446	/	35	=	15,610
509	/	34	=	17,306
467	/	35	=	16,345
492	/	34	=	16,728
2,394				83,269

Weighted AWT: 83,269 / 2,394 = 34.8

A monthly or weekly weighted OPR is calculated from several total-day ratios, as shown in the following example:

Example:

IPS		AWT		WV seconds
480	/	1.06	=	508.80
446	/	1.06	=	472.76
509	/	1.09	=	554.81
467	/	1.06	=	495.02
492	/	1.08	=	531.36
2,394				2,562.75

Weighted OPR: 2,562.75 / 2,394 = 1.07

Note: When enhanced MFADS is implemented with PS-based measurements, the IPS column contains PS measurements instead of IPS as illustrated.

Basic operator feedback form (front)

TOPS Individual Operator Feedback

Operator______________________ Office__________________________

Group Mgr__________________ Year______________________

Date	Time	Number of IPS	Operator AWT	Office AWT (FADS)	O.P.R Office AWT Operator AWT

Basic operator feedback form (back)

OPR.														AWT
1.44														
1.40														
1.36														
1.32														
1.28														
1.24														
1.20														
1.16														
1.12														
1.08														
1.04														
1.00														
.96														
.92														
.88														
.84														
.80														
.76														
.72														
.68														
.64														
.60														
.56														
.52														

Operator study data

The operator study data system is capable of collecting detailed productivity and efficiency data from up to 900 operators. The operational elements of the operator study data system are similar to those of the operator feedback system.

Note: With QMS, study data can be collected from up to 450 operators.

The elements are as follows:

- The DMS switch defines the operator number through datafill in Table OPRDAT.
- The software registers used to accumulate data are associated with the position at which the operator is working (Table TOPSPOS).
- Data cease to be accumulated when the operator leaves the position.
- Study data registers are automatically initialized (reset to zero) daily at the start-of-day.
- The contents of the study data registers are not written to magnetic tape.

There are two essential differences between the feedback and the study data system:

- The feedback system incorporates registers for the maximum coincident number of operators on the payroll during the engineered life of the installation; the study data system incorporates registers for up to 900 operators at any given time.

  Note: With QMS, study data can be collected from up to 450 operators.

- The feedback system provides accumulated measurements of operator IPS (or PS) and AWT; the study data system provides the same data broken into a maximum of 15 call type groups. These call type groups (assigned in Tables CLASSNAM and CLASSDEF) are the same as those assigned to DMS memory for controlled traffic purposes. The following table shows a typical assignment of call type groups.

  Note: In setting up controlled traffic for QMS, Tables TQCLSNAM and TQCLSDEF are the equivalents of Tables CLASSNAM and CLASSDEF. For more information on setting up controlled traffic, refer to the "Controlled traffic" section later in this chapter.

Typical assignment of call type groups

Group no.	Call type
1	Recalls (NFY, OVT, RCL)
2	CAMA/RCAMA (ONI and ANI FAIL)
3	01+, 011+ DDO (overseas coin, noncoin, hotel)
4	0– Noncoin
5	0– Coin
6	0+ Noncoin
7	0+, 1+ Coin
8	0+, 1+, 0– Hotel
9	Combined/undefined
10	Delay
11	411 (local directory assistance)
12	555-For (foreign NPA)
13	DA-Rcl (recall)
14	Int-ONI (intercept operator number identification)
15	Int-Rcl (intercept recall)

If an operator has been assigned to the operator study data system, pressing the **{Print Stats}** softkey at the operator position (while the position is in make-busy mode) generates a printout of study data register contents at the SADS or TADS TTY. These study register data are printed instead of the feedback message.

This feature can be modified through a data modification order (DMO) routine so that the operator can generate only individual operator feedback data, even if assigned to the operator study data system. The Table OFCVAR parameter TOPS_DUMP_STUDY_REG must be set to Y before an operator assigned to study registers can request and receive a printout of study data sorted by call type.

If the parameter is set to N, when operators press **{Print Stats}** they receive a printed copy of basic feedback data only.

If Table OFCVAR parameter TOPS_DUMP_STUDY_REG is set to N and Table OFCVAR parameter TOPS_ZERO_FB_REG is set to Y, the **{Print Stats}** softkey zeros the basic feedback registers. The parameter values have no effect on zeroing study registers. If both parameters are set to Y, neither the basic feedback registers nor the study data registers are zeroed.

When the enhanced MFADS feature is implemented and the TOPS_PEG_MODE parameter in Table OFCENG is set to PS, the operator TOTAL statistics displayed in the operator study register reports are modified to reflect total position seizures (IPS + TPS + RPS) rather than IPS only.

When the TOPS_PEG_MODE parameter in Table OFCENG is set to IPS, the data presented in the current operator study register reports are based only on IPS.

TTY commands

The force supervisor assigns study registers to operators through commands entered at the TADS TTY. The following table lists the five TTY commands used to administer the operator study data system.

Operator study data system TTY commands

Command	Purpose
RA	Assigns an operator number to the operator study data system
RD	Prints an operator’s accumulated study data without zeroing out the registers
RQ	Lists the operator numbers assigned to the operator study data system in each traffic office. The report content differs, depending on whether the command was entered from a FADS, TADS, or SADS TTY.
RR	Releases the study registers assigned to an operator number
RT	Applies to multitraffic office configurations only and is issued from a FADS TTY. The RT command releases all of the study data registers assigned to a given traffic office.

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Operator study data system guidelines

This section provides guidelines for administering the operator study data system. The operator study data system collects detailed productivity and efficiency data (IPS [or PS] and AWT by call type) on up to 900 operators in a TOPS MP at any given time. It is intended as an enhancement to the operator feedback system that provides less detailed data on productivity and efficiency (total IPS [or PS] and AWT) for all operators in the system.

Note: With QMS, study data can be collected from up to 450 operators.

Data collection and manipulation

Each operating company, or TOPS MP installation, or both, select and label up to 15 call type groups. These groups are the same as those used in the controlled traffic feature and in the call type summaries of the 6HR and 24HR reports. Calls are scored for IPS (or PS) and AWT in the appropriate call type groups, in the TOTAL, or in both. These call types are datafilled in Table CLASSDEF and Table CLASSNAM.

In addition to toll and assist (TA) call types, six directory assistance (DA) call types and five intercept call types can be assigned:

- 411 (local)
- 555-For (foreign NPA)
- 555-Hom (home NPA)
- 555 (undifferentiated)
- 131 (inward)
- DA-Rcl (recall)
- Int-ANIF (intercept ANI failure)
- Int-Cut (intercept cut-through)
- Int-ONI (intercept ONI)
- Int-Rcl (intercept recall)
- Int-Spl (intercept special)

Each of the call types is defined by what the subscriber dials to reach the directory assistance operator.

The operator number (Table OPRDAT) is common to the operator logon procedure and the assignment of an operator to the study data system. The DMS switch accumulates the data by correlating the operator number with the registers assigned to the operator, regardless of the positions at which the operator has worked throughout the day.

Data start accumulating at the completion of each logon procedure for that operator and cease accumulating each time the operator leaves a position (unplugs the headset).

The DMS switch categorizes each IPS (or PS) into a call type group by noting the trunk group and the customer’s dialing pattern (such as 0+, 0-, or 1+). A peg count is registered and work volume data are accumulated in the appropriate call type group and in the total.

If the TOPS_PEG_MODE parameter in Table OFCENG is set to IPS, there are three exceptions to the procedure:

- Recalls of any type are scored for IPS and AWT in the RECALLS category (if datafilled in Table CLASSNAM) of the call type summary. Recalls are not pegged for the IPS of the call type register totals nor for the system IPS totals (system [SYST], non-CAMA, CAMA) in the FM periodic reports and summaries. RECALL WV is accumulated and used to calculate the AWT for the call type register totals and is included in the AWT calculation of the system AWT totals and the work volume hundred call seconds (WV-CCS) totals.
- Delay calls are scored for IPS and AWT in the DELAY category (if datafilled in Table CLASSNAM) of the call type summary. Delay calls are not pegged for the IPS of the call type register totals or for the system IPS totals (SYST, non-CAMA, CAMA) in the FM periodic reports and summaries. Delay call WV is accumulated and used to calculate the AWT for the call type register totals and is included in the AWT calculation of the system AWT totals and the WV-CCS totals.

  Note: Delay calls are scored differently in QMS. In the ACD system, IPS is not pegged for delay calls except in the 6- and 24-hour summary reports, although AWT is accounted for in the 15-minute reports. In QMS, delay calls are always pegged for IPS +TPS + RPS, so work volume coincides more accurately with AWT. For information on how IPS is scored in the ACD system and in QMS, refer to the previous chapter, "Force management measurement definitions."

- Calls that do not fall into any of the categories selected are scored for IPS and AWT only in the system total and in the call type register totals.

Because of the routines previously described, manual addition of the individual call group IPS and work volume does not always result in the same total as that calculated and printed by the DMS switch.

If parameter TOPS_PEG_MODE is set to PS, one similar exception can be handled. Position seizures (IPS, TPS, and RPS) are not pegged for delay calls; however, the call-busy work volume (CBWV) associated with the delay call is pegged against the position's current queue type. In addition, a service initiation and service work volume are pegged for the current service type and the loop accessed by the delay call.

The DMS switch automatically initializes all study data registers once each day, at the start-of-day. The start-of-day is set in Table OFCVAR parameter TOPS_START_OF_DAY. The system does not automatically initialize the assignments of operator numbers. Issuing the TTY command **RR** releases the study register assigned to an operator number and makes it available for reassignment.

Statistical reliability of average work time

The statistical reliability of an operator’s overall AWT and AWT by call type is influenced by the following factors:

- Length of time an operator is assigned to the study data system. In a short period of time, the operator may receive a disproportionate number of short or long work time calls.
- Team size. The percent occupancy of each operator rises as the team size increases.
- Call mix. Even if the total sample is sufficient to ensure statistical reliability for the overall AWT, certain call types may be inadequately sampled because they represent a small percentage of the total system traffic.
- Variance in AWT by call type. Some call types are generally constant in holding time, while others have a tendency to vary.

Generally, the larger the sample, the more reliable the data. As a rule, operators should not be assigned to the study data system for less than a full day of work. It is also recommended that operators be assigned, if possible, when the team size requires a minimum of ready-to-serve time.

The system AWT shown on the operator study data output report is subject to less variation in reliability, since all calls handled in the TOPS MP are included in the calculation of AWT. The hours worked by an operator may not coincide with those used as the base for the calculation of the system AWT (from the start-of-day each day to the time a request is made for a printout of the data).

Two factors influence the validity of comparisons between an individual operator’s AWT by call type and the corresponding system AWT:

- the extent to which call mix varies throughout the day
- the variation of individual call type holding times according to the time of day

Trending operator study data

Recording operator study data over a period of time increases its sample size and statistical reliability. The process reveals patterns that can serve as the basis for supplemental training, such as using controlled traffic to let an operator concentrate on a particularly difficult call type.

A form like the "Summary of operator work data" in the following figure can be used to record study data over a period of time. The form should provide space to record operator IPS (or PS) by call type and AWT by call type for the operator, the system, and the traffic office. There should be a column for every call type group assigned in Tables CLASSNAM and CLASSDEF.

There should also be a space for recording the operator's scheduled tour along with any changes to the tour (for example, time off less than a day, or a change tour), since such changes can affect the call mix and the resulting AWT. A weighted AWT is derived from several samples by multiplying each sample of IPS (or PS) by its corresponding AWT, adding the result of each of these calculations, and dividing by the sum of IPS (or PS).

Sample form for summary of operator work data

Summary of operator work data

Month: System:

Operator: Office:

Day	Date	Scheduled tour	Changes		Total									
				OPR IPS										
				OPR AWT										
				SYST AWT										
				OFC AWT										
				OPR IPS										
				OPR AWT										
				SYST AWT										
				OFC AWT										
				OPR IPS										
				OPR AWT										
				SYST AWT										
				OFC AWT										
				OPR IPS										
				OPR AWT										
				SYST AWT										
				OFC AWT										
				OPR IPS										
				OPR AWT										
				SYST AWT										
				OFC AWT										

Call transfer

Four call transfer capabilities are available for non-CAMA calls:

- transfer calls from one operator to another who is designated as a transfer operator
- route specific call types directly to a transfer calls-waiting (CW) queue
- route calls incoming over a specified trunk group directly to a specified transfer CW queue
- accumulate different statistics for different services (for example, toll versus DA)

TOPS MP provides these call transfer capabilities to guarantee that calls requiring the services of a transfer operator are connected to positions and operators providing transfer services. For example, the transfer service might provide operators capable of speaking an alternate language.

Calls requiring transfer services are placed in the transfer queue either directly, based on the datafill, or by another operator's transferring the call using the **XFR** keys. When a transfer operator reaches the top of the idle position queue, the system routes calls placed in the CW queue on a first-in, first-out (FIFO) basis.

Positions that can receive both transfer (XFR) and nontransfer (non-XFR) calls receive these calls on a FIFO basis.

When the number of transfer calls placed in the CW queue exceeds the queue threshold value for that transfer type, the `CW1`, `CW2`, or `CW3` (for DA calls) indicator displays on the IC and service assistance position screens. The Sonalert tone sounds at the IC position when calls are being transferred or queued for unoccupied transfer positions.

Activating call transfer

The call transfer feature is activated automatically when one, two, or three transfer queues are assigned to the Table OFCENG parameter TOPS_TRANSFER_TYPES. After the transfer queues have been activated for the first time, they can be controlled from the SADS, TADS, or FADS TTY.

> ***Note:*** The DA queue can be assigned only if the DA package is present in the office.

TTY commands

Five TTY commands administer the call transfer feature. Two activate or deactivate the call transfer feature, two change the operator profile, and one queries the number of operators and their associated profiles. These commands are defined in the following table.

Call transfer TTY commands

Command	Purpose
XA	Activates call transfer
XD	Deactivates call transfer
X...I	Specifies which operators can receive transfer calls, and from which queues
X...X	Prevents an operator from receiving transfer calls, either in general or from specific queues
X	Prints a list of operators in an office and the queues from which they can receive calls

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Deactivating call transfer

There are two ways to deactivate call transfer:

- by entering the XD TTY command at the TADS TTY (deactivates entire call-transfer feature)
- by removing a transfer type from the datafill for Table OFCENG parameter TOPS_TRANSFER_TYPES (deactivates that particular transfer type)

A transfer type cannot be deleted from the TOPS_TRANSFER_TYPES parameter nor can it be deactivated by the XD TTY command if a reference to the transfer type exists in any of the following tables:

- Table TOPS
- Table XFROPSEL
- Table OGTMPKEY (does not affect XD command)
- Table VSNOPT
- Table LANGTOQ

In addition, the queue must not be referenced in parameter DEFAULT_AABS_TO_OPR_QUEUE in Table LANGTOQ.

If the transfer type has already been activated and then is deleted from Table OFCENG parameter TOPS_TRANSFER_TYPES, the transfer type is automatically deactivated.

Call transfer from one position to another

The ability to transfer calls from one operator to another was originally intended to solve language incompatibility between operator and customer. This feature enables a unilingual operator to transfer any call except a CAMA call to a bilingual operator, or to transfer certain calls to other operators in the same TOPS MP system. The datafilled information in Table OPRDAT is modifiable using commands described in the chapter "ACD TTY commands, queries, and reports" later in this document, or through a DMO request to change the datafill in Table OPRDAT.

When an operator logs on to a position, the operator profile is associated with the position type. The position type can be XFR1, XFR2, GEN, DA or any combination of these. The position assignments are modified only by using a DMO request to change the datafill in Table TOPSPOS. Calls are transferred to transfer positions by pressing the **OGT** key + the appropriate number for XFR1 or XFR2 on the outgoing trunks menu + **Start**.

A call is transferred only if the combined profile of the transferring operator does not contain the appropriate transfer type. That is, an operator cannot transfer a call to another transfer operator if the first operator’s combined profile contains the appropriate transfer type. For example, if operator 101 has a combined profile containing both GEN and XFR1, operator 101 must handle any general and transfer 1 calls that arrive at that position. Operator 101 must transfer any calls that require transfer 2 or DA assistance. Also, a call cannot be transferred to a queue that is not active.

Call transfer based on call type

The DMS switch can route specific call types (except CAMA) directly to transfer positions when the datafill in Table TOPS specifies that certain call types are to be routed to a transfer position type. During translations, a call is assigned a call-origination type, which is used to index Table TOPS to determine the type of service required. To force a special index into Table TOPS, the standard pretranslator tables must be datafilled and the pretranslator name specified in the TOPS trunk group. This feature can be used, for example, to route 411 calls directly to a specified transfer operator who has directory assistance facilities.

When a call is routed directly to a transfer position translated using Table TOPS, the OFCENG parameter TOPS_TRANSFER_TYPES must include XFR1 to route to a XFR1 position, to XFR2 to route to a XFR2 position, and DA to route to a directory assistance position. The transfer feature does not need to be activated through the TTY command.

> ***Note:*** The datafill in Table OFCENG parameter TOPS_TRANSFER_TYPES cannot be removed if a reference to a particular transfer type exists in Table TOPS.

Call transfer based on trunk group

Calls (excluding CAMA calls) can also be routed directly to transfer positions based on the trunk group over which the calls arrive. The trunk groups are assigned in Table XFROPSEL, and the feature is activated when Table OFCOPT parameter TOPS_SEL_XFR_OPR_TRK is set to Y. Calls that come in over a designated trunk group are routed directly to the transfer operator type designated in Table XFROPSEL only if the OFCENG parameter TOPS_TRANSFER_TYPES equals the type datafilled in Table XFROPSEL and the feature has been activated at the SADS or TADS TTY.

> ***Note 1:*** The Table XFROPSEL datafill does not override any call types datafilled in Table TOPS for calls routed directly to a transfer position. Only call types that would otherwise be routed to general operators (based on call type) are sent to a designated transfer position using the trunk group assigned in Table XFROPSEL.
>
> ***Note 2:*** CAMA calls cannot be routed directly to transfer operator positions.
>
> ***Note 3:*** The datafill in Table OFCENG parameter TOPS_TRANSFER_TYPES cannot be removed if a reference to a particular transfer type exists in Table XFROPSEL.

Setting up the operator profile

The operator profile contains two sets of information:

- the queue or queues (non-XFR, XFR1, XFR2, DA) from which an operator can receive calls
- the types of services (such as toll and assist and directory assistance) an operator position can provide to a subscriber

This profile is assigned initially through datafill in Table OPRDAT. The operator profile can be changed at the TADS or SADS TTY by using the X...I or X...X commands. The following paragraphs explain how to set up and change the operator profile.

> ***Note:*** The terms transfer 3, XFR3, and DA are interchanged throughout this chapter. Most of the customer data tables refer to this queue as XFR3; however, TTY periodic reports list statistics for the XFR3 queue as DA statistics. The XFR3 queue is generally used for DA call management in offices that are not DA-only offices.

After call transfer is activated, the following data tables must be datafilled to associate transfer operators with the transfer types available in that TOPS MP:

1 The type of position an operator logs on to (GEN, XFR1, XFR2, DA, or any combination) is assigned in Table TOPSPOS. It is recommended that all positions include GEN in the XFRSET field.

2 The type of service an operator at a specific position can provide to subscribers (TASERV, DASERV, INTCSERV, ALL, or NONE) is assigned in Table TOPSPOS.

3 Valid operator queues (GEN, XFR1, XFR2, DA, all, or any combination) are assigned in Table OPRDAT.

4 The type of service an operator can provide for subscribers (TASERV, DASERV, INTCSERV, ALL, or NONE) is assigned in Table OPRDAT.

Up to three call transfer queues can be used, depending on the datafill in Table OFCENG parameter, TOPS_TRANSFER_TYPES.

Combined transfer profile

The combined transfer profile determines the transfer queues from which a specific operator, logged on to a specific position, can receive calls.

The combined transfer profile is based on the following conditions:

- In Table OPRDAT, all operator logon numbers are assigned and associated with the transfer types (GEN, XFR1, XFR2, DA, or any combination) that the operator can handle.
- In Table TOPSPOS, all operator positions are associated with the call queues (GEN, XFR1, XFR2, DA, or any combination) from which the position can receive calls.

The combined transfer profile contains only the transfer types that are in both the operator and the position profiles. For example, if the position is datafilled for all three call queues, but the operator logged on to the position is datafilled only for XFR1, then the combined transfer profile contains only XFR1, and only transfer 1 calls are distributed to that position while that operator is logged on.

After initially datafilling Table OPRDAT, the IC manager can change the operator profile at the appropriate TTY using commands listed in the "Call transfer TTY commands" table in this chapter. The position profile in Table TOPSPOS can be changed only through a DMO routine.

Operators can be assigned several logon numbers, each associated with different queues from which calls can be accepted. For example, operator one has two logon numbers, 100 and 200, datafilled in Table OPRDAT.

Number 100 is assigned to receive calls from the general queue. Number 200 is assigned to receive calls from the transfer 1 queue. When the operator logs on to a position (position type is GEN and XFR1, datafilled in Table TOPSPOS) with logon number 100 (GEN in Table OPRDAT), only calls from the general queue are forwarded to that position. When the operator logs on to the same position (position type is GEN and XFR1) with logon number 200 (XFR1 in Table OPRDAT), only calls from the transfer 1 queue are routed to the operator.

Assigning several logon numbers to one operator eliminates the need to constantly change the OPRDAT datafill using the input commands described in the following paragraphs.

Combined service profile

The combined service profile determines the service (TA and DA) that a specific operator, logged on to a specific position, can provide for subscribers. The combined service profile is based on the following conditions:

- In Table OPRDAT, all operator logon numbers are assigned and associated with the service type (TASERV, DASERV, INTCSERV, ALL, or NONE) that the operator can handle.
- In Table TOPSPOS, all operator positions are associated with the service (TASERV, DASERV, INTCSERV, ALL, or NONE) an operator can provide while logged on to that position.

The combined service profile contains only the service types that are in both the operator and the position profiles.

The following table shows how TTY entries and Table OPRDAT datafill identify transfer queues.

Identifying TOPS MP transfer queues

TTY entries	OPRDAT datafill	Queue
0	GEN	General queue (includes CAMA)
1	XFR1	Transfer 1 queue
2	XFR2	Transfer 2 queue
3	DA	Transfer DA queue

The digits indicating queues from which an operator is eligible to receive calls are referred to as the "operator profile." The operator profile can be altered from the TTY, using the X...I command. After the command is entered, the operator position screen displays the queues from which the operator can now receive calls on the assigned activities (position busy) screen.

Abbreviated forms of the X...I command (the transfer-only include command and the service-only include command) allow the IC manager to change the transfer profile or service profile from the TTY as necessary.

These commands can be entered only if Table OFCENG parameter TOPS_TRANSFER_TYPES equals XFR1, XFR2, DA, or any combination of these.

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Call transfer statistics

TOPS MP generates additional FM statistics in order to provide for force management (provisioning and administration) of the call transfer feature. These statistics are generated only when Table OFCENG parameter TOPS_TRANSFER_TYPES is set to XFR1, XFR2, DA or any combination of these, and the transfer type has been activated. These transfer statistics are in addition to the normal FM statistics. They appear on all of the FM periodic reports when call transfer is active in the office.

The statistics for XFR1, XFR2, and DA are all derived in the same manner. When call transfer is active in the office, FM statistics are reported based on queue type as follows: non-XFR, XFR1, XFR2, and DA.

Following is a list of the data provided for transfer 1 type operators. Data are provided in the same manner for transfer 2 and DA operators.

- title
- clock hours covered in the report
- actual number of scans in the time period covered
- MULT. Multiple activations of the feature during the period covered in the report (if appropriate)
- % XFR. Percentage of calls transferred. The DMS calculates this percent by dividing the total number of transferred calls by the number of calls handled by nontransfer operators.

- IPS (or PS). Number of calls marked as XFR1 at the time an IPS (or PS) (specifically TPS) was pegged. Each call is pegged only once. Because the IPS (or PS) for each call is pegged just before it is released from a position, it is pegged according to the call type assigned to it when it is released. For example, if a call arrives at an operator position as a GEN call and the operator presses the **XFR1** key to transfer the call to a transfer 1 position, the seizure is pegged as a transfer 1 (XFR1) call. If the GEN operator does not transfer the call to another position before releasing it, the IPS (or PS) is pegged as a GEN call. If the incoming call is routed directly to a transfer 1 operator who releases the call without transferring it, the IPS (or PS, specifically TPS) is pegged as a XFR1 call.
- WV-CCS. Sum of CBWV and NCWV accumulated by those operators that can receive calls from the transfer 1 queue, calculated as follows:
  - CBWV is tallied when calls marked as XFR1 have their work volume pegged. For operators serving more than one transfer type, CBWV is pegged against whatever the queue mark of the call is at the time it is pegged.
  - For operators receiving only XFR1 calls (for whom XFR1 is the only transfer type in their combined transfer profiles), the entire NCWV is added to the WV-CCS. For operators with more than one transfer type in their combined transfer profile, both NCWV and IDLT are pegged proportionally against each queue served based on the system-wide call mix for the previous 15-minute period.
- For example, assume that on a system-wide basis for the previous 15-minute period, 9000 seconds of CBWV were accumulated against the non-XFR queue, 1000 seconds were accumulated against the XFR1 queue, and 2000 seconds were accumulated against the XFR2 queue. The system-wide work volume total is 12 000 seconds.
- On average, operators with only non-XFR and XFR1 in their combined profile spent 90% of their time handling non-XFR calls and 10% of their time handling XFR1 calls, which is determined by dividing the WV accumulated against each queue type served by the total WV accumulated for operators with a given queue profile combination, as shown in the following example.

$$\frac{9000}{9000 + 1000} \text{ X } 100 = 90\% \text{ NON-XFR WV}$$

$$\frac{1000}{9000 + 1000} \text{ X } 100 = 10\% \text{ XFR1 WV}$$

- ANS. Answer delay encountered by subscribers waiting in the transfer 1 queue for operator answer. CW-XCS is gathered through a ten-second scan of calls waiting for an operator to answer in the transfer 1 queue. IPS (or PS, specifically TPS) is the number of calls marked as XFR1 at the time the calls were pegged. The formula is CW divided by IPS (or PS).

  Note: Calls that are transferred and subsequently abandoned before answer from a transfer operator are excluded from the base.

- CW-CCS. Value derived from a ten-second scan of calls waiting for operator answer in the transfer 1 queue.
- AWT. Average work time of transfer 1 type operators is calculated by the DMS using WV-CCS and IPS (or PS).
- AOP. Occupied position time accumulated by operators (CBWV + NCWV + IDLT) handling calls from XFR1 (or XFR2 or DA) queue divided by the number of seconds in the period.

  Note: AOP is converted to board hours in the 6-hour and 24-hour reports.

- %OCC. Percent occupancy of XFR1 type operators. Percent occupancy indicates the percentage of time logged-on operators are not available to handle new calls, either because they are handling a call or because they are in make-busy mode.
- XFR OUT. Number of calls transferred to XFR1 operators.

In addition to the transfer statistics, the following FM statistics relating to nontransfer operators are provided:

- IPS (or PS). Number of calls marked as non-XFR at the time an IPS (or PS, specifically TPS) was pegged.
- WV-CCS. Sum of CBWV and NCWV accumulated by operators who can receive calls from the nontransfer queue, calculated as follows:
  - — CBWV is tallied when calls marked as non-XFR have their work volume pegged. For operators serving more than one transfer type, CBWV is pegged against whatever the queue mark of the call is at the time it is pegged.
  - — For operators receiving only nontransfer calls (for whom non-XFR is the only transfer type in their combined transfer profiles), the entire NCWV is added to the WV-CCS. For operators with more than one transfer type in their combined transfer profile, both NCWV and IDLT are pegged proportionally against each queue served based on the system-wide call mix for the previous 15-minute period.

- ANS. Answer delay encountered by subscribers waiting in the nontransfer queue for operator answer. CW-XCS is gathered through a ten-second scan of calls waiting for an operator to answer in the nontransfer queue. IPS (or PS) is the number of calls marked as non-XFR at the time the IPS (or PS) were pegged. The formula is CW divided by IPS (or PS).
- CW-CCS. Value derived from a ten-second scan of calls-waiting for operator answer in the nontransfer queue.
- AWT. Average work time of operators who can receive calls from the general queue. AWT is calculated by the DMS using WV-CCS and IPS (or PS).
- AOP. Occupied position time accumulated by operators (CBWV + NCWV + IDLT) handling calls from non-XFR queue divided by the number of seconds in the period.

  Note: AOP is converted to board hours in the six-hour and 24-hour reports.

- %OCC. Percent occupancy of nontransfer operators. Percent occupancy indicates the percentage of time logged-on operators are not available to handle new calls, either because they are handling a call or because they are in make-busy mode.

For examples of the FM periodic reports with call transfer statistics, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Controlled traffic

The controlled traffic feature allows specified operators to avoid handling certain types of calls. This feature is used during training to protect student operators from call types for which they are untrained. It may also be used with experienced operators for whom concentrated practice on certain call types is indicated. This feature is not for the purpose of controlling answer on one or more types of calls.

For controlled traffic purposes, a maximum of 15 call type groups can be assigned and defined in Table CLASSNAM. These call types must be consistent with the call types assigned for the system in Table TOPS. The call types assigned in Table CLASSNAM are also the same call types that are printed in the 6- and 24-hour periodic reports and the operator study data reports. For a typical assignment of call type groups, refer to the "Basic operator feedback form" earlier in this chapter.

> ***Note:*** Any particular TOPS MP installation might not handle all of the call type groups shown in the sample assignment.

In addition, six directory assistance (DA) call types and five intercept call types can be assigned:

- 411 (local)
- 555-For (foreign NPA)
- 555-Hom (home NPA)
- 555 (undifferentiated)
- 131 (inward)
- DA-Rcl (recall)
- Int-ANIF (intercept ANI failure)
- Int-Cut (intercept cut-through)
- Int-ONI (intercept ONI)
- Int-Rcl (intercept recall)
- Int-Spl (intercept special)

Each call type is defined by what the subscriber dials to reach the directory assistance operator.

A copy of the assigned call type groups should be kept near the TTY used to enter controlled traffic commands.

When an operator in controlled traffic mode becomes available to accept a new call, the DMS searches through a specified number of calls in the calls-waiting queue (beginning with the call at the top of the queue) to find a call that is acceptable to the operator. If there is no match, the position occupied by that operator enters the idle position queue. The operating company specifies in Table OFCVAR how many calls are to be included in this search (recommended not to exceed ten). This value can be altered through a data modification order routine in Table OFCVAR parameter TOPS_CALLS_WAITING_SEARCH_DEPTH.

When a call enters the system, it routes to the most idle position, provided that the position is not associated with an operator number in a controlled traffic mode set to reject that call type. If the most idle position cannot accept the call, the system searches through the rest of the idle position queue to find an acceptable position to which to distribute the call.

Having operators in controlled traffic mode can adversely affect the efficiency of call distribution. The effect is minor when only one or two operators are relatively unrestricted and they represent a small proportion of the operating force. The effect becomes more serious as the proportion of operators in the controlled traffic mode increases, especially if they can receive only a few call types.

The proportion of logged-on operators in the controlled traffic mode to total logged-on operators should never exceed 25 percent. When the proportion of operators in the controlled traffic mode reaches 25 percent or higher, the warning 25% CT displays on the screens of the IC position and the force management cathode-ray tube (FMCRT) position.

TTY commands

The following table lists the three TTY commands used to administer the controlled traffic feature.

Controlled traffic TTY commands

Command	Purpose
T...I	Directs the DMS to route only certain call types to a specified operator. This format includes specified call types in the operator's controlled traffic set. When entered with a call type of zero, this command returns the operator to normal call distribution.
T...X	Directs the DMS to route only certain call types to a specified operator. This format excludes specified call types from the operator's controlled traffic set.
T	Lists all the operators in controlled traffic mode and the numbers of the call classes in those operators' controlled traffic sets.

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Broadcast messages

The broadcast message allows supervisors to quickly and efficiently transmit important information to operators. The broadcast message typically concerns network conditions and provides operators with network information for the following purposes:

- to protect the network against overloads and ineffective attempts
- to make most effective use of operator time during periods of network congestion

Broadcast messages are issued at the TTY. They can be up to 60 characters or spaces long.

TTY commands

The following table lists the three broadcast TTY commands.

Broadcast message commands

Command	Purpose
B	Allows the manager to enter the message to be sent and print it to verify that it was entered correctly
BX	Transmits the broadcast message to all operator and administrative position screens
BE	Erases the broadcast message from all operator and administrative position screens

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Information on operators

The operator information commands provide supervisors with a listing of all operators currently logged on, and a listing of the status of all TOPS MP positions in the system.

TTY commands

The following table defines the two commands used to solicit information about operators from the DMS.

Operator information commands

Command	Purpose
L	Prints a listing of all operators (including service assistants) currently logged on
P	Prints a listing of the status of all TOPS MP positions

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Password administration

The password administration feature requires operators and administrators to enter a password when logging on or when issuing commands at the TTY. The password administration feature is activated by setting Table OFCENG parameter TOPS_PASSWORD_ENABLE to Y.

TTY commands

The following table lists the five TTY commands used to administer the password feature. These commands are available only when the password feature is active in the office.

Password feature TTY commands

Command	Purpose
WP	Changes the password of the device.
WI	Resets an operator password.
WR	Resets a device password (multitraffic office only).
WD	Disables operator logon.
WA	Enables operator logon.

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

HOBIC control group

This group of TTY commands is usually entered from the hotel billing information center (HOBIC) TTY but can be assigned to the SADS TTY if a HOBIC input device is not provided.

In a HOBIC, the TTYs are configured to receive information only. The HOBIC TTYs include autoquote (AQ) and voicequote (VQ) TTYs, the record (REC) TTY, and the hotel administration data system (HADS) TTY. The HADS TTY is always in the HOBIC. The AQ, VQ, and REC TTY can be in the HOBIC or in the TOPS MP operator area. The VQ and REC TTYs are also known as time and charges (T&C) TTYs.

TOPS MP provides two kinds of quoting services for hotels: autoquote (AQ) and voicequote (VQ). The AQ is a receive-only TTY that automatically prints call details and T&C information at the hotel. The VQ TTY is a receive-only TTY in the HOBIC that assumes the function of the AQ TTY if there is no AQ TTY at the hotel.

The REC TTY is also a receive-only TTY whose primary purpose is printing a duplicate copy of the information sent to the AQ or VQ device.

Unlike the AQ, VQ, and REC TTYs, the HADS TTY is a keyboard-send-receive TTY. This TTY receives printouts of alarm messages from remote printers and provides status information on the remote printers.

It is sometimes necessary to temporarily shut down a particular AQ or T&C TTY located on individual hotel premises.

TTY commands

The following table lists the three TTY commands used to administer the HOBIC equipment.

HOBIC TTY commands

Command	Purpose
HO	Takes the HOBIC TTY out of service.
HI	Returns the HOBIC TTY to service.
H	Lists the HOBIC equipment currently out of service.

For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Administrative operator positions

This chapter describes the three types of TOPS MP administrative operator positions:

- the force management cathode-ray tube (FMCRT)
- the in-charge (IC) position
- the service assistance (SA) position

It defines the displays that appear on each position screen and the call-processing keys used on the SA and IC position keyboards. It also explains the procedures that service assistants and IC managers follow to log on and off, to answer assistance requests, to page and monitor operators, and to initiate outgoing calls.

The last section of this chapter describes the effect of the Queue Management System (QMS) on TOPS MP administrative screens.

For further details about the administrative operator screens and keys, refer to *TOPS MP Operator Guide*, 297-2281-300.

Common displays

The displays defined in this section appear on more than one of the administrative screens discussed in this chapter. Wherever they appear, their meaning is the same. Displays that appear on only one type of screen are defined later in the chapter, under the discussion of that screen.

Force management displays

The displays listed in the following table are updated every ten seconds with the number of positions in those states throughout the system. These displays appear on the FMCRT and on the IC position screen. They do not appear on the SA position screen.

Position status displays

Display	Definition
OC	Number of occupied positions for the whole system (in all traffic offices)
MB	Number of occupied positions that are in operator make-busy mode for any of the following reasons: • The headset is seated, but logon is not complete. • The operator has selected `Make Busy` from the functions menu, but is still occupied with a customer call • The operator has selected `Withhold Calls` from the functions menu, and is initiating a call (for example, for assistance, or a subsequent attempt) or performing some other miscellaneous activity.
OD	Number of positions that are out of service, either because a command has been entered from the MAP (maintenance and administration) terminal, the teletypewriter (TTY), or the TOPS position controller administration and maintenance interface (TAMI) terminal, or because the DMS has automatically removed the position from service
CT	Number of positions occupied by operators who have been placed in controlled traffic mode
UCP	Number of unoccupied positions with a call in progress
UCD	Number of unoccupied positions with a call that has terminated
ACS	Number of positions that have a loop accessed but neither a calling nor a called party attached and off-hook
OC1	Number of occupied operator positions system-wide with transfer 1 in the combined transfer set (OC1 displays only when the transfer 1 queue of the call transfer feature is activated.)
MB1	Number of made-busy operator positions system-wide with transfer 1 in the combined transfer set (MB1 displays only when the transfer 1 queue of the call transfer feature is activated.)
OC2	Number of occupied operator positions system-wide with transfer 2 in the combined transfer set (OC2 displays only when the transfer 2 queue of the call transfer feature is activated.)
MB2	Number of made-busy operator positions system-wide with transfer 2 in the combined transfer set (MB2 displays only when the transfer 2 queue of the call transfer feature is activated.)

—continued—

Position status displays (continued)

Display	Definition
OC3	Number of occupied operator positions system-wide with directory assistance (DA) in the combined transfer set (OC3 displays only if the DA transfer type is active.)
MB3	Number of made-busy operator positions system-wide with DA in the combined transfer set (MB3 displays only if the DA transfer type is active.)
—end—	

The OC3 and MB3 indicators display only if there is at least one traffic office in the multitraffic office configuration that provides DA service using TOPS MP positions. This applies to all statistics about the third queue (referred to as XFR3, DA, or transfer 3).

Calls-waiting displays

The indicators listed in the following table display whenever calls are waiting in a queue for an available operator. These indicators display on the FMCRT and the IC and SA position screens.

Calls-waiting displays

Display	Definition
CW	Displays when the ratio of calls in the nontransfer queue to occupied positions able to handle nontransfer calls reaches a predefined threshold. When the queue length subsides below a lower defined threshold, the CW indicator is erased.
CW1	Displays when the ratio of calls in the transfer 1 queue to positions occupied by transfer 1 operators reaches a predefined threshold. When the queue length subsides below a lower defined threshold, the CW1 indicator is erased.
—continued—	

Calls-waiting displays (continued)

Display	Definition
CW2	Displays when the ratio of calls in the transfer 2 queue to positions occupied by transfer 2 operators reaches a predefined threshold. When the queue length subsides below a lower defined threshold, the CW2 indicator is erased.
CW3	Displays when the ratio of calls in the DA queue to positions occupied by DA operators reaches a predefined threshold. When the queue length subsides below the defined threshold, the CW3 indicator is erased (CW3 displays only if the DA transfer type is active).

—end—

The CW3 indicator displays only if there is at least one traffic office in the multitraffic office configuration that provides DA service using TOPS MP positions. This applies to all statistics about the third queue (referred to as XFR3, DA, or transfer 3).

Calls-deflected displays

The indicators listed in the following table display whenever calls are being deflected for treatment. These indicators display on the FMCRT and on the IC and SA position screens.

Calls-deflected displays

Display	Definition
CD	Displays when the number of queued nontransfer calls reaches a predefined threshold, and new calls are deflecting. Accompanied by the Sonalert alarm.
CD1	Displays when the number of queued transfer 1 calls reaches a predefined threshold, and new calls are deflecting. Accompanied by the Sonalert alarm.

—continued—

Calls-deflected displays (continued)

Display	Definition
CD2	Displays when the number of queued transfer 2 calls reaches a predefined threshold, and new calls are deflecting. Accompanied by the Sonalert alarm.
CD3	Displays when the number of queued DA calls reaches a predefined threshold, and new calls are deflecting. Accompanied by the Sonalert alarm. (The CD3 indicator displays only if the DA transfer type is active.)

—end—

The CD3 indicator displays only if there is at least one traffic office in the multitraffic office configuration that provides DA service using TOPS MP positions. This applies to all statistics about the third queue (referred to as XFR3, DA, or transfer 3).

Miscellaneous displays

The indicators listed in the following table display miscellaneous information about the system. These indicators display on the FMCRT and the IC position screen, except for the messages NO ASST POS and POS BUSY, which display only on the SA and IC position screens.

Miscellaneous displays

Display	Definition
25% CT	Displays when the number of positions occupied by operators in the controlled traffic mode reaches 25 percent of all occupied positions. Accompanied by the Sonalert alarm.
All T&C POS OD	Displays when all T&C TTYs have been removed from service. A T&C TTY is either a voicequote (VQ) or a record (REC) TTY. Accompanied by the Sonalert alarm.
CAMA SUSPENDED	Displays when machine accounting has been suspended. Accompanied by the Sonalert alarm.
NO ASST POS	Displays on the IC or SA position when no SA positions are logged on and the IC position is not in GEN mode. Accompanied by the Sonalert alarm.

—continued—

Miscellaneous displays (continued)

Display	Definition
POS BUSY	Displays on the IC or SA position when the position is placed in POS BUSY mode. It is erased automatically when the {Accept Calls} softkey is pressed. Accompanied by the Sonalert alarm.
NO ST REG	Displays when all operator study data registers are in use. (The system maximum is 900.)
MON	Displays on the IC or SA position screen when an operator position is being monitored. Accompanied by the Sonalert alarm.
Broadcast message	Displays on the top line of the screen when a broadcast message is transmitted from the TADS or FADS TTY. Accompanied by the Sonalert alarm.
—end—	

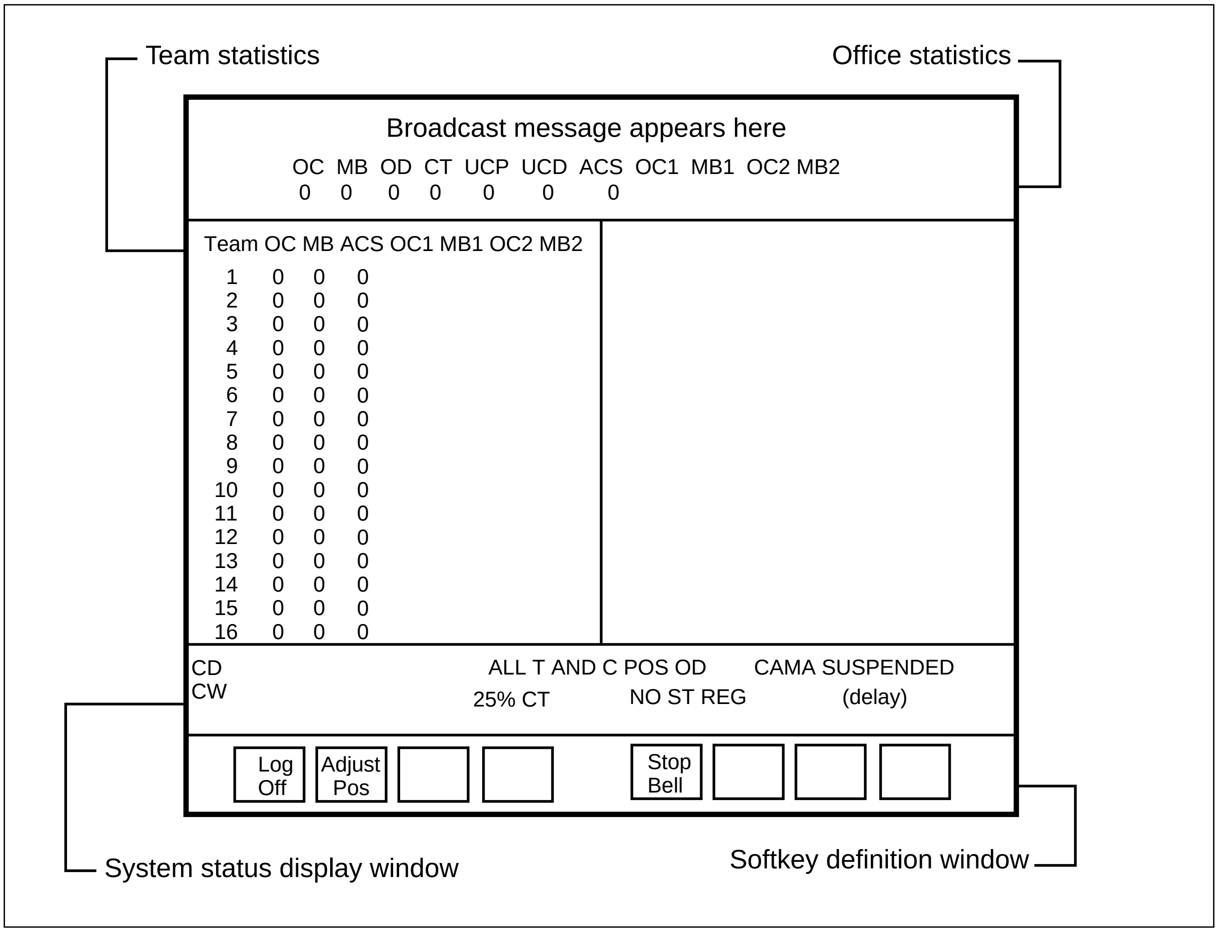
TOPS MP force management crt

In a multitraffic office, the force supervisor is provided with a specially configured TOPS MP position called the FMCRT. No keyboard is used with the FMCRT; its purpose is strictly to monitor the status of the office and the quality of the service being provided.

The FMCRT screen is divided into five general areas. The following legend refers to the following figure:

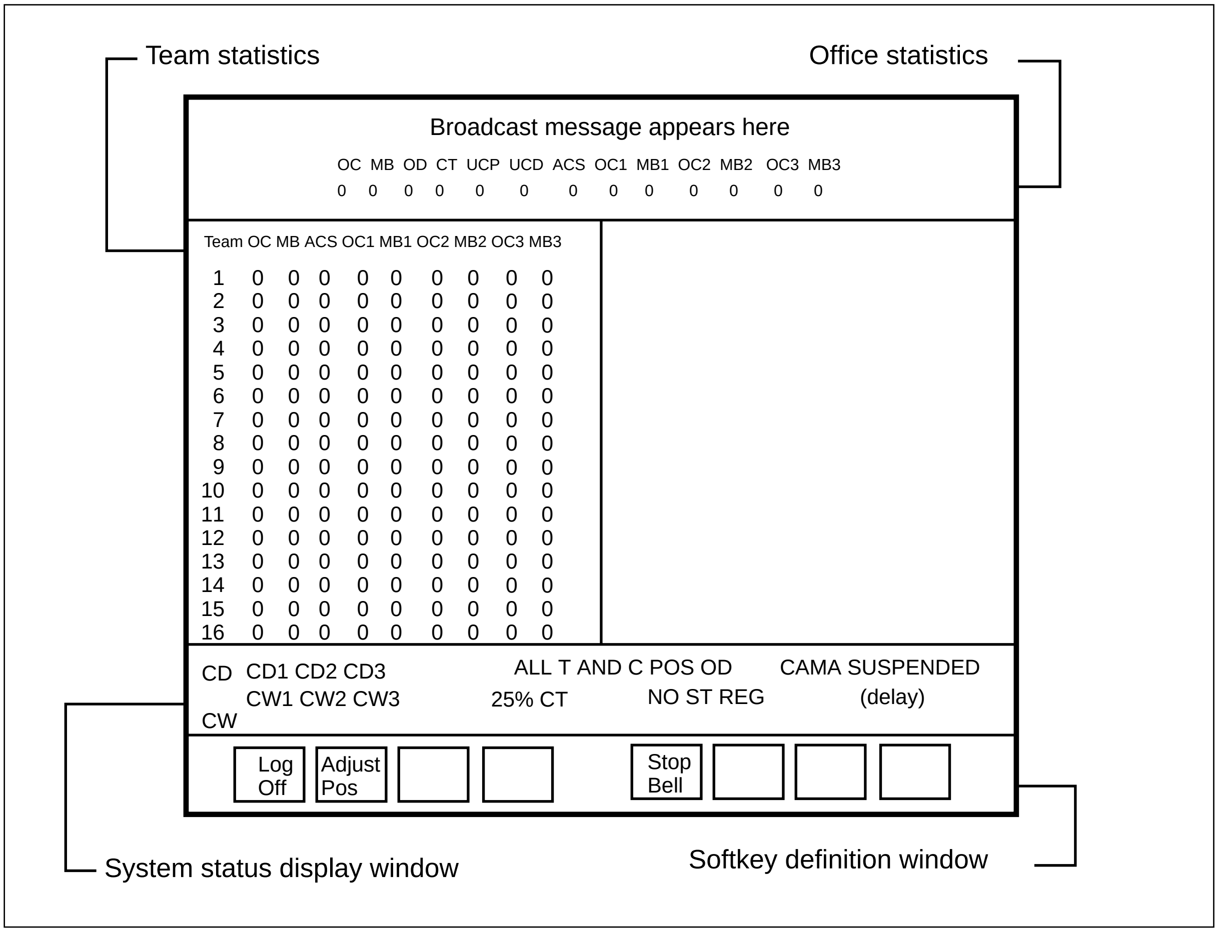
- The top area of the screen, known as the message/status area, displays any broadcast messages transmitted from the force administration data system (FADS) or traffic administration data system (TADS) TTY.
- The lower part of the message/status area displays the status of the operator positions for the entire system.
- The area beneath the system display provides the status of the operator positions in each traffic office.
- The area beneath the traffic office display area provides warning messages regarding various components in the system.
- Finally, the area at the bottom of the screen provides the softkey definitions. (This area displays softkey definitions regardless of position type.)

Force management screen, without call transfer active



The following figure shows the force management screen with call transfer active.

Force management screen, with call transfer active



The displays on the FMCRT screens are classified in the following paragraphs.

Position status displays for the system

The following displays are updated in ten-second scans with the number of positions in those states throughout the system: `OC`, `MB`, `OD`, `CT`, `UCP`, `UCD`, `ACS`, `OC1`, `MB1`, `OC2`, `MB2`, `OC3`, `MB3`.

During call processing, it can happen that all attached parties in a call go on-hook, yet remain attached to an unoccupied position. This might happen, for example, because the operator logged out before releasing the call or because the datapath was lost when the local area network went down.

When this happens and the operator does not press a key on the position, a sanity timer goes into effect and takes the call down after a set period of time has expired. In order for the sanity timer to be used, the parameter POSITION_SANITY_TIMER must be set in Table TOPSPARM.

When the sanity timer goes into effect, the `UCP` display appears on the FMCRT and on the IC position screen. If the timer expires, the call is taken down and the `UCP` display disappears. The sanity timer can be reset by pressing any key, which indicates to the system that the operator has not abandoned the call. If either of the attached parties goes off-hook again, the sanity timer is cleared.

Position status displays for each traffic office

The following displays are updated in ten-second scans with the number of positions in those states in each traffic office: `OC`, `MB`, `ACS`, `OC1`, `MB1`, `OC2`, `MB2`, `OC3`, `MB3`.

Calls-waiting displays

When calls are waiting in queues for available operators, and the number of calls queued exceeds the CWON threshold in the QT table, the calls-waiting indicators display (`CW`, `CW1`, `CW2`, or `CW3`, depending on which queues are busy). These indicators are erased when the number of calls in the queues drops below the CWOFF threshold.

Calls-deflected displays

Calls may be deflected to an announcement or treatment for the following reasons:

- The sum of the number of calls of the same transfer type (nontransfer, transfer 1, or transfer 2) in the call and recall queues is equal to or greater than the relevant deflect threshold (Tables QT0-QT5).
- An overflow occurs. Calls overflow when all CW queuing resources have been absorbed. That is, the number of calls enqueued exceeds the value set in Table OFCENG parameter TOPS_CALLS_WAITING_Q_SIZE.

When the ratio of queued calls to occupied positions able to handle the calls reaches a defined threshold, the `CD` indicator for that queue displays on the screen. It is accompanied by an audible alarm that informs the office manager of customer-dialed calls being refused entry into the queue (that is, of calls being deflected). When the number of queued calls falls below the threshold, the `CD`, `CD1`, `CD2`, or `CD3` indicator erases, and the audible alarm ceases.

Miscellaneous displays

Miscellaneous displays that appear on the FMCRT screen include the following : `25% CT`, `ALL T&C POS OD`, `CAMA SUSPENDED`, `NO ST REG`, and broadcast messages.

IC and SA positions

In a multitraffic office configuration, one IC position is located in each traffic office. The IC position screen displays information on the current status of operator positions and miscellaneous system information. Multiple SA positions may be located in a traffic office.

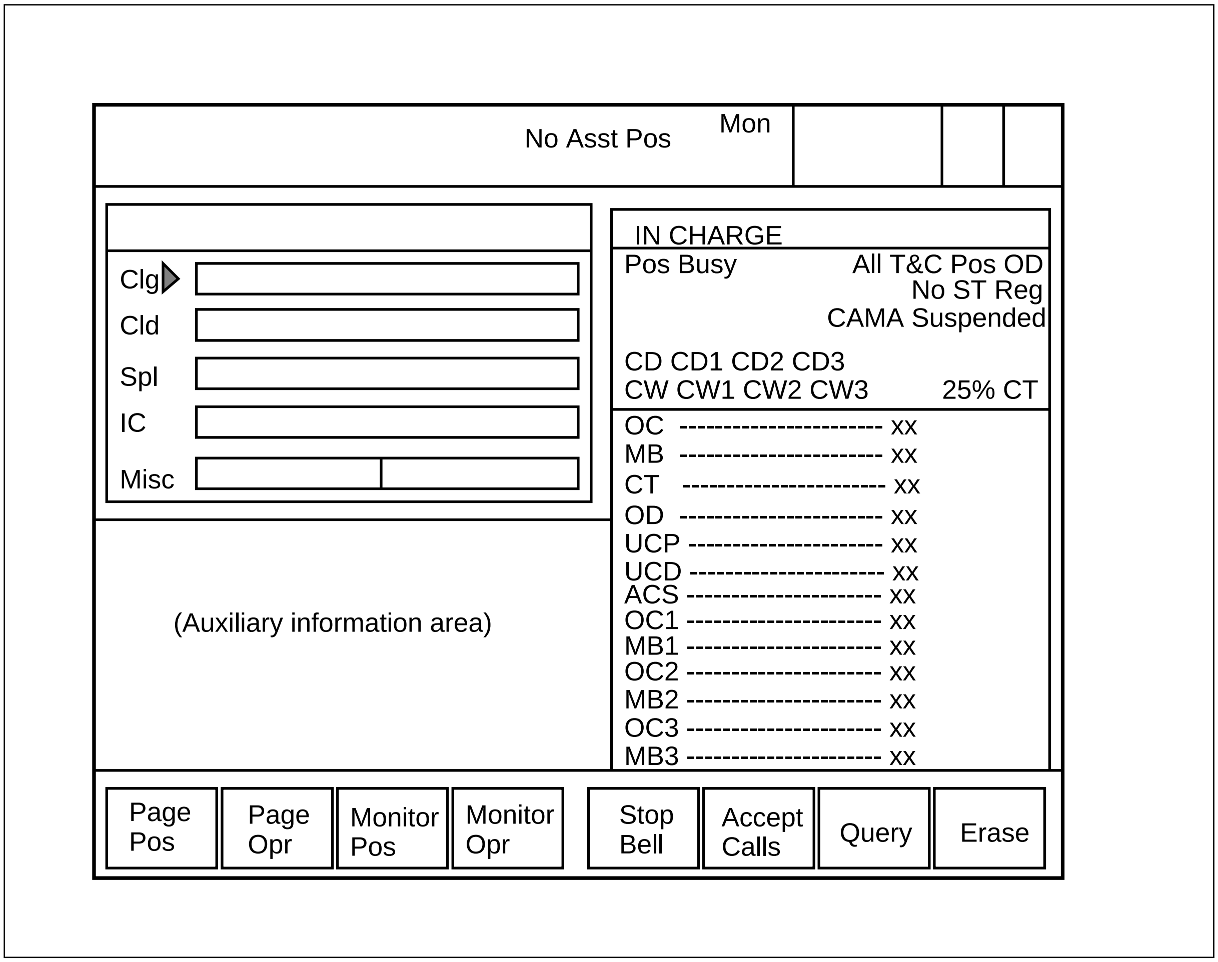
The IC and SA positions can be used to perform the following tasks:

- accept assistance requests
- monitor an operator
- page an operator
- initiate outgoing calls
- conduct an administrative search of the DA database

IC position screen

The IC position consists of a screen and a keyboard. The screen display is illustrated in the following figure. This figure shows the IC position screen when the call transfer feature is activated. When call transfer is not active, the `OC1` through `MB3` displays do not appear.

IC position screen – multitraffic with XFR



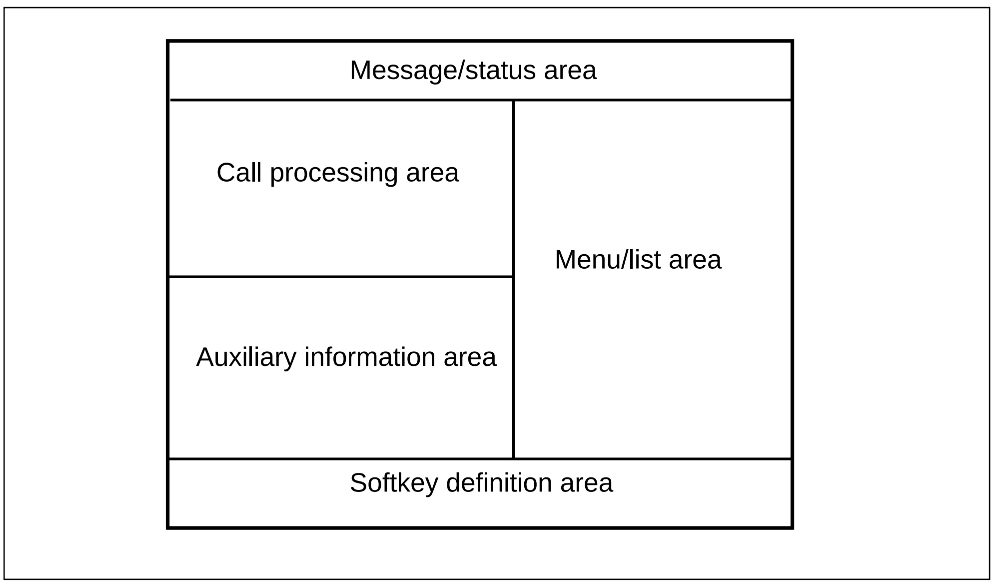
Screen areas

The IC position screen is divided into the following areas, as illustrated in the following figure.

- Message/status area. The top three lines of the IC position screen make up the message/status area. The following type of information displays in this area:
  - — system messages
  - — supervisory status
- Softkey area. The softkey definition area identifies the softkeys available and their functions for the current call context. When a new incoming call is presented, the loop status in presented in the loop status area, the cursor is positioned in the appropriate field, and the appropriate softkeys are displayed.

- Call processing area. The call processing area is broken down into the following fields:
  - — Service/type field – displays the service and call type information
  - — CLG field – used to display or enter the calling number
  - — CLD field – used to display or enter the called number
  - — SPL field – used to display or enter the special number
  - — IC (InterLATA carrier) field – used to display or enter the inter local access transport area (InterLATA) carrier code and carrier ID
  - — Misc – used to enter or display miscellaneous data, such as hotel room number, customer name, and trouble and charge adjust codes.
- Auxiliary information area. The auxiliary information area appears if required by the current call context.
- Menu/List area. The menus corresponding to the **Fncts**, **OGT**, **Svcs**, or **ORDB** keys display in this area.

Format of the TOPS MP screen



Position status displays

The following display fields are updated in ten-second scans with the number of positions in that particular office: `OC`, `MB`, `OD`, `CT`, `UCP`, `UCD`, `ACS`, `OC1`, `MB1`, `OC2`, `MB2`, `OC3`, `MB3`.

The `MB3` and `OC3` indicators on an IC position display only if there is at least one traffic office on the switch that provides DA service using TOPS MP positions. This applies to all statistics about the third queue (referred to as XFR3, DA, or transfer 3).

During call processing, it can happen that all attached parties in a call go on-hook, yet remain attached to an unoccupied position. This might happen, for example, because the operator logged out before releasing the call or because the datapath was lost when the local area network went down.

When this happens and the operator does not press a key on the position, a sanity timer goes into effect and takes the call down after a set period of time has expired. In order for the sanity timer to be used, the parameter POSITION_SANITY_TIMER must be set in Table TOPSPARM.

When the sanity timer goes into effect, the `UCP` display appears on the FMCRT and on the IC position screen. If the timer expires, the call is taken down and the `UCP` display disappears. The sanity timer can be reset by pressing any key, which indicates to the system that the operator has not abandoned the call. If either of the attached parties goes off-hook again, the sanity timer is cleared.

Calls-waiting and calls-deflected displays

The following calls-waiting displays appear on the IC screen if the calls-waiting threshold for that active transfer type is exceeded: `CW`, `CW1`, `CW2`, and `CW3`.

The following calls-deflected displays appear on the IC screen if the calls for that active transfer type are being deflected: `CD`, `CD1`, `CD2`, and `CD3`.

Note: The `CW3` and `CD3` indicators display only if there is at least one traffic office on the switch that provides DA service using TOPS MP positions. This applies to all statistics about the third queue (referred to as XFR3, DA, or transfer 3).

Calls may be deflected for the following reasons:

- The sum of the number of calls of the same transfer type (nontransfer, transfer 1, or transfer 2) in the call and recall queues is equal to or greater than the relevant deflect threshold (set in Tables QT0 through QT5).

- An overflow occurs. Calls overflow when all CW queuing resources have been absorbed (that is, the number of calls enqueued exceeds the value set in Table OFCENG parameter TOPS_CALLS_WAITING_Q_SIZE).

Miscellaneous screen displays

The following miscellaneous messages display on the IC position screen: `25% CT`, `ALL T&C POS OD`, `CAMA SUSPENDED`, `NO ASST POS`, `POS BUSY`, `DIR CALLS`, `AVAILABLE`, `NO ST REG`, and the broadcast message field. Except for `DIR CALLS` and `AVAILABLE`, these messages are defined. Those two messages are defined in the following paragraphs.

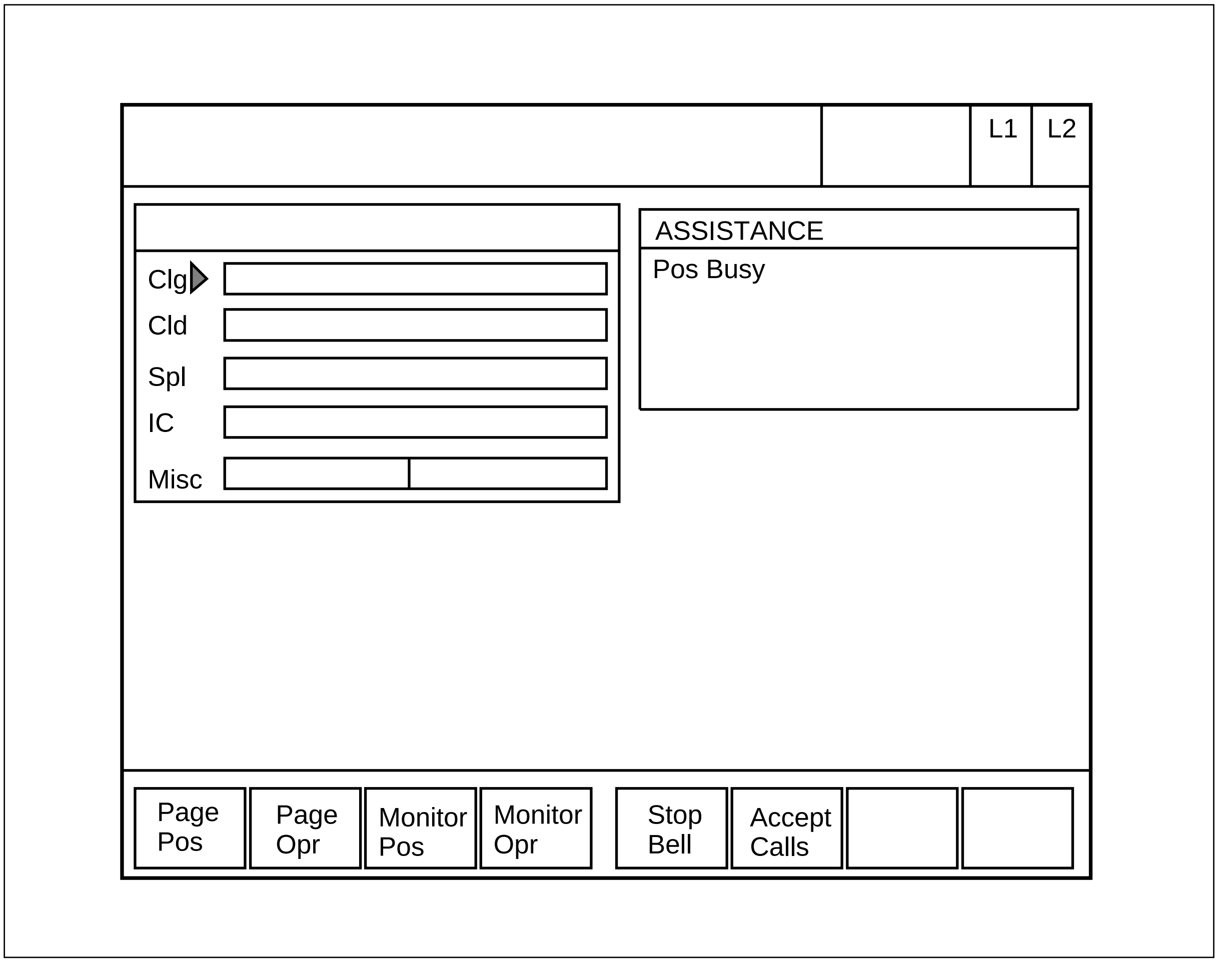
`DIR CALLS` displays on the IC screen when the position is available to accept only directed assistance requests. It changes automatically when the IC manager presses the **{Gen Calls}** softkey to accept general assistance requests at the position. It also changes automatically when the IC manager presses the **{Quit Calls}** softkey to busy the position.

`AVAILABLE` displays on the IC screen when the position is available to accept general assistance requests. It changes automatically when the IC manager presses the **{Dir Calls}** softkey to accept only directed assistance requests at the position. It also changes automatically when the IC manager presses the **{Quit Calls}** softkey to busy the position.

SA position screen

Except for the IC status displays, the SA position screen is identical to the IC position screen. The following figure shows the layout of the SA screen.

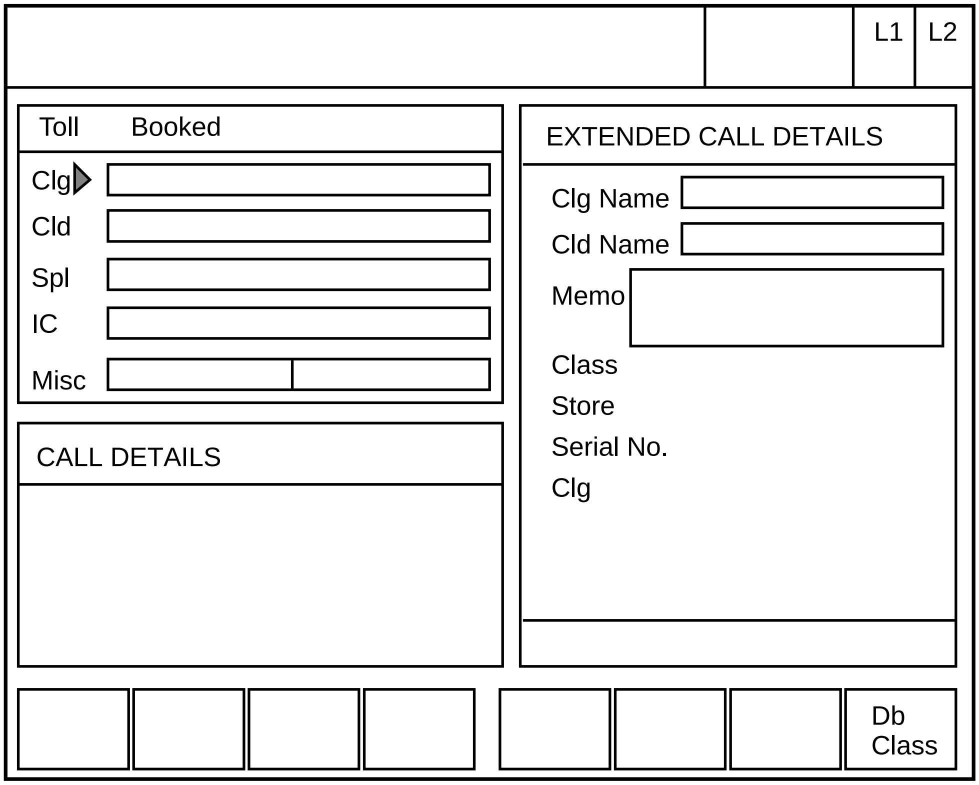
SA position screen



Extended call details window

At IC and SA positions, the IC/SA display may be temporarily overwritten by the extended call details display. Like the call details display, the extended call details window appears only if there is information to be displayed. The following figure shows the location and the displays of the extended call details window.

Extended call details window



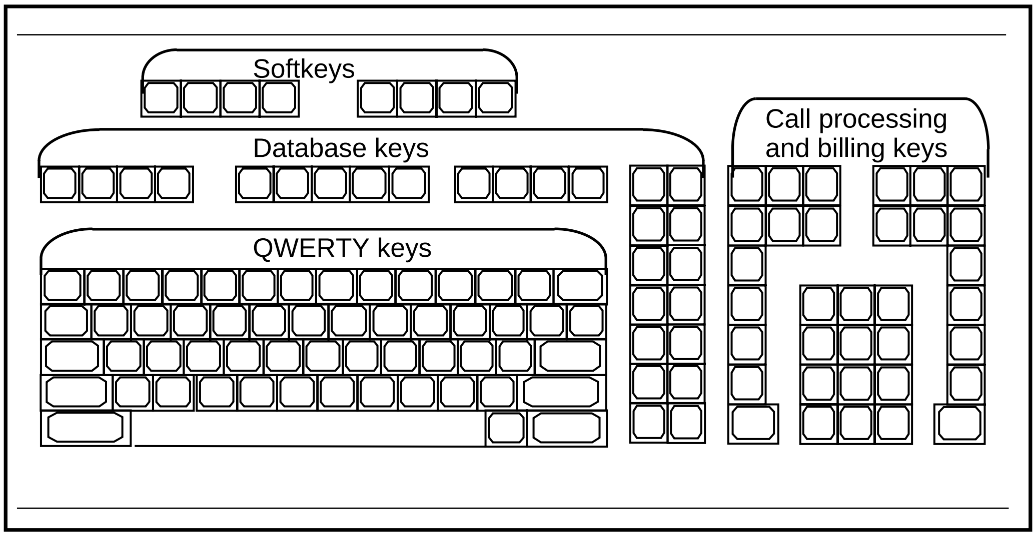
The last line of the extended call details area contains the command or input line for the class, store, serial number (Serial no.), and calling (Clg) fields. If it is not already displayed, the extended call details window is displayed and the cursor is positioned on the first column of the command line whenever the database class, store, or retrieve function is accessed.

For example, if the extended call details area is not displayed and the operator presses **Fncts** + 42 + calling number + **Start** for the retrieve by calling number function, the extended call details area is displayed with the cursor at the first column of the command line.

IC/SA position keyboards

The following figure shows the groupings of key functions on the TOPS MP IC and SA position keyboards.

IC/SA position keyboard



The physical keyboards for the TOPS MP IC and SA positions are identical. The differences between them are in the softkeys available. The IC position has Query softkeys that allow the IC manager to query the status of an operator position or a traffic office. These keys are defined in *TOPS MP Operator Guide*, 297-2281-300. Refer to the first chapter, "Equipment description," in the section entitled "In-charge position."

Logging on and off

The logon procedure for the service assistants and the IC manager is similar to the logon procedure for general operators. The logon screens are the same as those of the general operators.

TOPS MP logon procedure

Service assistants and the IC manager use the logon procedure described below.

Logging on to an SA or IC position

At the SA or IC position:

1 Plug in the headset.

The message "Please log on" appears.

2 Press the space bar to display the logon screen.

The logon ID screen appears.

3 Enter the operator ID (and a password, if required)

If invalid, the ID flashes.

4 Press Start.

Directory assistance service (DAS) logon is initiated.

Upon successful password entry, or if no password is needed, the central control (CC) initiates DAS logon if required by the position's service set. The CC sends a message to the TOPS position controller (TPC), instructing it to log on to a specific DAS based upon the position's service set. If the DAS logon is successful, the service set for the position is sent to the TPC. If the DAS logon is unsuccessful, the SA position still receives DAS assistance calls from a general operator. A log is provided at the MAP, indicating the failure to log on to the DAS.

TOPS MP logoff procedure

The logoff procedure for service assistants and the IC manager is described in the following procedure.

Logging off of an SA or IC position

At the SA or IC position:

1 When the active call is completed, press the **{Quit Calls}** softkey.

The position becomes available to handle new calls.

2 Unplug the headset.

The position returns to the logon screen.

Note 1: If the headset is disconnected before the call is finished, a logoff pending message displays on the SA screen. When the service assistant has finished processing the call, the screen is updated to the `Please log on...` screen.

Note 2: If the service assistant is monitoring another call or is not currently processing any calls, logoff occurs as soon as the headset is disconnected. The operator position screen is cleared of the monitoring display.

Security

Security may be added to the service assistance position by requiring the service assistant (SA) to enter a password when logging on to the system. If the parameter TOPS_PASSWORD_ENABLE in Table OFCVAR is active, then the SA is prompted for a password after entering the operator ID.

Password update

A password update softkey, **{Update Passwrd}**, is provided for updating operator passwords. Upon successful entry of a new password, a message is passed to the CC including the new password. The CC updates the password for this operator and sends a message back to the operator indicating whether the update was successful. The password can be updated only when there is no call at the position.

Note: The **{Update Passwrd}** softkey is displayed only when the TOPS_PASSWORD_ENABLE parameter in Table OFCVAR is set to Y (Yes).

Handling assistance requests

When an operator is unable to handle a call, a service assistant or the IC manager can provide assistance by answering operator questions or by talking to the customer directly.

There are two types of operator requests for assistance:

- directed requests
- general requests

In a directed request, a general operator asks a specific service assistant or the IC manager for help. (Service assistants and the IC manager can also make directed requests.) In a general request, an operator asks for help from any service assistant or IC manager available. (Service assistants and IC managers cannot make general requests.)

On the SA and IC positions, pressing the **{Quit Calls}** softkey informs the system that the position is available to handle assistance requests. Pressing **{Accept Calls}** erases the message and allows new service requests to arrive at the position. If the SA and IC positions are in the busy state and not available to receive new assistance requests, `NO ASST POS` is displayed at all assistance positions and the IC position.

On the IC position, after pressing **{Accept Calls}**, the IC manager can press either the **{Dir Calls}** or the **{Gen Calls}** softkeys to distinguish between accepting general or directed assistance requests. The SA position cannot request direct calls only; it must always accept both kinds of calls.

Responding to directed assistance requests

The following procedure describes how the service assistant or IC manager responds to a directed assistance request.

At the SA or IC position:

1 If the position is not already in Accept Calls mode, press the **{Accept Calls}** softkey.

The system puts you into Accept Calls mode.

2 On the IC position, press the **{Dir Calls}** softkey. (There is no corresponding key on the SA position.)

3 At the IC or SA position, choose `Access Loop 2` from the functions menu.

Loop 2 is accessed. (Directed assistance requests arrive on loop 2.)

4 Answer the operator's questions.

5 Press the **Pos Rls** key.

The request is released.

Note: To respond to an assistance request, the service assistant or IC manager must share service types with the requesting operator.

Responding to general assistance requests

Operators may also request help from any available supervisory position. A Sonalert is generated at the position receiving the request. The following procedure describes how the service assistant or IC manager responds to a general request.

At the SA or IC position:

1 If the system is not already in Accept Calls mode, press the **{Accept Calls}** soft key.

The system puts you into Accept Calls mode.

2 On the IC position, press the **{Gen Calls}** softkey. (There is no corresponding key on the SA position.)

3 At the IC or SA position, choose `Access Loop 1` from the functions menu.

Loop 1 is accessed. (General assistance requests arrive on loop 1.)

4 Answer the operator's questions.

5 Press the **Pos Rls** key.

The request is released.

Note: The IC manager can operate in direct mode or in general (GEN) mode. When the **{Gen Calls}** softkey is pressed at the IC position keyboard, the IC position is enqueued along with the SA positions to receive general assistance requests. Calls requiring general assistance do not access the IC position unless no SA positions are available. When the IC position is operating in direct mode, the operator must direct the call specifically to the IC position by entering the IC position number.

Viewing a database call

The service assistant or the in-charge manager can view, but not change, a call stored in the booked call database. The following procedure describes how to view a call stored in the database.

At the SA or IC position:

1 Select `Retr by Serial No.` or `Retr by Clg No.` from the functions menu.

2 Type in the digits of the stored call (either a serial or a calling number).

3 Press **Start**.

All database-related extended call details are displayed on the screen, overwriting any information previously displayed. If a calling number was entered when the retrieve function was selected, then selecting `Next Db Call` from the functions menu brings up the next database call with the same calling number. The next function is not allowed after the delete function has been used.

Note: This action displays all extended call details, overwriting any information previously displayed.

Monitoring and paging operators

Both SA and IC positions can monitor and page operators. The keys, procedures, and screen displays involved are the same for both types of positions. Neither IC positions nor SA positions can be monitored.

Monitoring an operator position

Monitoring an operator’s calls to determine efficiency is part of managing the work force. Service assistants and IC managers can monitor individual operator progress. Normally, the SA position is used to monitor operators, because the IC position constantly displays the position status for the traffic office. To monitor an operator, follow the steps in the following procedure.

At the SA or IC position:

1 Ensure that the position is in make-busy mode.

2 Press the **{Monitor Opr}** or **{Monitor Pos}** softkey.

3 Type in the number of the operator or position to be monitored (for example, 113).

4 Press **Start**.

The screen clears, and all call information that appears on the operator position screen also appears on the IC or SA position screen. The service assistant or IC manager can hear the operator's and customer's conversation. `MON` appears on the SA or IC screen.

To return to the regular position screen and stop monitoring, press the **{Quit Mon}** key.

Note 1: The monitoring process does not stop if the operator logs out. The only way to drop the monitor connection is for the service assistant or the in-charge manager to stop monitoring the operator.

Note 2: Any Sonalert condition takes the in-charge or assistance position out of monitoring mode and returns the original screen with an appropriate message displaying the condition that caused the Sonalert to sound.

Monitoring an operator position with DA capability

An SA position can monitor an operator with DA capability, as long as the assistance service set includes DA. When an SA position with DA capability monitors a TOPS MP operator position with DA capability, the DA service screen is shown on the SA position screen. If the TOPS MP operator position receives a toll and assist (TA) call while being monitored, the SA position screen is updated to reflect the arrival of the TA call.

The SA position screen is updated to reflect any changes on the TOPS MP operator position screen, as long as the changes on the TOPS MP operator position screen are requested by the DMS central control (CC). Local screen changes performed by the operator are not reflected on the SA position screen. For example, if a DA call is presented to the operator in the DA screen, the DA screen also displays at the SA position screen. If the operator switches to the billing screen by pressing one of the hardkeys, the SA position screen still displays the DA screen, unless the IC manager selects `Toll and Assist` from the services menu.

If an SA position without DA capability monitors a TOPS MP operator position with DA capability, only the TA screen displays on the SA position screen, even if the operator receives a DA call while being monitored.

If an SA position with DA capability monitors a TOPS MP operator position without DA capability, only the TA screen displays on the SA position screen.

Paging an operator position

All TOPS MP administrative positions have the ability to page a specific operator and request that the operator call back.

The operator position to be paged can be specified by position number or by operator number. The position number represents the location of the operator position in the traffic office floor plan. The operator number represents the identity of the particular operator being paged, regardless of floor plan location.

The following procedure describes how to page an operator from the IC or SA position.

At the SA or IC position:

1 Press the **{Page Opr}** or **{Page Pos}** softkey.

2 Type in the position or operator number (for example, 113).

3 Press **Start**.

The position field displays `OPR xxxx` or `POS xxxx` in the left lower edge of the IC/SA screen.

When an IC or SA position pages an operator position, the request flashes on the operator position screen, and the operator answers by making a directed set call to the paging position. A directed set call is a call made to a specific supervisory position.

Note: If the service assistance position is in make-busy mode, the operator cannot call the position to answer the page.

To cancel a page, press the following keys on the SA or IC position keyboard:

{Page Pos} + **Start** or **{Page Opr}** + **Start**

The operator position cannot page but can only respond to pages.

Initiating an outgoing call

The following procedure describes how to initiate an outgoing call from the IC or SA position.

At the SA or IC position:

1 Press the **Fncts** key.

2 Enter 1 (for loop 1) or 2 (for loop 2).

3 Press **Start**.

An idle loop is accessed.

4 Press the **CLD** key.

5 Type in the called number.

6 Press **Start**.

The outgoing call is initiated.

Responding to the local Sonalert (stop bell)

The Sonalert is an audible signal generated at the SA or IC position, or both. The following table lists conditions that cause the Sonalert tone to sound and indicates the positions at which it sounds.

Conditions under which the Sonalert is generated

Condition	Position	Screen display
All T&C positions out-of-order	IC and FMCRT	`All T&C POS OD`
Assistance request arrival	IC or SA position at which the assistance request has arrived	`Loop 1 Opr: xxxx POS xxxx` or `Loop 2 Opr: xxxx Pos: xxxx` (at top of screen)
Call in queue – no position occupied	IC, SA, and FMCRT (also operator position)	`CW`
Transfer call in queue – no transfer position occupied	IC, SA, and FMCRT (also operator position)	`CW1`, `CW2`, or `CW3`
Assistance request queued	IC	`POS xxxx in Queue` (in message/status area)
Calls-deflected	IC, SA, and FMCRT	`CD`

—continued—

Conditions under which the Sonalert is generated (continued)

Condition	Position	Screen display
Transfer calls-deflected	IC, SA, and FMCRT	`CD1`, `CD2`, or `CD3`, depending on the transfer queue affected
CAMA suspended	IC, FMCRT	`CAMA SUSPENDED` (On the IC position, `CAMA SUSP`)
25% controlled traffic	IC, FMCRT	`25% CT`
—end—		

To silence the Sonalert at the IC position, press the **{Stop Bell}** softkey on the IC or SA position keyboard where the Sonalert is being generated.

To silence the Sonalert tone generated at the FM position, enter **S** at the FADS TTY. For details, refer to the chapter "ACD TTY commands, queries, and reports" later in this document. If the bell was caused by a calls-deflected condition, it ceases automatically when the queue length drops below the calls-deflected threshold. The tone returns when the threshold is passed again.

Remote Sonalert

A remote Sonalert is provided on each position controller equipment cabinet. If the local Sonalert sounds on any one of the TOPS MP terminals connected to the PCE, it causes the remote Sonalert to sound.

There is a one-minute timeout on the remote Sonalert. The remote Sonalert in deactivated only when the last local Sonalert on the TPCs in the PCE has been deactivated.

Handling assistance request queues

When general operators request assistance from a service assistant or an IC manager and no SA or IC positions are available to answer them, these requests are queued. Enhanced SA and IC queueing allows up to 16 operator requests to be queued for assistance.

Table SAQSIZE

Table SAQSIZE allows operating companies to datafill the depth of the queue for assistance requests. The maximum allowable depth is 16. This table also allows the company to determine when the Sonalert should be activated. When the number of SA/IC requests in queue exceeds the datafilled value, the Sonalert is activated. When the number of queued requests falls below this value, the Sonalert is deactivated.

Note: If a team is not datafilled in this table, its queue size defaults to one. The Sonalert for that team is activated whenever assistance requests are in queue.

Table OFCVAR

An office parameter available in Table OFCVAR controls whether an operator in one team can receive assistance from a service assistant or IC manager in another team. The TOPS_CROSS_TEAM_ROUTING parameter applies to both general and directed requests. When this office parameter is set to yes (Y) and a general operator requests assistance, the DMS first searches the operator group for an available service assistant or IC manager. If none is available, the DMS searches the other teams for an available service assistant or IC manager.

When TOPS_CROSS_TEAM_ROUTING is set to Y:

- A general operator can enter **OGT** + menu option number + **Start** + **Start** and be connected with the first available service assistant or IC manager. Service assistants are checked first, then the IC manager. If no one is available, the search proceeds to the next team. This process is repeated until an available service assistant or IC manager is found. If none is found, the request is queued, and the queueing indication appears on the original team’s IC position.
- A general operator can key **OGT** + menu option number + **Start** + assistance position floor plan number + **Start** to be connected to a particular service assistant or IC manager in any team. If the service assistant or IC manager is not available, the general operator hears a busy tone. There is no queueing. The general operator must release the call and try again.
- A service assistant or IC manager can key **OGT** + menu option number + **Start** + assistance position floor plan number + **Start** to be connected to a particular service assistant or IC manager in any team. The same indications apply for both service assistants and IC managers.

When TOPS_CROSS_TEAM_ROUTING is set to N:

- A general operator can key **OGT** + menu option number + **Start** + **Start** and be connected with the first available service assistant or IC manager. Service assistants are checked first, then the IC manager. If no available service assistant or IC manager is found, the request is queued. The queueing indication appears on the IC position of the general operator’s team. Service assistants and IC managers becoming available in other teams do not get the queued request. It can be serviced only by a service assistant or IC manager from the same team. The general operator cannot connect to a service assistant or IC manager in another team.

- A general operator can key **OGT** + menu option number + **Start** + assistance position floor plan number + **Start** to be connected to a particular service assistant or the IC manager in that operator’s team. The operator cannot connect to a service assistant or IC manager in another team.
- A service assistant or IC manager can key **OGT** + menu option number + **Start** + assistance position floor plan number + **Start** to be connected to a particular service assistant or IC manager in any team. Service assistants and IC managers are not affected by the TOPS_CROSS_TEAM_ROUTING parameter.

  Note 1: The TOPS_CROSS_TEAM_ROUTING parameter also controls whether an SA or IC position can page a general operator in another team.

  Note 2: General operators cannot request assistance from service assistants or IC managers in other switches without dialing an outside number.

  Note 3: The functionality offered by these key sequences is also available through the functions menu. For further information, refer to *TOPS MP Operator Guide*, 297-2281-300.

Table TOPSPARM

A parameter in Table TOPSPARM allows the operating company to queue assistance requests strictly by the age of the request. The parameter SA_QUEUEING_BY_REQUEST_AGE applies to general requests. When this office parameter is set to yes (Y), the DMS searches each team’s request queue. It connects the oldest request in the entire switch to the next available SA or IC position that has compatible service types.

Table TOPSPOS

The maximum number of SA/IC positions that can be datafilled in Table TOPSPOS is 126. These 126 positions may be divided among teams, or up to 126 SA/IC positions may be datafilled for a single team. (Only one of these can be an IC position.) If a team is datafilled with 126 SA/IC positions, then no other SA and IC positions may be datafilled in any other teams.

Releasing calls to queue

When the general operator requests assistance and is queued, the service assistant or IC manager does not answer immediately. The on-hook forward supervision display appears on the operator screen to indicate that the request is in queue. If the general operator is no longer needed, the operator can press **Pos Rls** to release the call into queue. The operator should inform the calling party that the subscriber is in queue by saying, "Please hold for assistance." At this time, the general operator is released from the call and is free to handle the next call.

When the SA or IC position is connected to the call, the position receives a message. If the general operator is no longer attached, the message reads:

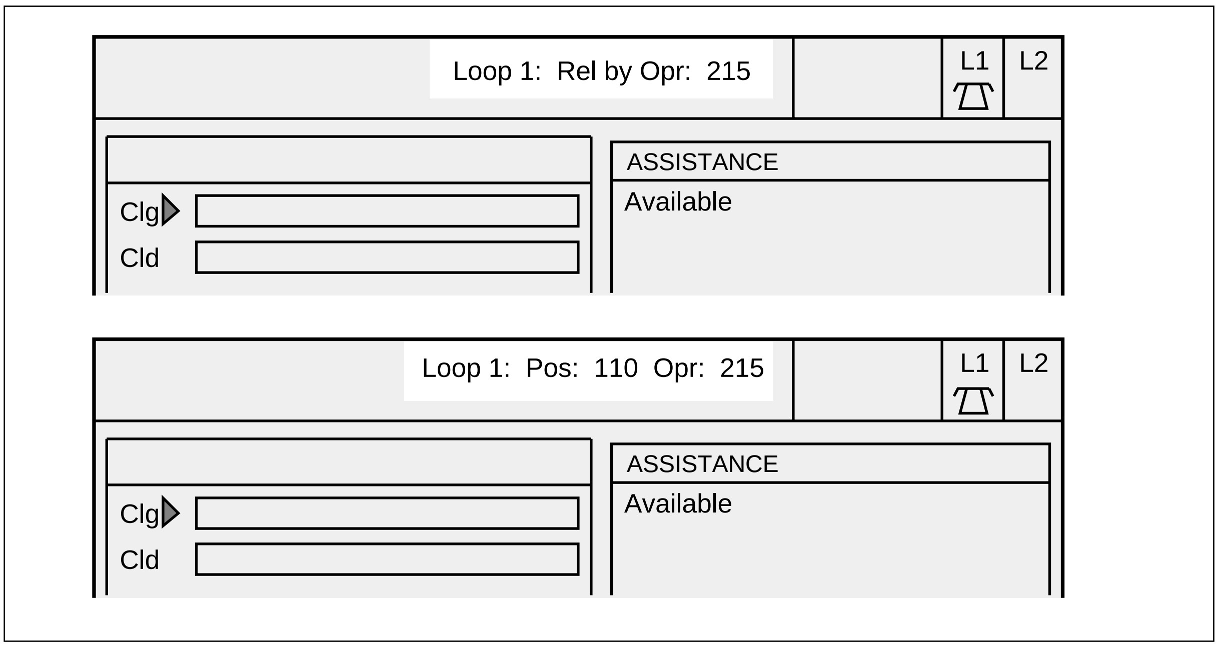
`REL BY OPR#XXXX`

If the operator is still attached, the message reads:

`POS#XXXX  OPR#XXXX`

The partial screens in the following figure illustrate the location of these messages.

Location of operator-attached messages on SA screen



The IC displays also show how many calls are in queue and whether the queue is full. When SA/IC requests are in queue, a display appears on the IC screen, indicating that requests are queued. The IC manager can become available to assist or can note that more service assistants are required during that particular time of day. When operators are queued, the display `ACW nn` shows (with `nn` representing the number of operators in queue). When the queue is full, the display `ACW nn` changes to `ACW FULL`.

Handling out-of-service positions

When moving an SA position or the IC position from one outlet jack to another, first remove the position from service. At the TTY, enter **O**, followed by the floor plan number of the SA or IC position.

Note: When all SA positions have been removed from service, `NO ASST POS` displays on the IC position screen.

To place an SA or IC position back in service, enter **I** and the floor plan number of the position at the TTY.

To query the status of SA or IC positions, enter **O**. For further details on the TTY commands, refer to the chapter "ACD TTY commands, queries, and reports" later in this document.

Restoring communication with the DMS

The following events show that an SA or IC position has lost contact with the DMS:

- There is no response to keystrokes.
- A call arrival tone sounds, but there is no screen update.
- The position contact message disappears.

In any of these situations, pressing the **Call Details** key refreshes the screen and reestablishes the call. (Service assistants and IC managers who do not have a **Call Details** key should instead press **Fncts** + 0 + **Start**.)

Effects of QMS on TOPS MP SA and IC screens

Although QMS does not affect queueing to SA and IC positions, the displays at SA and IC positions differ depending on whether TOPS QMS or TOPS ACD is used. For example, `CW` and `CD` displays on SA and IC positions in QMS teams are located in the same positions as on SA and IC positions in TOPS ACD teams. They are distinguished from the ACD displays by their abbreviations: `QCD` and `QCW`.

Note: SA and IC displays associated with TOPS ACD teams remain unchanged.

The `QCW` and `QCD` displays are updated on a ten-second basis. They are not displayed for each queue. A force management command is provided at QMS force management TTYs to query which queue is in the CW or CD state. A TOPS QMS queue reaches CW or CD state based on datafill in Tables TQCQINFO, QMSCQDEF, and QAPLNDEF.

For backup purposes, real-time statistics are displayed at IC positions associated with QMS teams. These indicate the total statistics for the positions in their respective teams. The team statistics displayed include, for example, the number of positions made busy, the number occupied, and the number out of order.

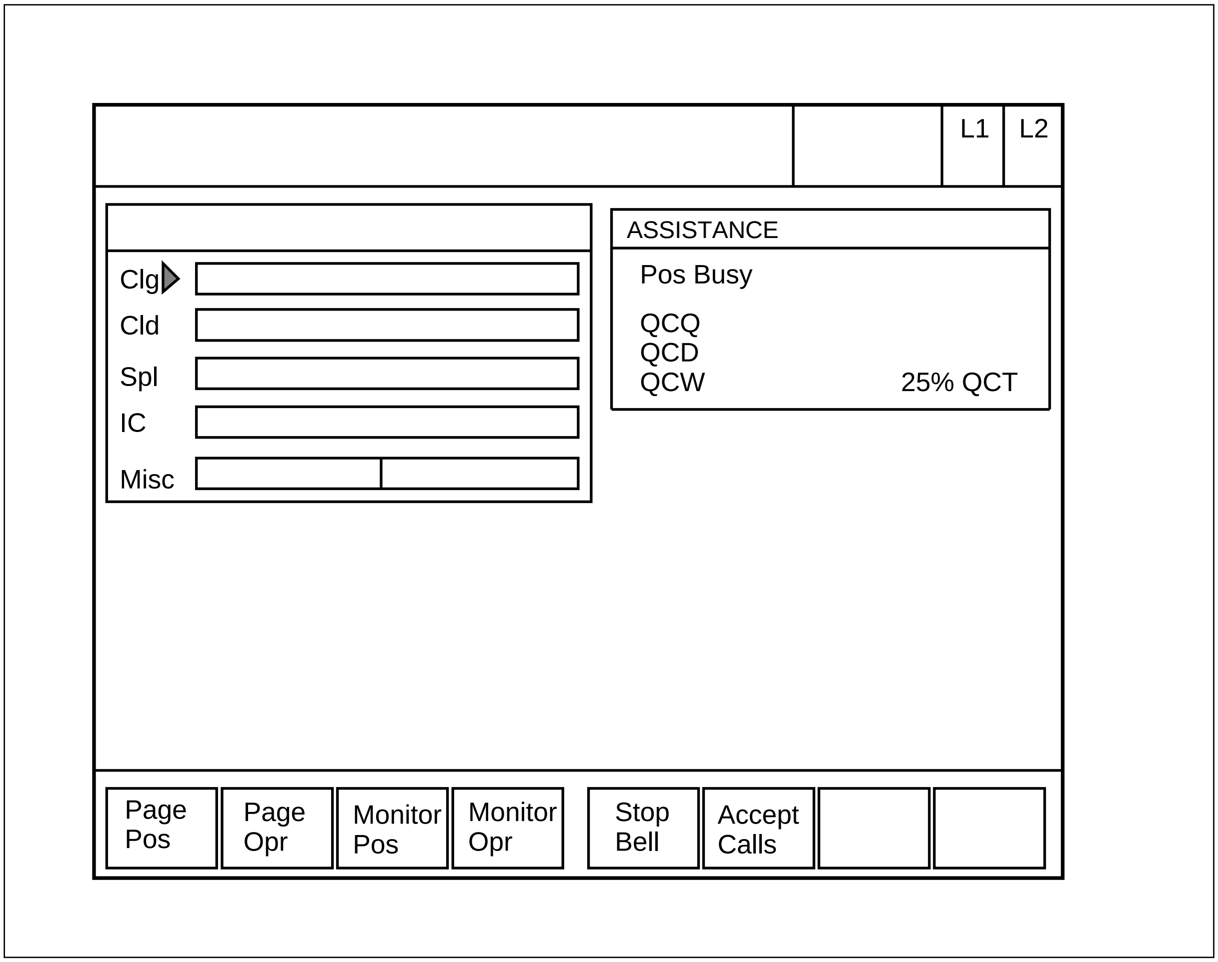
SA and IC positions associated with TOPS QMS teams also include a real-time display, `QCQ`, which appears when there are calls in a queue that is not in any logged-in operator's profile.

When SA and IC positions monitor TOPS QMS operator positions, TOPS QMS-related displays appear at the monitoring position during the monitoring session.

To specify whether TOPS QMS or TOPS ACD is to be associated with each team of operators, the operating company datafills Table TEAMACD.

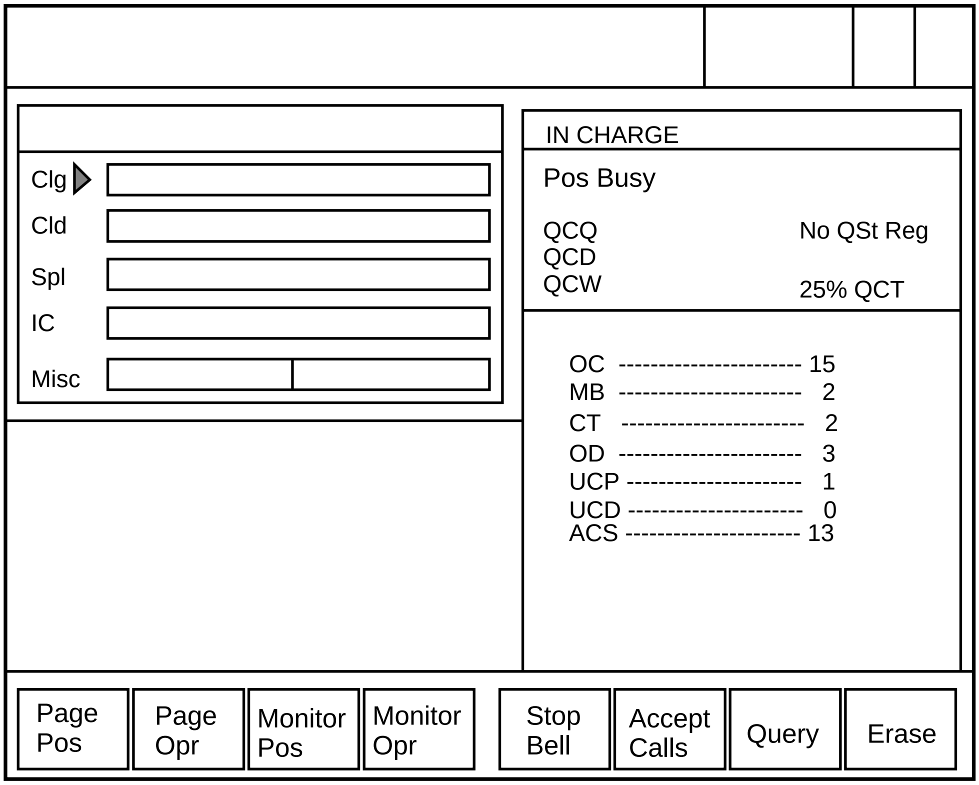
The location of the TOPS QMS displays is shown in the following two figures.

SA position screen with QMS



The team statistics displays on IC positions associated with QMS teams have the same meanings and are located in the same positions as on IC positions associated with TOPS ACD. The location of the displays is shown in the following figure. IC positions associated with QMS teams do not display statistics for each queue.

IC position screen with QMS



Effects of QMS on TOPS MP FMCRT screen

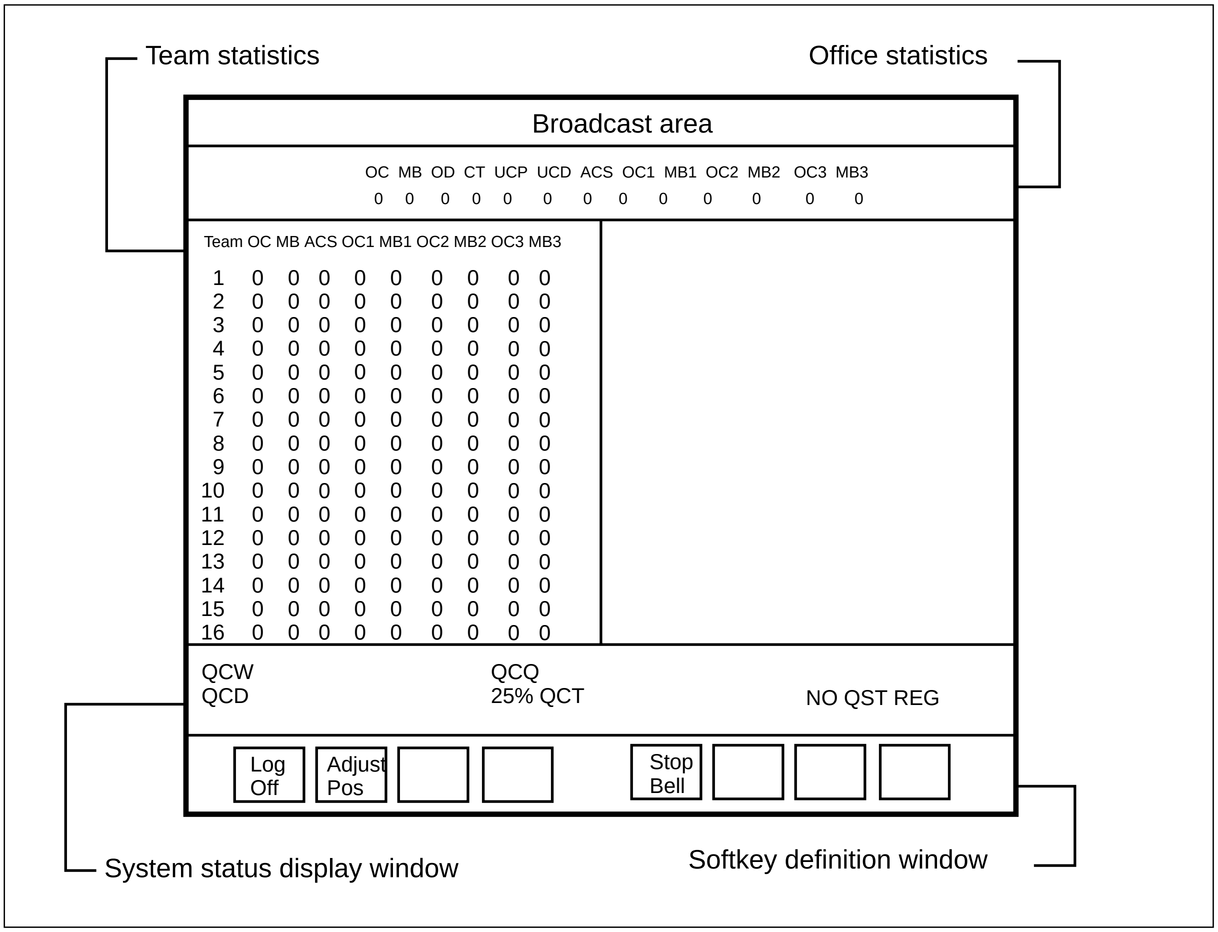
The screen displays may differ slightly on FMCRT positions, depending on whether the configuration is purely QMS or a mixed configuration containing TOPS ACD and TOPS QMS positions. For purely QMS configurations, the office statistics do not contain data about each individual queue. The per team statistics also contain no individual queue data. Only team totals are displayed. Similarly, only system QCW, QCD, and QCQ displays are present on an FMCRT in a purely QMS configuration.

Note: Entering the **CW**, **CD**, and **CQ** commands from the QTADS TTY causes the TTY to identify specific queues that have calls waiting or deflecting, or that have calls but have no operator assigned. These commands are explained in the chapter "QMS TTY commands, queries, and reports" later in this document.

The following figure shows the FMCRT screen with QMS displays for a purely QMS configuration.

Note: For emphasis, the following figure shows only the QMS displays. All of the non-QMS fields, however, remain unchanged. On a real screen, the non-QMS fields would also appear.

FMCRT screen with QMS displays for a purely QMS configuration



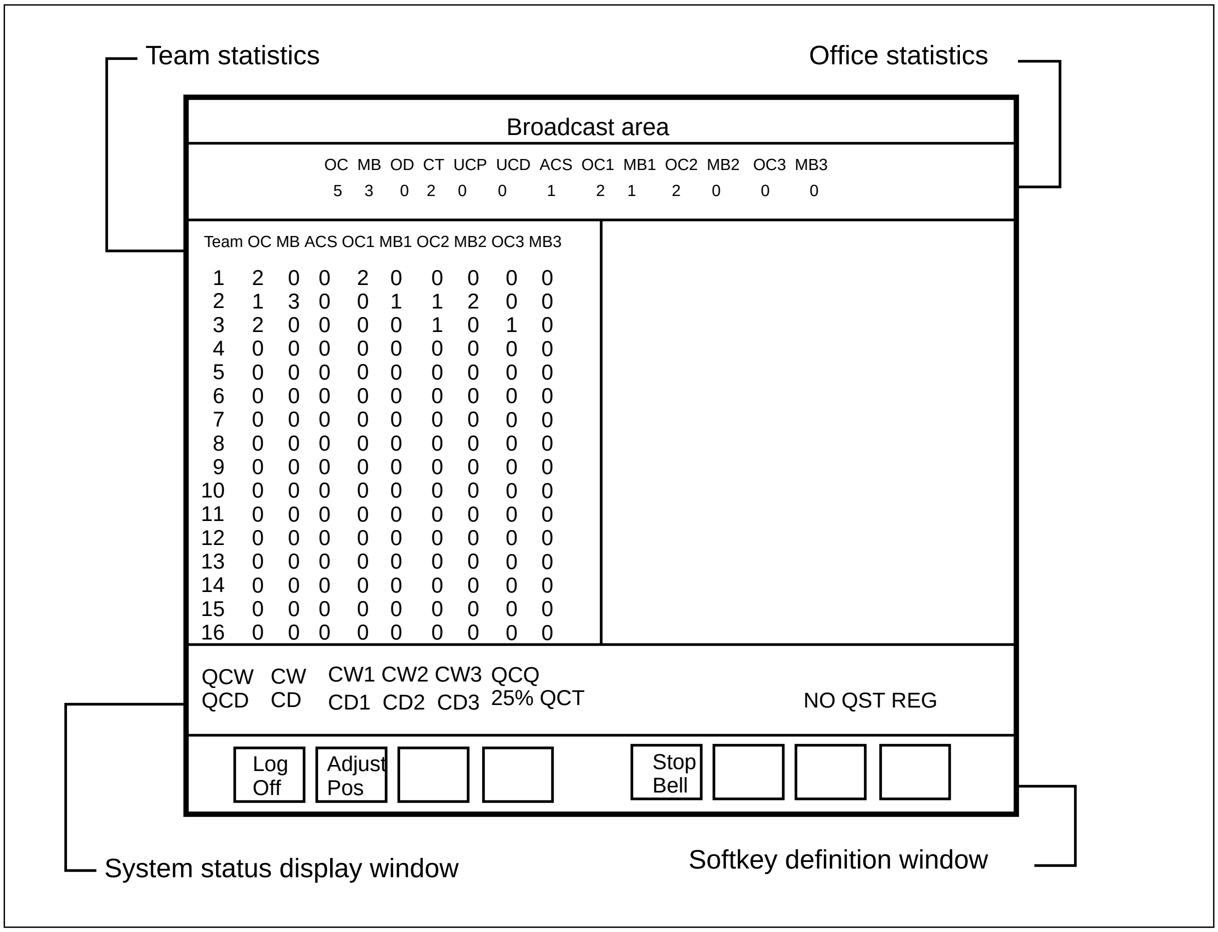
In mixed configurations containing TOPS ACD teams and QMS teams, per-queue data (`OC1`, `MB1`, `OC2`, and so forth) is displayed in the office statistics area only for TOPS ACD teams. The office totals (`OC`, `MB`, `OD`, and so forth) pertain to both TOPS ACD teams and QMS teams.

Also in mixed configurations, the team statistics display per-queue data (`OC1`, `MB1`, `OC2`, and so forth) only for TOPS ACD teams. The team totals (`OC`, `MB`, `ACS`, and so forth) pertain to both TOPS ACD and QMS teams. The per-queue CW and CD displays (`CW1`, `CD1`, and so forth) pertain only to TOPS ACD positions.

The next figure shows the FMCRT screen with QMS displays for a mixed QMS and ACD configuration.

Note: For emphasis, the next figure shows only the QMS displays. All of the non-QMS fields, however, remain unchanged. On a real screen, the non-QMS fields would also appear.

FMCRT screen with QMS displays for a mixed QMS and ACD configuration



Mechanized force administration data system

This chapter explains how the mechanized force administration data system (MFADS) works. It describes the MFADS report and explains the additional measurements available on the enhanced MFADS report. At the end of the chapter is a discussion of the QMFADS mechanized report format used with the queue management system (QMS).

MFADS report

MFADS is an optional minicomputer system that uses data from the DMS to calculate service and work-force statistics. Statistical summaries are developed from ten-second scans of operator activity. These summaries are used to determine the number of operators required. The formats of these summaries are similar to those of the force management (FM) periodic reports printed at the SADS or FADS TTY. MFADS allows TOPS MP FM measurements to be polled at 15- or 30-minute intervals.

MFADS extracts FM measurements from a pollable port in TOPS MP. This port is a trunk connected to a TOPS MP digital modem that uses the network. The minicomputer sends a two-character polling ID to initiate a data dump. TOPS MP collects these two characters and compares them to the entries in Table OFCVAR parameter TOPS_MFADS_POLLING_ID. If there is no match, MFADS responds with an ASCII question mark character. If the characters match, MFADS evaluates the time of the message request.

Report transmission must be completed in the current MFADS reporting period. Thirty-minute MFADS reports can be requested only in the 15-minute period immediately following data collection. Since the data collection buffers are switched between periods, MFADS reports spanning periods would result in corrupted data. As a result, the telephone company polling request is rejected if MFADS report transmission cannot be completed in the current FM period.

Therefore, if the 30-minute report is requested and that request did not occur in the first fifteen minutes of the period, MFADS does not produce a report and responds with the ASCII characters TIME. If all conditions are met (if the polling ID characters match and the request is within the current FM period), TOPS MP sends the FM data to the minicomputer.

The Table OFCENG parameter TOPS_MFADS_PERIOD determines whether the TOPS MP FM measurements are polled at 15- or 30-minute intervals. If the office parameter is set to MFADS_15_MIN, data are sent every 15 minutes. If the office parameter is set to MFADS_30_MIN (the default value), data are sent to the minicomputer every 30 minutes.

The time required to transmit an MFADS report depends on the baud rate, the number of active traffic offices, and system loading.

> ***Note:*** The optional enhanced MFADS feature supports two transfer rates: 300 and 1200 baud. For maximum configurations (30 traffic offices), the transfer time would be approximately five minutes at 300 baud; because of the large amount of data transmitted by enhanced MFADS, the preferred transmission rate is 1200 baud.

Enhanced MFADS position seizure measurements

Enhanced MFADS position seizure (PS) and work volume (WV) measurements can be restricted to this feature or extended, on a limited basis, to other TOPS features.

The parameter TOPS_PEG_MODE in Table OFCENG defines the scope of enhanced MFADS measurements. If this parameter is set to IPS (initial position seizures only), this feature is independent of other TOPS features except for the FORMAT field discussed later in this chapter.

If this parameter is set to PS, enhanced MFADS measurements are applied to queue thresholding, FADS, SADS, or TADS reports, operational measurements, operator feedback registers, operator study registers, and the data present in the current MFADS interface when the MFADS FORMAT field is set to FORMAT1 (or FORMAT1A), disabling enhanced MFADS reports.

This option replaces IPS-based measurements with PS measurements, because of the internal database structures. Force management maintains several measurement databases. The primary database contains data used in queue control, TOPS reports, and the MFADS interface. This database is replicated for 15-minute, 30-minute, 6-hour, and other periodic reports.

Enhanced MFADS implements a separate database that is duplicated only for 15- and 30-minute reports. When TOPS_PEG_MODE in Table OFCENG is set to IPS, new measurements are placed in the enhanced MFADS database, and pegging of the primary database is unchanged (that is, it remains IPS-based).

If TOPS_PEG_MODE is set to PS, pegging of the primary database is PS-based. That is, the database IPS fields for each queue type contain the sum of IPS plus transfer position seizures (TPS), plus recall position seizures (RPS): IPS + TPS + RPS. This pegging occurs when the enhanced MFADS database is pegged and is source queue based.

Since the data collected represent per-seizure measurements, the values in the IPS fields increase, and the calculation of AWT decreases. This reflects per-seizure statistics, rather than per-call data.

For example, if we assume a single queue type with 50 recalls, 100 IPS, and 1500 seconds of call-busy work volume (CBWV), the IPS-based AWT (ignoring noncall work volume [NCWV]) for this queue is 15 seconds. If PS measurements replace IPS measurements, 150 PS is recorded for the queue type. This reduces the AWT to ten seconds, the average work time required to support each PS for the queue type.

In addition to changing the pegging procedures for the primary database, the parameter TOPS_PEG_MODE in Table OFCENG also controls the pegging of PS for operational measurements and the operator feedback registers. If TOPS_PEG_MODE is set to PS, the pegging of IPS in registers IPSZ and IPSZ2 of group TOPSPSZ is based on queue type measurements. If this parameter is set to IPS, operations measurements do not change.

Similarly, when TOPS_PEG_MODE is set to PS, the data presented at an operator's position represent PS, rather than IPS, measurements. (The data displayed are based on PS, but the screen display column titles continue to indicate IPS.) If this parameter is set to IPS, the screen displays indicate the current IPS measurements.

> ***Note:*** The STATSPAC feature is implemented in a separate database and is not affected by the TOPS_PEG_MODE parameter in Table OFCENG.

FM statistics

TOPS MP sends the following FM measurements to the MFADS device:

- the number of scans for TOPS MP in XCS
- the number of IPS (or PS, for enhanced MFADS)
- work volume usage accumulated in actual work seconds
- calls-waiting usage for TOPS MP accumulated in XCS
- occupied position usage accumulated in XCS

> ***Note:*** XCS is a unit of time equal to ten seconds.

In offices equipped with the call transfer feature, TOPS MP accumulates and sends additional FM statistics for each call transfer type. The data are calculated as explained in the chapter "Force management measurement definitions" earlier in this chapter. They include the following:

- number of the transfer type, 1, 2, or directory assistance (DA)

  Note: This is provided at the beginning of the relevant by-transfer portion of the data if Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to Y.

- calls-waiting usage for the appropriate transfer type
- number of TPS for the transfer type
- amount of work volume generated by operators assigned the call transfer type

  Note: CBWV is generated for each call type associated with each transfer type. NCWV for each transfer type is pegged for each operator in proportion to the number of transfer types in the operator's combined transfer profile.

- number of calls transferred from each traffic office
- sum of occupied positions of the appropriate transfer type for each ten-second scan

  Note: If an operator serves more than one queue, the AOP is indicated only in the highest number queue; that is, an operator serving transfer 1 (XFR1) and transfer 2 (XFR2) queues shows an AOP in XFR2 only.

If Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to Y, MFADS provides data for all transfer types that have been datafilled in Table OFCENG parameter TOPS_TRANSFER_TYPES.

Fields 16 through 24 report repeatedly for each transfer type that was active during the report period. Fields 16a and 16b indicate the transfer type and are provided at the beginning of each transfer type portion of the MFADS report. Data are provided in the following order: XFR1, XFR2, and DA.

If parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to N, the number of the transfer type is not presented (that is, fields 16a and 16b) at the beginning of each transfer type portion of the MFADS report. This permits downstream MFADS processors to handle MFADS data generated in the same manner as BCS22 and earlier.

In a case such as this, transfer types should be enabled in order. If XFR2 is enabled and XFR1 is not, transfer data are not processed properly at MFADS. Regardless of whether DA has been enabled by parameter

TOPS_TRANSFER_TYPES, DA data are not processed by MFADS. This is because pre-existing MFADS downstream processors are not capable of handling DA data.

MFADS data output strings

The MFADS data are dumped as a string of ASCII characters. The following example shows the string of ASCII data sent by the DMS to the MFADS device when Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to Y:

```
<0000001726010101 09000000 00000 00000 00180A2
1000000000000000000000 00000 00000 2 00000000000000000000
00000 00090>
```

This sample output shows that two transfer queues were active for the period polled. The data printed are the data accumulated for the 15- or 30-minute period prior to the period polled.

The following provides an example of the string of ASCII data sent by the DMS to the MFADS device with Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER set to N:

```
<0000001726010101 09000000 00000 00000 00180A2
000000000000000000000 00000 00000 00000000000000000000
00000 00090>
```

This sample output shows that two transfer queues were active for the period polled. The data output are the data accumulated for the 15- or 30-minute period prior to the period polled.

The following provides another example of the string of ASCII data sent by the DMS to the MFADS device with Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER set to Y:

```
<0000001726010101 09000000 00000 00000 00180A1
1 000000000000000000000 00000 00000>
```

This sample output shows that one transfer queue was active for the period polled. The data output are the data accumulated for the 15- or 30-minute period prior to the period polled.

MFADS message formats

The format of the data presented on the MFADS interface is controlled by the MFADS FORMAT field. If the FORMAT field is set to FORMAT1 (or FORMAT1A), existing MFADS reports print. (The enhanced MFADS feature continues to collect measurements, but does not provide enhanced MFADS reports.) If the FORMAT field is set to FORMAT2, the enhanced MFADS reports print.

The parameter TOPS_PEG_MODE in Table OFCENG defines the type of PS measurements presented to the MFADS interface. If this parameter is set to IPS, the current call-based (IPS only) measurements are presented. If this parameter is set to PS and the format selection remains FORMAT1 (or FORMAT1A), the format of the MFADS reports is unchanged, but the data presented in the IPS and WV fields are based on the PS and WV measurements of this feature.

Both the FORMAT selection and the type of PS measurements determine the makeup of the MFADS report. One option is to receive reports in the current message format using all IPS-based or all PS-based data for FADS, TADS, SADS, or MFADS measurements.

The other choice is to receive reports in the enhanced MFADS message format with the PS data set to IPS. An IPS setting with a FORMAT2 field selection results in IPS-based pegging for FADS, TADS, or SADS measurements, and PS-based pegging for MFADS measurements only. A PS parameter setting with a FORMAT2 field selection results in all PS-based pegging for FADS, TADS, SADS, or MFADS measurements.

Changes in the FORMAT parameter field become effective in the period following the change.

FORMAT1/FORMAT1A output

Under Busy Hour conditions, certain fields in the MFADS FORMAT1 reports may overflow. The affected fields may be extended in an optional MFADS format, which is selected by datafilling FORMAT1A in the FORMAT field for the MFADS tuple entry in Table TOPSDEV.

The following table explains the output message format for field selection FORMAT1 and FORMAT1A. The value under the Number of characters heading indicates the size of the original MFADS format field (FORMAT1), in characters, followed by a slash (/), and then the size when FORMAT1A has been selected. For example, 5/6 indicates a field size of 5 characters for FORMAT1 and 6 characters for FORMAT1A. Unaffected fields show a single size value.

FORMAT1/FORMAT1A current MFADS message format

Field number	Number of characters	Field description
1	1	Start of message character (ASCII "<" value)
2	6	TOPS office identifier (datafilled in Table OFCENG parameter OFFICE_ID_ON_AMA_TAPE)
3	4	Time – hour/minute corresponds to the last FM 15- or 30-minute report
4	4	Date – day/month
5	2	Number of traffic offices
6	1	Space
7	3	Actual number of ten-second scans in the period (number of scans in the nontransfer [non-XFR] or general [GEN] queue, since it is always active).
8	5/7	Sum of the calls-waiting XCS for the non-XFR, non-XFR recall, and centralized automatic message accounting (CAMA) queues this period. (This number is divided by 10 and rounded to make the unit ten call seconds (XCS).
9	1	Space
10	5/6 for each traffic office	Sum of IPS handled during the period. Includes transfer (XFR1, and XFR2), CAMA, and GEN or non-XFR queues. No calls in the recall queues are counted. (In a multitraffic office, this field is printed repeatedly for each traffic office, starting with traffic office number 1.)
11	1	Space
12	5/7 for each traffic office	Total work volume XCS, including CBWV and NCWV. In a multitraffic office, this field is printed repeatedly for each traffic office, starting with traffic office number 1. (This number is divided by 10 and rounded to make the unit ten call seconds (XCS).
13	1	Space
14	5/6 for each traffic office	Total occupied positions XCS. Transfer and nontransfer positions. (In a multitraffic office, this field is printed repeatedly for each traffic office, starting with traffic office number 1.)

—continued—

FORMAT1/FORMAT1A current MFADS message format (continued)

Field number	Number of characters	Field description
15	2	Additional measurements indicator: • A0 = no additional statistics generated • A1 = transfer 1 statistics generated • A2 = transfer 2 statistics generated • A3 = DA statistics generated
16	1	Space
16a	1	Transfer type of information to follow: • 1 = information for transfer 1 • 2 = information for transfer 2 • 3 = information for DA This field is printed only if Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to Y.
16b	1	Space. This field is printed only if Table OFCVAR parameter TOPS_MFADS_OUTPUT_XFR_NUMBER is set to Y.
17	5/7	Calls-waiting XCS for the appropriate transfer type (XFR1, XFR2, DA). In a multitraffic office, this value is the system transfer type data.
18	5/6	IPS for the appropriate transfer type (XFR1, XFR2, DA). In a multitraffic office, this value is the system transfer type data.
19	5/6	IPS for the appropriate transfer type (XFR1, XFR2, DA). (This field is the same as field 18). In a multitraffic office, this value is the system transfer type data.
20	5/7	For the appropriate transfer type, the work volume accumulated by operators during the period, calculated as in "Call transfer statistics." In a multitraffic office, this value is the system transfer type data.
21	1	Space

—continued—

FORMAT1/FORMAT1A current MFADS message format (continued)

Field number	Number of characters	Field description
22	5/6 for each traffic office	For the appropriate transfer type, the number of calls transferred. In a multitraffic office, this field is printed repeatedly for each traffic office, starting with traffic office number 1.
23	1	Space
24	5/6 for each traffic office	For the appropriate transfer type, total occupied positions at the end of each ten-second scan. In a multitraffic office, this field is printed repeatedly for each traffic office, starting with traffic office number 1.
25	1	End of message character (ASCII ">" sign)
		—end—

Note 1: Before the MFADS format is changed from FORMAT1 to FORMAT1A, the device to which MFADS data is sent must be upgraded to handle the larger field sizes of FORMAT1A.

Note 2: FORMAT2 is unaffected by the existence of FORMAT1A.

FORMAT2 output

The enhanced MFADS report configuration differs from the FORMAT1/FORMAT1A configuration; however, the MFADS message is presented as a fixed-length ASCII field. Numeric fields are decimal and are padded with leading zeros when required. One limitation is that work volumes in FORMAT2 are presented as a six-digit field. This restricts the maximum number of operators supported by the new format to 555 per traffic office (team).

Enhanced MFADS messages are enclosed in message start and end characters. Each message contains two levels of information: message and system data, and a series of traffic office reports. The message and system data portion of an MFADS message includes a TOPS office identifier, time and date of the message transmission, system-level period and queue type (CAMA, GEN, XFR1, XFR2, and DA), service (toll and assist [TA], DA, and intercept [INTC]), and extended nonqueue work volume (NQWV) measurement reports for each traffic office. The output message format for field selection FORMAT2 is illustrated in the following table.

> ***Note:*** If the number of traffic offices is zero, MFADS reports terminate after field 8 with an end-of-transmission character.

FORMAT2 enhanced MFADS message format

Field number	Number of characters	Field description
1	1	Start of MFADS transmission character, indicated by an ASCII "<" character
2	6	The TOPS office identifier datafilled in parameter OFFICE_ID_ON_AMA_TAPE in Table OFCENG
3	4	Time of report transmission (hhmm)
4	4	Date of report transmission (day)(month)
5	4	MFADS period, identifying the actual reporting period in seconds
6	3	Number of ten-second scans that occurred in this reporting period
7	5 x 6	Calls-waiting, presented by queue, based on 10-second scans of each queue type. Each field contains an XCS total of the nonrecall and recall calls-waiting for both active and inactive queues. (Inactive queues have a CW value of zero.)
8	2	Number of active traffic offices
Traffic office 1...n measurements (TO reports) (216 characters per traffic office)		
9	1	End-of-MFADS transmission, indicated by an ASCII ">" character

Traffic office reports

When the enhanced MFADS feature is implemented and FORMAT2 is selected, traffic office reports follow the message and system data message portion of the MFADS report. Traffic office reports begin with data for traffic office 1, are followed by data for traffic office 2, and end with data presented for the last active traffic office.

Each traffic office report contains a series of queue, service, and extended measurement (NQWV) reports. Assuming all queue and service types are active, the order of these reports is as follows:

- CAMA queue
- GEN queue
- XFR1 queue
- XFR2 queue

- DA queue
- TA service
- INTC service
- DA service
- NQWV

Queue reports

Traffic office reports begin with reports for each active queue type. Since the GEN and CAMA queue types are always active, the minimum number of queue reports is two. The maximum number, five, is set by datafill of parameter TOPS_TRANSFER_TYPES in Table OFCENG for the optional XFR1, XFR2, and DA queue types.

The order of the queue reports is fixed. When each queue report is transmitted, the type of report is determined by a header field that identifies queue type. For example, if TOPS_TRANSFER_TYPES defines DA as the only active optional queue type, a total of three queue reports are transmitted for each traffic office. When these queue reports are transmitted, the queue types are identified by the header fields Q0 and Q1 through Q4. The output message format for field selection FORMAT2 is illustrated in the following two tables.

CAMA queue (Q0) report format

Field number	Number of characters	Field description
1	2	Queue type, always Q0 for CAMA queue
2	6	The number of IPS for queue types in the current MFADS period
3	6	CBWV for CAMA traffic office queue type

GEN, XFR1, XFR2, and DA (Q0, Q1, Q2, and Q3) queue report formats

Field number	Number of characters	Field description
1	2	Queue type, where Q0 = GEN, Q1 = XFR1, Q2 = XFR2, and Q3 = DA queues
2	6	The number of IPS for queue types in the current MFADS period
3	6	The number of TPS for queue types in the current MFADS period
4	6	The number of RPS for queue types in the current MFADS period
5	6	CBWV for the traffic office queue type, Q0 through Q3, in seconds
6	6	NCWV for the traffic office queue type, Q0 through Q3, in seconds
7	6	Idle work volume time for the traffic office queue type, Q0 through Q3, in seconds

Service reports

After the active queue reports are produced, enhanced MFADS presents service reports for the TA, DA, and INTC services. The order of the service reports is fixed, and the reports are presented only for active services. Transmission of the optional DA and INTC reports is determined by datafill in Table SERVICES. Each service report includes a header that identifies the service type being reported. The output message format for field selection FORMAT2 is illustrated in the following table.

TA, DA, and INTC (S0,S1, S2) service report formats

Field number	Number of characters	Field description
1	2	Service type S0 = TA, S1 = DA, and S2 = INTC services
2	6	Service initiations, total number occurring for the service type in the current MFADS period
3	6	Service work volume, total WV for the service type in the current MFADS period

Extended measurement report

Once the service reports are produced, enhanced MFADS presents the extended measurement report. This report specifies the NQWV for enhanced MFADS total WV calculations. The output message format for field selection FORMAT2 is illustrated in the following table.

NQWV extended measurement report

Field number	Number of characters	Field description
1	2	Measurement type of the data in this report (for this feature, limited to the value MO)
2	6	NQWV for the traffic office in the current MFADS period

STATSPAC force management capability

STATSPAC is an optional feature for generating FM statistics. When connected to an operating company-provided device, it delivers raw data about every operator logged on during a defined interval.

The STATSPAC feature eliminates the need for study registers by sending all FM data directly to the operating company device. This feature provides the raw data needed for the operating company to perform its own statistical analysis. It also allows the operating company to choose the format of the report.

The following raw data are delivered to the operating company device for each 15- or 30-minute time interval:

- operator number
- operator team number
- number of logons and logoffs
- operator idle time in seconds
- IPS for each call type
- work volume for each call type

Enhanced MFADS does not apply to STATSPAC measurements and study registers. STATSPAC is implemented in a separate database and is not affected by parameter TOPS_PEG_MODE. PS-based measurements do not replace IPS-based measurements for the STATSPAC feature.

QMFADS reports

When an operating company has QMS, reports are printed on the QMFADS device. The following section describes the format used to print the QMFADS mechanized reports.

> ***Note:*** Parameter QMSFM_BASIC in Table TQMSOPT enables or disables the collection and reporting of TOPS QMS basic statistics. When this parameter is set to N, the DMS does not generate reports at QMFADS, QFADS, or QTADS devices, or update real-time QMS information on the FMCRT, IC, or SA positions. Operator feedback statistics are frozen. **L**, **P**, **F**, **R**, and **C** commands are disabled. Setting QMSFM_BASIC to N saves CPU time that would have been spent collecting, collating, and reporting system data. When QMSFM_BASIC is set to Y (the default), the DMS generates real-time displays and reports and enables QMS force management commands.

QMFADS report format

Data in a QMFADS mechanized report is presented in fixed-length ASCII fields. When required, numeric fields are padded with leading zeros.

QMFADS reports are encapsulated within report begin and end characters. Each report contains report/system general information, as well as information on QMS queues, QMS teams, and QMS services.

A QMFADS report prints a record for a traffic office if and only if that traffic office is datafilled with an ACD type of QMS in Table TEAMACD.

The report/system information portion of a QMFADS mechanized report includes a TOPS office identifier, the time and date of the report transmission, and the length of the report period.

The following table illustrates the QMFADS report format.

QMFADS report format

Field number	Number of characters	Field description
1	1	Start of QMFADS transmission character, indicated by an ASCII "<" character
2	6	TOPS office identifier datafilled in parameter OFFICE_ID_ON_AMA_TAPE in Table OFCENG

—continued—

QMFADS report format (continued)

Field number	Number of characters	Field description
3	4	Starting time of QMFADS report transmission in a 24-hour (hhmm) format
4	4	Starting date of QMFADS report transmission in a month day (mmdd) format
5	4	QMFADS period, identifying the actual reporting period of the QMADS report, in seconds
Note: At 15-minute intervals, QMS FM statistics are collected into one of two alternating sets of buffers. At any given time, one buffer contains data currently being collected, while the other contains measurements for the preceding period. This second buffer is used in all the QMS FM reports. The buffers are switched after every 15-minute period. The actual time when this switch occurs is subject to small system discrepancies and may not happen exactly on the 15-minute boundary. Thus, the measurements in a QMFADS report may represent data collected over a period slightly greater or less than 15 minutes. This field shows the actual reporting period, which is the measurement used in calculating AOP.		
6	2	Number of call queues (the total number of QMS call services reported on)
Note: CW is the total amount of time (in seconds) that calls spent waiting in a particular queue. The number of call queues is needed in order to determine the number of CW records. One CW record is sent for each QMS call queue. It records the total amount of CW time pegged against a queue during the last QMFADS report period. The QMFADS report sends CW records for QMS call queues 0 to (QMSFM_NUM_SERVICES–1), in numerical order.		
Call waiting record (8 characters per record)		
		.
		.
		.
7	2	Number of traffic office (team) records sent with the report
Traffic office record		

—continued—

QMFADS report format (continued)

Field number	Number of characters	Field description
		.
		.
		.
8	1	End of QMFADS transmission character, indicated by an ASCII ">" character

—end—

Traffic office record format

The following table shows the format of a QMS traffic office (team) record.

Traffic office record format

Field number	Number of characters	Field description
1	2	Traffic office (a two-digit ID between 1 and 30, identifying the traffic office to which this record corresponds)
2	8	The amount of non-call work volume (NCWV) pegged against this traffic office during the report period, measured in seconds
3	8	The amount of idle time (IDLT) pegged against this traffic office during the report period, measured in seconds
4	8	Average occupied positions work volume (AOPWV)
Note: This work volume measurement, in seconds, is necessary to accurately calculate the average occupied positions and percent occupancy for the traffic office. The value of this measurement differs from the sum of the NCWV and CBWV generated by operators in the traffic office. For more information on how AOPWV is measured, see "Calculating AOP and %OCC," in the chapter "Force management measurement definitions" earlier in this document.		
5	8	Average occupied positions idle time (AOPIDLT)

—continued—

Traffic office record format (continued)

Field number	Number of characters	Field description
Note: The idle time measurement, in seconds, is necessary to accurately calculate the average occupied positions and percent occupancy for the traffic office. The value of this measurement differs from the value of the IDLT measurement.		
6	2	Number of QMS call queue records sent in the traffic office record. (The value in this field equals the value of the office parameter QMSFM_NUM_SERVICES in Table OFCENG.)
Call queue record (26 characters per call queue record)		
		.
		.
		.
7	2	Number of QMS call queue records sent in the traffic office record. (The value in this field equals the value of the office parameter QMSFM_NUM_SERVICES in Table OFCENG.)
Service record (14 characters per service record)		
		.
	,	.
		.
—end—		

One traffic office record is sent for each traffic office datafilled as QMS in Table TEAMACD.

Queue record format

The following table shows the format of a QMS call queue record.

Queue record format

Field number	Number of characters	Field description
1	6	The number of initial position seizures (IPS) pegged against the queue in the report period
2	6	The number of recall position seizures (RPS) pegged against the queue in the report period
3	6	The number of transfer position seizures (TPS) pegged against the queue in the report period
4	8	The amount of call busy work volume (CBWV) pegged against the queue in the report period, measured in seconds

The first queue record contains data for call queue 0, the second contains data for call queue 1, the third contains data for call queue 2, and so forth. The number of call queue records sent for each traffic office equals the value of the new office parameter QMSFM_NUM_QUEUES in Table OFCENG.

The data sent in a queue record is accumulated only for calls of that queue type that were handled by operators in the associated team. Data for calls handled by other teams is sent in the queue records for those teams.

Service record format

The following table shows the format of a QMS service record.

Service record format

Field number	Number of characters	Field description
1	6	The number of times a service initiation (SI) was pegged against this service during the report period
2	8	Service work volume (SWV), the total amount of call work volume pegged against this service during the report period, measured in seconds

The first service record contains data for service 0, the second contains data for service 1, the third contains data for service 2, and so forth. The number of service records sent to the QMFADS device equals the value of the office parameter QMSFM_NUM_SERVICES in Table OFCENG.

Interactions with TOPS ACD MFADS

The QMFADS device may exist in the same office as a TOPS ACD MFADS device. When this combination occurs, the MFADS device continues to print reports for traffic offices 1 up to the number specified in the parameter TOPS_MAX_TRAFFIC_OFFICES, even for traffic offices that are datafilled as QMS in Table TEAMACD.

When reports for traffic offices datafilled as QMS in Table TEAMACD are printed at MFADS devices, however, all fields are zeroed. Traffic office information for traffic offices datafilled as QMS in Table TEAMACD should be discarded from the MFADS reports.

Using the QMFADS device

A QMFADS report is sent to the QMFADS device following the QMSFM_POLLING_ID parameter in Table TQMSOPT. Each report contains data gathered during the preceding 15-minute period. For instance, a report printed at 1:17 would contain the data accumulated from between 1:00 and 1:15.

After the polling ID is received, the DMS formats a buffer with the QMS force management data collected from the previous period and sends it to the QMFADS device. The DMS can transmit data at either 300 or 1200 bps. If the entire report cannot be sent during 15 minutes, there is a risk of missing some reports. This should be noted when datafilling services and traffic offices, and when determining a modem baud rate.

If a report requires too much time, the QMFADS prints a message. Receiving this message indicates that the number of queues needs to be reduced.

ACD TTY commands, queries, and reports

This chapter describes the commands and queries entered at the system administration data system (SADS), force administration data system (FADS), and traffic office administration data system (TADS) teletypewriters (TTYs) and the reports generated by them. The TTYs referred to in this chapter are defined in the chapter "Work force office configurations" later in this document.

The TTY commands, queries, and reports described in this chapter apply to automatic call distribution (ACD). The following chapter, "QMS TTY commands, queries, and reports," describes the commands, queries, and reports used in the Queue Management System (QMS).

The non-QMS commands, queries, and reports discussed in this chapter are grouped according to their functions as follows:

- force management (FM) and traffic office (TO) periodic reports
- operator feedback system
- operator study data system
- call transfer
- controlled traffic
- broadcast messages
- position control
- password administration
- call distribution
- silence Sonalert tone
- position information
- information on operators
- hotel billing information center (HOBIC) state control group

The following table lists the commands discussed in this chapter and identifies the section where they are described.

Subsection to commands, queries, and reports cross-reference

Subsection	Command/query/report
FM and TO reports	M15, M30, FM15, FM30, FM6HR, FM24HR, TO15, TO30, TO6HR, TO24HR
Operator feedback system	FD, FI, FZ
Operator study data system	RA, RR, RQ, RD, RT
Call transfer	X..I, X..X, XA, XD, X
Controlled traffic	T..I, T..X, T
Broadcast messages	B, BX, BE
Position control	O, I
Password administration	WP, WI, WD, WA, WR
Call distribution	AM, AX, AD, AQ
Silence Sonalert tone	S
Position information	O
Information on operators	L, P
HOBIC control state group	HO, HI, H

In many cases, commands and queries are not available on all of the TTY types. A command may be available at a FADS and SADS TTY, for example, but not at a TADS TTY. Such restrictions are indicated in the command description. These restrictions are based on the office configuration in use. In addition, the following table provides a list of the TTY devices and the commands they accept.

Device to command cross-reference

Device	Commands it accepts
SADS	M15, M30, FD, FI, FZ, RA, RR, RQ, RD, XA, XD, X...I, X...X, X, T...I, T...X, T, B, BX, BE, O, I, WP, WI, WD, WA, AM, AX, AD, AQ, L, P, HO, HI, H
TADS	M15, M30, FD, FI, FZ, RA, RR, RQ, RD, X...I, X...X, X, T...I, T...X, T, B, BX, BE, O, I, WP, WI, WD, WA, L, P, HO, HI, H
FADS	M15, M30, RT, XA, XD, B, BX, BE, WP, WR, AM, AX, AD, AQ, S, HO, HI, H

In this chapter, an input prompt (>) indicates that the subsequent information is a command. Capital letters represent commands, fixed parameters, and responses from the TTY. Enter the command or fixed parameter exactly as it appears on the page. Lowercase letters represent variables. For commands and parameters, enter the letters or numbers that the variable represents. At the TTY, type in the command and press the **Return** key. All commands and queries entered at the TTY must be followed by a carriage return.

When any part of a command is not accepted by the system, a question mark (?) is printed at the TTY on which the command was issued, and no action is taken.

FM and TO periodic reports

The FADS TTY allows the force supervisor to print and modify system information without reference to individual operators. The four FM and four TO periodic reports listed in the following table provide force management data.

FM and TO periodic reports

Reports	Purpose
FM15 and TO15	Provide 15 minutes of data accumulation
FM30 and TO30	Provide 30 minutes of data accumulation
FM6HR and TO6HR	Provide 6 hours of data accumulation
FM24HR and TO24HR	Provide 24 hours of data accumulation

The FM reports are printed at a FADS TTY for a multitraffic office configuration and at a SADS TTY for a single-traffic office configuration.

The TO reports apply to a multitraffic office configuration only. They are printed in the traffic office at the TADS TTY.

Except for FM15 and TO15, all the reports are generated automatically at specified time intervals. These intervals are all relative to the system start-of-day time, which is set by the operating company through an office parameter.

In a multitraffic office, the TO reports provide data for the whole system and for the traffic office in which they are generated. The FM reports provide overall system data and data for each traffic office within the multitraffic office configuration.

All of the FM and TO reports start with a header that specifies the type of report, the time period covered, the date, and the actual number of scans made by the DMS during that time period.

Enhanced MFADS

The enhanced MFADS feature allows extension of the position seizure (PS) measurements from initial position seizure (IPS) only to include IPS, transfer position seizures (TPS), and recall position seizures (RPS). The way to extend the PS measurements is to change the setting of the TOPS_PEG_MODE parameter in Table OFCENG to PS instead of IPS. The extended PS and work volume (WV) measurements replace the IPS and WV measurements used in FADS or TADS reports.

The only visible change to the FADS or TADS display format is that IPS labels are replaced by PS labels. (The French display changes from PPP to PP when this parameter is sent to PS.)

The following are the primary changes in the data presented:

- The IPS data fields are replaced with total PS, (where PS is the sum of IPS + TPS + RPS), for the respective system- and queue-level displays.
- PS replaces IPS in the calculation of AWT and other calculations that rely on IPS only.

With a PS setting, the resulting display reflects statistics for each seizure rather than each call.

When the enhanced MFADS feature is implemented, caution should be exercised when changing the parameter TOPS_PEG_MODE to either IPS or PS. If that parameter is changed, the 30-minute, 6-hour, and other FM reports will reflect a mixture of IPS and PS pegging procedures. To avoid ambiguous reports, this parameter should be changed only before the start-of-day defined in Table OFCENG or before a cold restart.

Contents of periodic reports

The information shown in the following table appears in the periodic reports.

TOPS MP status displays in periodic reports

Printed display	Meaning
`IPS` (initial position seizures)	Is increased by one when any new call reaches an operator position. (This does not include recalls.)
`WV-CCS` (work volume in hundred call seconds)	Reflects the work volume accumulated by all operators whenever they are unavailable to receive a new call for any reason.
`CW-CCS` (calls waiting in hundred call seconds)	Reflects the number of calls waiting for an idle operator during the sample period.
`AWT` (average work time)	Reflects the average work time of the operator work force. AWT is measured by dividing the work volume accumulated (in seconds) by the number of IPS.
`ANS` (answer)	Reflects the answer delay encountered by customers waiting for an operator. ANS is measured by dividing the calls waiting for an operator by the number of IPSs added within the sample period.
`AOP` (average occupied positions)	Reflects the average number of positions occupied within the sample period.
`BDH` (board hours)	Reflects the total number of positions occupied during the report period. BDH is calculated by multiplying AOP by the report period expressed in hours.
`%OCC` (percent occupancy)	Reflects the ratio of operator time spent handling calls to the total time operators are assigned. %OCC is calculated by dividing CBWV + NCWV + IDLT into CBWV + NCWV and multiplying by 100 to obtain a percentage.

Note: Not every field in this list appears on every report. For example, FM15 and FM30 do not include BDH.

Report contents when call transfer is active

If the call transfer feature is active, statistics are also included to break the global statistics into their nontransfer and transfer components. The information for each active transfer type is printed separately.

If call transfer is active, the information shown in the following tables is included in all the periodic reports printed at the FADS and TADS.

For nontransfer calls, the system information in the following table is printed.

Displays for non-XFR calls

Printed display	Definition
IPS	Total IPS for all operators able to handle non-XFR calls
WV-CCS	Total accumulated work volume for all operators able to handle non-XFR calls
AWT	Ratio of accumulated work volume to IPS for all operators
AOP	Average occupied positions for all operator positions that are able to handle only non-XFR calls (no XFR capability)
%OCC	Ratio of operator time spent handling calls to the total time operators are assigned to positions for handling calls
ANS	The number of seconds the average call waits for attachment to a position during a given period
CW-CCS	Calls waiting, expressed in hundred call seconds

The traffic office information shown in the following table is also included in the reports. (The FADS provides statistics for all traffic offices, but the TADS provides statistics only for the traffic office in which it is located.)

Traffic office information displays for nontransfer reports

Display	Definition
AOP	Shown as for the system AOP, but for each traffic office
AWT	Shown as for the system AWT, but for each traffic office. (This AWT, however, is weighted. It allows for the difference between the percentage of nontransfer positions in each traffic office and in the system.)

For transfer calls, the system information in the following table is printed (one report for each active transfer type).

Displays for transfer calls

Printed display	Definition
`IPS`	Total IPS for all operators able to handle calls of the given transfer type
`WV-CCS`	Total accumulated work volume for all operators able to handle calls of the given transfer type
`CW-CCS`	Volume of calls waiting in the given transfer queue
`AWT`	Ratio of accumulated work volume to IPS for all operators able to handle the given transfer type
`ANS`	Ratio of calls waiting in the given transfer queue to the IPS pegged for calls of the given transfer type
`AOP`	For transfer 1 (XFR1) report, all operators who have XFR1 call-handling capability but not transfer 2 (XFR2) For XFR2 report, all operators who have XFR2 call-handling capability
`XFR OUT`	The number of calls transferred from one position to another. This field is unique to transfer reports.
`%XFR`	Ratio of total calls transferred (for the given transfer type) to the total of nontransfer calls. This field is unique to transfer reports.
`%OCC`	Ratio of the portion of operator time spent handling calls to the total time operators are assigned to positions for that purpose

The traffic office information shown in the following table is also included in the transfer reports. (The FADS provides statistics for all traffic offices, but the TADS provides statistics only for the traffic office in which it is located.)

Traffic office information displays for transfer reports

Display	Definition
`AOP`	Shown as for the system AOP, but for each traffic office.
`AWT`	Shown as for the system AWT, but for each traffic office.

For more information about these fields, including how they are calculated, refer to the chapter "Force management measurement definitions" earlier in this document.

FM15 and TO15 reports

The periodic 15-minute accumulation of force management statistics is necessary for analyzing the distribution of work volume CCS within half hours. The preparation of basic schedules and the weekly force-estimating process both require knowledge about quarter-hourly work volume distribution. Fifteen-minute statistics, accumulated for the same period over several days, often indicate how the operator schedules can be fine-tuned to achieve service and efficiency.

Since the 15-minute reports do not print automatically, a command (M15) must be entered at the TTY to request their output. If the command is entered at a SADS or FADS, FM15 reports are printed. If the command is entered at a TADS, TO15 reports are printed. The following example illustrates the format of the command. Always press **RETURN** after typing a command (except in the case of the S command, used to silence the Sonalert).

Enter the following command at a SADS, FADS, or TADS TTY:

>M15

The TTY responds in the following way:

```
M15 OK
```

The 15-minute report prints every 15 minutes until the M30 command is entered to halt printing. To stop the printing of FM15 reports, enter the M30 command at the SADS or FADS, whichever applies. To stop the printing of TO15 reports, enter the M30 command at the TADS. The following example illustrates the format of the command.

Enter the following command at a SADS, FADS, or TADS TTY:

>M30

The TTY responds in the following way:

```
M30 OK
```

Examples of FM15 and TO15 reports

The FM15 periodic report is printed at a SADS. The TO15 periodic report is printed at a TADS. Examples of these reports are shown in the following figure. FM15 periodic reports are also printed at a FADS. FM15 periodic reports printed at a FADS include all of the information listed in the following figure as well as the IPS or PS, WV-CCS, ANS, AWT, AOP, and %OCC for each traffic office within that system.

If call transfer is active in a multitraffic office, statistics are provided on a queue basis (general [GEN], XFR1, XFR2, and directory assistance [DA]).

Examples of FM15 and TO15 periodic reports

```
FM15  05:45-06:00    89/03/02   90 SCANS

       IPS   WV-CCS   ANS  CW-CCS   AWT  AOP   %OCC
SYST    12        2   0.0       0  18.2  1.9     13
NCAMA    9        2   0.0       0  21.9
CAMA     3        2   0.0       0   4.7


TO15  12:45-13:00    89/03/12   90 SCANS

         IPS WV-CCS   ANS  CW-CCS  AWT    AOP  %OCC
SYST     269     56   1.6       4  20.6   8.4    73
NCAMA    157     48   1.5       2  30.8
CAMA     112      6   1.7       2   5.3

TO 2     176     35                 19.9  5.4    72
```

> ***Note:*** If the enhanced MFADS feature is in effect, and parameter TOPS_PEG_MODE in Table OFCENG is set to PS, then all the periodic reports show PS instead of IPS statistics.

FM30 and TO30 reports

The 30-minute reports are printed automatically every 30 minutes on the hour and half hour. No TTY command is required to generate the 30-minute report. The FM30 reports are printed at the SADS or FADS TTY. The TO30 reports are printed at the TADS TTY.

Examples of FM30 and TO30 reports

The following figure provides an example of an FM30 periodic report printed at a SADS in a single-traffic office that has call transfer active. TO30 reports provide the same information; however, in addition to providing the system statistics, they also provide the statistics for the traffic office in which they are printed.

> ***Note:*** When call transfer is active, statistics are broken down by queue (GEN, XFR1, XFR2, and DA).

Examples of FM30 periodic reports with call transfer (single-traffic office)

```
 FM30  11:00-11:30    89/03/02   180  SCANS

        IPS  WV-CCS    ANS   CW-CCS    AWT   AOP   %OCC
SYST    155      49    2.2        4   32.2  13.0    21
NCAMA   107      36    2.2        2   33.4
CAMA     16       1    2.2        0    7.2

NON XFR  OPRS
        IPS  WV-CCS    ANS  CW-CCS   AWT   AOP   %OCC

SYST     59      18    2.2       1  29.7  5.0   20

XFR 1  OPRS   11:00-11:30   180 SCANS   %XFR = 39.0
        IPS  WV-CCS    ANS  CW-CCS   AWT  AOP   %OCC  XFR OUT

SYST    32        7    2.8       1  21.9  2.0    19       23

XFR 2  OPRS   11:00-11:30   180 SCANS   %XFR = 15.2

        IPS  WV-CCS    ANS  CW-CCS   AWT  AOP   %OCC  XFR OUT

SYST    32       12    2.8       1  38.7  3.0    23        9

XFR DA  OPRS   11:00-11:30   180 SCANS   %XFR = 15.2
        IPS  WV-CCS    ANS  CW-CCS   AWT  AOP   %OCC  XFR OUT

SYST     32      12    2.8       1  38.7  3.0    23        9
```

The following figure provides an example of the FM30 report printed at a FADS. The statistics provided in this report are for all of the traffic offices in the system.

Examples of FM30 periodic reports with call transfer (multitraffic office)

```
 FM30  15:00-15:30    89/03/02   180  SCANS

         IPS  WV-CCS   ANS  CW-CCS    AWT   AOP %OCC
SYST    3794    866    0.6      22   22.8  55.9   86
NCAMA   2960    782    0.6      18   26.4
CAMA     834     54    0.5       4    6.5

TO 1    1352    290                  21.4  18.6   87
TO 2    2436    550                  22.6  35.2   87
TO 3       6     26                 432.2   2.2   67
NON XFR  OPRS
        IPS   WV-CCS   ANS  CW-CCS    AWT   AOP  %OCC

SYST    3788     840   0.6      22   22.2  53.8   87

TO 1    1352     290                 21.4  18.6
TO 2    2436     550                 22.6  35.2
TO 3       0       0                    0     0
XFR 1  OPRS   15:00-15:30   180 SCANS   %XFR =   0.0
                                                       XFR
         IPS  WV-CCS    ANS  CW-CCS    AWT   AOP  %OCC  OUT

SYST       0       0      0       0      0     0     0    0

TO 1       0       0                     0     0          0
TO 2       0       0                     0     0          0
TO 3       0       0                     0     0          0
XFR 2  OPRS   15:00-15:30   180 SCANS   %XFR =   0.0
                                                       XFR
         IPS  WV-CCS    ANS  CW-CCS    AWT   AOP  %OCC  OUT

SYST       0       0      0       0      0     0     0    0

TO 1       0       0                     0     0          0
TO 2       0       0                     0     0          0
TO 3       0       0                     0     0          0
XFR DA  OPRS   15:00-15:30   180 SCANS   %XFR =   0.0
                                                       XFR
         IPS  WV-CCS    ANS  CW-CCS    AWT   AOP  %OCC  OUT

SYST       6      22      0       0  370.7   2.2    57    0

TO 1       0       0                     0     0          0
TO 2       0       0                     0     0          0
TO 3       6      22                 370.7   2.2          0
```

FM6HR and TO6HR reports

The 6-hour reports are automatically printed 6, 12, 18, and 24 hours after the system start of day. The 6-hour reports provide call type summaries. In addition, the AOP is converted to BDH.

Examples of FM6HR and TO6HR reports

The following figure provides an example of an FM6HR periodic report printed at a SADS TTY and a TO6HR periodic report printed at a TADS TTY. In the FM6HR periodic reports printed at a FADS, statistics are provided for each traffic office in the system. If call transfer is active in the office, the statistics are provided on a per-queue basis (GEN [or non-XFR], XFR1, XFR2, and DA).

Examples of FM6HR and TO6HR periodic reports

```
 FM6HR  00:00-06:00    89/03/02   2160  SCANS

          IPS  WV-CCS    ANS  CW-CCS    AWT   BDH %OCC
SYST      350     127    1.6       6   36.2  12.3   29
NCAMA     291     124    1.8       5   42.1
CAMA       59       3    0.7       0    5.1

SYST CALL       IPS     AWT
TYPE

DELAY             3    11.3
RECALLS           2     5.0
CAMA-1+          59     5.1
OVERSEAS          5    70.2
NCN-0MINUS      114    63.4
CN-0MINUS        59    29.6
NCN-0+           46    26.2
CN-0-1+          22    22.3
HOTEL            39    26.6
COMBINED          3    36.3

 TO6HR  00:00-06:00    89/03/02   2160  SCANS

           IPS WV-CCS    ANS  CW-CCS    AWT   BDH %OCC
SYST       444   134     0.8       4   30.3  13.9   27
NCAMA      353   127     0.8       3   36.0
CAMA        91     6     1.0       1    6.8
TO 2       444   134                   30.3  13.9   27

SYST CALL       IPS    AWT
TYPE

DELAY             0     0
RECALLS           1   3.0
CAMA-1+          91   6.8
OVERSEAS         14   61.4
NCN-0MINUS      139   44.6
CN-0MINUS        59   35.6
NCN-0+           50   30.9
CN-0-1+          50   18.9
HOTEL            39   23.2
COMBINED          2    8.0
```

FM24HR and TO24HR reports

The 24-hour reports provide force management data for the previous 24 hours. They are generated automatically at the start of day. In the 24-hour reports, AOP is converted to BDH.

Examples of FM24HR and TO24HR reports

The example of the FM24HR periodic report provided in the following figure is printed at a SADS. The TO24HR periodic report includes the system statistics and the individual statistics for the traffic office in which the report is printed.

FM24HR periodic reports printed at a FADS include system statistics and the statistics for each traffic office in the system. In addition, if call transfer is active, the statistics are broken down by queue (GEN [or non-XFR], XFR1, XFR2, and DA).

Example of FM24HR periodic report

FM24HR 06:00–06:00 90/03/12 8640 SCANS

	IPS	WV-CCS	ANS	CW-CCW	AWT	BDH	%OCC
SYST	22308	5152	2.2	482	23.1	200.2	71
NCAMA	13715	4622	2.4	335	33.7		
CAMA	8593	511	1.7	147	5.9		
TO1	7953	1786			22.4	76.9	65
TO2	14355	3376			23.5	123.4	76

SYST CALL TYPE

	IPS	AWT
RECALLS	220	31.7
CAMA-1PLUS	8593	5.5
OVERSEAS	56	37.1
NCN-0MINUS	5441	39.2
CN-0MINUS	2383	33.9
NCN-0PLUS	2945	28.9
CN-0PLUS	1528	31.5
HOTEL	1332	25.8
COMBINED	30	80.9

TO1 CALL TYPE

	IPS	AWT
RECALLS	82	28.1
CAMA-1PLUS	3073	5.1
OVERSEAS	24	53.0
NCN-0MINUS	1953	39.4
CN-0MINUS	837	38.8
NCN-0PLUS	1053	28.5
CN-0PLUS	520	28.7
HOTEL	482	23.9
COMBINED	11	56.6

TO2 CALL TYPE

	IPS	AWT
RECALLS	138	33.9
CAMA-1PLUS	5520	5.7
OVERSEAS	32	50.0
NCN-0MINUS	3488	39.1
CN-0MINUS	1546	34.5
NCN-0PLUS	1892	29.9
CN-0PLUS	1008	33.2
HOTEL	850	26.9
COMBINED	19	75.4

The example of the TO24HR periodic report provided in the following figure is printed at the TADS.

Example of TO24HR periodic report

```
>TO24HR  00:00–00:00   90/03/02   8640 SCANS

           IPS   WV-CCS   ANS  CW-CCS    AWT     BDH   %OCC

 SYST     22308     5152   2.2     482   23.1   200.2    71
 NCAMA    13715     4622   2.4     335   33.7
 CAMA      8593      511   1.7     147    5.9

 TO2      14355     3376                 23.5   123.4    76


SYST CALL TYPE            IPS       AWT

RECALLS                   220      31.7
CAMA-1PLUS               8593       5.5
OVERSEAS                   56      37.1
NCN-0MINUS               5441      39.2
CN-0MINUS                2383      33.9
NCN-0PLUS                2945      28.9
CN-0PLUS                 1528      31.5
HOTEL                    1332      25.8
COMBINED                   30      80.9

TO 2 CALL TYPE            IPS       AWT

RECALLS                   138      33.9
CAMA-1PLUS               5520       5.7
OVERSEAS                   32      50.0
NCN-0MINUS               3488      39.1
CN-0MINUS                1546      34.5
NCN-0PLUS                1892      29.9
CN-0PLUS                 1008      33.2
HOTEL                     850      26.9
COMBINED                   19      75.4
```

Operator feedback system

The operator feedback system provides online individual operator feedback. A pair of software registers are provided in the DMS for each operator. Based on the operator logon identification number, one register accumulates the number of IPS or PS arriving at the operator position. The second register gathers work volume usage for the operator. The registers are automatically initialized (reset to zero) at the start of each day.

Operators can request a display of their feedback data at their screen or request a hardcopy at the office TTY. Management personnel can also request a printout of an individual operator's data by issuing commands at the TTY. The feedback consists of the operator's identification number, the date and time, the number of IPS or PS, the AWT, and the system work time. The three TTY commands listed in the following table are used to administer the operator feedback system.

Operator feedback system commands

Command	Purpose
FD	Prints the feedback data for a specific operator
F1	Prevents an operator from zeroing out the feedback registers
F2	Restores the operator's ability to zero out the feedback registers

Note: The operator feedback system applies only to general operator IDs. It does not apply to the in-charge (IC) and service assistance (SA) positions.

FD command

The FD command allows management personnel to request feedback data on any operator in the office. After the command is issued, the system responds by printing out the operator number, the date and time, the operator's accumulated IPS or PS, AWT, and the system work time for the period from the start-of-day to the time the request is made.

Note 1: The operators can request a copy of their feedback data by pressing the **{Print Stats}** softkey at the TOPS MP operator position. This request resets the feedback registers unless parameter TOPS_ZERO_FB_REG in Table OFCVAR is set to N or the FI command is issued at the TTY to prevent the zeroing of the registers.

Note 2: The appearance of the system AWT can be prevented from printing out by using the data modification order routing. Set OFCVAR parameter TOPS_DISPLAY_AWT to N if the SYST information is not to appear on the operator position screen or on the printout.

Enter the following command at a SADS or TADS TTY:

>FD operator_number

For example:

>FD303

The TTY responds in the following way:

```
OPR  #303  89/03/02   14:47
IPS   601
AWT   34.0
SYST  35.0
```

FI command

Using the FI command, management personnel can prevent operators from zeroing out their feedback registers from the operator position by denying them write access to these registers.

Enter the following command at a SADS or TADS TTY:

>FI operator_number

For example:

>FI303

The TTY responds in the following way:

```
F OK
```

An option is available though the DMO routine to prevent all operators from zeroing out their feedback registers. Set Table OFCVAR parameter TOPS-ZERO_FB_REG to N to prevent all operators from zeroing out their feedback registers.

FZ command

The FZ command allows management personnel to restore the ability to zero out feedback registers from the operator position. Enter the following command at a SADS or TADS TTY:

>FZ operator_number

For example:

>FZ303

The TTY responds in the following way:

```
F OK
```

Operator study data system

The operator study data system collects productivity and efficiency data for up to 900 operators in an office at any given time and provides an enhancement to the operator feedback system. Study registers are used to accumulate data for each assigned operator. The study registers are automatically initialized daily, at the system start-of-day. Data ceases to be accumulated when the operator leaves the position.

The operator study data system provides accumulated IPS, AWT, and SYST measurements, broken down into call type groups. A maximum of 15 call type groups can be assigned to study registers.

When the optional MFADS feature is implemented (the TOPS_PEG_MODE parameter in Table OFCENG set to IPS), the IPS and AWT fields of the TOTAL line are based on IPS only. However, if the optional enhanced MFADS feature is implemented by setting the TOPS_PEG_MODE to PS, the operator TOTAL statistics are modified to reflect total PS (IPS + TPS + RPS), rather than IPS-only totals.

Position seizure reports are identified by a PS column title in the report header instead of IPS. In these reports, the operator TOTAL (line 3) indicates total position seizures in the PS column and a PS-based AWT in the AWT column. All remaining call class (CALL TYPE) lines of these reports are unchanged.

For example, a PS extension produces a report like the following:

```
STUDY  OPR 112 89/01/06  08:15

   CALL TYPE      PS    AWT   SYST
   TOTAL          499   30    27
   RECALLS        11    28    30
   CAMA           41    5     6
   OVERSEAS       7     22    40
   NCN-0MINUS     164   34    30
   CN-0MINUS      38    33    31
   NCN-0+         158   34    28
   CN-0-1+        58    23    32
   HOTEL          14    29    27
   COMBINED       8     27    51
```

The five TTY commands listed in the following table are used to administer the operator study data.

Operator study data commands

Command	Purpose
RA	Assigns an operator number to the operator study data system
RR	Releases the study register assigned to an operator number
RT	Applies to multitraffic office configurations only and is issued from a FADS. The RT command releases all of the study data registers assigned to a given traffic office.
RQ	Lists the operator numbers assigned to a study register. Also, at the FADS TTY, this command prints the number of study data registers assigned to each traffic office.
RD	Prints an operator's accumulated study data

RA command

The RA command is used to assign an operator number to the operator study data system. When the command is issued, the DMS immediately begins to accumulate study data (IPS and work volume by call type group) for the operator assigned and for the call types associated in Tables CLASSNAM and CLASSDEF.

Enter the following command at a SADS or TADS TTY:

>RA operator_number

For example:

>RA243

The TTY responds in the following way:

```
R OK
NO STUDY REG (no study registers available)
```

The maximum number of study registers that can be made available for assignment is 900. If all study registers have been assigned and the RA command is entered at the TTY, the system response is `NO ST REG`. This message is also displayed on the IC position screen when all registers have been assigned.

Parameter TOPS_DISPLAY_ST in Table OFCVAR can be activated to display `ST` on the operator position screen. This notifies the operator that the operator number has been assigned to a study register.

RR command

The RR command releases the study register assigned to an operator number. When the RR command is issued, the system releases the study register associated with the specified operator number and prints the study data accumulated up to that point. The printed data shows operator number, date, time, IPS, and AWT by call type for the operator and system AWT by call type for the period from the start of the day up to the time the command was entered.

When the RR command is issued, data ceases to be accumulated for the given operator number, and the study register becomes available for reassignment. To release a study register, enter the following command at a SADS or TADS TTY:

>RR operator_number

For example:

>RR333

The TTY responds in the following way:

```
   TO STUDY OPR 333 91/03/02 23:02

 CALL TYPE        IPS     AWT    SYST
 TOTAL            543     34      27
 DELAY              0      0       0
 RECALLS           14     29      35
 CAMA-1+           55      9       6
 OVERSEAS          13     43      45
 NCN-0MINUS       188     43      33
 CN-0MINUS         30     48      29
 NCN-0+           193     31      28
 CN-0-1+           38     48      31
 HOTEL             23     24      24
 COMBINED           3     33      41
```

Note: The SYST column is printed only if the parameter TOPS_DISPLAY_AWT is set to Y (for *yes*) in Table OFCVAR.

RT command

The RT command releases all of the study registers assigned to a particular traffic office. This command applies to multitraffic office configurations only and is issued from the FADS TTY. Once the RT command is issued, all study registers assigned to the given office are immediately released and available for reassignment to another traffic office.

Note: The RT command can be used to release study registers only in an office where no headsets are seated at any operator position. This command is normally used if a traffic office has been shut down. If the RT command is issued and headsets are seated, the system responds with a question mark and takes no action.

To release study registers associated with a traffic office, enter the following command at the FADS TTY:

>RT traffic_office_number

For example:

>RT5

The TTY responds in the following way:

```
RT 5 OK
```

RQ command

The RQ command lists all of the operator numbers assigned to a study register. When the RQ command is issued, the system responds by showing the total number of registers assigned in the traffic office and listing the operator numbers that are assigned a study register.

To list all the operator numbers assigned to the operator study data system, enter the following command at the SADS or TADS TTY:

>RQ

The TTY responds in the following way (for example):

```
TO 2       5/900

             9
            77
           136
           796
          1555
```

In a multitraffic office, to list the number of operators assigned to the operator study data system in each traffic office, enter the following command at the FADS TTY:

>RQ

The TTY responds in the following way (for example):

```
   SYST    5/900

           TO1   2
           TO2   1
           TO3   1
```

RD command

The RD command prints out an operator's accumulated study data, which includes operator number, date, time, operator IPS and AWT by call type, and system work volume for the period from the start of day to the time the command is issued. This command does not zero out the study data registers.

To see an operator's accumulated study data, enter the following command at the SADS or TADS TTY:

>RD operator_number

For example:

>RD333

The TTY responds in the following way:

```
TO STUDY  OPR 333 89/03/02  23:36

   CALL TYPE      IPS   AWT   SYST
   TOTAL          488   30    27
   DELAY          0     0     0
   RECALLS        11    28    30
   CAMA-1+        41    5     6
   OVERSEAS       7     22    40
   NCN-0MINUS     164   34    30
   CN-0MINUS      38    33    31
   NCN-0+         158   34    28
   CN-0-1+        58    23    32
   HOTEL          14    29    27
   COMBINED       8     27    51
```

> ***Note:*** The SYST column is printed only if the parameter TOPS_DISPLAY_AWT is set to Y (for *yes*) in Table OFCVAR.

Call transfer

The call transfer feature allows non-CAMA calls to be handled in two ways:

- transferred from one operator to another who is designated a transfer operator
- routed directly to a transfer operator based on call type or trunk group type

It also enables the system to provide separate statistics for different call types.

Call transfer capability is activated when the TOPS_TRANSFER_TYPES parameter in Table OFCENG is set to XFR1, XFR2, DA, or all three. Once the call transfer capability is activated, it can be controlled from the SADS, TADS, or FADS TTY.

The five TTY commands listed in the following table are used to administer the call transfer feature.

Call transfer commands

Command	Purpose
XA	Activates the call transfer feature (see notes)
XD	Deactivates the call transfer feature (see notes)
X...I	Specifies which operator can receive transfer calls and from which queue the operator will receive the transfer calls
X...X	Prevents an operator from receiving transfer calls in general or those from a specific transfer queue
X	Prints the number of operators in the office and the queues from which they can receive calls

Note 1: If parameter TOPS_TRANSFER_TYPES in Table OFCENG is set to NONE (no transfer type assigned), the SADS, TADS, or FADS TTY accepts no call transfer input commands.

Note 2: If parameter TOPS_TRANSFER_TYPES is set to XFR1, only the XFR1 queue can be activated using the XA1 command and deactivated using the XD1 command.

Note 3: If parameter TOPS_TRANSFER_TYPES is set to XFR1 XFR2, both XFR1 and XFR2 queues can be activated using the XA1 and XA2 commands or deactivated using the XD1 and XD2 commands.

Note 4: Although it is possible to set parameter TOPS_TRANSFER_TYPES to XFR2, allowing only the XFR2 queue to be activated, it is recommended to use XFR1 if only one XFR queue is required.

Note 5: Refer to *Office Parameters Reference Manual*, 297-1001-455, for additional information on parameter TOPS_TRANSFER_TYPES.

XA command

The XA command is used to activate the call transfer feature by queue.

- XA1 is used to activate the XFR1 queue.
- XA2 is used to activate the XFR2 queue.
- XA3 is used to activate the DA (XFR3) queue.
- XA1, 2, 3 can be used to activate all three queues.

The XA command is cumulative. If XA1 is entered, the XFR1 queue is activated. If XA2 is entered next, both transfer queues are activated, and the system response is XA1 2 ACT. One command does not overwrite the other.

To activate a transfer queue, enter the following command at a SADS or FADS TTY:

>XA transfer_queue

For example:

>XA1

The system responds in the following way:

```
XFR 1 ACT
```

Note: The XA command is not available from the TADS TTY.

XD command

The XD command deactivates the call transfer feature by queue. If all transfer queues have been deactivated, the system response is XFR OFF; however, if transfer queues are still active, the system response to the XD command indicates which transfer queues are no longer active.

To deactivate a call transfer queue, enter the following command at a SADS or FADS TTY:

>XD transfer_queue

For example:

>XD1
>XD2
>XD1,2

The TTY responds in the following way:

```
XFR 1 OFF
XFR 2 OFF
XFR OFF           (transfer types 1 and 2 are not active)
```

Note 1: A transfer queue cannot be deactivated with the XD command if a reference to it exists in Table TOPS or Table XFROPSEL.

Note 2: If the XFR1 or XFR2 queue is not activated, calls cannot be transferred between operators in the same office.

Note 3: The XD command is not available from the TADS TTY.

X...I command

The operator profile is identified initially through data tables at the DMS. Once the operator profile is established, it can be changed from the TTY. Only transfer-related data can be changed from the TTY, using the X...I command and the X...X command in non-DA offices.

Issuing the X...I command overrides any previous transfer assignments made at the TTY and overwrites what is currently datafilled in Table OPRDAT, in field XFRSET, for the given operator number.

When the X...I command is issued, the system response contains the following information:

- the operator number
- all the call queues in the operator profile
- all the service types in the operator profile (applicable only if the DA package is present).

If the operator is logged on when the command is issued at the TTY, the message `COMB:` is displayed, followed by the operator’s combined transfer profile (the calls the operator can receive at that specific position, based on both the operator’s profile and the position profile).

The X...I command syntax requires that a service type be identified if the DA package is present in the office.

To change an operator’s transfer profile, enter the following command at a SADS or TADS TTY:

>X operator_number I transfer_type service_type

where

transfer_type can be the following:

0 = GEN queue
1 = XFR1 queue
2 = XFR2 queue
3 = DA queue

and service_type can be the following:

T = toll and assist
D = directory assistance

For example:

>X104I1,2,3,T,D

The TTY responds in the following way:

```
OPR # 104 1 2 3  T D
```

Any reference to service type assumes that the DA package is present in the office. If the DA package is not present, the the service type option on the X...I command does not apply.

The operator profile must be compatible with the position profile. For example, an operator profile might specify GEN (or non-XFR) and XFR1, but the position profile might not include either of these queues in its profile, as the following example shows:

>X123I0,1

The system responds in the following way:

```
OPR # 123 0 1 COMB:NONE
```

The command in this example specifies that operator number 123 can now receive calls from the GEN and the XFR1 queues. The operator, however, is logged onto a position that has neither the GEN nor the transfer queue in its profile, so there is no compatibility between the two. The operator can never receive GEN or XFR1 calls while logged on to that position. This is indicated by the `COMB: NONE` response from the system. The IC manager should instruct the operator to log off and then log on to another position that matches the operator's profile.

To direct the DMS to restore a specified transfer operator to normal call distribution mode, enter the following related command at a SADS or TADS TTY:

>X operator_number I0

For example:

>X123I0

The TTY responds in the following way:

```
OPR # 123 0 1
OPR # 123 0 1 COMB: 0 1
```

If the operator is logged on, the TTY response shows the combined transfer set of the position and the operator.

The X...I command can also be used to alter the service profile of the operator. The service profile must be compatible with the operator's transfer profile.

There are two variations on the X...I command:

- The service-only include form allows the manager to change the service profile of the operator without affecting the transfer profile
- The transfer-only include form allows the manager to change the transfer profile of the operator without affecting the service profile.

To change only the service profile of an operator, enter the following command at the SADS or TADS TTY:

>X operator_number I service_type

For example:

>X104IT,D

The TTY responds in the following way:

```
OPR # 104 0 3  T D
```

> ***Note:*** An operator's service profile cannot be altered using the X...I command while the operator is logged on.

To change only the transfer profile of an operator, enter the following command at the SADS or TADS TTY:

>X operator_number I transfer_type

For example:

>X104I0,2

The TTY responds in the following way:

```
OPR # 104 0 2  T D  COMB:  0 2 T
```

X...X command

The X...X command is used to exclude specified call queues from an operator’s profile.

The system response to the X...X command indicates the operator number, all the call queues in the operator profile, and, if the operator is logged on, the calls the operator can receive at that specific position (based on both the operator profile and position profile datafilled in Table TOPSPOS).

To prevent calls in a given queue from being routed to a specified operator, enter the following command at the SADS or TADS TTY:

>X operator_number X transfer_type

where

transfer_type can be any combination of the following:

0 = GEN queue
1 = XFR1 queue
2 = XFR2 queue
3 = DA queue

For example:

>X104X1

The TTY responds in the following way:

```
OPR # 104 0 2
```

In this example, operator 104 will receive calls from the GEN queue only.

Note: The X...X command is not available in offices with DA service.

X command

The X command prints the operator numbers of all operators (logged on and not logged on) and the queues from which they can receive calls. The printout covers not only transfer operators, but all operators in the traffic office.

To query the number of operators and the queues from which they can receive calls, enter the following command at the SADS or TADS TTY:

>X

The TTY responds in the following way (for example):

```
OPR   XFR

112   0  1  2
115*  0  2
119   2
121   0
122*  1
```

The asterisk (*) in this sample response indicates transfer operators assigned but not logged on.

Controlled traffic

The IC manager can place an operator in controlled traffic mode using the T...I and T...X TTY commands and can query the number of operators in controlled traffic mode using the T command. These three commands are defined in the following table.

Controlled traffic commands

Heading	Heading
T...I	Allows the IC manager to specify which call type groups may access a given operator
T...X	Allows the IC manager to specify which call type groups may not access a given operator
T	Queries the number of operators in controlled traffic mode in the office

Being in controlled traffic mode allows an operator to receive only specified types of calls. This capability is useful when training new operators to ensure that they receive only call types they have been trained to handle.

A maximum of 15 call type groups can be assigned. These are defined in Table CLASSNAM.

> ***Note:*** The call types assigned in Table CLASSNAM are the same as the ones printed in the 6HR and 24HR periodic reports and in the operator study data reports.

The T...I and T...X commands are not cumulative. The DMS switch always assumes that 15 call types are included or excluded with each command.

The previous command has no effect on the command being entered. For example, the IC manager might place operator 111 in controlled traffic mode and route only call types 1, 2, and 3 to that operator. Then if the manager enters the command to include call types 4, 5, and 6, operator 111 receives only call types 4, 5, and 6. Call types 1, 2, and 3 are no longer included, because the last command entered for operator 111 assigned only call types 4, 5, and 6 out of the possible 15.

Up to 15 call types can be included or excluded using these input commands. The DMS allows 15 call types to be assigned at the TTY, even when fewer are assigned in Table CLASSNAM. Only the call types assigned in Table CLASSNAM and also entered at the TTY are actually included. For example, if nine call types are assigned in Table CLASSNAM and the input command entered at the TTY includes call types 1 through 10, only call types 1 through 9 are assigned, even though the system allows the user to enter 10 at the TTY.

The same principle applies to the exclude command. The DMS allows up to 15 call types to be excluded, but the only call types actually assigned to an operator are those assigned in Table CLASSNAM and are not excluded using the exclude command.

T...I and T...X commands

The T...I command allows the IC manager to specify the call types a particular operator will receive. This places the operator in controlled traffic mode.

To include specific call types in the controlled traffic set of a particular operator, enter the following command at the SADS or TADS TTY:

>T operator_number I call_group_types

For example, the following command includes call types 1, 2, and 3 in the controlled traffic set of operator #105:

>T105I1,2,3

The TTY responds in the following way:

```
OPR # 105 1 2 3
```

To exclude specific call types from the controlled traffic set of a particular operator, enter the following command at the SADS or TADS TTY:

>T operator_number X call_group_types

For example, the following command excludes call types 12, 13, 14, and 15 from the controlled traffic set of operator #222:

>T222X12, 13, 14, 15

The TTY responds in the following way:

```
OPR # 222 1 2 3 4 5 6 7 8 9 10 11
```

The system response to a controlled traffic input command lists the call types group numbers that are included for the specified operator. This applies to both T...I and T...X commands.

Including (I) zero (0) call types cancels controlled traffic mode. To remove an operator from controlled traffic mode, enter the following command at the SADS or TADS TTY:

>T operator_number I0

For example:

>T222I0

The TTY responds in the following way:

```
OPR # 222 ALL
```

T command

The T command requests a list of the operators currently in controlled traffic mode.

To request a list of the operators in controlled traffic mode, enter the following command at a SADS or TADS TTY:

>T

The TTY responds in the following way (for example):

```
CT OPR

OPR       107   7     9   11
OPR   *    111   1     5
OPR       120   8     9   13
OPR       126   5     6    8     9      10
OPR   *    129   6     9   11    14
```

The system response includes the operator numbers and the call type groups from which each operator will receive calls. An asterisk (*) on the output indicates that an operator is in controlled traffic mode but not logged on.

Broadcast messages

Broadcast messages allow managers to transmit important information to operators quickly and efficiently. These messages typically concern network conditions. From them, operators get the information they need to protect the network against overloads and ineffective attempts and to use their time effectively during periods of network congestion.

A message of up to 60 characters or spaces can be entered at the TTY keyboard. The three broadcast TTY commands are defined in the following table.

Broadcast message commands

Command	Purpose
B	Allows the manager to enter the message to be sent and print it to verify that it was entered correctly
BX	Transmits the broadcast message to all operator and administrative position screens
BE	Erases the broadcast message from all operator and administrative position screens
Note: A broadcast message sent from the FADS TTY overwrites any message already transmitted from the TADS TTY and remains until it is erased at the FADS TTY.	

B command

The B command allows the manager to enter a broadcast message at the TTY and have it echoed back to verify accuracy before sending it to all operators and administrators.

A broadcast message of up to 60 characters or spaces can be entered at the TTY keyboard.

The system response echoes the message entered. This allows the manager to reenter the message if necessary. If corrections are required, the message must be reentered, starting with B. Reentering the message overwrites the previous entry.

To enter a broadcast message, enter the following command at the SADS, TADS, or FADS TTY:

>B broadcast_message

For example:

>BTWO-HOUR DELAY ON CALLS TO JAPAN

The TTY responds in the following way:

```
TWO-HOUR DELAY ON CALLS TO JAPAN
```

BX command

The BX command transmits the broadcast message to the operator and administrative position screens. Once this command is issued, the broadcast message displays immediately on the administration positions. The broadcast message displays on the operator positions when the operator receives a call or when `Make Busy` is selected from the functions menu. Broadcast messages are not displayed at unoccupied operator positions.

To send a broadcast message, enter the following command at the SADS, TADS, or FADS TTY:

>BX

The TTY responds in the following way:

```
BX OK
```

BE command

The BE command erases the broadcast message from all position screens. (The broadcast message is immediately erased from all administrative position screens and from all occupied operator position screens when a call arrives, or when the operator selects `Make Busy` from the functions menu.)

To erase a broadcast message, enter the following command at a QFADS or QTADS TTY:

>BE

The TTY responds in the following way:

```
BE OK
```

Position control

The IC or SA positions can be removed and returned to service using the two TTY commands defined in the following table.

Position control TTY commands

Command	Purpose
O	Removes an IC or SA position from service
I	Returns an IC or SA position to service

O command

To remove an IC or SA position from service, enter the following command at the SADS or TADS TTY:

>O position_number

For example:

>O121

The TTY responds in the following way:

```
POS # 121 OFF ASST
```

I command

To return an IC or SA position to service, enter the following command at the SADS or TADS TTY:

>I position_number

For example:

>I121

The TTY responds in the following way:

```
POS # 121 ON ASST
```

Password administration

There are two types of passwords: one associated with a device and one associated with an operator. The availability of the password commands depends on the setting of office parameter TOPS_PASSWORD_ENABLE. The device password must precede any of the W commands when issued at a SADS, TADS, or FADS TTY.

Passwords are administered using the five TTY commands defined in the following table.

Password administration commands

Command	Purpose
WP	Changes the password associated with a device
WI	Resets an operator password
WR	Resets a device password to its initial value (multitraffic office only)
WD	Disables operator logon
WA	Enables operator logon

Note 1: The W commands work from both TADS and FADS TTYs, except for the WR command, which works only from the FADS. A command issued from the TADS affects only the office and team assigned to that TADS. An operator is assigned to a TADS team either by being logged on to that team, or by being datafilled as a team member in the XFRTEAM field in Table OPRDAT. An operator may also be assigned to the TADS team through the TADS commands X...I and X...X, which are used to modify an operator's transfer/service types.

Note 2: The FADS operations for WI, WD, and WA commands operate identically to the TADS commands, but without the team restrictions. Therefore, using the asterisk (*) option for the WA and WD commands on the FADS TTY means that all TOPS operators are enabled or disabled.

WP command

The WP command changes the password associated with the device on which the command is entered. If this is the first time the password is being changed, the initial password is TOPS.

To change a device password, enter the following command at the SADS, TADS, or FADS TTY:

>WP current_password new_password

For example:

>WP TOPS DEVPW

The TTY responds in the following way:

```
WP OK
```

WI command

The WI command resets the password of the specified operator to the initial value of TOPS.

To reset an operator password, enter the following command at the SADS, TADS, or FADS TTY:

>WI device_password operator_number

For example:

>WI DEVPW 121

The TTY responds in the following way:

```
WI OK
```

WR command

The WR command resets a team password. This is applicable only in a multitraffic office configuration and can be issued only from the FADS TTY.

To reset a team password, enter the following command at the FADS TTY:

>WR device_password team_number

For example:

>WR DEVPW 19

The TTY responds in the following way:

```
WR OK
```

WD command

The WD command disables an operator number and consequently the password. This prevents an operator from logging on to any positions in the office using that number.

There are three options available with the WD command. When issued, the office manager can specify that a particular operator number be disabled, that all operator numbers for a given traffic office be disabled (multitraffic configuration only), or that only unused operator numbers be disabled.

To disable operator numbers, enter the following command at the SADS, TADS, or FADS TTY:

>WD device_password option

where

option can be one of the following:

1 = operator number (to disable a given operator number)
2 = * (to disable all operator numbers in the traffic office—multitraffic office configuration only)

3 = U (to disable all unused operator numbers—that is, all operator numbers that still have their initial password of TOPS)

For example:

>WD DEVPW 121

or

>WD DEVPW *

or

>WD DEVPW U

In any of these cases, the TTY responds in the following way:

```
WD OK
```

WA command

The WA command allows operator numbers that have previously been disabled to be enabled again.

To enable operator numbers, enter the following command at the SADS, TADS, or FADS TTY:

>WA device_password option

where

option can be one of the following:

1 = operator number (to enable a given operator number)
2 = * (to enable all operator numbers in the traffic office—multitraffic office configuration only)
3 = U (to enable all unused operator numbers—that is, all operator numbers that still have their initial password of TOPS)

For example:

>WA DEVPW 121

or

>WA DEVPW *

In either case, the TTY responds in the following way:

```
WA OK
```

Call distribution

A primary function of TOPS MP is to assign each call to an available operator. Incoming calls are generally placed in queue and distributed to idle and occupied positions on a first-in, first-out (FIFO) basis. Initial calls are placed at the bottom of the calls-waiting (CW) queue until they are passed to an available operator. These calls are connected to operator positions in the order they were received.

Recalls, calls that reaccess an operator position, are placed at the top of the CW queue, and are handled before any other calls in the queue. When a TOPS MP position becomes available, the DMS searches the CW queue and connects the calls at the top of the queue to the idle position in the following order:

- recalls (oldest recall first)
- initial calls (oldest call first)

Three features affect call distribution:

- Assignable grade of service allows the operator company to assign an aging parameter to queues, allowing some queues to have higher priority than others.
- Controlled traffic allows specified operators to receive specified call types. This feature is used mainly as a training tool.
- Call transfer allows calls to be transferred from one operator to another, or to be routed directly to a transfer operator based on call type or trunk group type.

The separation of TOPS MP positions into two or more traffic offices, which may be at different locations, does not affect the distribution of calls.

When more calls arrive than there are operators to handle them, calls are placed in the CW queue. There is a limit to the number of calls allowed to go into the CW queue. Changes in the number of occupied positions or in the value of the AWT cause changes in operator capacity. As the operator capacity changes, the number of calls that can be placed in the queue but still be serviced within a specified amount of time changes. To accommodate fluctuating operator capacity, six data tables are used to limit queue size. Each table specifies queue thresholds for a particular average work time (AWT) and covers the entire range of occupied position quantities. The values in these six tables determine when the CW display appears and when calls start being deflected.

The DMS dynamically selects the table that comes closest to the conditions in the office, based on system AWT for the previous 15 minutes and on the number of occupied positions.

The automatic selection can be manually overridden using TTY commands. The four commands associated with call distribution are defined in the following table.

Call distribution commands

Command	Purpose
AM	Instructs the DMS to immediately start referencing the sixth queue threshold table
AX	Instructs the DMS to immediately start referencing the specified queue threshold table for the specified active transfer type
AD	Restores dynamic selection of the queue threshold table
AQ	Requests an indication of the queue threshold table currently being referenced by the DMS

AM command

The AM command eliminates dynamic selection and forces the DMS to refer only to the sixth QT table (QT5) for all active XFR types. This procedure is activated only under periods of severe service degradation and only with appropriate authorization.

To eliminate dynamic selection, enter the following command at the SADS or FADS TTY:

>AM

The TTY responds in the following way (for example):

```
             #      AWT
             0      020
             1      025
             2      030
             3      035
             4      040
             5      050
   XFR    QTABLE   SEL
    0        5       M
    1        5       M
    2        0       D
```

Note: The D or M abbreviation in the SEL column indicates whether the selection is manual (M) or dynamic (D).

AX command

The AX command allows manual selection of any queue threshold table for any XFR type. It instructs the DMS switch to immediately start referencing the specified queue threshold table for the specified active XFR type.

To select a queue threshold table for a specific active transfer type, enter the following command at a SADS or FADS TTY:

>AX active_transfer_type QT queue_threshold_table

where

active_transfer_type:

0 = GEN queue
1 = XFR1 queue
2 = XFR2 queue
3 = DA queue

queue_threshold_table:

0 – 5

For example:

>AX1QT4

The TTY responds in the following way:

```
          #      AWT
          0      020
          1      025
          2      030
          3      035
          4      040
          5      100

  XFR    QTABLE   SEL
   0        3       D
   1        4       M
   2        0       D
```

Note: The D or M abbreviation in the SEL column indicates whether the selection is manual (M) or dynamic (D).

AD command

The AD command restores dynamic selection of the queue threshold tables. Note that only active transfer types can be specified.

To restore dynamic selection of threshold tables for a specified transfer type, enter the following command at a SADS or FADS TTY:

>AD transfer_queue

where

transfer_queue:

0 = GEN queue
1 = XFR1 queue
2 = XFR2 queue
3 = DA queue

For example:

> AD2

The TTY responds in the following way:

```
            #      AWT
            0      020
            1      025
            2      030
            3      035
            4      040
            5      100

    XFR    QTABLE   SEL
     0        5      M
     1        5      M
     2        0      D
```

> ***Note:*** The D or M abbreviation in the SEL column indicates whether the selection is manual (M) or dynamic (D).

Entering the AD command without parameters restores all queues under manual selection control to dynamic selection.

To restore all queues to dynamic selection, enter the following command:

>AD

The TTY responds in the following way (for example):

```
            #      AWT
            0      020
            1      025
            2      030
            3      035
            4      040
            5      050

    XFR    QTABLE   SEL
     0        3      D
     1        1      D
     2        0      D
```

> ***Note:*** The D or M abbreviation in the SEL column indicates whether the selection is manual (M) or dynamic (D).

AQ command

The in-charge manager can use the AQ command to query the DMS about which AWT has been dynamically selected for each transfer type, in order to determine which QT table the DMS is using. The system responds by listing

- the six tables and the AWT associated with each
- the specific table associated with each active transfer type
- whether the QT table was selected manually or dynamically

To query the DMS about which AWT has been selected for each transfer type, enter the following command at a SADS or FADS TTY:

>AQ

The TTY responds in the following way (for example):

```
              #      AWT
              0      020
              1      025
              2      030
              3      035
              4      040
              5      050

  XFR    QTABLE   SEL
   0        3       D
   1        1       D
   2        0       D
```

Note: The D or M abbreviation in the SEL column indicates whether the selection is manual (M) or dynamic (D).

Silence Sonalert tone

Entering the S command at the FADS TTY silences the Sonalert at the FM CRT position.

S command

To silence the Sonalert tone at the FMCRT, enter the following command at the FADS TTY:

>S

Do not press **RETURN**. The TTY responds in the following way:

```
>
```

Position information

Entering the O command generates a list of the IC or SA positions that have been removed from service.

O command

To generate a list of the IC or SA positions (or both) removed from service, enter the following command at the SADS or TADS TTY:

>O

The TTY responds in the following way:

```
OS       POS
POS   #102 OFF IC
POS   #121 OFF ASST
```

Information on operators

Two commands are used to solicit information from the DMS:

- L – prints a listing of all operators (including service assistants) currently logged on
- P – prints a listing of the status of all TOPS MP positions

L command

The L command creates a listing of all operators currently logged on. The system lists the operators' numbers (OPR), the positions they are logged on to (POS), their combined transfer profiles (XFR) if the call transfer feature is active, and their combined service profiles if DA is active. If DA is not active, the combined service (COMBSVC) field does not appear on the report. The COMBSVC field indicates that the operator and the position both have the combined capability to perform toll and assist (T) and directory assistance (D).

Note 1: Activating the call transfer feature modifies the format of the system's response to the L command, indicating the queues from which logged-on operators can receive calls (0 = GEN queue, 1 = XFR1 queue, 2 = XFR2 queue, and 3 = DA queue).

Note 2: For a logged-on operator, the combined transfer profile is determined by comparing the operator's transfer capability profile (from Table OPRDAT) with the position's transfer set (from Table TOPSPOS). If an XFR type is listed in both the operator's and the position's profile, the operator can receive calls from that XFR queue. In that case, the XFR type also appears in the combined transfer profile for the operator and the position.

To create a listing of operators currently logged on, enter the following command at a SADS or TADS TTY:

>L

The TTY responds in the following way (for example):

```
OPR   POS   COMBXFR
 73   107    0
 11   112    0
101   114    0
127   143    0
```

With XFR 1 and 2, the TTY responds in the following way (for example):

```
OPR   POS   COMBXFR
 73   107    0
 11   112    0  1  2
101   114    0
127   143    0  1
```

With XFR 1 and 2 and DA, the TTY responds in the following way (for example):

```
OPR   POS   COMBXFR    COMBSVC
 73   107    0         T
 11   112    0 1 2 3   T D
101   114    1 2 3     T D
127   143    3         D
```

P command

The P command lists the current status of the TOPS MP positions. The system response lists the number of positions in each condition. The overall system status is printed as well as the individual traffic office statistics for the status displays shown in the following table.

TOPS MP status displays

Display	Definition
OC	Occupied positions (headset seated), excluding those in training or maintenance mode
MB	Occupied positions in one of the following states: • after seating the headset but before completing the logon procedure • after an operator selects {Make Busy} from the functions menu, but is still occupied with a call • after {Withhold Calls} has been selected from the functions menu and the operator is initiating a call (for example, a subsequent attempt or a call to the SA position), or performing some other necessary activity)
OD	Occupied or unoccupied positions out of order, for any of the following reasons: • entering a maintenance command at a TTY • entering a maintenance command at the MAP • entering a maintenance command at the TAMI
CT	Positions occupied by operators in controlled traffic mode
UCP	Unoccupied positions with a call in progress (that is, held on loop)
UCD	Unoccupied positions on which the call in progress (see UCP) has terminated (been disconnected)
ACS	Positions that have a loop accessed but at which neither the calling nor the called party is attached and off-hook

Note: Activating the call transfer feature causes the P command to include OC and MB data for XFR1, XFR2, and DA type operators, or a combination of these.

To print a report on the current status of the TOPS MP positions, enter the following command at the SADS or FADS TTY:

>P

The TTY responds in the following way (for example):

```
               TOPS POS

      OC  MB  OD  CT  UCP  UCD  ACS

SYST   9   5   1   1    2    1    1

TO1    2   1   1   0    0    0    1
TO2    1   1   0   1    0    0    0
TO3    2   0   0   0    1    0    0
TO4    1   2   0   0    1    1    0
TO5    3   1   0   0    1    1    0
```

Activating the call transfer feature modifies the format of the system response to the P command to include OC and MB data for XFR1 and XFR2 operators.

To modify the system response to include OC and MB data for XFR1 and XFR2 operators, enter the following command:

>P

The TTY responds in the following way (for example):

```
               TOPS POS

     OC  MB  OD  CT  UCP  UCD  ACS  OC1  MB1  OC2  MB2

SYST  9   5   1   1    2    1    1    6    4    3    1

TO1   2  1   1   0    0    0    1    2     0    0    0
TO2   1  1   0   1    0    0    0    0     1    1    0
TO3   2  0   0   0    1    0    0    1     0    1    1
TO4   1  2   0   0    1    1    0    1     2    0    0
TO5   3  1   0   0    1    1    0    2     1    1    0
```

HOBIC state control group

HOBIC is a centralized operator-attended location that provides quotation of call details to hotels for guest-dialed long distance calls. In addition, it provides quotation of time and charges to guests upon request, and it can provide a centralized location for reporting hotel equipment problems and billing inquiries.

The three TTY commands listed in the following table are used to administer the HOBIC equipment.

HOBIC commands

Command	Purpose
HO	Takes the HOBIC equipment out of service
HI	Returns the HOBIC equipment to service
H	Lists all the HOBIC equipment currently out of service

HO command

To put a particular time and charge or autoquote TTY out of service, enter HO followed by the floor plan number of the equipment.

Enter the following command at a SADS, TADS, or FADS TTY:

>HO floor_plan_number

For example:

>HO81

The TTY responds in the following way:

```
>POS # 81 OFF MAC
```

HI command

To return a time and charge or autoquote TTY to service, enter HI followed by the floor plan number of the equipment.

Enter the following command at a SADS, TADS, or FADS TTY:

>HI floor_plan_number

For example:

>HI81

The TTY responds in the following way:

```
>POS # 81 ON MAC
```

H command

To list all of the time and charges and autoquote TTYs currently out of service, enter H.

Enter the following command at a SADS, TADS, or FADS TTY:

>H

The TTY responds in the following way:

```
 OS POS

  POS #14 OFF CAP
  POS #20 OFF CDN
  POS #27 OFF REG
  POS #32 OFF T&C
```

The TTY response lists all of the out-of-service HOBIC equipment with the floor plan number and the three-letter acronym assigned to that piece of equipment.

QMS TTY commands, queries, and reports

This chapter describes the commands and queries entered at the QMS force administration data system (QFADS), and QMS traffic office administration data system (QTADS) teletypewriters (TTYs), as well as the reports generated by these TTYs. The TTYs referred to in this chapter are defined in the chapter "Work force office configurations" earlier in this document.

The TTY commands, queries, and reports described in this chapter apply to the Queue Management System (QMS). The previous chapter, "ACD TTY commands, queries, and reports," describes the commands, queries, and reports used in the automatic call distribution (ACD) environment.

The commands, queries, and reports discussed in this chapter are grouped according to their functions as follows:

- force management (FM) and traffic office (TO) periodic reports
- operator feedback system
- operator study data system
- broadcast messages
- password administration
- position control
- information on operators
- silence Sonalert tone
- report QMS call queue conditions

The following table lists the commands discussed in this chapter and identifies the section where they are described.

Subsection to commands, queries, and reports cross-reference

Subsection	Command/query/report
QMS reports	QTADS report, QFADS report
Operator feedback system	FD, FI, FZ
Operator study data system	RA, RR, RQ, RD, RT
Broadcast message	B, BX, BE
Password administration	WP, WI, WD, WA, WR
Position control	O, I
Information on operators	L, P
Silence Sonalert tone	S
Report QMS call queue conditions	CD, CW, CQ

In many cases, commands and queries are not available on a particular TTY type. A command may be available at a QFADS TTY, for example, but not at a QTADS TTY. Such restrictions are indicated in the command description. These restrictions are based on the office configuration in use. In addition, the following table provides a list of the TTY devices and the commands they accept.

Device to command cross-reference

Device	Commands it accepts
QTADS	FD, FI, FZ, RA, RR, RQ, RD, B, BX, BE, O, I, WP, WI, WD, WA, L, P, CW, CD, CQ
QFADS	RT, B, BX, BE, WP, WR, S, CW, CD, CQ

In this chapter, an input prompt (>) indicates that the subsequent information is a command. Capital letters represent commands, fixed parameters, and responses from the TTY. Enter the command or fixed parameter exactly as it appears on the page. Lowercase letters represent variables. For commands and parameters, enter the letters or numbers that the variable represents. At the TTY, type in the command and press the **RETURN** key. All commands and queries entered at the TTY must be followed by a carriage return.

When any part of a command is not accepted by the system, a question mark (?) is printed at the TTY on which the command was issued, and no action is taken.

QMS reports

TOPS QMS generates force management reports that are printed at the QMS FADS (QFADS) and QMS TADS (QTADS) devices. The QFADS report pegs data on traffic offices, queues, services, and call classes. The QTADS report pegs data on queues, services, and call classes. The QFADS report (except for traffic office data) prints data that is summed over all traffic offices. The QTADS report prints only data accumulated by operators in the team to which that QTADS device belongs.

QMS has the potential to print up to 255 queue records, if used with an external vendor's MIS report package. The system limits the number of service records printed to 16.

> ***Note:*** The QMS basic statistics package allows reporting on the first 32 queues only.

The actual number of queue records printed in both the QFADS and QTADS reports equals the value of the office parameter QMSFM_NUM_QUEUES. The actual number of service records printed in both the QFADS and QTADS reports equals the value of the office parameter QMSFM_NUM_SERVICES.

QFADS and QTADS reports are generated automatically every 15 minutes. No 6-hour or 24-hour summary QFADS or QTADS reports are available. QFADS and QTADS reports should print within 15 minutes. If a report requires too much time, the QFADS or QTADS prints a message. Receiving this message indicates that the number of queues needs to be reduced.

Character counts

The following table specifies the number of characters contained in each part of the QFADS and QTADS reports.

QFADS and QTADS report character counts

Report section	Number of characters
Traffic office report heading	73
Traffic office record	73
By-system queue report heading	59
By-system queue record (containing CW and ANS)	59

—continued—

QFADS and QTADS report character counts (continued)

Report section	Number of characters
Service report heading	31
Service record	31
FM call class report heading	49
FM call class record	49

—end—

The QFADS printed report

The following figure shows an example of a QFADS report. All time measurements are reported in seconds.

The QTADS printed report

The QTADS TTY prints statistics compiled over the last 15-minute report period by operators in the team to which that QTADS device belongs.

The QTADS report sorts data by three categories: QMS queue, QMS service, and QMS force management call class. It also prints out one line of system totals and one line of team totals for initial position seizures (IPS), recall position seizures (RPS), total position seizures (TPS), call busy work volume (CBWV), non-call work volume (NCWV), idle time (IDLT), average occupied positions (AOP), and percent occupancy (%OCC).

System totals are printed for each QMS call queue, QMS service, and QMS force management call class included in the QTADS reports. System totals are printed directly above the traffic office totals.

Sample QFADS report

```
12:34:56

QMS TEAMS
        IPS    RPS    TPS    CBWV    NCWV    IDLT    AWT     AOP    %OCC
SYST    618    224     80   19695    1700    2200    21.4    26.2     90

TO 1    310     68      4   10782     800    1400    28.2    14.4     89
TO 2    178     44     40    4256     600     500    16.2     6.0     91
TO 3    130    100     36    4657     300     300    17.5     5.8     94

QMS QUEUES
        IPS    RPS    TPS    CBWV    AWT     CW     ANS
CQ4     160    112     40   11509    13.6    265    0.8
CQ5      40      0     20    2400    20.0     39    0.7
CQ6     234     50      0    1223    10.8    355    1.2
CQ7     126     46     18    2689    15.2    190    1.0
CQ8      58     16      2    1874    24.8     23    0.3


QMS SERVICES
         SI     SWV   SAWT
SRV 0   463    7037   15.2
SRV 1   318    6868   21.6
SRV 2   306    5791   18.9


QMS CALL CLASSES
               IPS     RPS     TPS    CBWV     AWT
UNDEFINED        0       0       0       0     0.0
DELAY           76       0       0     605     8.0
COIN_RECALL      0     112       0    1589    14.1
DA_RECALL        0     112       0    1952    17.4
CAMA            40       0       0     200     5.0
OVERSEAS        14       0      10    2000    83.3
NCN-0MINUS     138       0      44    4256    23.4
CN-0-1PLUS      58       0       4    1362    22.0
NCN-0PLUS      144       0      12    3562    22.8
CN-0MINUS       90       0      10    3162    31.6
INWARDS         44       0       0     367     8.3
DA              70       0       0     640     9.1
```

The following two figures show parts 1 and 2 of a sample QTADS report. All time measurements are reported in seconds.

Sample QTADS report, part 1

```
09:45:23

QMS TEAMS
        IPS    RPS    TPS    CBWV    NCWV    IDLT     AWT     AOP   %OCC
SYST    618    224     80   19695    1700    2200    21.4    26.2     90

TO 1    310     68      4   10782     800    1400    28.2    14.4     89


QMS QUEUES
        IPS    RPS    TPS    CBWV     AWT      CW     ANS
CQ4     160    112     40   11509    13.6     265     0.8
CQ5      40      0     20    2400    20.0      39     0.7
CQ6     234     50      0    1223    10.8     355     1.2
CQ7     126     46     18    2689    15.2     190     1.0
CQ8      58     16      2    1874    24.8      23     0.3


TO1 QUEUES
        IPS    RPS    TPS    CBWV     AWT
CQ4     156      0      4    4219    26.3
CQ5      40      0      0    1398    34.9
CQ6     114      1      0    2238    19.4
CQ7       0     46      0     629    13.7
CQ8       0     16      0     394    24.6


QMS SERVICES
         SI    SWV   SAWT
SRV 0   463   7037   15.2
SRV 1   318   6868   21.6
SRV 2   306   5791   18.9


TO1 SERVICES
         SI    SWV   SAWT
SRV 0   120   3490   29.1
SRV 1   276   7292   24.6
SRV 2     0      0    0.0
```

Sample QTADS report, part 2

QMS CALL CLASSES

	IPS	RPS	TPS	CBWV	AWT
UNDEFINED	0	0	0	0	0.0
DELAY	76	0	0	605	8.0
COIN_RECALL	0	112	0	1589	14.1
DA_RECALL	0	112	0	1952	17.4
CAMA	40	0	0	200	5.0
OVERSEAS	14	0	10	2000	83.3
NCN–0MINUS	138	0	44	4256	23.4
CN–0–1PLUS	58	0	4	1362	22.0
NCN–0PLUS	144	0	12	3562	22.8
CN–0MINUS	90	0	10	3162	31.6
INWARDS	44	0	0	367	8.3
DA	70	0	0	640	9.1

TO1 CALL CLASSES

	IPS	RPS	TPS	CBWV	AWT
UNDEFINED	0	0	0	0	0.0
DELAY	20	0	0	257	12.8
COIN_RECALL	0	40	0	689	17.2
DA_RECALL	0	0	0	0	0.0
CAMA	24	0	0	101	4.2
OVERSEAS	14	0	10	2000	66.7
NCN–0MINUS	54	0	22	1857	24.4
CN–0–1PLUS	34	0	4	765	20.1
NCN–0PLUS	102	0	6	2361	21.9
CN–0MINUS	68	0	6	2248	30.4
INWARDS	26	0	0	207	8.0
DA	38	0	0	297	7.8

Interactions with FADS reports

Printed office-wide reports are provided for TOPS ACD offices by a FADS device. Since TOPS ACD and QMS ACD may coexist within the same office, FADS and QFADS devices may exist within the same office.

A FADS report prints records for all defined traffic offices, regardless of whether the traffic office is entirely QMS ACD or TOPS ACD. However, all traffic office records printed for an office datafilled as QMS in Table TEAMACD will have all fields set to 0. Records for QMS traffic offices should be discarded when printed from a FADS device.

QMS MIS interface

Basic QMS force management devices, report formats, and data are fixed for all offices. A TOPS office can customize its force management system, however, through the optional QMS management information system (MIS) interface and an external vendor's force management software. For example, an office might use the QMS MIS interface to generate graphical instead of numerical reports, to generate reports on a flexible basis instead of every half hour or 15 minutes, or to create new types of force management devices.

Real-time and periodic reports are calculated from the same set of base queue and operator events. With the QMS MIS interface, however, the DMS gives an external vendor the appropriate information about these base events, continuously and within a few seconds of the event. The external vendor can then choose, based on the event information, which real-time statistics and periodic reports to generate.

This feature sends queue and position event information to an outside device through a high-speed datalink within a datafillable time after the event occurs. The external device then decides what real-time calculations to make, what data to use for periodic reports, what kind of output devices will receive real-time and periodic reports, and how these reports will be formatted and displayed. In effect, the external device controls the display and collation of force management data. The DMS offloads to the outside MIS the responsibility for calculating and maintaining reports and statistics, outputting to various devices, and formatting and displaying reports. It only provides the event information that the MIS needs to generate reports.

Sending event messages adds a number of benefits for force management monitoring. With this process, the external MIS system can break down information to a finer level of detail. For example, the MIS can monitor

- individual operators over a wide range of detailed criteria, including average work time (AWT) per force management call type or operator
- the performance, in detail, of each individual queue, including the AWT of calls from the queue, the average answer time of calls in the queue, and the number of calls in queue at any one time
- the performance of detailed call types

  Note: With non-QMS TOPS ACD, the finest force management call type granularity offered by the force management system is 15 call classes made of force management call type groups. With TOPS QMS, the operating company can specify up to 2047 force management call types.

- the disposition of calls released from an operator (whether, for example, a call was transferred to DA ARU announcement, to automated alternate billing service, or to some other feature)
- the billing class of calls serviced by an operator

The MIS can also produce reports on the traffic originating from a certain geographical area, based on incoming trunk group.

QMS MIS, together with the call queue assignment processing feature, allows the MIS to provide statistics for each new possible service provided by TOPS solely by changing datafill. (With non-QMS TOPS ACD, each new service may require enhancements in the DMS software to provide effective force management capabilities.

QMS MIS requires no changes to DMS switch software to quickly manipulate data into any kind of format, report, graph, or chart.

With this feature, the operating company can implement a wide variety of display terminals, printers, and computers that may collect and display data with minimal DMS switch interaction. For instance, a TOPS office might implement separate devices for reporting on operators, queues, teams, and services, without new development on the DMS switch side.

QMS TTY commands

Through commands typed at QFADS and QTADS devices, QMS provides the following capabilities:

- operator feedback
- operator study registers
- broadcast messages
- password administration
- removing and returning service assistance (SA) and in-charge (IC) positions from and to service
- printing a real-time list of logged-on operators
- silencing the Sonalert tone
- reporting on QMS call queue conditions

All of these capabilities, except for queue condition reporting, are also available with TOPS ACD FADS and TADS devices. However, commands used at QFADS and QTADS devices affect only QMS positions, operators, and services, while commands used at FADS and TADS devices affect only TOPS ACD positions, operators, and services.

Similarly, QMS and ACD have analogous office parameters for functions such as displaying system AWT and zeroing feedback registers. However, the QMS parameters operate only on QMS offices or operators, and the corresponding TOPS ACD parameters operate only on TOPS offices or operators.

The call distribution commands of the ACD system (AM, AX, AD, and AQ) do not apply in QMS. QMS call distribution is controlled by datafilling the tables described in the chapter "Understanding how the DMS switch distributes calls." For details, refer to the section "TOPS call queue assignment with QMS."

Operator feedback

TOPS QMS has a system of online individual operator feedback that provides the raw total of the number of position seizures and the AWT of any operator. Two software registers are provided internally for each operator. One register pegs the number of position seizures (PS) accumulated by the operator. The other register pegs the amount of CBWV generated by each operator. This differs from TOPS ACD in its use of IPS and total work volume (WV).

Operators may display their accumulated PS and AWT (calculated from their accumulated CBWV) at their terminal. They may also print that information at the QTADS.

Note: Parameter QMSFM_BASIC in Table TQMSOPT enables or disables the collection and reporting of TOPS QMS basic statistics. When this parameter is set to N, the DMS does not generate reports at QMFADS, QFADS, or QTADS devices, or update real-time QMS information on the FMCRT, IC, or SA positions. Operator feedback statistics are frozen. L, P, F, R, and C commands are disabled. Setting QMSFM_BASIC to N saves CPU time that would have been spent collecting, collating, and reporting system data. When QMSFM_BASIC is set to Y (the default), the DMS generates real-time displays and reports and enables QMS force management commands.

Through a series of commands entered at the QTADS device, the traffic office manager may print the results of operator feedback data and allow the operator to zero the content of the registers.

In addition, the system AWT may be displayed and printed along with the operator statistics if the parameter QMSFM_DISPLAY_AWT in Table TQMSOPT is set to Y.

Note: The system AWT for both display and print is the system AWT for the prior 15-minute reporting period, because system statistics for QMS are not accumulated throughout the day as they are for TOPS ACD. Thus, while this approach to QMS feedback register administration is identical to the equivalent TADS and TOPS ACD operator feedback system functionality, the values displayed for operator and system statistics are different because of different measurement methods.

The three TTY commands listed in the following table are used to administer the operator feedback system.

QMS operator feedback system commands

Command	Purpose
FD	Prints the feedback data for a specific operator
FI	Prevents an operator from zeroing out the feedback registers
FZ	Restores the operator's ability to zero out the feedback registers

Note: The operator feedback system applies only to general operator IDs. It does not apply to the SA or IC positions.

FD command

Operator feedback data may be printed by entering the FD command, along with an operator number, at a QTADS device. The system responds by printing the operator number, the date and time, the operator's number of position seizures, and the operator's AWT. The AWT is calculated from the number of position seizures and the amount of CBWV accumulated by the operator and stored by the DMS switch.

The display of the system AWT is controlled by parameter QMSFM_DISPLAY_AWT in Table TQMSOPT. This is the AWT from the prior 15-minute reporting period. Printed operator and system AWT are provided to an extra decimal point of accuracy over that displayed at an operator's terminal, where the values are rounded.

Enter the following command at a QTADS TTY:

>FD operator_number

For example:

>FD319

The TTY responds in the following way:

```
OPR # 319 91/10/24 14:37

PS   672
AWT   27.8
SYS   28.3
```

FZ command

The team administrator can enable or disable the option of allowing individual operators to zero their own feedback registers. The FZ command enables the option, thus allowing operators to zero feedback registers from the operator position.

Enter the following command at a QTADS TTY:

>FZ operator_number

For example:

>FZ272

The TTY responds in the following way:

```
F OK
```

FI command

The FI command disables the option, thus inhibiting operators from zeroing feedback registers from the operator position.

Enter the following command at a QTADS TTY:

>FI operator_number

For example:

>FI272

The TTY responds in the following way:

```
F OK
```

If parameter QMSFM_ZERO_FB_REG in Table TQMSOPT is set to N, zeroing of all QMS operator registers is disabled, as are the FI and FZ QTADS commands.

Operator study registers

The operator study register system collects data on the total number of position seizures and amount of work volume generated by an operator, segregated by the QMS FM call classes found in Table TQCLSNAM. Unlike feedback registers, study registers are not automatically allocated to each operator. Study registers are assigned to operators through a command at the QTADS device. In addition to the 900 study registers available for ACD, the DMS can allocate up to 450 QMS study registers. The number of QMS study registers allocated is determined by the office parameter QMSFM_NUM_STUDY_REG in Table OFCENG.

The TTY commands in the following table are used to administer operator study data.

QMS operator study data commands

Command	Purpose
RA	Assigns an operator number to the operator study data system
RR	Releases the study register assigned to an operator number
RT	Releases all study data registers assigned to a given traffic office
RQ	Lists the operator numbers assigned to a study register. Also, at the FADS TTY, this command prints the number of study data registers assigned to each traffic office.
RD	Prints an operator’s accumulated study data

RA command

The RA command is used to assign an operator number to the operator study data system.

Enter the following command at a QTADS TTY:

>RA operator_number

For example:

>RA229

The TTY responds in the following way:

```
R OK
```

The DMS switch begins accumulating study data for operator 299.

The characters ST are displayed at the operator's terminal unless the parameter QMSFM_DISPLAY_ST in Table TQMSOPT is set to N. If no study registers are available to assign to the operator, the system response is `NO STUDY REG`.

RR command

The RR command releases the study register assigned to an operator number. When the RR command is issued, the system releases the study register associated with the specified operator number and prints the study data accumulated up to that point. The printed data shows operator number, the date and time, and a breakdown of the number of position seizures and AWT by QMS FM call class. The system also totals position seizures and averages AWTs over all QMS FM call classes.

When the RR command is issued, data ceases to be accumulated for the given operator number, and the study register becomes available for reassignment. To release a study register, enter the following command at a QTADS TTY:

>RR operator_number

For example:

>RR333

The TTY responds in the following way:

```
   TO STUDY OPR 333 91/10/17 15:09

 QMS CALL CLASS    PS     AWT   SYST
 TOTAL            698    40.0   39.5

 UNDEFINED          0     0.0    0.0
 DELAY              0     0.0    0.0
 DA RECALLS        23    19.3   20.4
 COIN RECALLS      28    42.5   45.5
 CAMA              55     9.1    8.7
 NCN–0MINUS       160    48.3   44.6
 NCN–0PLUS        234    38.2   38.2
 CN–0MINUS         38    56.8   58.3
 CN–OPLUS          45    49.4   47.2
 CN–1PLUS          92    45.7   46.3
 HOTEL             23    22.4   23.9
```

Note: The system AWT is printed only if the parameter QMSFM_DISPLAY_AWT in Table TQMSOPT is set to Y. The system AWT values are those for the prior 15-minute reporting period. This differs from TOPS ACD system AWT displays, which are accumulated over the day.

RT command

The RT command releases all of the study registers assigned to a particular QMS traffic office. Once the RT command is issued, all study registers assigned to the given office are immediately released and available for reassignment to another traffic office.

Note: The RT command can be used to release study registers only in a QMS office where no headsets are seated at any operator position. This command is normally used if a traffic office has been shut down. If the RT command is issued and headsets are seated, the system responds with a question mark and takes no action.

To release study registers associated with a traffic office, enter the following command at the QFADS TTY:

>RR traffic_office_number

For example:

>RT3

The TTY responds in the following way:

```
RT 3 OK
```

On a switch with both TOPS ACD and TOPS QMS traffic offices defined, entering the RT command at a QFADS does not release study registers assigned to TOPS ACD traffic offices. Similarly, entering an RT command at a FADS device does not release study registers assigned to a TOPS QMS traffic office.

RQ command

The RQ command lists all of the operator numbers assigned to a study register. When the RQ command is issued, the system responds by listing the number of registers assigned in the traffic office, followed by the total number of study registers available for assignment (defined in parameter QMSFM_NUM_STUDY_REG in Table OFCENG), and the number of study registers currently in use by each traffic office.

To list all the operator numbers assigned to the operator study data system, enter the following command at the QFADS TTY:

>RQ

The TTY responds in the following way (for example):

```
SYST    12/120

TO1      5
TO2      3
TO3      4
```

In an office with both TOPS ACD and TOPS QMS teams, when the RQ command is entered at a QFADS device, the number of study registers assigned to TOPS ACD teams is not returned. Similarly, when the RQ command is entered at a FADS device, the number of study registers assigned to TOPS QMS teams is not returned.

The RQ command may also be entered from a QTADS device. When the RQ command is entered from a QTADS device, the system responds by printing the operators assigned to study registers within the team and the total number of study registers assigned to operators within the team.

To list all the operator numbers assigned to the operator study data system in one traffic office, enter the following command at the QTADS TTY:

>RQ

The TTY responds in the following way (for example):

```
     TO   2    5

         92
        289
        311
        571
       1133
```

RD command

The RD command prints out an operator's accumulated study data, which includes operator number, date, time, the number of position seizures and the AWT accumulated by the operator's study register, segregated by QMS FM call class. It also prints a total number of position seizures and average AWT over all the QMS FM call classes, the operator number, the time, and the date.

The parameter QMSFM_DUMP_STUDY_REG in Table TQMSOPT controls what is printed when an operator assigned to a study register presses the **{Print Stats}** softkey. If this parameter is set to Y, pressing the **{Print Stats}** softkey prints the operator's study data. If it is set to N, pressing this key prints the operator's feedback data.

The display of system AWT is controlled by the parameter QMSFM_DISPLAY_AWT in Table TQMSOPT. System AWT is displayed for the prior 15-minute reporting period.

To see an operator's accumulated study data, enter the following command at the QTADS TTY:

>RD operator_number

For example:

>RD293

The TTY responds in the following way:

```
TO STUDY  OPR # 293 91/12/5  18:37

   QMS CALL CLASS        PS   AWT   SYST
   TOTAL                966   30.6  31.2

   UNDEFINED              0      0     0
   DELAY                  0      0     0
   DA_RECALL             32   19.2  20.1
   COIN RECALL           56   34.1  35.7
   DA                   190   19.8  20.0
   CAMA                  75    9.2   8.9
   NCN–0MINUS           163   36.4  37.1
   NCN–0PLUS            172   33.2  30.8
   CN–0MINUS             74   45.1  44.9
   CN–0PLUS              80   40.5  40.9
   CN–1PLUS             102   37.3  38.0
   HOTEL                 22   27.0  27.0
```

Broadcast messages

Broadcast messages allow managers to transmit important information to operators quickly and efficiently. These messages typically concern network conditions, such as overloads and downed equipment.

A message of up to 60 characters or spaces can be entered at the TTY keyboard of a QFADS or a QTADS, transmitted to TOPS QMS positions, and then erased from the positions. The three broadcast TTY commands are defined in the following table.

Broadcast message commands

Command	Purpose
B	Allows the manager to enter the message to be sent and print it to verify that it was entered correctly
BX	Transmits the broadcast message to all operator and administrative position screens
BE	Erases the broadcast message from all operator and administrative position screens

Note: Just as with the FADS and TADS TTYs, a broadcast message sent from the QFADS TTY overwrites any message already transmitted from the QTADS TTY and remains until it is erased at the QFADS TTY.

B command

The B command allows the manager to enter a broadcast message at the TTY and have it echoed back to verify accuracy before sending it to all operators and administrators.

A broadcast message of up to 60 characters or spaces can be entered at the TTY keyboard.

The system response echoes the message entered. This allows the manager to reenter the message if necessary. If corrections are required, the message must be reentered, starting with B. Re-entering the message overwrites the previous entry.

To enter a broadcast message, enter the following command at the QTADS or QFADS TTY:

>B broadcast_message (up to 60 characters)

For example:

>BLIDB DATABASE IS DOWN

The TTY responds in the following way:

```
LIDB DATABASE IS DOWN
```

The message is stored in DMS memory, but not sent out to operators until the transmit command (BX) is entered. Broadcast messages entered at a QTADS device are stored in the broadcast message area of that traffic office.

BX command

The BX command transmits the broadcast message stored in the system broadcast message area to all of the occupied TOPS QMS positions on the DMS. Once this command is issued, the broadcast message displays immediately on the administration positions. The broadcast message displays on the operator positions when the operator receives a call or toggles the make-busy function. Broadcast messages are not displayed at unoccupied operator positions.

To send a broadcast message, enter the following command at the QFADS or QTADS TTY:

>BX

The TTY responds in the following way:

```
BX OK
```

Entering BX at a QTADS device transmits the broadcast message stored in the particular traffic office's broadcast message area to all of the occupied TOPS QMS positions within that traffic office and to the in-charge and assistance positions.

Broadcast messages from a QFADS are also displayed immediately at the FMCRT. The FMCRT broadcast message display area is shared by QMS QFADS and ACD FADS broadcasts. If only the QFADS is broadcasting a message, that message is displayed at the FMCRT. The same is true for a FADS-only broadcast. If both are broadcasting a message, however, only the more recent broadcast message is displayed.

BE command

When the BE command is entered, broadcast messages are erased from TOPS QMS operator positions after the make-busy function is toggled or upon call arrival. Broadcast messages are erased from administrative positions as soon as the BE command is entered.

To erase a broadcast message, enter the following command at a QFADS or QTADS TTY:

>BE

The TTY responds in the following way:

```
BE OK
```

Password administration

There are two types of passwords: one associated with a device and one associated with an operator. Password administration commands are available only when the QMS parameter QMSFM_PASSWORD_ENABLE in Table TQMSOPT is set to Y. The device password must precede any of the W commands entered at a QTADS or QFADS TTY.

Passwords are administered using the five TTY commands defined in the following table.

Password administration commands

Command	Purpose
WP	Changes the password associated with a device
WI	Resets an operator password
WR	Resets a device password to its initial value (on QFADS TTY only)
WD	Disables operator logon
WA	Enables operator logon

WP command

The WP command changes the password associated with the device on which the command is entered. If this is the first time that the password is being changed, the initial password is TOPS.

To change a device password, enter the following command at a QTADS or QFADS TTY:

>WP current_password new_password

Note: The current password field must be separated from both the WP and the new password by exactly one space.

For example:

>WP TOPS DEVPW

The TTY responds in the following way:

```
WP OK
```

This changes the password necessary for using password administration at that particular TTY.

WI command

The WI command resets the password of the specified operator to the initial value, TOPS.

To reset an operator password, enter the following command at the QFADS or QTADS TTY:

>WI device_password operator_number

For example:

>WI DEVPW 121

The TTY responds in the following way:

```
WI OK
```

WR command

The WR command resets a team password. This command can be issued only from the QFADS TTY.

To reset a team password, enter the following command at the QFADS TTY:

>WR device_password team_number

For example:

>WR DEVPW 19

The TTY responds in the following way:

```
WR OK
```

This resets the QTADS password for that team.

WD command

The WD command disables an operator number and consequently the password. This prevents an operator from logging on to any positions in the office using that number.

There are three ways to use the WD command. The office manager can specify that a particular operator number be disabled, that all operator numbers for a given traffic office be disabled (multitraffic configuration only), or that unused operator numbers be disabled system-wide.

To disable operator numbers, enter the following command at the QFADS or QTADS TTY:

>WD password option

where:

option can be one of the following:

1 = operator number (to disable a given operator number)
2 = * (to disable all operator numbers in the traffic office—multitraffic office configuration only)

For example:

>WD DEVPW 121

or

>WD DEVPW *

In either case, the TTY responds in the following way:

```
WD OK
```

When the WD command is entered at a QTADS TTY with * as the parameter, all operators in the team are disabled from logging in. When the WD command is entered at a QFADS TTY with * as the parameter, all QMS operators datafilled for the entire DMS switch are disabled from logging in.

WA command

The WA command allows operator numbers that have previously been disabled to be enabled again.

To enable operator numbers, enter the following command at the QFADS or QTADS TTY:

>WA password option

where:

option can be one of the following:

1 = operator number (to enable a given operator number)
2 = * (to enable all operator numbers in the traffic office—multitraffic office configuration only)

For example:

>WA DEVPW 121

or

>WA DEVPW *

In either case, the TTY responds in the following way:

```
WA OK
```

QMSPW CI command

The password for the QFADS device can be reset to TOPS by entering QMSPW followed by a carriage return at a MAP (maintenance and administration position).

To reset the QFADS device password to TOPS, enter the following command at the CI level of a MAP:

>QMSPW

The MAP responds in the following way:

```
QFADS PASSWORD RESET
```

Position control commands

TOPS QMS SA and IC positions can be removed from and returned to service by issuing the O or I command from a QTADS TTY. These commands affect only SA and IC positions within the same traffic office as the QTADS administrator.

O command

To remove an SA or IC position from service, enter the following command at a QTADS TTY:

>O position_number

For example:

>O111

If the position number is for an SA position, the TTY responds in the following way:

```
POS #111 OFF ASST
```

If the position number is for an IC position, the TTY responds in the following way:

```
POS #111 OFF IC
```

Entering an O immediately followed by a carriage return generates a printout of all out-of-service SA and IC positions within the team.

To print a list of all out-of-service SA and IC positions within the team, enter the following command at a QTADS TTY:

>O

The TTY responds in the following way, for example:

```
OS POS
POS #112 OFF ASST
POS #120 OFF IC
```

I command

To return an SA or IC position to service, enter the following command at a QTADS TTY:

>I position_number

For example:

>I123

If the position number is for an SA position, the TTY responds in the following way:

```
POS #123 ON ASST
```

If the position number is for an IC position, the TTY responds in the following way:

```
POS #123 ON IC
```

Information on operators

Two commands are used to solicit information from the DMS:

- L – prints a listing of all operators (including service assistants) currently logged on
- P – prints a listing of the status of all TOPS QMS positions

L command

The L command creates a listing of all operators currently logged on. The system lists their operator numbers (OPR), the TOPS QMS position numbers they are logged into, the QMS call queue profile number or QMS controlled traffic profile number, and the QMS service profile index.

> ***Note:*** This QMS command differs from the equivalent TOPS ACD command in that the QMS profiles replace the TOPS ACD combined transfer profile list.

To create a listing of operators currently logged on, enter the following command at a QTADS TTY:

>L

The TTY responds in the following way (for example):

```
  OPR    POS      CQPROF   CTPROF    SRVPROF
 114      21        2                   1
  90     108       13                   2
 283     186                 3          1
 925     445        7                   1
```

P command

The P command lists the current status of TOPS QMS positions. The system response lists the number of positions in each condition. The overall system status is printed as well as the individual traffic office statistics for the status displays shown in the following table.

TOPS MP status displays

Display	Definition
OC	Occupied positions (headset seated), excluding those in maintenance busy mode
MB	Occupied positions that are in the make busy mode
OD	Positions that are not in service
CT	Occupied positions that are in controlled traffic mode
UCP	Unoccupied positions with a call at position and some parties off hook
UCD	Unoccupied positions with a call at position and all parties on hook
ACS	Positions at which the operator has accessed a loop without a call in progress

To print a report on the current status of TOPS QMS positions, enter the following command at the QFADS TTY:

>P

The TTY responds in the following way (for example):

```
QMS POS

      OC   MB   OD   CT   UCP  UCD  ACS
SYST  87   14    5    3     2    1    2

TO1   29    5    2    0     0    0    0
TO2   31    4    0    2     1    0    1
TO3   12    3    1    0     1    1    0
TO6   15    2    2    1     0    0    1
```

Because data is printed only for teams datafilled as QMS in Table TEAMACD, team numbers are not necessarily printed in numerical order.

QMS position states are the same as those for TOPS ACD, excluding the TOPS ACD transfer states (such as OC2, MB2, and so forth).

Silence Sonalert tone

A Sonalert tone sounds at a QFADS position when one of a number of critical system events occurs. Entering the S command at a QFADS TTY silences the Sonalert at that position.

S command

To silence the Sonalert tone at a QFADS TTY, enter the following command at that QFADS TTY:

>S

It is not necessary to press **RETURN**. The TTY responds in the following way:

```
>
```

Report QMS call queue conditions

Force managers should be aware when three special queue conditions occur:

- calls deflecting (QCD)
- calls waiting (QCW)
- calls in queue without operator (QCQ)

Every 10 seconds the DMS switch updates which queues have calls deflecting, calls waiting, or calls queued without an operator.

CD command

A force manger or team manager can determine which call queues are deflecting calls by entering CD at a QFADS or QTADS TTY. When the CD command is entered correctly, the system replies by printing the date, the time, and the call queues that are deflecting calls.

To print the call queues that are deflecting calls, enter the following command at a QFADS or QTADS TTY:

>CD

The TTY responds in the following way, for example:

```
QMS QUEUES  91/11/23  3:34:07

CQ1
CQ11
```

CW command

A force manger or team manager can determine which call queues have calls waiting by entering CW at a QFADS or QTADS TTY. When the CW command is entered correctly, the system replies by printing the date, the time, and the call queues that have calls waiting.

To print the call queues that have calls waiting, enter the following command at a QFADS or QTADS TTY:

>CW

The TTY responds in the following way, for example:

```
QMS QUEUES  91/11/18  21:34:56

CQ7
CQ12
```

CQ command

A force manager or team manager can determine which call queues have the QCQ condition by entering CQ at a QFADS or QTADS TTY. When the CQ command is entered correctly, the system replies by printing the date, the time, and the call queues that have calls but no operators assigned. The QCQ condition is automatically cleared once an operator is assigned to a call in that call queue. After a call queue is cleared, it is no longer displayed when the CQ command is issued, unless another call arrives in that call queue and no operator is assigned to the call.

To print the call queues that have the QCQ condition, enter the following command at a QFADS or QTADS TTY:

>CQ

The TTY responds in the following way, for example:

```
QMS QUEUES  91/11/18  21:34:56

CQ4
CQ8
```

CQ command with reset

Entering a call queue number with the CQ command allows the force manager or team manager to clear the QCQ condition manually. If another call arrives in the call queue and no operator is assigned to the call, the call queue reverts back to the QCQ condition.

To clear the QCQ condition manually, enter the following command at a QFADS or QTADS TTY:

>CQ call queue number

For example:

>CQ26

The TTY responds in the following way:

```
CQ26     OK
```

QMSCASE

QMSCASE overview

The TOPS Queue Management System Customer Assistance Service Enhancements (QMSCASE) allows selected QMS operators at general operator positions to have functionality historically associated with service assistance (ASST, or SA) and in-charge (IC) operators and positions. With QMSCASE software in the IWS and the DMS switch, the SA and IC positions can be eliminated, and the SA and IC operators can be datafilled by the service provider as QMS operators with special capabilities. More experienced general operators can be datafilled to handle assistance requests, without giving them access to full SA functionality. Operators who handle assistance requests, or who have supervisory responsibilities, or both, are referred to as customer service experts (CSEs).

Without QMSCASE, SA and IC operators log on to positions datafilled as ASST or IC. QMS operators can obtain assistance from them, but the SA and IC operators cannot complete subscriber calls that have been referred to them for assistance, and they cannot receive subscriber calls directly. When providing assistance, they do not have access to full call details.

Assistance requests to SA and IC operators cannot be queued by type or priority, so it is not possible for an operator to direct an assistance request to a pool of specially trained SA and IC operators, or to give higher priority to an emergency request. No statistics are available to measure SA/IC operators' performance for use in managing the assistance work force.

QMS partially addressed these problems with senior operators. Senior operators can log on to the general operator positions, receive both assistance requests and subscriber calls, and complete calls on which they are providing assistance. But senior operators do not have access to full call details, and loop-around trunks are required.

With QMSCASE, CSEs have the same call handling capability as other QMS operators on assistance requests as well as subscriber calls. On assistance requests, they have access to the same call details as the operator requesting assistance. Unlike QMS senior operators, CSEs do not require loop-around trunks.

The same mechanisms that are used for queueing subscriber calls in QMS are used for QMSCASE assistance requests, so datafill in the QMS environment can set up call queue priorities so that an operator who handles both assistance requests and subscriber calls gets any waiting assistance request with priority over any new subscriber call.

QMSCASE is a registering application that is installed with the IWS Base software. This application, along with the QMSCASE DMS switch software, allows the functionality of both a traditional SA and an IC to be combined with a general operator's functionality.

QMSCASE operators

QMSCASE gives the service provider the ability to datafill operators who possess both call-handling and force management capabilities, so that some operators who mainly view team statistics, offer assistance, and monitor other operators may also handle calls. In addition, certain senior operators may have additional functionalities such as offering assistance to other operators. Although these features are driven by datafill in the DMS switch, software on the IWS also supports the functionality.

A CSE is not a new type of operator. A CSE is a general operator who is datafilled to handle assistance requests and who also may have one or more of the four computing module (CM) capabilities (INTEROPR, MON, QINFO, and STATS) that are datafilled in DMS switch tables. From a general operator position, the CSE with all the datafillable capabilities can complete the following tasks:

- view team statistics and office alarms
- view warnings about the status of QMS call queues
- query additional queue and statistical information (up to 56 total positions or operators and queues)
- monitor or page a specific operator or position
- receive a page from another operator
- receive a directed assistance request from another operator
- provide assistance to QMS operators with toll and assist (TA), directory assistance (DA), and intercept (INTC) calls
- initiate a directed assistance call to another operator
- converse with the requesting operator and the subscriber, while sharing control of the call with the requesting operator
- complete calls for which the CSE is providing assistance
- handle subscriber traffic

Detailed information on the SA and IC administrative positions in QMS is found in the chapter "Administrative operator positions" in this document.

Specialized CSE roles

Small traffic offices may want the same CSEs who receive team statistics or monitor other operators to handle general assistance requests and perhaps even subscriber calls. In a large traffic office, however, this may not be desirable. Therefore, service providers need to be able to define profiles for QMS operators who handle assistance requests but have no supervisory responsibilities, and also for QMS operators who perform supervisory tasks but do not receive general assistance (or subscriber) calls.

The QMSCASE application makes it possible to datafill an office-wide call queue profile with an empty call queue list. A CSE who does not want to receive general assistance requests (or subscriber calls) can log on with an ID that has such a call queue profile. An empty call queue profile only prevents a CSE from receiving general assistance and subscriber calls. It does not prevent directed calls from other CSEs.

Setting up QMSCASE operator capabilities

An operator’s datafilled capability set determines what supervisory capabilities (such as monitoring and viewing team statistics) the operator can exercise.

The operator’s capability set does not determine whether the operator can receive general assistance requests from other operators. This is determined by the call queues the operator serves and the call queues to which assistance requests are routed. Refer to *Translations Guide* for more information on routing assistance requests to CSEs.

The service provider can datafill QMS operators with any combination of the following capabilities.

INTEROPR

For QMS operators on the same switch, an operator with inter-operator communication (INTEROPR) capability can initiate a page, receive and respond to a page, initiate a directed assistance call, and receive a directed assistance call. Each of these actions can be performed so long as one of the operators involved has INTEROPR capability.

MON

An operator with monitor (MON) capability can monitor another operator if the monitoring operator is in the calls-withheld state and the monitored operator does not have MON capability. During the monitoring session, a display on the terminal shows the monitoring operator which position is being monitored. This display may be toggled on or off with a softkey.

QINFO

An operator with queue information (QINFO) capability receives warnings that QMS call queues have calls waiting longer than the datafilled threshold, calls deflecting to treatment, and calls queued with no operator logged in to serve the queue. The QINFO operator can query QCD or QCQ (see section "Statistics and alarms window") to learn which queues have these conditions.

STATS

An operator with statistics (STATS) capability receives nearly real-time information (updated every 10 seconds) about the number of positions in the team that are in states such as occupied, made busy, and out-of-service, and about the number of logged-in operators in the team who are receiving controlled traffic. The STATS operator also can query to learn which positions are in the indicated states and which operators are receiving controlled traffic. Additionally, the STATS operator is notified of alarms indicating that all datafilled time and charges devices are out-of-service, or that operator services are suspended.

An operator’s datafilled capability set cannot be changed while the operator is logged on. When an operator logs on to an IWS, the DMS switch looks up the operator’s capability set in datafill and communicates it to the position. This happens regardless of the Software Optionality Control (SOC) state for QMSCASE.

However, if the SOC state is set to "IDLE," the DMS switch does not allow the operator to exercise the datafilled capabilities. Changes in the SOC state are immediately effective, though, so if the SOC state is IDLE when the operator logs on but is subsequently changed to ON, the functionality available to the operator changes during the same logon session.

Datafilling CSE operators, positions, and capabilities

The positions used by CSEs are datafilled as QMS OPR positions in DMS table TOPSPOS. Operator numbers for all QMS operators, including CSEs, are datafilled in DMS table TQOPROF. Tables TQOPROF and TQCQPROF together specify the mix of assistance requests and subscriber calls each CSE will handle. Table TQCAPROF defines capability sets that can be associated with operator IDs.

The following table shows examples of QMSCASE capability profiles.

QMS capability profile

PROFNUM	CAPSET
0	NONE
1	INTEROPR MON QINFO $
5	INTEROPR QINFO STATS $
10	ALL

Datafill for positions, operators, and capability sets is discussed in detail in *Translations Guide*.

Differences between CSEs and IC managers

Following is a summary of the ways in which the functionality conferred on CSEs by the QINFO, MON, and STATS capabilities differs from the similar functionality of IC managers. This section does not address differences between IC managers and CSEs in paging or handling assistance calls.

- For CSEs, alarm, warning, statistics, and query functionality is controlled by capabilities that can be assigned to operator profiles through datafill. For IC managers, functionalities go automatically with the operator and position type.
- Unlike the restriction of one IC manager on a team, the DMS switch does not limit the number of CSEs who can be datafilled with these capabilities. Note that because of the volume of messaging for the real-time displays, problems may arise if too many logged-in operators on the same TOPS Message Switch (TMS) have QINFO and STATS capability.
- Queue status and other alarm conditions do not cause the DMS switch to terminate a monitoring session at a CSE’s position. Various conditions cause the DMS to terminate an IC monitoring session.
- For CSEs, the Sonalert is controlled by the position and not by the DMS switch. For IC managers, the DMS switch instructs the position to sound a Sonalert when alarm conditions arise.
- A CSE who is monitoring can optionally display the position number and operator ID of the monitored operator, whereas an IC manager cannot.
- Although an IC position generates alarms even when no IC manager is logged in, a CSE’s position does not. The CSE can log into any supported operator position and have the same functionality; the DMS uses the logged-in operator’s profile, not the position’s characteristics, to determine what alarms should be sent.

- A CSE with QINFO capability can query to learn which call queues have calls deflecting or calls arriving with no logged-in operator who serves the queue. An IC manager does not have this functionality.
- An IC manager can key to receive directed assistance calls only, but a CSE cannot. A CSE who wants to receive only directed assistance calls can log on with an operator ID whose call queue profile includes no queues. With that capability set, the CSE can still receive pages and directed assistance calls, but not general assistance requests or subscriber traffic.
- Some of the information that is sent to IC positions is not sent to CSEs regardless of their capabilities. The information that is sent to IC positions but not to CSEs includes:
  - — an alarm when 25% of logged-in operators on the switch are datafilled to receive controlled traffic

    This alarm is not needed, since CSEs with the STATS capability receive near-realtime information about the number of logged-in operators who are datafilled to receive controlled traffic, and can query to learn the operator IDs.
  - — an alarm when no QMS study registers are available for assignment, and ability to query which operators in the team have study registers assigned

    Study register administration is done at the QTADS TTY. This device already supports a command to list the team's operators who have study registers assigned. Also, as explained in chapter "QMS TTY commands, queries, and reports," the QTADS output to the study register assignment and query commands has been enhanced to include the total number of available and assigned study registers. The information returned compensates for the apparent absence of functionality for the CSE at the general operator position.
  - — team monitor status

    This statistic tells the IC manager whenever a service assistant in the team is monitoring. No CSE is told when another CSE is monitoring. Also, if a team has both CSEs and an IC manager, the IC manager is not told when a CSE is monitoring.
  - — team assistant position information, including
    - – a warning when no assistant position is available to serve general assistance requests
    - – the number of assistant positions in the team
    - – the position numbers of the team's assistant positions

- the number of assistants connected to operators
- the operator IDs of operators receiving assistance
- the state of the assistance queue

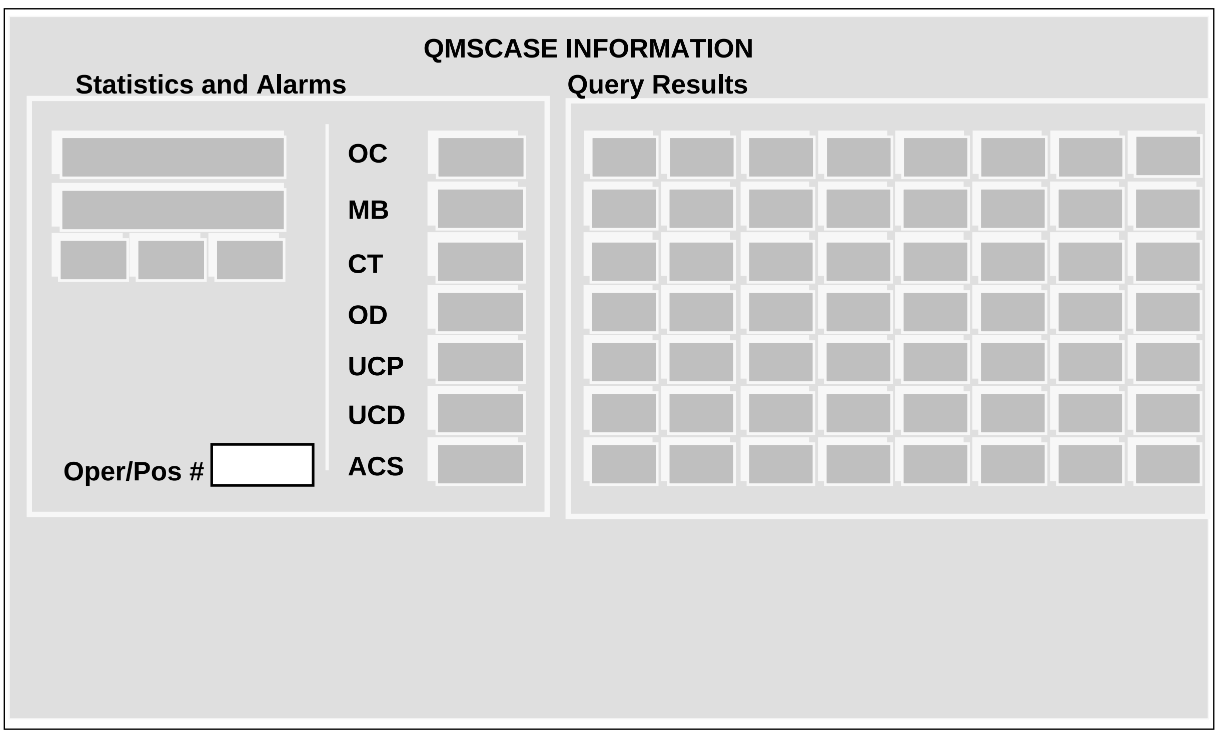
- Screen displays and keying are different, in some cases, for CSEs than for IC managers.

Accessing the QMSCASE application

The functionality provided by QMSCASE is controlled by SOC and DMS switch datafill. With the proper datafill, a CSE can handle assistance requests, monitoring, and paging through the functions menu without accessing the QMSCASE application. Only CSEs who need to use the QINFO and STATS capabilities must access the QMSCASE application.

The QMSCASE application can be accessed after logon through the applications menu (or on a hot key, if one has been datafilled). The following figure shows the QMSCASE application window.

QMSCASE application window

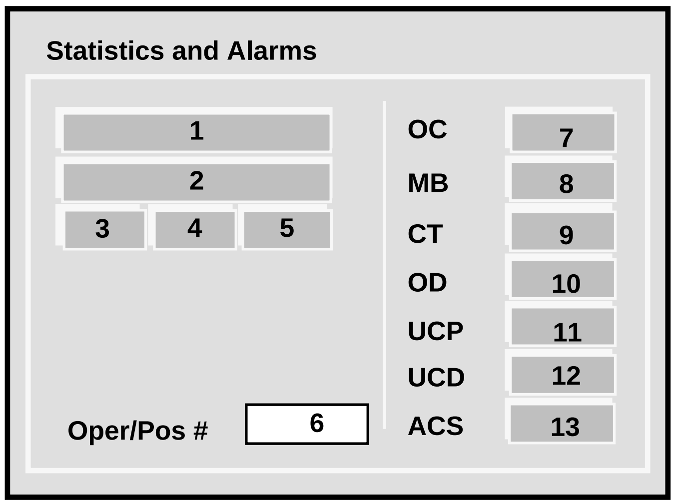


Once the above window is displayed, the operator can access all the IWS menus by using the QMSCASE softkeys (described in section "QMSCASE softkeys").

Statistics and alarms window

The statistics and alarms window displays information about statistics, alarms, and queues. This information is updated constantly by the DMS switch, even when the window does not have focus. Operators who have any combination of the STATS or QINFO logon capabilities can view the information presented in the statistics and alarms window. Datafill for operator capability sets is discussed in detail in *Translations Guide*. The figure below is an example of the statistics and alarms window. The figure is followed by descriptions of the fields in the window.

Statistics and alarms window



5

Field 1: Opr Svcs Suspended

Calls are not being routed to operators, but are being completed, where possible, regardless of whether billing has been satisfied. Maximum string length is 20 characters. Operators with STATS logon capability receive this office information.

Field 2: All T&C OD

All time and charges devices are out of order. Maximum string length is 20 characters. Operators with STATS logon capability receive this office information.

Field 3: QCQ

There are calls in QMS queues for which no operators are logged on. When the DMS switch detects that the condition has ended, the field is cleared. The QCQ condition is cleared when an operator logs in and receives a call from the queue in question. Maximum string length is three characters. Operators with QINFO capability receive queue status warning information about the office.

Field 4: QCD

Calls are being deflected from one or more QMS queues. When the DMS switch detects that the condition has ended, the field is cleared. Maximum string length is three characters. Operators with QINFO capability receive queue status warning information about the office.

Field 5: QCW

The number of calls to be handled is greater than the "calls waiting on threshold" value for one or more QMS queues. When the DMS switch detects that the condition has ended, the field is cleared. Maximum string length is three characters. Operators with QINFO capability receive queue status warning information about the office.

Field 6: Operator/position number data entry field

This field accepts data entry. When the operator presses a softkey that requests entry of an operator number, the window label changes to "Operator." When the operator presses a softkey that requests entry of a position number, the window label changes to "Position." When the operator presses the **Start** key to terminate data entry and send it to the DMS switch, the window label changes to the default, "Oper/Pos #." Operators with either MON or INTEROPR capability can enter data in field 6. The page is issued only if the paged or the paging operator has INTEROPR capability.

Fields 7-13: Position states

The following fields are identified and explained:

- OC–occupied
- MB–made busy
- CT–controlled traffic
- OD–out of service
- UCP–unoccupied with a call in progress
- UCD–unoccupied with a call disconnected
- ACS–loop accessed with no connected, off-hook party

Operators with STATS logon capability are eligible to receive information from the DMS switch about the number of positions in any of these states. If no information is available, a dashed (– – –) string displays in the field. In addition, the STATS operator can query the DMS switch to see the operator numbers for operators in the "CT" (receiving controlled traffic) state and position numbers for positions in the indicated states (except OC).

Alarm condition notification

Operators with STATS login capability see alarm text in fields 1–5 of the statistics and alarms window. The text remains until the condition is cleared, and the Sonalert beeps until the operator presses the **{Stp Bell}** softkey or invokes "Stop Bell" from the functions menu. Following are the alarms and the conditions that cause them.

Sonalert

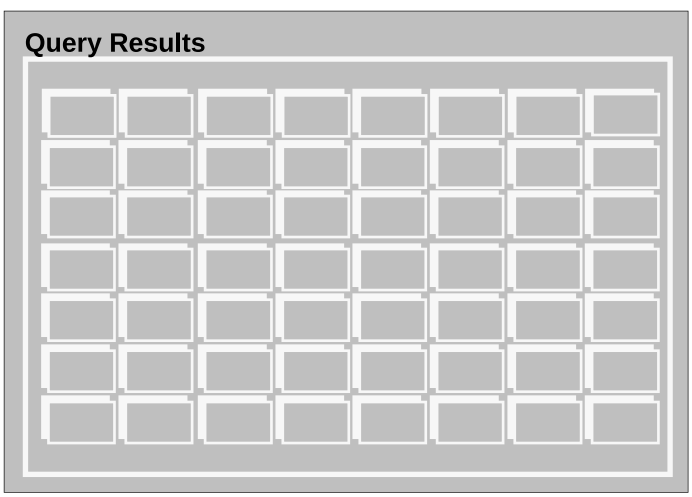
When the QMSCASE application has focus, the Sonalert sounds for the following alarms:

- Opr Svcs Suspended
- All T&C OD
- QCD
- QCQ

Query results window

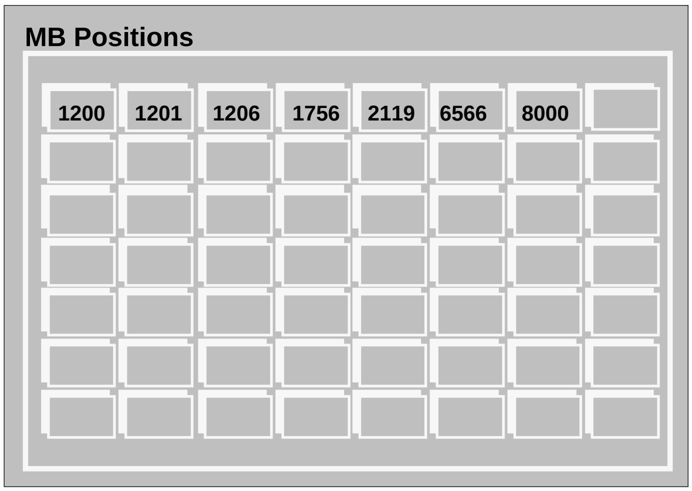
The query results window displays information about positions or operators in the team, or about call queues. A query can be invoked by pressing one of the query softkeys (described in section "QMSCASE softkeys"). The operator must have STATS capability to access the position state query softkeys, and must have the QINFO capability to access the queue query softkeys. The query results window is shown in the following figure.

Query results window



The operator uses the softkeys to initiate a query about the state of a position, and the title of the query results window changes accordingly. For example, if the operator presses the **{Qry MB}** softkey, a window such as that in the following figure displays, showing that the positions identified are in the made-busy state.

Made-busy query results window



If the operator presses the **{Qry CT}** (controlled traffic) softkey, operator numbers, rather than position numbers, display in the window.

If the operator presses the **{Qry QCQ}** or **{Qry QCD}** softkey, queue numbers display in the window.

If the operator presses the **{Clear}** softkey, the information in the query results window is erased.

QMSCASE softkeys

The QMSCASE application has two levels of softkeys with which the operator may invoke various functions. Some softkeys have two functions, one requiring a keypress of the softkey, and the other requiring <shift>+softkey. Like other softkey sets, the softkey strings are limited to seven characters on each line. The set defined in the following table is displayed as the default when the application is activated.

Default QMSCASE softkey set

Following is a figure representing the default set of QMSCASE softkeys and their definitions.

Page Opr Page Pos	Mon Opr Mon Pos		Stp Bell			Query	Clear

QMSCASE default softkey set

Softkey	Action
Page Opr	• allows operator to initiate a page to another operator by specifying login ID of the paged operator • cursor moves to data entry field 6 of statistics and alarms window
Page Pos	• allows operator to initiate a page to another operator by specifying position number of paged operator • cursor moves to data entry field 6 of statistics and alarms window
Mon Opr	• allows operator to monitor another operator by specifying login ID of monitored operator • cursor moves to data entry field 6 of statistics and alarms window
Mon Pos	• allows operator to monitor another operator by specifying position number of monitored operator • cursor moves to data entry field 6 of statistics and alarms window
Stp Bell	• deactivates Sonalert, if it is activated
Query	• allows operator to query information from DMS switch about operators, positions, or queues • activates second set of QMSCASE softkeys
Clear	• clears any data that has been entered into data entry field and removes cursor from field • clears cursor from data entry field after Page or Monitor softkey has been pressed if data has not yet been terminated and sent to switch • clears query results window if cursor is not active in data entry field, and restores original title

The **{Mon Pos}** and **{Mon Opr}** softkeys are blank if the operator does not have MON capability. The **{Query}** softkey is blank if the operator does not have QINFO or STATS capability.

QMSCASE second softkey set

To access the second softkey set, the operator presses the **{Query}** softkey in the default set.

The second level of softkeys is shown in the following figure. The set includes eight unshifted softkeys, which allow the operator to request specific information to be displayed in the query results window. When the operator presses one of the following softkeys, the request is sent to the DMS switch, and the softkey display returns to the default set. Following is a figure of the second set of default softkeys and their names.

Qry MB	Qry OD	Qry CT	Qry UCP	Qry UCD	Qry ACS	Qry QCQ	Qry QCD

QMSCASE second default softkey set

Heading	Heading
Qry MB	allows operator to query up to 56 positions that are in made-busy state
Qry OD	allows operator to query up to 56 positions that are in out-of-service state
Qry CT	allows operator to query up to 56 operators who are receiving controlled traffic
Qry UCP	allows operator to query up to 56 positions that are in unoccupied state with a call in progress
Qry UCD	allows operator to query up to 56 positions that are in unoccupied state with a call disconnected
Qry ACS	allows operator to query up to 56 positions that have a loop accessed with no connected, off-hook party
Qry QCQ	allows operator to query up to 56 queues with calls queued but no serving agent to answer calls
Qry QCD	allows operator to query up to 56 queues with calls deflecting to treatment

The **{Qry MB}**, **{Qry OD}**, **{Qry CT}**, **{Qry UCP}**, and **{Qry UCD}** softkeys are blank if the operator does not have STATS capability. The **{Qry QCQ}** and **{Qry QCD}** softkeys are blank if the operator does not have QINFO capability.

Paging an operator or position

With or without QMSCASE, a page can be issued by either operator number or position number, and the page is successful if either operator has INTEROPR capability. To page an operator at a specific position, press the **{Page Pos}** softkey or invoke "Page Position" from the functions menu. To page a specific operator, press the **{Page Opr}** softkey or invoke "Page Operator" from the functions menu. Once the appropriate function or softkey is selected, the cursor is placed in the Misc field of the call processing window. The operator enters the position number or operator number and presses **Start**. The paged operator can invoke "Paged Assistance" from the functions menu to respond to the operator who initiated the page.

If the paged operator receives another page before responding to the first, the first is canceled. If the paging operator initiates a second page before a first is answered, then the first is canceled.

However, if an operator in the QMSCASE environment initiates a page and then receives a page from another operator before responding to the first page, both pages are active. If an operator receives a page and then initiates another page to another operator before responding, both pages are active.

MSA displays

Depending on whether a position or an operator is being paged, one of the following messages is displayed in the message/status area (MSA). The strings are datafilled in file POSMSA.LNG.

Page To Pos <PPPP>

This message displays in the MSA of the paging operator’s screen when he or she pages another operator at a specific position. "PPPP" is the position number paged. The maximum text string length is 27 characters, allowing five characters for the position number.

Page To Opr <XXXX>

This message displays in the MSA of the paging operator’s screen when he or she pages a specific operator. "XXXX" is the number of the paged operator. (This number is the same as the operator’s login ID.) The maximum text string length is 27 characters, allowing five characters for the operator number.

Directed assistance

The term "Directed assistance" implies that an operator is requesting assistance from a specific operator, but this implication has changed focus with the introduction of QMSCASE. Previously, directed assistance was used by an operator who needed help from a senior operator. In the

QMSCASE environment, an operator cannot request directed assistance on a subscriber call. So the operator who requests directed assistance is probably calling another operator for information or permission of some sort. In this case, the operator requesting assistance is one with less seniority.

A directed assistance call is the fastest way to contact another operator, since the connection either is immediate or occurs as soon as the requested operator releases the current call.

Because assistance requests can be routed to particular pools of CSEs based on expertise, operators in the QMSCASE environment no longer need to use directed assistance to request help from a particular service assistant or IC position. However, if an operator wishes to reach a particular CSE, service assistant, or IC manager, he or she can do so, using directed assistance on an operator-initiated (delay) call in the QMSCASE environment. Additionally, a supervisor can use directed assistance to reach another supervisor. Directed assistance may be invoked from an operator with INTEROPR capability or by an operator who chooses to request assistance from an operator with INTEROPR capability.

With QMSCASE, a directed assistance request can be made by either operator number or position number. (With directed assistance by a service assistant or IC manager, all requests must be by position number.)

MSA displays

The following strings are displayed in the page field of the MSA to indicate directed assistance information. These strings are datafilled in file POSMSA.LNG.

Dir Pos: <PPPP> Opr: <XXXX>

This string is displayed on both the requesting and the requested operators' positions when they are connected. When this string is displayed on the position of the requested operator, "XXXX" reflects the operator number and "PPPP" reflects the position number of the requesting operator. When this string is displayed on the requesting operator's position, "XXXX" reflects the operator number and "PPPP" reflects the position number of the requested operator.

Queued

If an operator requests a directed assistance connection and the requested operator is handling a call, this string is displayed in the pending field of the MSA to indicate the operator is in queue for the directed assistance connection. The maximum string length of this display is six characters.

Denying a directed assistance request

A directed assistance request might be denied for one of the following reasons.

- Neither the requesting or requested operator has INTEROPR capability.
- The requesting or requested position is not supported by QMSCASE.
- The active call of the requesting operator is not an operator-initiated (delay) call.
- The requested operator is handling a call, and one directed assistance request is already waiting.
- The requesting operator tried to reach a position number that is not datafilled, is not logged in, is out-of-service, or has calls withheld.
- The requesting operator tried to reach an operator number that is not datafilled, is not logged in, or is logged in but has calls withheld.

Ending a directed assistance request or connection

While waiting in queue, the requesting operator may cancel the request either by accessing "Release Operator" from the functions menu or by pressing **Pos Rls**. Either action frees the loop so the operator can receive calls again.

After the two operators are connected, if either operator presses **Pos Rls** or invokes "Release Operator" from the functions menu, both operators are disconnected and their loops freed unless a calling or called party is attached.

Differences between paging and directed assistance

Sometimes paging is preferable; sometimes directed assistance is preferable:

- Response to a page requires keying by the paged operator, but response to a directed assistance call is automatic, with no keying.
- Paging permits the requested operator to respond when convenient.
- A directed assistance call is the fastest way to contact another operator, since the connection either is immediate or occurs as soon as the requested operator releases the current call. But if the requested operator is not immediately available, the requesting operator cannot put the request on hold or handle other calls while waiting. Also, if the requested operator is not a service assistant or IC manager, directed assistance can be done only on a delay (non-customer-initiated) call.
- An unanswered page is canceled by a subsequent page.

Monitoring an operator/position

Monitoring in the QMSCASE environment is similar to monitoring by service assistants and IC managers, except for the following differences:

- Rather than being automatically associated with fixed operator types, QMSCASE monitoring functionality can be assigned to individual QMS operator IDs through datafill.
- Rather than being automatically available on fixed position types, QMSCASE monitoring functionality is potentially available on all TOPS IWS positions datafilled as QMS OPR. Whether or not the functionality can be put to use depends on the datafilled capabilities of the operator.
- Unlike service assistants and IC managers, CSEs can be monitored (so long as they do not have MON capability) because they are datafilled as QMS OPR and use positions datafilled as QMS OPR. CSEs with any QMSCASE capability cannot be monitored by a service assistant or IC monitor.
- Monitoring with QMSCASE is not constrained by teams (traffic offices). A CSE with MON capability can monitor operators in all QMS teams that are datafilled in the DMS switch.
- No position other than the monitoring one, and optionally the monitored one, is informed that a CSE is monitoring an operator in the team.

The monitoring session

The DMS switch accepts requests from positions to monitor either a specified position number or a specified operator ID.

Once the monitoring session begins, the DMS switch sends the monitoring CSE’s position all the screen update messages that it sends to the monitored position. For example, the monitoring position receives toll and assist (TA) screen updates (regardless of whether the monitoring operator has TA services).

The monitoring operator’s position should be datafilled with a superset of the services of the operators who are likely to be monitored. The service text datafill in file XSERVS.TBL should be the same for each operator providing that service and also for the monitoring operators. Position datafill should be the same, except for services. Otherwise, the monitored operator displays might not reflect what is presented to the monitoring operator, and the monitoring operator might experience keyboard functionality differences (for example, context change keys could be ignored).

For DA calls, if the monitoring operator has the DA services of the monitored operator, the directory assistance system (DAS) is informed of the monitor’s presence. It should then send duplicate screen update messages to the monitored and monitoring positions. If the monitoring operator does not have a base DA service that the monitored operator has, the DAS is not informed that monitoring is occurring, and the monitoring position does not receive screen updates from the DAS.

Certain screen updates at the monitored position occur without any involvement on the part of the DMS switch or the DAS. When the DMS switch does not know about a screen update at the monitored position, it cannot notify the monitoring position to make the same screen update. The screen updates that occur without knowledge of the DMS switch or the DAS, and therefore are not mirrored at the monitor's position, include:

- local echoing of keystrokes, before they have been sent to the DMS switch
- OIA (Open Information Access) displays, including those from an Operator Reference Database
- changes between the billing and the search screen on DA calls
- any other screen updates that result from messages sent directly to the position by some entity outside the DMS switch

The DMS switch ignores all keying input messages from a monitoring position except for a request to terminate the monitoring session.

If a monitoring session is initiated with an operator who has a call in progress, the monitoring operator's display for the call in progress is incomplete until there are updates from the DMS switch.

If the monitoring operator is datafilled to receive alarm or warning messages (such as QCW, QCQ) or position state messages (number of positions occupied or made busy), the DMS switch continues to send these messages to the monitor during the session.

MSA display

The monitoring operator must have MON capability, and the operator to be monitored may not have MON capability. If the session is allowed by the DMS switch, the QMSCASE application window and softkeys are removed and the following message is displayed in the MSA.

Mon Opr:XXXX Pos:YYYY

This string is displayed on both the requesting and the requested operators' positions when they are connected. This message displays in the MSA of the monitoring operator's screen. The display is a combination of three datafilled strings that indicate that the operator is monitoring another operator whose operator number is "XXXX" and position number is "YYYY." This display may be toggled on or off using the "Monitor Display

Toggle" function from the functions menu. If the DMS switch changes the monitored position's state, the display is either changed or cleared. When the session ends, the display is cleared.

This string is datafilled in file POSMSA.LNG.

Ending the monitoring session

The monitoring session is ended under the following circumstances.

- A request to end the monitoring session is keyed at the monitoring position.
- The monitoring or monitored operator logs out.
- The monitored position is taken out of service.

If the monitoring operator decides against monitoring while the cursor is still in the data entry field, he or she can press the **{Clear}** softkey.

General assistance requests

QMSCASE operators may receive general assistance requests at their positions if DMS switch datafill is set up so that they are serving a queue to which such assistance requests are routed. Assistance requests may arrive on either loop, and they arrive as an active call to the position. With QMSCASE, an operator can get assistance while the called party is present. Service assistants and IC managers cannot have the called party present. Assistance call arrival does not activate the Sonalert.

Operators request general assistance by invoking "General Assistance" from the functions menu. Because the CSE is an operator, he or she may also request general assistance. An operator who has requested assistance may either stay on the call and talk with the CSE, release the call to queue for assistance, or cancel the request by invoking "Release Operator" from the functions menu.

When an assistance call arrives at the CSE's position, the operator ID and position number of the operator who made the request are displayed. If the operator who made the request remains on the call until the CSE is connected, the CSE's position number and operator ID are displayed to the requesting operator.

MSA displays

The following strings are displayed in the pending field of the MSA to indicate that the current call is a general assistance request. These strings are datafilled in file POSMSA.LNG.

Gen Pos: <XXXX> Opr: <PPPP>

When this string is displayed on the assisting operator’s position, "XXXX" reflects the operator number and "PPPP" reflects the position number of the requesting operator. When this string is displayed on the requesting operator’s position, "XXXX" reflects the operator number and "PPPP" reflects the position number of the operator providing assistance.

Queued

If an operator requests assistance and all operators who can provide assistance are busy, this string is displayed in the pending field of the MSA to indicate the operator is in queue for assistance. The maximum string length of this display is six characters.

Rlsd Opr: <XXXX>

If an operator who has been queued for assistance releases the call, this string is displayed on the assisting operator’s MSA to indicate that the call is an assistance request, and that it has been released to queue. This string is also displayed on the requesting operator’s MSA if the assisting operator is released. "XXXX" reflects the number of the operator who released the call to queue.

Processing an assistance request when a CSE is immediately available

If a CSE who serves the call queue selected for an assistance request is idle when the request is processed, the CSE is connected immediately.

If traffic is heavy in an operator centralization host-remote environment, a short delay may occur between the time the request is made and the idle CSE is connected. This delay is the time needed for messaging between the host and the remote to get the CSE added to the call. Because of the need to keep a consistent call state while this messaging is in progress, keying by the requesting operator is ignored while the CSE is connecting.

Note this implies that when a CSE is immediately available to serve the request, the requesting operator does not have an opportunity to cancel the request or to release it to queue. Also, while both operators are attached, neither operator can put the call on hold. Once the CSE is connected, the requesting operator can drop out of the call.

Processing when queued for CSE

If no CSE is immediately available to serve an assistance request, the operator can wait, cancel the request by invoking "Release Operator" from the functions menu, or release the call to queue (to be presented to the first available CSE who serves that queue).

In an operator centralization host-remote environment under heavy traffic, a short delay may occur while the host and remote exchange messages to get the request queued. All keying by the requesting operator, including **Pos Rls**, is ignored until this messaging is completed.

Processing input from two positions

When two operators are on a call, both can key on the call and see the results on their respective positions, with the following restrictions and conditions.

Restrictions

The DMS switch denies certain requests from positions when a call has two operators attached:

- Requests to put the call on hold are denied, so pressing **HOLD**, **REQUEST CAMA**, or **ACS1/2** is ignored.
- Requests for assistance are denied.
- Requests to change the service to one not supported by both operators are denied.

Call-related versus position-related input

When two operators are attached to a call, position-specific keying applies only to the position where the keying occurs, as shown in the following examples:

- If either operator keys to make-busy or withhold-calls, only that operator’s position becomes busy-pending or has calls withheld-pending.
- Time keying is position-specific.

Releasing either or both of two connected operators

When two operators are on a call, each can release him- or herself, and each can release the other:

- releasing self

  Keying **Pos Rls** releases the operator who did the keying. The remaining operator has full control of the call.

  If a call is marked for transfer and two operators are connected, the keystroke **Pos Rls** by one operator *does not transfer the call*. The call is still marked for transfer, but it is not actually transferred until the second operator also keys **Pos Rls**.

  If a call is marked for handoff to an automated system, or is marked to be canceled, it remains marked but is not actually handed off or taken down when only one of two connected operators keys **Pos Rls**.

- releasing other operator

Keying **Rls Opr** releases the operator who *did not* do the keying. The remaining operator has full control of the call. The DMS switch informs the remaining operator that the other operator is released from the call.

Position release and release operator keying

When a listing has been selected, position release keying is sent to the DAS, which saves the operator from having to manually key in the requested number. The DAS forwards the requested number to the DMS switch for automatic inclusion in the AMA record.

However, if **Pos Rls** is keyed before a listing has been selected, the keystroke is sent to the DMS switch. This scenario usually occurs when the operator quotes the requested number from memory and keys it in manually. After receiving the position release keying, the switch ends the call and generates an AMA record.

Furthermore, if an operator wishes to release a call to queue, the operator must do so before a listing has been selected, or the keystroke will cancel the queued request and end the DA call. A call released to queue for a QMS CASE assistant resembles a transfer call.

The function of **Rls Opr** keying is not affected by listing selection. **Rls Opr** releases the operator, if attached. If the assistance request was queued, **Rls Opr** cancels the request. The DA call remains at the keying operator’s position.

Reasons for denial of an assistance request

A general assistance request might be denied for one of the following reasons.

- The call might be deflected because the QMS Call and Agent Manager (CAM) determines the wait will be too long.
- There are insufficient resources for queueing the request.
- No three-port circuits are available.
- No operator centralization resources are available.
- The positions are incompatible (for example, a QMSCASE assistance request is routed to a TOPS04 position).
- There is a hardware or network connection failure.

Ending an operator assistance session

If the requesting operator has been placed in queue, he or she has three choices: cancel the request, release the call to queue, or wait for the requested operator. To cancel the assistance request directly, the requesting operator invokes "Release Operator" from the functions menu. This action has no effect on the subscriber. Note that pressing the **Rls Cld** key does not break the assistance connection as it does for service assistants and IC managers in a non-QMSCASE environment. The operator presses **Pos Rls** to release the call to queue. If no subscriber is present, the key press is interpreted as a request to cancel the assistance request and end the call.

Either of the two connected operators can press **Pos Rls** and be disconnected Unless the call is a delay call, the call is not affected.

QMSCASE commands in the functions menu

The functions associated with QMSCASE are described below.

Dir. Asst. by Position

The requesting operator must access a loop before selecting this function. The cursor is placed in the extra entry field of the functions menu. The operator then enters the appropriate position number and presses the **Start** key to send the data to the DMS switch. If the operator presses **Start** without entering a position number, a general assistance request is issued. If datafill in the DMS switch does not allow the directed assistance request, a no action reason displays in the MSA.

Dir. Asst. by Operator

The requesting operator must access a loop before selecting this function. This function allows one operator to initiate a directed assistance call to another operator, service assistant, or IC manager by specifying that operator’s number. When this function is invoked, the cursor is placed in the extra entry field of the functions menu, indicating that the operator number is required. After the operator number has been entered, the operator must press **Start** to send the data to the DMS switch. If **Start** is pressed with no data entered, a general assistance request is issued.

Release Operator

This function allows an operator who has requested assistance from another operator to cancel the assistance request while remaining on the call. In addition, if two operators are currently attached to the call, this function allows one operator to drop the other from the call.

Page Operator

This function allows one operator to page another by specifying the operator number (which is also the login ID). When this function is invoked, the cursor is placed in the extra entry field of the functions menu, indicating that the operator number is required. After the operator number has been entered, the operator must press the **Start** key to send the data to the DMS switch. If

DMS switch datafill does not allow the page request, a no action reason displays in the MSA.

Page Position

This function allows one operator to page another by specifying the operator's position number. When this function is invoked, the cursor is placed in the extra entry field of the functions menu, indicating that the position number is required. After the number has been entered, the operator must press **Start** to send the data to the DMS switch. If DMS switch datafill does not allow the page request, a no action reason displays in the MSA.

Monitor Operator

This function allows one operator to monitor another by specifying the operator number. When this function is invoked, the cursor is placed in the extra entry field of the functions menu, indicating that the operator number is required. After the operator number has been entered, the operator must press **Start** to send the data to the DMS switch. If the requesting operator does not have the appropriate capabilities to invoke this request, or if the operator to be monitored has MON capability, a no action reason displays in the MSA.

Monitor Position

This function allows one operator to monitor another by specifying the operator's position number. When this function is invoked, the cursor is placed in the extra entry field of the functions menu, indicating that the operator's position number is required. After the number has been entered, the operator must press **Start** to send the data to the DMS switch. If the requesting operator does not have the appropriate capabilities to invoke this request, or if the operator to be monitored has MON capability, a no action reason displays in the MSA.

Monitor Display Toggle

This function allows a monitoring QMSCASE operator to toggle the display of the monitor string that specifies the monitored operator's position and operator numbers. If the string is displayed, this function toggles the display off. If the monitor string is not currently displayed, this function toggles the display on. If the operator is not currently monitoring, this function does nothing.

Force management statistics on assistance

Force management statistics are collected on CSEs who are requesting assistance or receiving assistance requests. These statistics are made available to QMS basic statistics and to the QMS Management Information System (MIS), if present.

When the CSE begins servicing an assistance request, the following statistics accumulate.

- Call busy work volume (CBWV) begins accumulating towards the call queue used to reach the CSE.
- CBWV begins accumulating towards the force management call class of the CT4Q used to reach the CSE.
- Service work volume (SWV) begins accumulating towards the service associated with the call queue used to reach the CSE.

When CSEs and general operators are on the same team, team statistics such as AWT reflect assistance requests as well as subscriber calls. Therefore, if a typical assistance request takes more or less time than a typical subscriber call, the team AWT is affected.

When the CSE finishes servicing an assistance request, the following statistics accumulate.

- CBWV and SWV stop accumulating/
- A transfer position seizure (TPS) is pegged towards the call queue used to reach the CSE.
- A TPS is pegged towards the FMCT of the CT4Q used to reach the CSE.
- A service initiation (SI) is pegged towards the service associated with the call queue used to reach the CSE.

When the CSE is waiting or unavailable to service an assistance request, the following statistics accumulate.

- Idle time (IDLT) accumulates while the CSE waits to service a request
- Non-call work volume (NCWV) accumulates while the CSE is unavailable to handle a request, unless the CSE is unavailable because he or she is handling call.

Sometimes an operator remains with the call and waits for the CSE. While waiting, the requesting operator continues to accumulate CBWV and SWV. The CSE is brought into the call, and if the service of the call queue used to reach the operator is different from the service of the call queue used to reach the CSE, the service of the actual call changes, in what is known as an "implicit service switch." When this switch occurs, the operator stops accumulating SWV towards the original service and begins accumulating SWV towards the new service, even if the new service is not in his or her service profile.

Since a CSE is a QMS operator, CSE work volume is reported along with the work volume of other QMS operators. A CSE who is monitoring must have calls withheld, so the time a CSE spends monitoring is pegged and reported to the QMS MIS system, if present, as non-call work volume (NCWV). With QMS basic statistics, this added NCWV is indistinguishable from NCWV accumulated by general operators in the same operator team (traffic office). Separate operator teams can be assigned for CSEs to help distinguish the added NCWV.

GOS-related TTY commands, queries, and reports

One Global Operator Services (GOS) feature is the booked call database, which stores the details of calls that cannot be processed immediately, so the information can be used when the call is eventually processed. Calls stored in the booked call database can be retrieved using the directory number of the calling party, or the serial number assigned to the call when it was stored in the database.

Operators can modify calls and delete them from the database. The operator can store a call, set a recall time, and have the call automatically returned to the position when the timer expires. The operator can also store calls in the database without a specified time. These calls are recalled only when the operator manually retrieves them. Route-queued calls can be stored against a specific outgoing trunk and recalled when that trunk becomes available.

The booked call database is administered through the booked call database administration (DADS) teletypewriter (TTY). In addition to storing calls, viewing them, and deleting them, administering the booked call database involves using DADS TTY commands.

> ***Note:*** The method of obtaining booked call database information does not have to be limited to the DADS TTY. The operating company may choose to make the information available on a dumb terminal.

DADS TTY commands

The commands listed in the following table are used to administer the booked call database.

DADS TTY commands

Command	Purpose
DQS	Displays database entry by serial number
DQC	Displays database entry by calling number
DD	Deletes database entry
DT	Displays database thresholds
DC	Changes database thresholds
DP	Turns on/off printing of deleted calls
DB	Prints a subset of the calls in the database
DM	Sets/displays mass deletion period
DV	Displays the number of calls by country
DO	Displays the number of old calls in the database

Note: When commands are entered at the DADS device, blanks are optional except where noted. When extra parameters are typed in after the required command parameters, the message `ERR – TOO MANY PARMS` is printed. If a non-existent command is entered, such as DX, the message `ERR– INVALID COMMAND` is printed.

DQ command

The DQ command is used to display entries in the database. The command is entered in one of two forms:

- DQS, followed by a six-digit serial number
- DQC, followed by a calling number up to eighteen digits long

The output of the command is a printout of the entries that match the serial or calling number. If the serial number command DQS is used, only one item is printed. If the calling number is used, any item in the database with that calling number is printed, with a blank line between each entry. Calls are displayed in random order. Except that the heading is omitted, the format for the printout matches the deleted call printout and the mass deletion report, which are described later in this chapter in the section "DADS TTY reports."

If no calls in the database match the given serial number or calling number, the message `NO ENTRIES FOUND` is displayed. If the number entered does not match the valid serial number or calling number format (six or eighteen digits), an error message is displayed: `INVALID SERIAL/CALLING NUMBER`.

Enter the following commands at a DADS TTY:

>DQS nnnnnn (a six-digit serial number)

or

>DQC nnnnnnnnnnnnnnnnnn (a calling number up to eighteen digits long)

For example:

>DQS 1234567

The TTY responds in the following way:

```
ERR – INVALID SERIAL NUMBER
```

>DQS 260001

The TTY responds:

```
NO ENTRIES FOUND
```

>DQS 260051

The TTY responds:

```
6132391234        0226  0900 STA SPL CLG   T&C
43123456                                HOTEL
260051  0400 DELAY    1111 2012A  0132391243XXXX
```

>DQC 0132391234

The TTY responds:

```
6132391234        0226  0900 STA SPL CLG   T&C
43123456                             HOTEL
260051  0400 DELAY    1111 2012A  0132391243XXXX


6132391234        0226  1135 STA SPL CLG   T&C
334567788                            HOTEL
260067  0630 DELAY    1111 2012A  0132391243XXXX
```

Note: It is possible for an operator to delete a call from the database while it is being printed with the DQ command. In this case the next call with the same calling number cannot be retrieved without the old call's information. Instead, the following message is displayed: `CALL DELETED BY OPERATOR DURING PRINTING – TRY THIS COMMAND AGAIN`.

DD command

The DD command is used to delete calls manually from the database. The command is entered followed by the six-digit serial number of the call to be deleted. If the call can be deleted from the database, the call details are printed out and then the call is deleted. If an operator is currently viewing the call, that call cannot be deleted, and the following message prints: `CALL BEING VIEWED, NOT DELETED`.

If no calls in the database match the given serial number, the message `NO ENTRIES FOUND` is displayed. If the number entered does not match the valid serial number format (six digits), an error message is displayed: `INVALID SERIAL NUMBER`.

Enter the following command at a DADS TTY:

>DD nnnnnn (a six-digit serial number)

For example:

>DD 260051

The TTY responds in the following way:

```
6132391234         0226 0900 STA SPL CLG   T&C
43123456           AUSTRIA      020  HOTEL
260051 0400   DELAY   1111  2012A   6132391243XXXX
```

DT command

The DT command is used to display the current settings for the database thresholds and to indicate whether any have been reached. This command has no parameters.

The first line of the output displays the total number of calls allowed in the database. If an attempt to store a call in the database fails, this line has an asterisk on the left side indicating that the database is full. Once a call is deleted from the database, the asterisk is not displayed on this line.

The following 16 lines on the output display the number of booked calls that will be recalled in each half-hour period. The 48 half-hour periods are printed in three columns. Each printed entry contains the number of calls stored in that half-hour period (to the left of the slash). Along with each half-hour period also appears the total number of calls allowed in that period (to the right of the slash). If the number of calls in any particular half-hour period equals the total number allowed, an asterisk is displayed to the left of the half-hour period output line.

Enter the following command at a DADS TTY:

>DT

The TTY responds in the following way:

```
*  TOTAL CALL CAPACITY:  5120
   00:00 – 2/45    08:00 – 9/25    16:00 – 0/25
   00:30 – 4/10  * 08:30 – 15/15   16:30 – 0/40
*  01:00 – 10/10       .               .
      .                .               .
      .                .               .
   07:00 – 0/40    15:00 – 0/35    23:00 – 0/50
*  07:30 – 5/10    15:30 – 0/35    23:30 – 0/50
```

The time periods given are for the current time period up to the same time the next day, even though they are listed from 00:00 to 23:30. In other words, if it is currently 9 AM, Feb. 26, then 00:00–08:30 correspond to Feb. 27, and 9:00–23:30 correspond to Feb. 26.

These thresholds limit the number of calls in the database that are set to be recalled in any particular half-hour period.

DC command

The DC command is used to change the maximum number of calls allowed in a particular half-hour period. The format for the command is DC hhmm n, where hhmm is the half-hour period you wish to change (in a 24-hour clock format) and n is the new value for the threshold. The value for n must be between 1 and 50, inclusive. If the leading digits of hhmm are omitted, they are assumed to be 0. Although the blank between DC and hhmm is optional, the blank between hhmm and n must be entered to separate the fields.

Enter the following command at a DADS TTY:

>DC hhmm n

For example:

>DC 1130 4

The TTY responds in the following way:

```
11:30 – 2/4
```

The response from the DC command is identical to the portion of the output generated by the DT command for that time period.

It is possible to set the threshold below the number of calls currently in a half-hour period. For example:

>DC 130 35

The TTY responds in the following way:

```
1:30 – 35/25
```

If an invalid time period or a threshold number outside the 1 through 50 range is entered, the system responds with an error message. The time 2400 is allowed and is interpreted as 0000.

DP command

The DP command is used to control the printing of deleted database calls. If it is followed by ON, printing is activated and the details of all calls deleted from the database by operators are printed at the DADS. If the command is followed by OFF, printing is deactivated and no more deleted calls are printed at the DADS. If a parameter other than OFF or ON is entered, the system responds with an error message. If no parameter is given, the current setting is displayed.

To activate printing, enter the following command:

>DP ON

The TTY responds in the following way:

```
DP ON OK
```

To deactivate printing, enter the following command:

>DP OFF

The TTY responds in the following way:

```
DP OFF OK
```

To check whether printing is activated, enter the following command:

>DP

The TTY responds in the following way:

`DP OFF` (or `DP ON`, if that is the current setting)

Printing of the deleted database calls is reactivated after all restarts except warm ones.

DB command

The DB command is used to print a subset of the calls in the database. All calls in the database that match the search criteria are printed in random order. The command is followed by two parameters. The first is a country code. Only calls with this country code are printed. The second is an optional "C." If this parameter is used, instead of printing all the call entires that match the search criteria, the system provides a count of the number of calls in the database that match the criteria.

When the count (C) option is not used, the output is printed in the following format:

```
                           Called party's
Calling number          Called number          country name    Serial #
xxxxxxxxxxxxxxxxxx  xxxxxxxxxxxxxxxxxx  xxxxxxxxxxxx   xxxxxx
```

Enter the following command at a DADS TTY:

>DB country code

For example:

>DB 43

The TTY responds in the following way:

```
6132391111      43121256      FRANCE    260101
6133134653      43365565      FRANCE    260013
2049491233      43234436      FRANCE    260081
4134345432      43654654      FRANCE    260243
2043435435      438324436     FRANCE    260147
4134543543      43109301      FRANCE    260635
2041901905      43150700      FRANCE    260633
  7 ENTRIES MATCHED
```

Enter the following command at a DADS TTY:

>DB country code C

For example, the code for France would appear as:

>DB 43 C

The TTY responds in the following way:

```
7 ENTRIES MATCHED
```

If an invalid country code is entered, the system responds with the message `INVALID COUNTRY CODE`. If any character but C is entered as the second parameter, the system responds with the message `SECOND PARM MUST BE C`.

DM command

The DM command is used to set and display the mass deletion period (the period of time a call must be in the database before it is deleted by the midnight mass deletion process). This command has one optional parameter, a number between 1 and 7 inclusive. This number represents the minimum number of days a call must remain in the database before it can be mass deleted. If no parameter is entered, the value currently in use is the default. The mass deletion period value survives over a cold restart.

Enter the following command (with no parameters) at a DADS TTY:

>DM

The TTY responds in the following way:

```
MASS DELETION PERIOD = 3 DAYS
```

Enter the command with parameters. For example:

>DM 2

The TTY responds in the following way:

```
MASS DELETION PERIOD = 2 DAYS
```

If a parameter outside the range of 1 through 7 is entered, the system responds with the error message `MASS DELETION PERIOD MUST BE BETWEEN 1 AND 7`.

If the minimum parameter for mass deleted calls is set at 7, for example, then when mass deletion is run, no calls under seven days old are deleted. Calls over 28 days old are always mass deleted, as explained in the following section.

DV command

The DV command is used to display the volume of calls in the database by country. This command has no parameters.

Executing this command prints out a list of country codes in random order. Beside each country code it prints the number of calls in the database that have been directed toward that country. Countries for which the count is zero are not printed.

Enter the following command at a DADS TTY:

>DV

The TTY responds in the following way:

```
   CNTRY       #
    011       10
     33        1
```

If there are no calls in the database, the TTY prints the message `NO ENTRIES FOUND`.

DO command

The DO command is used to display all calls that have been in the database longer than a specified number of days. The command's parameter must be a number between 1 and 28 inclusive. The maximum is 28, because all calls are mass deleted from the database after 28 days.

The output from the command, which is printed in random order, contains the date and time the call was originally entered in the database and the serial number of the call.

Enter the following command at a DADS TTY:

>DO number

For example:

>DO 4 (entered on 8/26 at 12:00)

The TTY responds in the following way:

```
    190051 – 1987/08/19  13:33:03
    210097 – 1987/08/21  21:11:55
    170155 – 1987/08/17  03:44:32
    200033 – 1987/08/20  12:31:54
    200041 – 1987/08/20  12:31:54
```

In this case, all calls that have been in the database for more than 4 days are displayed. If no calls have been in the database longer than the specified number of days, the TTY prints the message `NO ENTRIES FOUND`. If a parameter is entered outside the range of 1 through 28, the TTY prints the message `NUMBER OF DAYS MUST BE: 1–28`.

Time changes

When a time change occurs, the time is changed as necessary for all database calls. A call created at 10:00 to recall in two hours still recalls in two hours even if the time has been set backward or forward. All time changes relate to the time calls were entered, not to the switch time.

DADS TTY reports

Two booked call database reports are printed at the DADS TTY:

- the deleted call report
- the mass deletion report

These reports are described in the following paragraphs.

The deleted call report

The deleted call report is generated whenever an operator deletes a call from the booked call database using the delete function. This report is optional. In order for the deleted calls to be printed, printing must be activated by the DP command. When the DP command is turned on, the DADS TTY prints the details of all calls that are individually deleted by operators, as shown in the following two examples:

```
CA DB
  6132391234        0226 0900  STA SPL CLG T&C
  43123456           AUSTRIA      CAL  HOTEL
  260051      DELAY      1111  2012A  6132391234XXXX
  THIS IS A TEST CALL


CA DB
  6132391235        0226 0905  STA PD
  43123457
  260053      MESSENGER      1111
```

The fields on the report are described in the following table. The fields are read left to right and top to bottom.

Deleted call report fields

Field name	Field description
CA DB	Title identifying this printout as a deleted call report.
Calling number	Number of the calling party (up to 18 alphanumeric characters).
Date	Date when the call was originally stored in the database (mmdd format).
Time	Time when the call was originally stored in the database (hhmm format).
Billing type	A two-part field with the following values: 1 STA (station-to-station call) or PER (person-to-person call) 2 COL (collect call) PD (paid call, that is, not collect) SPL CLG (special calling call, for which the calling party bills the call to a special number) SPL CLD (special called call (that is, a collect call), for which the called party bills the call to a special number)
Time and charges	Field that has two possible values: T&C or blank. The T&C display indicates that time and charges were requested on this call.
Calling name	Name of the calling party (up to 20 alphanumeric characters).
Called number	Number of the called party (up to 18 alphanumeric characters).
Country name	The name of the country being called, taken from Table ICNTRY (up to 12 characters). If there is no country name, this field is blank.
Alternate route name	Three-character abbreviation for the alternate route, taken from Table IALTRTE. If no alternate route was used, this field is blank.
Class of service	A field that displays HOTEL if the paying party is calling from a hotel. Otherwise, this field is blank.
Called name	Name of the called party (up to 20 alphanumeric characters).
Serial number	The six-digit serial number assigned to this call when it was entered in the database.

—continued—

Deleted call report fields (continued)

Field name	Field description
Timed delay	The amount of time the call will be stored in the database before being recalled to an operator. This field is present only if the operator enters a timed delay when storing a call in the database.
Database class	The database call class as datafilled in Table IDBCLASS (10 characters).
Operator number	Number of the operator who stored this call in the database.
Room number	The room number of the paying party, used only if the paying party is calling from a hotel. If the paying party is not calling from a hotel, this field is left blank.
Special number	The special billing number, if one was used (up to 23 characters). If a national calling card number is used, the last four digits contain XXXX.
Memo	Any memo about the call, up to 64 alphanumeric characters.
—end—	

The mass deletion report

When calls are deleted by the mass deletion process, the call details are printed at the DADS TTY. The format for the report is exactly the same as the format of the deleted call report, except that the first line contains the heading `MASS DELETION`. The following example shows the format of the report:

```
MASS DELETION
  6132391234        0226 0900  STA SPL CLG T&C
  43123456                             HOTEL
  260051 0400 DELAY     1111  2012A  6132391243XXXX
```

If the DADS TTY is printing output from another command when the mass deletion runs, the call information for the mass deleted calls is stored in a temporary holding buffer. Once the command at the DADS has completed its output, the call information is taken from the temporary holding buffer and printed at the DADS. The buffer holds up to 50 calls. If a mass deletion involves more than 50 calls, the first 50 are printed. Deleted call reports are stored in the same temporary buffer.

Route-queued calls

Route queuing is a method of storing calls in the booked call database that are waiting for an outgoing route (trunk) group. When a member in the trunk group becomes available, the member is reserved. The call is recalled to the position so that the operator can place the call using the available outgoing trunk. This saves the time and effort of checking repeatedly for an available trunk. The outgoing trunk group is considered the outgoing route. Calls queued in this manner are referred to as route-queued.

Assigning a trunk group for route-queued calls

When an operator queues a call, it is queued for a trunk group. More than one call can be queued for the same trunk group. When the trunk group has a free member, that member is not put on the trunk idle queue until TOPS checks to see whether any calls are queued against that trunk group. If no calls are queued, the trunk member is put on the trunk idle queue.

If at least one call is queued, the trunk member is not put on the trunk idle queue. The trunk is held for the queued call. The call that has been queued against this trunk group for the longest period of time is recalled to a position for completion. When the position is reached, the trunk data is updated to indicate that this particular call is no longer queued (that is, the call is removed from the call queue).

When the route-queued call is completed, the associated call resources are freed. The trunk is cleared as it would be at the end of any call. At this point, TOPS checks the calls queued against the trunk. If the queue is not yet empty, the trunk is held again for the next call queued against this trunk group.

A given trunk continues to be held and used by TOPS route-queued calls until the number of calls queued for it is zero. At this point, it is put on the trunk idle queue for use by regular call processing.

Held trunks appear at the maintenance and administration position (MAP) in restricted idle (RES) state. Trunks held in restricted idle are not available for normal call processing.

Trunk call processing

TOPS operators route-queue calls against a trunk group. More than one call can be queued against the same trunk group. Calls can be queued even though members of the group may be idle.

The administration must keep in mind, however, that as soon as a TOPS call is route queued against an outgoing route, this trunk group cannot process subsequent non-route-queued calls until a member is idled. Normal direct dialed (DD) calls continue to get general no circuit treatment (GNCT), indicating that all routes are busy. When a member becomes free, it is held for the call, and DD calls still continue to get GNCT treatment. This continues until all route-queued calls are satisfied, and another member of the trunk group eventually becomes free.

For this reason it is recommended that the administration have a separate trunk group for route-queued calls, and a separate trunk group for DD calls. This can be accomplished through the office datafill. The trunk groups to be used for route-queued calls will be the ones routed to through the positions translations tables. The trunk groups to be used for DD calls are not in any route lists for the TOPS translations tables. This lessens the impact on DD calls.

Database class

When storing a call in the booked call database, the operator must enter a database class for the call. This class is datafilled in Table IDBCLASS. The route field in IDBCLASS indicates whether this class pertains to a route-queued call or a regular queued call.

If the value is N, the call is recalled after a specified time has elapsed (if a time period was entered). If the value is Y, the call is stored against the outgoing route for the called party rather than for a specified time. The operating company administrator must define parameters in Table IDBCLASS, shown in the following table.

Table IDBCLASS

CLASSNUM	SCRNDISP	FIRSTCON	Route
10	MESSENGER	CALLED	N
20	NO-CIRCUIT	CALLING	N
30	NO-PERSON	CALLED	N
40	RTE-QUEUED	CALLED	Y
50	NO-ROUTE	CALLING	Y

All calls stored with a database class of 40 or 50 are queued against the outgoing route for the called party rather than stored with a time limit. The field FIRSTCON refers only to the party first outpulsed to when the START key is struck. FIRSTCON is independent of the ROUTE field.

Manual changes

The administration can manually manipulate the trunks in an office at the MAP (maintenance and administration position). Manual maintenance on a trunk group can occur, or changes can be made through trunk control. Attempts to delete trunk groups, or members in a trunk group, are allowed only if the trunk is installation busy (INB).

Maximum call threshold

The booked call database can accommodate a maximum of 5120 booked calls at any given time. Once the maximum capacity (5120) is reached, any attempt to store a call in the database fails. The message `STORE` indicates that the database maximum has been exceeded.

For all half-hour periods, a limit from 1 through 50 may be defined on the number of booked calls to be recalled to the operator. Any attempt to add a booked call to the database beyond this limit will cause the attempt to fail. The message `STORE + hhmm` indicates that the half-hour capacity has been exceeded.

Office parameters

Office parameter MAX_ROUTE_QUEUED_PER_TRKGRP, in Table OFCENG, specifies the maximum number of calls that can be route queued on an outgoing route at any given time. Attempts to store a call that exceeds this maximum will fail. The default value for this office parameter is 0. The maximum value is 100.

The office parameter TOTAL_ROUTE_QUEUED_CALLS is also in Table OFCENG. This parameter determines the number of call queue elements to allocate on restarts. These elements are used to queue themselves to the trunk group. The default value for this office parameter is 0. The maximum value is 5120, which is also the maximum number of calls that can be stored in the database.

If either office parameter is decreased in such a way that a call can no longer be put in a call queue, the call remains in the database as untimed but not route queued. For example, route X has 22 calls queued, and the office parameter MAX_ROUTE_QUEUED_PER_TRKGRP is decreased to 20. Two of those calls will never recall to an operator and must be manually retrieved.

The following calculation for the value of TOTAL_ROUTE_QUEUED_CALLS is suggested as a safe one:

TOTAL_ROUTE_QUEUED_CALLS = TOPS_MAX_ROUTE_QUEUED_PER_TRKGRP x Number of trunk groups being queued on

This calculation guarantees that the largest possible number of route queued calls will be satisfied.

Table OFCENG contains office parameter DB_MAX_SIZE. DB_MAX_SIZE has a range of 1280 to 5120. Values entered must be in increments of 128 from the base value of 1280. The following are the possible values of the parameter: 1280, 1408, 1536, 1664, 1796, 1290, 2048, 2176, 2304, 2432, 2560, 2688, 2816, 2944, 3072, 3200, 3328, 3456, 3584, 3712, 3840, 3968, 4096, 4224, 4352, 4480, 4608, 4736, 4864, 4992, 5120.

FM administrative procedures

The vehicle for force planning is the force program. A long-range force program should be prepared and maintained for a period of 12 to 15 months. Successful force planning depends on the accumulation of complete and accurate historical records.

Each week, the short-range force program for the office must be extended to a realistic estimate of the force required for each of the seven days of the week ahead. The daily estimates are used to develop half-hourly operator requirements that serve as the basis for the daily tour schedule and for the assignment of operators to tours and days off.

This chapter contains the TOPS hundred call second (CCS) force management administrative procedures and forms. The procedures described are specific to TOPS and CCS force management (or both) and do not include procedures pertaining to the force management of a particular operator services office. Examples of the latter include estimating call volumes, planning force programs, preparing and assigning operators to tour schedules, and maintaining personnel and payroll records.

This chapter describes the TOPS CCS force management administrative procedures to the point where they overlap traditional force management procedures that apply in any non-CCS operator services system.

The information in this section applies to both single- and multitraffic office TOPS installations unless otherwise noted.

Definitions

The following terms and definitions are used in this chapter:

- Average work time (AWT) is the average amount of time an operator requires to handle a call. For force planning purposes, the AWT includes all call types and is calculated on a system basis.
- Average speed of answer (ANS) is the average length of time an incoming call waits in a queue for operator answer.

- Work volume (WV) is the total amount of time all operators spend handling calls within a given time period. For force planning purposes, the WV is calculated for each half hour or quarter hour, includes all call types, and is calculated on a system basis.
- Percent occupancy (%OCC) is the ratio of the portion of operator time spent handling calls to the total time operators are logged on to TOPS positions for the purpose of handling calls. Percent occupancy should never be as high as 100% for the following two reasons:
  - — Operator fatigue would lead to a higher AWT.
  - — If all operators were occupied handling calls, none would be available to answer calls as they arrived, and the ANS would increase to unacceptable levels.

  The ideal level of occupancy varies with the size of the work force, assuming that the desired ANS and AWT remain constant. If the work force is relatively small, extra operators are needed to ensure that there is an operator available to answer incoming calls within the desired ANS. As the size of the work force increases, the larger number of operators increases the chance that operators will be available to handle incoming calls, and percent occupancy can increase without endangering ANS. The half-hourly force capacity tables are based on a percent occupancy equal to 92 percent, the maximum value that maintains efficiency.

- Ready-to-serve time is the percentage of time that operators spend *not* handling calls. The formula for calculating ready-to-serve time is as follows:

  – Ready-to-serve time = 100 percent occupancy

TOPS half-hourly CCS force capacity tables

CCS force management depends on two components:

- measurement data obtained from the DMS through the force administration data system (FADS)
- half-hourly force capacity tables that enable the force supervisor to determine the number of operators required every half hour to provide prompt customer service

The TOPS half-hourly force capacity tables are based on the following assumptions:

- When the number of operators corresponds to table requirements over a number of half hours, the ANS should be 2.1 seconds or less.
- As the size of the operator team increases, operator percent ready-to-serve time is not reduced below eight percent.

- Under overload conditions (a five-percent increase in work volume hundred call seconds [WV-CCS]) the ANS should not exceed 10.0 seconds, averaged over a number of such half hours.

  Note: The last two fixed assumptions provide protection against the likelihood that relatively small errors in the estimation of offered load, or the provision of operators, would create inordinate delay for subscribers.

A TOPS half-hourly force capacity table consists of three parts:

- operators required, listed vertically in the far-left column
- AWT, banded into 15 columns across the top of the table
- WV-CCS, in the body of the table

To determine the half-hourly operator requirements, the force supervisor must consider two things: the WV-CCS and the AWT. The estimated WV-CCS is the estimate of call initial position seizures (IPS) or position seizures (PS) AWT. The AWT determines which column to reference in the capacity table. The WV-CCS, under the appropriate column, determines the number of operators required.

For example, assume an AWT of 45 seconds and an estimated work volume of 360 CCS. Consult the following table under the column labeled 40.5 - 45.4 seconds and read down until the 360 CCS is within a range of WV-CCS. The 360 CCS is in the range 348-364 CCS. Reading laterally to the left, the table shows that 24 operators are required to handle that call load with an average answer time of 2.1 seconds.

For high levels of WV-CCS (above 3320 CCS), the required number of operators does not vary with the AWT.

The capacity table is based on predictable relationships between the work volume, the number of operators, and the amount of time operators spend handling calls and doing other necessary work. The work volume is estimated for the TOPS system as a whole.

The TOPS half-hourly force capacity tables are computed using a modified Erlang C mathematical model. The values derived and summarized from the force capacity table are used throughout the range of CCS force management activities.

The following items depend on the information in the capacity table:

- force planning
- tour schedule preparing
- weekly and daily estimating

- intraday force projecting
- efficiency evaluating

TOPS half-hourly force capacity table

Actual work time (seconds) and work volume (CCS)								
Op	**13.3–17.4**	**17.5–21.4**	**21.5–25.4**	**25.5–30.4**	**30.5–35.4**	**35.5–40.4**	**40.5–45.4**	**45.5–50.4**
1	0-3	0-2	0-2	0-2	0-1	0-1	0-1	0-1
2	4-20	3-18	3-17	3-16	2-15	2-14	2-14	2-13
3	21-35	19-33	18-31	17-30	16-28	15-27	15-26	14-25
4	36-50	34-48	32-46	31-44	29-42	28-41	27-40	26-39
5	51-66	49-64	47-61	45-59	43-57	42-55	41-54	40-53
6	67-82	65-79	62-77	60-74	58-72	56-70	55-69	54-67
7	83-99	80-96	78-93	75-90	73-88	71-86	70-84	68-82
8	100-116	97-112	94-109	91-106	89-103	87-101	85-99	83-98
9	117-132	113-129	110-126	107-122	104-119	102-117	100-113	99-113
10	133-149	130-145	127-142	123-139	120-136	118-133	114-131	114-129
11	150-167	146-162	143-159	140-155	137-152	134-150	132-147	130-145
12	168-184	163-179	160-176	156-172	153-169	151-166	148-163	146-161
13	185-201	180-196	177-193	173-189	170-185	167-182	164-180	162-178
14	202-218	197-213	194-210	190-205	186-202	183-199	181-196	179-194
15	219-236	214-230	211-227	206-222	203-219	200-215	197-213	195-210
16	237-253	231-248	228-244	223-239	220-235	216-232	214-229	211-227
17	254-270	249-265	245-261	240-256	236-252	233-249	230-246	228-243
18	271-287	266-282	262-278	257-273	253-269	250-266	247-263	244-260
19	288-305	283-299	279-295	274-290	270-286	267-283	264-279	261-276
20	306-322	300-317	296-313	291-308	287-303	284-300	280-296	277-293

—continued—

TOPS half-hourly force capacity table (continued)

Actual work time (seconds) and work volume (CCS)								
Op	**13.3–17.4**	**17.5–21.4**	**21.5–25.4**	**25.5–30.4**	**30.5–35.4**	**35.5–40.4**	**40.5–45.4**	**45.5–50.4**
21	323-340	318-334	314-330	309-325	304-320	301-317	297-313	294-310
22	341-357	335-352	331-347	326-342	321-338	318-334	314-330	311-327
23	358-375	353-369	348-364	343-359	339-355	335-350	331-347	328-344
24	376-392	370-386	365-382	360-376	356-372	351-368	348-364	345-361
25	393-410	387-404	383-399	377-393	373-389	369-385	365-381	362-378

—end—

Supplementary force capacity tables for call transfer

The call transfer feature enables certain operators to transfer calls to other operators within the same TOPS installation. One application of this feature allows a unilingual operator to transfer a call to a bilingual operator in the event of language incompatibility with a subscriber. For more information on the call transfer feature, refer to the chapter "Force management features" earlier in this document.

At low levels of call transfer, the overall efficiency of the TOPS operating team is not significantly affected, and more operators are not required. The increased volume of transferred calls directly affects the capacity of the team to maintain the grade-of-service criteria. Eventually, more operators must be provided to absorb the additional work associated with transferring the call.

Supplementary force capacity tables help determine when additional operators are required. Call transfer is used when the majority of the operators can handle all call types. This minimizes the volume of calls transferred and the additional operators required to handle transferred calls. The call transfer provisioning tables do not indicate values beyond 1.20, providing for a maximum staff increase of 20% over the original total of required operators in order to handle transferred calls.

The potential requirement for additional operators is caused by the subscriber-to-operator language mix, or more specifically, by the following:

- the percent of calls offered by minority language subscribers
- the percent of available operators who are bilingual

The supplementary force capacity table is organized in two main parts:

- percent of bilingual operators available (in descending percentages), located in the first column at the left
- percent minority language calls (in ascending percentages, includes a series of provisioning coefficients in the body of the columns), located in the several columns to the right

To determine whether additional operators are required, and if so, how many, the force supervisor must perform the following actions:

1. Determine overall operator requirements.
2. Read down the first column of the supplementary force capacity table to a percentage corresponding to the percent bilingual operators available. If the percentage of bilingual operators available falls between percentages (for example, 82.5%), the lower percentage (82% in this example) should be used. The lower percentage corresponds to the higher provisioning coefficient and ensures that service criteria are met.
3. Read across to the appropriate column corresponding to the percentage minority language calls offered.
4. Determine the provisioning coefficient where the two points intersect.
5. Multiply the total number of required operators by the coefficient from the supplementary capacity table, rounding up or down as appropriate (for example, 24.3 = 24 and 37.6 = 38).
6. If the coefficient has increased the total number of operators required, determine the number of bilingual operators required by multiplying the number of total operators required by the percentage of bilingual operators available. Always round up in this process (for example, 24.1 = 25 operators required).
7. Determine the number of unilingual operators required by deducting the number of bilingual operators required from the total number of operators required.

Volume records

The daily, weekly, and monthly call volume and work volume records described in the following paragraphs provide a means of systematically recording volume data for future use.

The data recorded in these forms, referred to as historical data, are the basic information necessary to estimate operator requirements. Accurate estimates of calls and work volume require reference to historical records.

In a TOPS installation with more than one traffic office, the historical records that pertain to call volumes are maintained on a total TOPS basis.

Forms that are used to record AWT data are maintained for each traffic office as well as for the total TOPS installation.

Monthly volume data – Form FM 904

Form FM 904 is used to maintain monthly comparisons, for a period of years, of average traffic volume for business days, Saturdays, Sundays, and holidays. Data assembled on this form are used primarily to determine traffic estimates for long-range force programs.

Weekly call volume data – Form FM 906

Form FM 906 is used to maintain a record of weekly traffic volumes. This data can then be used to make call estimates for short-range force programs and the weekly estimating process. Percentages are computed by comparing each week's traffic volume with that of the average week, the previous week, and the same week of the previous year.

Daily traffic record – Form FM 905

Form FM 905 is maintained in all TOPS installations where daily traffic volumes fluctuate sufficiently to affect the number of employees on duty each day. A record of daily AWT is kept on this form so that weekly estimates, made from data on Form FM 906, can be broken into daily estimates for day-to-day force provisioning. This process is consistent with the method that uses Form FM 4915A to develop daily force requirements.

A separate Form FM 905 should be used to record AWT daily and weekly. Weekly estimates of AWT are necessary to prepare short-range force programs. Daily AWT estimates are required for the force estimation process that utilizes Form FM 4915A.

The remarks space on Form FM 905 should be used to record any unusual circumstances that have affected call volumes or AWT. Examples would include storms, power failures, or major conventions.

Daily traffic record by periods of the day – Form FM 905A

Form FM 905A can be used to record AWT by period of the day, by the total day, and by average business day (ABD). Form FM 905A can thus be used in place of Form FM 905 for recording daily AWT. The period of day AWT is used as part of the estimating process that utilizes Form FM 4915.

Force planning

The force program is an administrative tool that gives the in-charge manager and the force supervisor a systematic method of determining future force requirements on both a short-range and long-range basis. The purpose is to configure the force available in future months or weeks with the force required to meet subscribers' needs for service and to accommodate training, vacations, absences, and other necessary items such as management, instruction, and clerical hours.

All operator services offices and systems require force programs. To accommodate TOPS, the force program currently in use in an operating company may require only minor modifications to several lines at the top of the form. The FADS and the TOPS half-hourly force capacity table add precision to the estimation of work volume and the determination of board hours. The following paragraphs describe the procedures and the historical trend data used to estimate board hours.

Historical trend data for force programs

The historical trend data used in estimating board hours for long-range and short-range force programs consist of measurements of calls (IPS or PS), work volume, and efficiency. The data are summarized by ABD.

Miscellaneous data – Form FM 907

Form FM 907 is used to record ABD summaries of efficiency measurements, some of which are used for force programming purposes. The source for the entries on this form is the Daily and Monthly Productivity Report, Form FM 2580. The data should be averaged for the business days in the calendar month, excluding unusual days. If the effect of a holiday or other recurring events requires a special one-day or two-day estimate, these days should be noted in the Remarks space on Form FM 905, Daily Traffic Record.

Items recorded on Form FM 907 are as follows:

- Actual work time per call – Enter the ABD actual work time for the month, from Form 2580. Space is also provided to record average Saturday and average Sunday actual work time for each month.
- CCS board hour, actual (ABD) – Enter the actual CCS per board hour for the month. The value is computed from ABD data on Form 2580:
  - — Actual Work Vol. CCS (Col 8) / Scanner board hours (Col 14) – Actual CCS board hours, used on force programs, builds in the ready-to-serve time required based upon past empirical data. It reflects the over- or under-provisioning of board hours that occurred for the actual WV-CCS.

- CCS board hour, standard (ABD) – Efficiency measurements; operating, overall, ratios; and operator team, schedule, administrative – The accurate estimation of board hours for force programs does not depend on these additional efficiency measurements and ratios. Where appropriate, the monthly ABD measurements and ratios may be copied from Form FM 2580 (Daily and Monthly Productivity Report) to Form FM 907 (Miscellaneous Data).

Estimating board hours for long- and short-range force programs

Estimates of board hours for future months or weeks are developed as follows:

1. Estimate the call volume.
2. Estimate the AWT.
3. Compute the estimated WV-CCS using the following formula:
   – WV-CCS = (IPS or PS/AWT) / 100.
4. Estimate the CCS/board hour.
5. Compute estimated board hours using the following formula:
   – Estimated board hours = WV-CCS + (CCS/board hours)

Calls are estimated using period over period and curve projection methods and by estimating future trends. The historical volume records described in the previous section "Volume records" provide the database on which call estimates are developed. Call volume estimates, particularly for long-range force programs, reflect information from various sources including the Traffic Engineering/Facilities group.

Estimates of AWT are usually based on current operator efficiency levels and are modified to reflect the following considerations:

- current and proposed training activities that improve operator efficiency
- addition of inexperienced operators or, conversely, an improvement in experience levels
- proposed operating practice changes
- improved customer acceptance of expanded dialing capabilities
- improvement in network completion rates
- improved speed of answer or service at auxiliary switchboards
- changes to end-office equipment that affect trunking to TOPS and the discrimination of call types within TOPS
- addition of ANI equipment in end offices

- changes in the mix of call types
- other recurring variations in AWT detected from historical records

Estimated WV-CCS is computed for each future month or week on the force program, using the following formula:

– Estimated WV-CCS = (Estimated IPS or PS/ Estimated AWT)/ 100

CCS per board hour is the amount of WV-CCS handled during the average operator hour. There are 3600 seconds, or 36 CCS, in one hour. If operators were occupied handling calls one hundred percent of the time, the CCS per board hour would be 36 and the ANS would be unacceptably high. Actual CCS per board hour (ABD) is recorded on Form FM 907, Miscellaneous Data.

The force program estimate of CCS per board hour for future months or weeks is based on projections of current actual CCS per board hour. This estimate would represent an extension of the empirical ready-to-serve time percentage reflected in recent trend data.

This projection can be modified in anticipation of improvements in the precision of force scheduling. The projection reflects any significant changes in the volume of work estimated for the TOPS installation. In this case, a half-hourly distribution of WV-CCS may be necessary. Use the TOPS half-hourly force capacity tables to estimate the effect on CCS per board hour.

The force program estimate of board hours is computed by dividing estimated WV-CCS by estimated CCS per board hour.

Tour schedules

Operator tour schedules are prepared by developing quarter hourly operator requirements from trended CCS work volumes. Because the FADS provides accurate work volume data, the distribution of operator requirements throughout the day can be precise.

While WV-CCS is usually obtained for half hour periods, quarter hourly measurements are taken periodically to determine exact operator requirements, particularly during periods when the work volume is fluctuating. The FM15 periodic reports generated at the system administration data system (SADS) or FADS TTY show 15-minute accumulations of WV-CCS. This information may be recorded in the space provided on Form FM 48, half-hourly force data.

An operator tour schedule provides the best estimate of the number of operators needed at TOPS positions each quarter hour. The level of the total day work volume and distribution of the operators' CCS work volume within the day tend to have seasonal patterns for a given area or community.

From historical records of calls, AWTs, and CCS work volumes, the life of the schedule may be determined by selecting an average basis for the schedule for a period during which deviations from the average are minimal. This period varies with the nature of the traffic handled and with changes in the engineered work volume for each TOPS installation.

There are two types of tour assignment plans:

- The first plan provides a schedule of tours that meets a basic or average level of requirements, and supplements that basic schedule with a few more tours each day. This is more economical than redrawing requirements for the entire schedule each day. Providing a stable number of tours representing 70-90 percent of average daily requirements reduces the work of scheduling the supplementary tours.
- The second plan provides an open-scheduling procedure that potentially reassigns all tours each day, giving full recognition to seniority choices for all tours in the schedule. Open-scheduling provides increased flexibility to management and the operator force for changes in schedule introduction and tour preferences.

Both assignment plans benefit from having a substantial number of basic tours remaining constant, thus reducing the repetitive work of assigning the same name to the same tour each day.

Total operator requirements are developed from the standard TOPS half-hourly force capacity table. The half-hourly estimated work volume is used as an index into the capacity table to derive the total half-hourly operator requirements (basic plus supplementary). The number of operators in the basic schedule is then deducted from the total requirements, leaving the supplementary requirements for that tour. The supplementary operator requirements must not be developed directly from WV-CCS.

Operator requirements from 2 a.m. to 6 a.m. are usually based on the work volume offered in the busiest half hour during that period. The night force generally remains constant.

Estimated quarter- or half-hourly operator requirements should follow the flow of traffic as precisely as possible. Another recommendation is that tours be selected to provide exactly the number of operators required. The excess can be minimized by smoothing the required line from quarter hour to quarter hour. If tours are permitted to start and end on quarter hours, with similar flexibility for lunch periods, the excess can be minimized.

When preparing supplementary tours, it may be more economical to permit a small scattered shortage (usually under a 0.5 percent total day and not over 2.0 percent in any quarter hour) in exchange for substantially reducing the excess quarter hours.

Schedules based on CCS-measured work volumes are continuously evaluated for effectiveness by trending the level and distribution of the continuing flow of CCS data. As work volumes or their distribution within the day change, supplementary tours may become difficult to select while constraining the excess or shortage within reasonable limits. If the efficiency of the schedule and the quality of the speed of answer deteriorate or require too many intraday adjustments, the basic schedule should be replaced. Either Form FM 4915 or FM 4915A provides a good basis for comparing current smoothed-average half hour operator requirements with the requirements on which the schedule is based.

In a TOPS installation with more than one traffic office, the master schedule must be allocated among the various offices. The section "Multitraffic office TOPS" later in this chapter contains the additional considerations relevant to this process.

Half-hourly force requirements – Form FM 916

Form FM 916 (see the following figure) provides a procedure for calculating quarter-hourly basic-schedule operator requirements. The procedure employs historical smoothed-average WV-CCS distributions, along with estimated total day calls and AWT for the lowest day in the expected life of the schedule.

Use the following instructions to fill out the FM 916 form:

1 Columns 1-3 - Distribution WV-CCS

   a. In Columns 1 and 2, enter the CCS work volume for each half hour, taken from the smoothed-average work volumes shown on Forms FM 4915/4915A for the week(s) that best represent(s) the average distribution for the scheduled period. The representative week(s) are often from the previous year's scheduled period.

      The selected week may be any average mid-week (the middle week in the corresponding period of the previous year), when the work volume distribution for this week is considered to be representative for future schedule distribution. Alternatively, two representative weeks may be selected from the previous year's corresponding period.

      When a schedule is expected to be in effect for three months, the fifth and twelfth (middle and last) weeks may be selected from the previous year, if their distribution is considered representative. More current influences on distribution may be taken into consideration by including a recent week in Column 1 or 2. The ABD distribution is obtained by adding half-hourly smoothed-average CCS (AVG CCS) for Monday to Friday, laterally across Form FM 4915/4915A, and dividing by 5. The resulting half-hourly smoothed-average CCSs are entered in Columns 1 and 2.

b. The average distribution is entered in Column 3, if more than one week of smoothed-average distribution has been selected. At the bottom of Column 3, enter the sum of the half-hourly WV-CCS.

2 Lines 8-11 - Basic Schedule Estimates

a. The estimated number of total-day calls from which the basic schedule is derived is entered on line 8. Basic schedule calls are obtained by estimating the number of calls for the lowest day in the scheduled period, and then reducing this estimate by about five percent. The reduction percentage may vary from five percent in inverse proportion to the confidence in the low-day estimate.

b. The estimated Basic AWT is entered on line 9. This estimate is based on the current AWT and adjusted to reflect anticipated changes that could affect its value. The estimation process includes a review of Form FM 905/905A, which shows AWT by day, to search for significant daily deviations from average business day AWT.

c. Basic schedule WV-CCS is entered on line 10. Multiply IPS or PS (line 8) by AWT (line 9) and divide the product by 100 to convert to CCS.

d. The volume adjustment factor on line 11 is obtained by dividing the total-day Average smoothed-average CCS in Column 3 into the Basic WV-CCS on line 10. Calculate the factor or ratio to two decimals, and enter the result on line 11.

3 Columns 4-5 - Basic Schedule

a. Apply the ratio on line 11 to Column 3 for each half hour, and enter the product in Column 4.

b. Use the TOPS half-hourly force capacity table to develop the half-hourly operator requirements in Column 5. These half-hourly requirements should be reviewed so that relatively large changes between half hours can be converted to smaller changes between quarter hours. Form FM 48, half-hourly force data, should reflect periodic 15-minute studies of WV-CCS for this purpose. During periods of increasing or decreasing work volume, the two quarter hours should be divided in a way that provides operators relative to the flow of traffic.

4 Columns 6 and 7 are not used.

Form FM916

Half-Hourly Force Requirements

Date________________ Requirements for ________________ Office______________

Time	Distribution Work Volume CCS			Basic Schedule			
	Week of	Week of	Average Smoothed Average	Work Volume CCS	Operator Require-ments		
	1	2	3	4	5	6	7
6–6:30							
6:30–7							
7–7:30							
7:30–8							
8–8:30							
8:30–9							
9–9:30							
9:30–10							
10–10:30							
10:30–11							
11–11:30							
11:30–12							
12–12:30							
12:30–1							
1–1:30							
1:30–2							
2–2:30							
2:30–3							
3:30–4							
4–4:30							
4:30–5							
5–5:30							
5:30–6							
6–6:30							
6:30–7							
7–7:30							
7:30–8							
8–8:30							
8:30–9							
9–9:30							
9:30–10							
10:30–11							
11–11:30							
11:30–12							
12–12:30							
12:30–1							
1–1:30							
1:30–2							
2–6 AM							
Total day							

8. Basic Schedule Calls____
9. Basic Actual Work Time _____________________________________
10. Basic Work Volume CCS_____________________________________
11. Volume Adjustment Factor (10+3) __________________________________

Weekly force estimation

This section describes the process of taking the ABD or total day estimates of call volumes and total day or period-of-day estimates of AWT and using mathematical techniques to determine half-hourly operator requirements for each day.

Providing the force required to give prompt customer service, consistent with economical operation of the operator services office, is achieved through accurate forecasts of WV-CCS and operator productivity. The weekly force plan should be based on the best possible estimate of anticipated call volumes, AWT, and efficiency levels consistent with the half-hourly force capacity table.

Weekly volume and force estimate, Forms FM 4915, FM 4915A

To develop operator requirements for each day of the week and to determine the half-hourly distribution of the operator force, a procedure for estimating WV-CCS has been developed that uses Form FM 4915 or FM 4915A. This procedure requires estimates of call volumes and AWT that combine to produce the total day or session WV-CCS. The half-hourly distribution of the WV-CCS determines precise operator requirements to provide an ANS.

The estimated call volumes used in this procedure are obtained from historical data, curve projections, or period-over-period volume records. AWT is estimated from trend data. Distribution of work volume is developed by exponentially smoothing average trends with adjustments based on good judgment. Once the amount of WV-CCS and its distribution throughout the day have been determined, the number of operators required to handle that work volume is determined from the half-hourly force capacity table.

The following alternate weekly volume and force estimate forms are used to permit some flexibility in planning force requirements:

- Form FM 4915 is recommended for use in offices where the relationship of call volumes and AWT in the sessions of a given weekday varies from week to week.
- Form FM 4915A is appropriate in offices where the AWT varies between sessions of a day in a relatively consistent pattern. For example, the AWT for Tuesday morning sessions may be several seconds lower than the afternoon, while the AWT in the evening sessions is substantially longer than in the afternoon. If these or any other relationships are generally consistent for a particular day of the week, Form FM 4915A is recommended.

The process treats each day of the week discretely. Estimates for Mondays incorporate historical distributions for previous Mondays as well as the distribution of work volume for the most recent Monday. This process applies for all seven days of the week.

Form FM 4915

Form FM 4915 is used to develop half-hourly operator requirements based on the estimates of session call volumes and AWT.

The upper portion of Form FM 4915 is used to estimate ABD and daily values for the following items:

- smoothed-average calls
- estimated total calls
- estimated actual work times
- estimated CCS work volume

The estimates are recorded for four periods of the day as well as for the total day. ABD call volumes are estimated from the curve projection or period-over-period data.

The estimated calls are multiplied by the AWT for the appropriate day of the week to produce WV-CCS.

Columns 1 through 9 in the upper portion of Form FM 4915 contain space for developing smoothed-average calls for ABD and each day of the week. The two-part exponential smoothing process is an averaging technique that helps predict daily and session trends of traffic call volumes:

- The historical trend of calls is given a weighting of 70 percent (or 0.70).
- The most recent week's calls are weighted at 30 percent (or 0.30).

The two combine to form 100 percent of the calls expected in the week ahead. This is shown in the following example:

Smoothed-average calls (history)	= 10,000 calls / 0.70 =	7,000
Recent day calls	= 10,900 calls / 0.30 =	3,270
New smoothed-average calls		10,270

When an individual day's current value is abnormal, it is adjusted by weighting the historical smoothed-average at one hundred percent. If the current week's call volume or work volume distribution is affected by a condition that persists for several months (Daylight Saving Time, school opening, or closing), history and current week weighting can be adjusted to reflect the new condition, history at 20 percent and the current week at 80 percent.

On the lower portion of the form, the session work volume is distributed half-hourly using smoothed-average work volumes. The smoothed-average WV-CCS is increased or decreased, in proportion to the level of the estimated work volume.

Based on the estimated work volume, the operator requirements are determined from the TOPS half-hourly force capacity table and entered for each half hour in the lower part of Form FM 4915.

Three forms are required for weekly estimations:

- blank FM 4915 (Weekly Volume and Force Estimate)
- the previous week's completed FM 4915
- TOPS half-hourly force data, FM 48 for the most recent seven days or eight days, as required for the schedule assignment process

The top portion of Form FM 4915 is completed first, a section at a time, columns 1 through 25. Use these instructions for filling out the FM 4915 form.

1 Columns 1 through 9, smoothed-average calls

   a. Using the previous week's Form FM 4915, weight each session at an appropriate value (such as 0.70), and weight the most recent day sessions (recent week's daily data) at 0.30 to develop calls by session.

   b. Enter the total smoothed-average calls (by session) in columns 1, 3, 5, and 7.

   c. Enter the sum of each session in column 9, Total day.

   d. Determine the ABD Total day figure by totaling the Monday through Friday figures in column 9 and dividing by 5. Enter this figure at the top of column 9.

   e. Determine the ratio of each session to its total day and enter the percentage beside the volume for the session in columns 2, 4, 6, and 8. This procedure starts with Tuesday's calls and each successive day, until the following Tuesday morning, is added. At that time, data for Monday are added.

2 Columns 10 through 15, Estimated total calls

   a. Estimate the ABD calls for the week ahead (this usually can be done on the preceding Tuesday) and enter the results in column 10.

b. Develop a ratio of smoothed-average total day calls (ABD) (column 9) to estimated Total ABD calls (column 10), carried to three decimal places. Apply the ratio to the total day volumes, column 9, to develop the daily estimates for the week ahead, column 10.

c. Review the total day call-estimating procedure and determine the deviation from trend data. If the smoothed-average trend result estimates are modified, enter these results in column 11.

d. Apply the daily session percentages (in columns 2, 4, 6, and 8) to column 10 totals to estimate calls by session of the day (columns 12, 13, 14, and 15).

3 Columns 16 through 20, Estimated AWT

In most offices, the AWT is substantially different for each session. The AWT, which directly affects operator requirements, becomes an important controlling factor in reaching the efficiency goals stated in the Short Range Force Program. The in-charge manager and the force supervisor determine the AWT. It reflects a realistic and optimal level for each session of the day. The session AWT, when weighted by session calls, should total the AWT goal established for the day. The AWT figures are entered in columns 16, 17, 18, 19, and 20. Before estimating the AWT for each day of the week, careful consideration should be given to any unusual events that could influence the AWT, such as new operators added to the force, or anticipated changes in call mix.

4 Columns 21 through 25, Estimated CCS work volume

a. Complete columns 22 through 25 by multiplying the AWT (columns 17 through 20) by the estimated calls (columns 12 through 15) for the respective sessions. The basic force formula is:

   – WV-CCS = (IPS or PS/ AWT)/ 100.

b. Column 21 is the sum of columns 22 through 25.

c. Transcribe the estimated CCS work volume to the lower portion of the form in the EST CCS columns provided for total day and session estimates.

d. Develop the smoothed-average half-hourly WV-CCS as described previously, and enter it in the AVG CCS columns.

e. Add the half-hourly CCS from the same days in the previous week's smoothed-average (normally weighted at 0.70) to the most recent day's half-hourly actual WV-CCS (normally weighted at 0.30) to give the smoothed-average WV-CCS for the half hour.

f. Enter the session AVG CCS, which is the average of the half-hourly CCS values in the session.

5 Develop a ratio between the AVG CCS and the EST CCS work volume for each session to factor the half-hourly smoothed-averages (AVG CCS) to the estimated level for the week ahead.

6 Multiply each of the AVG CCS values by the ratio to arrive at the new EST CCS work volume by half hour for the coming week. This ratio reflects the call volume and AWT expected during each session of the day.

7 Use the EST CCS work volume to find operator requirements from the TOPS half-hourly force capacity table. Enter each half-hourly operators required in the column labeled Table.

8 Enter the basic schedule of half-hourly requirements, shown in the column beside the Oprs Req'd – Table column.

9 Deduct this value from the table requirements. The balance is the supplementary operator requirements for the office. Schedule supplementary operator tours to provide the number of operators to meet this line of operator requirements.

Copy the Half-Hourly Oprs Req'd – Table column in column 12 of Form FM 48, TOPS half-hourly force data, for each day. The scheduling process, after the supplementary operator tours have been assigned, may result in a scheduling of operators that does not precisely match the Oprs Req'd – Table column for each half hour. Copy the half-hourly operators scheduled, including any excess or possible shortage, in column 13 of Form FM 48. Finally, copy the half-hourly EST CCS work volume in column 7 of Form FM 48.

Form FM 4915A

Form FM 4915A is used to develop half-hourly operator requirements based on total day estimates of call volumes and AWT.

The upper portion of Form FM 4915A is used to make the following estimates:

- ABD calls
- the percent each day is of ABD calls
- total day calls
- the AWT for each of the seven or eight days as locally appropriate
- the estimated WV-CCS for each day

Use these instructions for filling out the top of Form FM 4915A.

1 Record the estimate of ABD calls. The estimate is derived from historical records and developed using curve projection and period-over-period methods. These and other circumstances that may affect call estimates are taken into account.

2 From Form FM 905, Daily Traffic Record (Calls), estimate the percentage that each of the days represents of the ABD estimate.

3 Using the FM 905 estimated percentages, calculate the estimated total calls for each of the days of the week.

4 Estimate the AWT for each of the seven or eight days, using historical data with respect to circumstances that can affect operator efficiency. An anticipated change in the call mix or the addition of several new operators to the force can affect the AWT. The force supervisor and the in-charge manager estimate the total day AWT.

5 For each day, multiply estimated total calls by estimated AWT, and divide by 100 to obtain estimated CCS work volume.

The bottom portion of the form is used for the following:

- new smoothed-average WV-CCS
- a ratio between total day smoothed-average WV-CCS and total day estimated WV-CCS
- a distribution of total day estimated WV-CCS over the half hours of the day
- half-hourly operator requirements from the TOPS half-hourly force capacity table

The forms required to complete Form FM 4915A are:

- new Form FM 4915A (blank except for the top four lines)
- the previous week's completed Form FM 4915A
- TOPS half-hourly force data, Form FM 48, for the most recent seven or eight days as locally appropriate

The following procedures for completing the lower part of the form use Friday as an example.

1 Transfer the estimated CCS work volume figure for Friday from the top portion of new Form FM 4915A to the bottom of the same form, under the heading FRIDAY in the vertical column EST CCS, where that column intersects with the horizontal line TOTAL.

2 Using the half-hourly AVG CCS for Friday on the previous week's completed Form FM 4915A, multiply each of the half hour CCS values by 70 percent (0.70). At this moment, the AVG CCS column on the previous week's completed form is called the old smoothed-average CCS.

3 Take the TOPS half-hourly force data, Form FM 48, for the most recent Friday. Multiply the half-hourly actual WV-CCS (column 7 on Form FM 48) by 30 percent (0.30).

4 For each separate half hour, add the two results from steps 2 and 3, and enter the total on the new Form FM 4915A under the heading FRIDAY and in column AVG CCS. When all half hours are complete, the new smoothed-average CCS has been developed.

5 Enter the sum of all half-hourly entries where the FRIDAY AVG CCS column intersects with the horizontal line TOTAL.

6 Develop a ratio between total AVG CCS and total EST CCS for Friday, and enter the ratio in the space provided at the bottom of the Friday column (for example, AVG CCS = 5250, EST CCS = 5520, RATIO = 1.05).

7 Apply the ratio to each of the half-hourly AVG CCS values to factor the new smoothed-average CCS up (down) to the estimated WV-CCS.

8 Use estimated half-hourly WV-CCS from the column corresponding to total day or period-of-day AWT in the half-hourly force capacity table to determine half-hourly operator requirements.

The seven or eight days of the week are completed in the same manner.

Calculating the new smoothed-average is possible with a desk calculator that can store the results of one multiplication, perform a second, and then add both products. No intermediate worksheet is required in this case.

```
Example:    half hour
            88 (CCS)/ 0.70  =  store
            94 (CCS)/ 0.30  =  store
                  SUM =  90
```

A weight of 70 percent for the historical file and 30 percent for the most recent data are appropriate under typical circumstances. The discussion of Form FM 4915 earlier in this chapter describes situations where the percentages should be altered.

The FM15 report, representing 15-minute accumulations of FM statistics, identifies half hours in which the WV-CCS is not evenly spread between the two constituent quarter hours. Analysis usually reveals a recurring pattern during periods of the day when traffic volumes are ascending or descending quite rapidly. For example, in the periods 8:00 a.m. to 10:00 a.m. and 4:30 p.m. to 6:00 p.m., quarter-hour scheduling can be most beneficial. The OPRS REQ'D column on Form FM 4915A may be divided with a diagonal line separating the half hour into two quarter hours. In this way, a requirement for 18 operators between 8:30 a.m. and 9:00 a.m. may become 16/20 for respective quarter hours.

For each day of the week, the half-hourly EST CCS and OPRS REQ'D columns should be copied from newly-completed Form FM 4915A to columns 7 and 12 respectively on Form FM 48 for the week ahead.

The quarter-hourly operator requirements, as developed on Form FM 4915A for each day, should be entered on the first of the horizontal lines of the E-201.

If a basic weekday schedule is in effect for several months, the quarter-hourly operators provided by that basic schedule could be printed across the second horizontal line of a form similar to the E-201. Then, 100 copies of this form could be reproduced.

The basic schedule figures (on the second line) are subtracted from the top line required figures. The difference represents quarter-hourly operator requirements that must be filled by supplementary tours. These supplementary tours can be drawn in the remaining space on the E-201 form. The total scheduled operators (basic and supplementary), including excess or shortage, must then be copied in column 13 of Form FM 48, TOPS half-hourly force data, for each day of the coming week.

Although the FM 4915A process deals in total-day call volumes and AWT (6 a.m. to 6 a.m.), operator requirements for the hours 2 a.m. to 6 a.m. are usually based on the WV-CCS offered in the busiest half hour during that period. The night force generally remains constant during this period and any excess is used for clerical and associated activities. Consequently, the AVG CCS and EST CCS columns should be completed for the 2 a.m. to 6 a.m. period, but the entry in the Operators required (OPRS REQ'D) column should represent the total number of half hours scheduled in the period.

Intraday force projections

This section describes the procedures used to make intraday force projections, and the TOPS half-hourly data form (FM 48).

Knowledge of the force status and control of the operator force is essential for balancing good service with economical operation. CCS measurements provide the supervisor with current data indicating the level and the trend of CCS work volume by half hour. Actual WV-CCS should be compared with estimates at appropriate times throughout the day, to update half-hourly force requirements several hours ahead. The accuracy of this process depends on the reliability of half-hourly WV-CCS estimates. When force requirements can be predicted three to six hours ahead based on a projection of current CCS work volume, operator services management can take corrective action to avoid operator surpluses or shortages.

Effective half-hourly force control has the following requirements:

- prompt recording of the FM statistics provided by TOPS
- reliable estimates of half-hourly work volumes
- half-hourly operator schedule

Entries from a Daily Force Memorandum form (E-199 or similar), continuously updated, show deviations from the half-hourly scheduled number of operators. This reflects absentee replacements, loans, and absent employees.

The force projection technique is used to update the traffic estimate, revise the number of operators required, and provide information for more precise force control as follows:

1 The first review of operator requirements for the day is normally made when the force available for the morning and afternoon periods is known, and when sufficient work volume data have been accumulated to establish a reliable and predictable trend. Skilled force management provides accurate force requirements as far in advance as possible. This highlights the importance of the weekly force planning process and the precision of the operator schedule.

2 The status of the available force is determined from entries on the Daily Force Memorandum (E-199). Projected force available is obtained from this form. In the example illustrated in the following table, each of the half hours shows a net of plus one operator. This net condition is used to correct the scheduled operators and project the force available for half-hourly periods being estimated.

Projected force

TOPSTOWN	**8:30**	**9:00**	**9:30**	**10:00**	**10:30**	**11:00**	**11:30**	**12:00**
Absentees	1	1	1	1	1	1	1	1
Replacements	2	2	2	2	2	2	2	2
Net + or -	+1	+1	+1	+1	+1	+1	+1	+1

3 The projection of the available force, and comparison of the actual CCS work volumes with the estimated CCS work volumes, is normally made on Form FM 48, half-hourly force data. The example illustrated in the following table, which shows the projection of the force available for 8:30 a.m. to 2:00 p.m., is based on Daily Force Memorandum entries that resulted in a net of plus one operators. The net additions are added to the number of operators scheduled each half hour. The revised operator force is shown in the Available column.

Projection of the force available

Operators scheduled (including excess)		WV-CCS			Projected force status		
Time	**Operators**	**Actual**	**Estimated**	**Projected**	**Revised**	**Available**	**+ or –**
8:30	33					34	
9:00	36					37	
9:30	42					43	
10:00	50					51	
10:30	61					62	
11:00	65					66	
11:30	62					63	
12:00	60					61	
12:30	52					53	
1:00	49					50	
1:30	56					57	
2:00	60					61	

4 CCS work volumes for several hours ahead are projected based on the trend of actual work volumes compared to estimated work volumes. The CCS work volume trend is normally based on the most recent three or four half-hourly periods with consideration for weather, emergencies, and business conditions.

For example, if the early morning CCS work volume offered to a system is less than estimated, and fair weather is forecast for the rest of the day, and no unusual social or political events are predicted, this lower level of traffic could be expected to continue for several hours during the day.

Intraday projections of operator requirements to handle the current view of CCS work volume are made by calculating the ratio of cumulative actual CCS work volume to the cumulative estimated CCS work volume. This ratio is then applied to the estimated CCS work volume for each half-hourly period for several hours ahead. In the example illustrated in the following table, the CCS work volume is projected to 2:00 p.m.

Intraday projections

Operators scheduled		**WV-CCS**			**Projected force status**		
Time	**Operators**	**Actual**	**Estimated**	**Projected**	**Revised**	**Available**	**+ or –**
8:30		495	503				
9:00		510	555	Trend			
9:30		610	656	(0.93)			
10:00		725	790				
10:30			998	928	56		
11:00			1062	988	60		
11:30			1015	944	57		
12:00			970	902	55		
12:30			831	773	48		
1:00			782	727	45		
1:30			905	842	51		
2:00			978	909	55		

By 10:00 a.m., the Actual CCS work volume is about seven percent lower than the estimate during the early-morning period. The ratio of actual to estimated CCS work volume (0.93), developed for the 8:00 a.m. to 10:00 a.m. period, is projected for several hours by applying the 0.93 factor to the half-hourly estimates. Operator requirements can then be updated, based on the projected CCS work volumes. The revised operator requirements are obtained by reading the half-hourly projected CCS work volumes into the TOPS half-hourly force capacity table.

5 Comparison of the revised Operators required and the Force available form provides data on which accurate and timely force decisions can be made. The example illustrated in the following table shows a comparison of the revised Operators required and the Force available form that shows a surplus of four to five operators.

Operators required and force available

Time	Operators	Actual	Estimated	Projected	Revised	Available	+ or –
8:30						34	
9:00						37	
9:30						43	
10:00						51	
10:30					56	62	+6
11:00					60	66	+6
11:30					57	63	+6
12:00					55	61	+6
12:30					48	53	+6
1:00					45	50	+6
1:30					51	57	+6
2:00					55	61	+6

Half-hourly force data, TOPS – Form FM 48

Form FM 48, Half-Hourly Force Statistics, is used to record information required to administer the force throughout the day. The contents of the DMS output reports (FM30 and FM15) are copied directly and promptly from the FADS or SADS TTY to Form FM 48.

These are the instructions for filling out form FM 48:

1 Columns 1 through 4

a. The calls (IPS or PS), WV-CCS, average occupied positions (AOP) CCS, and calls-waiting CCS are recorded directly from the FM15 report, obtained each quarter hour at the FADS or SADS TTY.

b. When AOP must be compared with the number of operators scheduled for a quarter hour period, the occupied positions CCS in column 3 are divided by nine to obtain AOP.

Note: FM15 reports provide insight into the distribution of WV-CCS within a half hour, particularly during periods of the day when traffic volumes are ascending or descending rapidly. This insight is necessary when preparing basic schedules and in the weekly force estimating process. Special FM15 studies should be scheduled to accumulate the necessary information.

2 Columns 5, 6, 9, 10, 11, and 15 – Calls (IPS or PS), actual WV-CCS, average answer, calls-waiting CCS, AWT, and AOP are recorded directly from the FM30 reports, obtained each half hour at the FADS or SADS TTY.

a. Record in column 5 the number of IPS or PS from the FM30 report. All customer- or outside operator-originated calls that reach a position are included in the count of IPS only. Position reseizures (recalls or coin overtime) and operator-originated delay calls (for example, subsequent attempts, calls to rate and route, calls to the service assistance position, calls to the SOST board) are excluded from the count of IPS. However, if TOPS_PEG_MODE is set to PS, all call types will be represented in the PS (IPS + TPS + RPS) value.

b. Record in column 6 the WV-CCS shown on the FM30 report. This actual WV-CCS, as seen by the DMS, represents the total time (expressed in CCS) that any occupied operator positions were unavailable to handle a new call for any reason. The DMS count of WV-CCS does not include occupied operator positions in the training mode (that is, connected to and working with the training adapter) or maintenance-busy mode.

c. Record in column 9 the average answer shown on the FM30 report. Average answer is calculated each half hour by the DMS and is shown in seconds, correct to one decimal, on the FM30. Average answer represents the total time of subscribers waiting in queue for an operator answer, divided by the number of answered subscribers in the same period of time.

Note: ANS is meaningful as an indicator of speed-of-answer service for five-hour or six-hour periods. For shorter intervals, ANS is less accurate than WV-CCS. Force requirements must be based on work volumes and the half-hourly force capacity table to ensure satisfactory speed of answer.

d. Record in column 10 the calls-waiting CCS shown on the FM30 report. Period-of-the-day (that is, 6:00 a.m. – 12:00 noon, noon – 6:00 p.m., 6:00 p.m. – midnight, midnight – 6:00 a.m.) is required for indexing purposes. ANS results are computed by totaling the period-of-the-day sum of IPS or PS and dividing into calls-waiting CCS X 100 (CW-CCS X 100/ IPS or PS). Do not add the various half-hourly average answer entries and divide the total by the number of half hours in the period. This does not yield a correct entry for column 10.

e. Record in column 11 the AWT shown on the FM30 report. AWT, calculated each half hour by the DMS, is shown in seconds, correct to one decimal, on the FM30. AWT represents operator time used to process the average call and do other necessary work. Period-of-the-day (PD) and total-day (TD) AWT may be manually calculated as follows:

– PD AWT = (SUM PD WV-CCS/ 100) / SUM PD IPS or PS.

– TD AWT = (SUM TD WV-CCS/ 100)/ SUM TD IPS or PS.

f. Record in column 15 the AOP shown on the FM30 report. AOP, calculated each half hour by the DMS is shown correct to one decimal. AOP represents the average number of operator positions seen as occupied in the half hour. For example, if 12 operator positions are occupied throughout the first quarter hour, and 14 throughout the second quarter hour, the FM30 report would show AOP 13.0. AOP is the same as board half hours. The DMS count of occupied positions includes any operator position with a headset plugged in to the position headset jacks except positions in the training mode (that is, connected to the training adaptor) or in the maintenance-busy mode.

Note 1: If it is necessary for plant maintenance personnel to use a position headset jack to test a position, the position should be busied from the MAP position.

Note 2: Any headset seated at an operator position in any DMS-initiated maintenance state is excluded from the count of occupied positions or work volume.

3 Column 7 – Estimated WV-CCS: The half-hourly entries in this column are preposted. They are obtained from the weekly volume and force estimate process that utilizes Forms FM 4915 or FM 4915A. The half-hourly estimated WV-CCS in column 7 is the basis for the required operators shown in column 12.

4 Column 8 – Projected WV-CCS: When the estimate of WV-CCS is revised on the basis of a comparison between actual and estimated WV-CCS trends (columns 6 and 7), enter the projected (revised) work volume in this column. Compute a ratio of the trend by dividing accumulated estimated WV-CCS for a period of several half hours into a similar accumulation of actual WV-CCS. Apply the resulting ratio to future half-hourly estimated WV-CCS to factor it up or down. From this projection, use the half-hourly force capacity table to determine new operator requirements for a period of several hours.

5 Column 12 – Required operators (FM 4915): The half-hourly entries in this column are preposted. They are obtained for each day from Forms FM 4915 or FM 4915A. The number of operators required each half hour is entered in column 12. The half hour may be split into quarter hours so a difference in required operators may be shown, that is, 16/20.

6 Column 13 – Scheduled operators (including excess): The entries in this column are preposted. They represent the actual number of operators expected to be seated at TOPS operator positions each half hour as a result of the scheduling and assignment process. A difference in scheduled operators between quarter hours in any half hour should be shown with an oblique line, that is, 16/20. The number of operators each half hour can be expected to correspond closely to the number in column 12. The number of scheduled operators must include any excess, but does not include absentee replacements or operators to be used for miscellaneous training or other nonoperating activities on a planned basis. In-charge managers should be advised of any scheduled excess so plans may be made to remove this excess, thus maintaining the operator team’s work pace at satisfactory levels. In-charge managers must be informed of any unavoidable shortages that would impair customer service.

7 Column 14 – Required operators (for actual WV-CCS): Record the number of operators required as specified by the TOPS half-hourly force capacity table. Obtain the actual work volume CCs from column 6, the AWT from column 11, and use the capacity table to determine required operators (the number that ensures proper balance between objective speed of answer and economy of operation). Use the following sequence:

   a. Enter in column 16 the revised estimate of operators required for future hours, based on the revised (projected) WV-CCS in column 8 and using the half-hourly force capacity table.

b. Enter in column 17 the operators available for several hours or longer into the future. The number of half-hourly operators available is obtained by taking the number of scheduled operators (shown in column 13) and updating this figure to reflect the net effect of absentees and absentee replacements as shown at the bottom of Form E-199 or the equivalent.

c. Enter in column 18 the difference, expressed as a surplus (+) or shortage (–) of operators for the several half hours ahead. Subtract column 16 from column 17, and enter the difference, positive (+) or negative (–) value. For example:

FW-xxxxx

Col 16	Col 17	Col 18
36	38	+2
24	23	–1
41	41	*

8 Column 19: The half hours of the day are preprinted on both sides of Form FM 48 to facilitate accurate lateral reading of data.

9 Column 20 - Standard WV-CCS: This item may be computed for each half hour by multiplying IPS or PS (column 5) by the standard work time (posted in the upper right-hand corner of Form FM 48) and dividing by 100 to convert to standard WV-CCS.

10 Column 21 - Standard board half hours: The standard WV-CCS (column 20) for each half hour is read into the capacity table under the column appropriate for the standard work time, to obtain standard board half hours. Standard board half hours are summed for the total day, divided by two to obtain standard board hours, and posted to Form FM 2580, Daily and Monthly Productivity Report.

Note: The calculation of standard WV-CCS (column 20) and standard board half hours (column 21) should be done for each half hour at the end of the day (next morning) rather than half-hourly throughout the day.

The time that operators spend at TOPS positions answering real calls for training purposes is included in the DMS count of occupied positions and therefore AOP (board half hours). A record of this time, in minutes, must be maintained, summed for the day, and entered at the bottom of Form FM 48, on the line designated "TOTAL DAY MINUTES OF 627-021, 627-031 TIME INCLUDED IN COL 15 (AOP)." This record of time does not include that of operators spent at TOPS positions connected to the training adapters, because this time is not included in AOP.

The DMS program that accumulates the FM statistics usually scans 180 times each half hour. The actual number of scans is printed on all force management periodic reports. In the unlikely event that the scan count is not

180, the actual scan count on the FM30 report should be noted in the left-hand margin of Form FM 48 beside the half hour affected. The calls-waiting CCS for that half hour should be encircled in column 10. The period-of-the-day computation of average answer should omit IPS or PS and calls-waiting CCS from the affected half hour. Other data on the FM30 report are suspect. The IPS or PS, actual WV-CCS, and AOP may be estimated using previous valid half hours and similar data from the same time and day in previous weeks.

As locally required, a copy of completed Form FM 48 may have to be sent to the service analysis group for independent computation of answer indexes. A local requirement to retain FM30 reports for some period of time, such as one week, may also exist.

Efficiency ratios and measurements

This section describes the efficiency ratios and measurements that are used to indicate trends in the efficiency of customer service. The Daily and Monthly Productivity Report, Form FM 2580, is also described.

This section uses the following industry-standard forms, procedures, or accounting systems:

- Daily Force Record, Form E-200
- Traffic Expense Accounts and Subaccounts (FCC Part 31, Rules and Regulations for the Uniform System of Accounts)
- detailed rules for the accounting and classification of hours included or excluded from efficiency measurements, as they apply in any operator services office
- the supplementary peg count process that equates the local call mix with standard work second allowances to derive a standard work time per call

AWT and SWT

AWT reflects the average operator work time required to handle the average call and do other necessary work. AWT is calculated each half hour by the DMS. AWT can be manually recalculated to obtain the total day value as follows:

– (Total Day Actual WV-CCS/100) / Total Day IPS or PS

Standard work time (SWT) may be developed by periodically weighting the TOPS average operator standard work seconds, according to the class-of-call volumes in the local TOPS office. The SWT so derived may serve as a standard for comparison to the AWT. The SWT includes average allowances for operator inexperience (based on system studies) and other operator busy time such as discussion with an instructor service assistant and other position made-busy time that normally occurs.

Analysis of the traffic in a TOPS office is provided through the use of the traffic sampling feature (TSF), which provides a sample of the toll and local call types reaching the TOPS operator. The TSF provides the operating company with the ability to record on AMA tape "one of n" distinct calls that reach a TOPS position. "One of n" equals the sampling interval. Sampling intervals must be determined in each TOPS office for weekdays, Saturdays, and Sundays. The TSF removes the requirement for manual traffic sampling studies in TOPS offices.

Speed-of-answer measurement

Over a period of the day or a month, the ANS measurement reflects the promptness with which customer calls are answered. The responsibility for providing consistently prompt speed of answer is combined with the responsibility for controlling costs.

Speed-of-answer results depend on the accuracy of call estimates and the precision of the scheduling process that estimates the exact number of operators required each quarter hour. The number of scheduled operators can require adjustment prior to or within the day in response to changes in work volume trends.

The speed-of-answer service measurement may be improved by increasing the number of operators serving a particular queue. The force management ratios and measurements can assist managers in achieving the proper balance between the quality of service and the cost of operating TOPS.

Operator team efficiency ratio

Operator team efficiency is the ratio of AWT to SWT. The ratio is developed from the following formula:

– SWT/AWT = Operator team efficiency

This comparison can reflect the experience of the operator force, its motivation and skill, the effectiveness of methods, work habits, and training, the equipment used in the offices, and the quality of the toll network with which the TOPS operator interfaces. Individual offices that handle similar traffic during similar hours of operation can be compared through their AWT levels in a TOPS installation with more than one traffic office.

Schedule efficiency ratio

Schedule efficiency is the ratio between required board hours and the actual (scanned) board hours counted by the DMS. The ratio is developed from the following formula:

– Required board hours/Actual board hours = Schedule efficiency

Required board hours are the board hours that contain the proper ready-to-serve time required to ensure prompt speed of answer. They are developed by reading half-hourly actual WV-CCS and AWT into the TOPS half-hourly force capacity table. The sum of the resulting required board half hours at the end of the day (next morning), divided by two, equals required board hours.

The DMS reports average occupied positions (AOP) each half hour, and board hours in the six- and 24-hour (FM6HR and FM24HR) reports.

This schedule efficiency ratio is independent of the SWT. It measures the accuracy with which the operator force was provided based on the half-hourly force capacity table requirements for the actual WV-CCS. It evaluates both the accuracy of work volume estimates and the precision of the scheduling process, as well as the responsiveness to subsequent changes in work volume trends.

The ANS must always be stated with the schedule efficiency ratio (for the same time period) to ensure that the service perspective is fully recognized.

Administrative ratio

Administrative ratio represents the relationship between overall hours and account 624 board hours. This ratio shows the proportion of overhead hours used to administer the TOPS installation or an individual office within a TOPS installation to board hours. The formula is as follows:

– Overall Hours / Account 624 board hours = Administrative ratio

For example, 300 overall hours/ 200 account 624 board hours = 1.33.

Overall hours reflect most operating expenses and consist of the following:

- board hours
- supervisory hours
- relief, clerical, and miscellaneous hours
- initial training hours
- supplementary training hours
- departmental paid hours not on duty
- premium overtime hours

Note: Hotel billing and information center (HOBIC) hours are included in relief, clerical, and miscellaneous hours.

Operating efficiency measurement

Operating efficiency is the measurement that incorporates the following two concepts:

- the efficiency of the operator force as indicated by the relationship between AWT and SWT
- the efficiency with which the force was scheduled and administered as indicated by the schedule efficiency ratio

Operating efficiency is developed from the following formula:

– (Standard board hours / Actual board hours)/100 = Operating efficiency

Standard board hours are developed as follows:

1 Develop half-hourly standard WV-CCS:

   a. multiply half-hourly IPS or PS by SWT.

   b. divide by 100 to convert to CCS.

2 Use standard WV-CCS in the TOPS half-hourly force capacity table in the column appropriate to the SWT to determine standard board half hours.

3 Divide the sum of standard board half hours by two to produce standard board hours for the total day.

Actual board half hours are scanned by the DMS and reported each half hour as AOP on the FM30. AOP is summed for the day and divided by two to produce total day actual board hours. The actual (scanned) board hours so derived include the occupied position time of operators in training that is spent handling customer calls.

The actual board hours are influenced by an AWT that is less or greater than the SWT and may also reflect a schedule surplus or shortage for the actual work volume offered. When the operator team is working at the system average speed for the local mix of calls, and when the number of operators at positions is the same as that specified by the TOPS half-hourly force capacity table, then the operating efficiency should center around 100.

Overall efficiency measurement

Overall efficiency is the measurement that relates the overall hours of running the TOPS installation with the standard board hours. The measurement is computed as follows:

– (Standard board hours/Overall hours) / 100 = Overall efficiency

Overall hours reflect most traffic operating expenses, including supervision, relief, clerical, miscellaneous, training, paid absence, and premium overtime hours.

Daily and monthly productivity report – Form FM 2580

The Daily and Monthly Productivity Report, Form FM 2580, is designed to summarize calls, work volumes, and employee hours, and to compute efficiency measurements in TOPS.

Form FM 2580 is basically a calendar month form. Sufficient lines are provided to record weekly and monthly ABD estimates and actual measurements for subsequent transfer to columns on the force program.

The scanned hours recorded by the DMS are used in the efficiency measurements. The time that night operators occupy positions is included in scanned hours. Incidental time spent away from their positions by night operators is reported in miscellaneous hours.

The line and column entries on Form FM 2580 are described in the paragraphs that follow. The data source for several of the columns is Form E-200, the Daily Force Record. This is an industry-standard form that may require individual operating company modification. Forms E-199 and E-201 can serve as a source for entries on Form FM 2580.

1. Date: In this column the dates of the calendar month are entered. The entries for business days, Saturdays, Sundays, and holidays are made under the appropriate headings.
2. Column 1 – Estimated calls: Enter the estimated calls for each day, for subsequent comparison with corresponding actual calls.
3. Column 2 – Actual calls: Obtain this value by totaling the half-hourly count of IPS or PS as recorded on Form FM 48, TOPS half-hourly force data.
4. Columns 3–6 – Use as locally required.
5. Columns 7, 8 – WV-CCS: Enter the estimated and the actual WV-CCS. The total day actual WV-CCS is obtained from Form FM 48, TOPS half-hourly force data.
6. Column 9 – SWT/ AWT: The SWT is developed by company, regional or area staff, who may provide separate figures for weekdays, Saturdays, and Sundays. Obtain the AWT for the total day from Form FM 48, TOPS half-hourly force data, or calculate it by multiplying WV-CCS (Form FM 2580, Column 8) by 100 to convert to seconds and dividing by the total calls (Form FM 2580, Column 2).
7. Column 10 – Estimated board hours: Enter the estimated board hours for the day in this column.

8 Column 11 – Scanned board hours: Enter the total board hours reported by the DMS in the FM24HR report. Scanned board hours are also referred to as actual board hours and they include time spent handling customer calls.

9 Column 12 – Training board hours: Enter the total hours spent handling customer calls at TOPS positions by employees whose time is charged to training. Obtain this value from the entry at the bottom of Form FM 48, TOPS half-hourly force data.

10 Column 13 – Regular board hours: Enter the board hours of employees whose time is charged to regular board hours by deducting training board hours from scanned board hours (Column 11 minus Column 12).

11 Column 14 – Required board hours: Enter the board hours indicated as required by the TOPS half-hourly force capacity table for the actual WV-CCS. Obtain required board hours for the total day from Form FM 48, TOPS half-hourly force data.

12 Column 15 – Standard board hours: Develop standard board hours by multiplying half-hourly IPS or PS values by the SWT and dividing by 100 to produce the standard WV-CCS. Use the standard WV-CCS in the Capacity Table, in the column appropriate for the SWT, to read out standard board half hours. Divide the standard board half hours by two to obtain standard board hours for entry in Column 15.

13 Column 16 – Supervisory hours: Obtain these hours from Form E-201 and the payroll as locally appropriate.

14 Column 17 – Relief, clerical, and miscellaneous hours: Obtain these hours by subtracting the sum of regular board and supervisory hours from the total on duty hours, excluding training (Column 23 minus Columns 13 and 16).

15 Column 18 – Total employees on duty, excluding training: Enter this figure from the appropriate column on Form E-200.

16 Column 19 – Average tour length: This item can be obtained separately for weekdays, Saturdays, and Sundays from the assignment of hours currently in effect. Therefore, it is not an actual tour length, but rather a calculated average tour length based on the schedule in force at the time.

17 Column 20 – Daily overtime hours: Enter these hours from the appropriate column on Form E-200.

18 Column 21 – Excused unpaid hours: These are excused unpaid hours of less than a session. Obtain the daily total from the appropriate column on Form E-200.

19 Column 22 – Travel time (hours) outside of scheduled hours: Record these hours to the extent that they are paid at straight time, on Form E-200 and transfer the value to Column 22.

20 Column 23 – Total on duty hours (paid) in administrative ratio, excluding training: obtain these hours by multiplying total employees on-duty excluding training (Column 18) by the average tour length (Column 19), and then adding overtime hours (Column 20) and travel hours outside of scheduled hours (Column 22).

21 Columns 24, 25 – Training hours, initial and supplementary: Obtain these hours from Form E-199 or from the payroll. Include the relief time of employees charged to the training account.

22 Column 26 – Department paid hours not on duty: Develop these hours from the number of employees recorded as paid absence, incidental, or miscellaneous, on Form E-200. Multiply the number of employees so classified by the number of paid hours in the standard day tour (typically 7.5 or 8.0 hours) to obtain hours for Column 26.

23 Column 27 – Premium overtime hours: Enter these hours based on local procedure. They generally result from daily overtime worked or counted as worked in excess of a full tour, or weekly overtime worked in excess of ten full sessions. Also, a contract can specify premiums for other reasons. In some companies, for example, a rescheduled relief day results in premium payment to the employee. Another example would be special minimum call-in premiums paid in addition to or instead of time paid for hours worked. The premium hours associated with any of these conditions must be calculated and included in the overall hours. Form E-200 and the associated instructions should serve as the source for the calculation of premium hours appropriate in the company.

24 Column 28 – Overall hours: Obtain these hours by adding the entries in Columns 23 through 27.

25 Column 29 – Employees in overall hours: Obtain this entry from Form E-200.

26 Column 30 – Administrative ratio: Enter the ratio of overall hours to board hours. It is obtained by dividing overall hours (Column 28) by regular board hours (Column 13), correct to two decimal places.

27 Column 31 – Operator team efficiency ratio: Develop this ratio by dividing AWT, as recorded daily in Column 9, into the appropriate SWT entered at the top of Column 9, correct to two decimal places.

28 Column 32 – Schedule efficiency ratio: Develop this ratio by dividing scanned board hours (Column 11) into required board hours (Column 14), correct to two decimal places.

29 Column 33 – Operator efficiency: Develop this measurement by dividing scanned board hours (Column 11) into standard board hours (Column 15) and multiplying by 100. Show as an integer value.

30 Column 34 – Overall efficiency: Develop this measurement by dividing overall hours (Column 28) into standard board hours (Column 15) and multiplying by 100. Show as an integer value.

31 Columns 35–38 – Use as locally appropriate.

When summarizing data on Form FM 2580, such as business days, Saturdays, Sundays, holidays, Sat-Sun-Hol or ACD, the following guidelines apply:

1 Add the appropriate daily entries and divide by the number of days for these items: calls, WV-CCS, various statements of board hours, and other classifications of hours including overall hours.

2 Using the formula near the top of each column, recalculate various efficiency measurements and ratios, such as operator team, schedule and administrative ratios, and the operating and overall efficiency measurements. Recalculate the AWT per call by multiplying total WV-CCS (Column 8) by 100 to convert to seconds, then dividing by the total calls (Column 2).

3 Average calendar day (ACD) SWT can be properly weighted as follows:

   a. Total business day calls (calendar month)/ weekday SWT

   b. Total Saturday calls (calendar month) / Saturday SWT

   c. Total Sunday calls (calendar month) / Sunday SWT

   d. Total holiday calls (calendar month) / holiday SWT

4 Add the results of steps 3a through 3d and divide by total calendar month calls.

The following provisions also apply when summarizing Form FM 2580:

- The appropriate SWT per call (weekday, Saturday, or Sunday) is effective for all days of the calendar month.
- ABD is the average for all the business days in the calendar month.
- ACD is the average for each day of the calendar month, except December 25.
- Average Saturday, Sunday, and holiday is the average for the Saturdays, Sundays, and holidays in the calendar month. December 25 is the only holiday excluded from this calculation.

Multitraffic office TOPS

This section describes the administrative principles and procedures that apply to a TOPS installation with more than one traffic office.

Multitraffic office force management principles

The large-team concept of force administration emphasizes the interdependence of all offices in the TOPS installation. It requires centralized force administration to maintain all force data. All operators in the traffic offices served by a TOPS installation constitute a single force administration team, because any call may be distributed to any occupied position.

Large team operation requires less ready-to-serve time in slow hours as well as in busy hours, but introduces the risk of a delicately balanced relationship between work volumes and service. Skillful force management is required to capitalize on these opportunities for large team savings and to maintain a balance between efficiency and service. The efficiency-service relationship must be constantly monitored by analyzing the data provided by the DMS. This monitoring must be performed for the entire TOPS installation on a centralized basis. This ensures a uniform and complete interpretation of the load-to-service relationship.

A TOPS installation with more than one traffic office has a single, combined speed of answer measurement. The mutual support of all offices contributing to this measurement is required to ensure consistent and satisfactory customer service. Each traffic office is responsible for performing at its estimated AWT, and for providing the exact number of operators each half hour as scheduled by the force administrator. Although the AWT is unique for each traffic office, the combined AWT must be predictable in order to estimate the precise number of operators required to achieve the objective speed of answer.

There are advantages inherent in a large TOPS installation with several constituent traffic offices:

- Large team operation saves operator hours through more efficient utilization of operator time at positions.
- Customer service may be more consistent and is less likely to be subject to long delays during traffic peaks.
- The gathering of large traffic volumes in a single force administration team contributes to more accurate estimates of work volumes to be offered to TOPS.
- Some of the traffic offices may close down during periods of light traffic, and calls are automatically routed to the office(s) that remain open. Administrative hours may thereby be reduced.

- In an emergency, one traffic office may be uncovered, without necessarily impairing customer service.
- The size and location of the various traffic offices may be configured to take advantage of other considerations:
  - — the span of control for in-charge managers
  - — locations of good labor markets
  - — night and weekend work assigned in locations where operators live

A TOPS work force can consist of from one to 30 traffic offices. The number of positions in each office can vary.

The large base of traffic and operator work volumes in a multitraffic office TOPS installation results in a relatively stable foundation for a basic schedule. Up to 90 percent of the total hours required for the lowest week during the life of the schedule can safely be drawn as basic tours. The remainder can be drawn for each day of the week to fit the operator requirements precisely.

This procedure is compatible with either of the two widely-used operator tour assignment plans:

- fixed basic schedule assignment plan, in which the basic tours are assigned to individuals for the fixed life of the schedule
- open schedule assignment plan, in which all tours are reassigned each week on the basis of seniority choices

The scheduled force must be adjusted to meet changes in the distribution and volume of WV-CCS as the day progresses. By comparing the actual half-hourly work volume with the estimate on which the schedule for the day is based, force supervisors reassess the half-hourly operator requirements. If necessary, force supervisors request that traffic offices add or subtract operators from positions. By changing the number of operators required in the traffic offices, force administrators can effectively shift work volumes from one office to another as required by the force or positions available in each traffic office.

The traffic office contribution to consistently satisfactory speed of answer can be summarized as follows:

- make accurate AWT estimates for future months, weeks, and days
- ensure that the scheduled number of operators are at positions each half hour and quarter hour
- respond as effectively as possible to requests from the centralized force group to modify the scheduled number of operators

Successful force management in a TOPS installation with more than one traffic office depends on clearly understood responsibilities and the closest possible cooperation between the centralized force group and the managers in all of the traffic offices. The force supervisor develops schedules that require a minimum of intraday adjustment. The traffic offices must ensure that the scheduled number of operators is available at all times.

Offline computer processing of force administration data may provide more timely force management information.

Call transfer considerations

The call transfer feature enables certain operators to transfer calls to other operators in the same TOPS installation. The feature can be used at minimal levels, with no formal force provisioning process required for transfer operators (that is, only the overall operator requirements need be identified, knowing that there will always be sufficient transfer operators available). A lower availability of transfer operators might still involve no formal transfer operator half-hourly provisioning process, but rather an administrative system that ensures that there are always some transfer operators available.

The worst situation would be that the number of transfer operators available is so small that a separate half-hourly provisioning process for them is necessary. Such a process would require attention to the number of transfer operators available for each traffic office. Availability may depend on the labor market close to each office, but every attempt should be made to retain a proportionate number of transfer operators in each office.

The minor cost of this additional element of the force management job, along with potential degradation of grade of service and efficiency, must be constantly examined, with alternative solutions being identified and pursued where possible.

Force programs

In the development of a long-range force program for a TOPS installation with more than one traffic office, the centralized force group is responsible for the following:

- computing estimated board hours, by month, for the TOPS installation as an entity
- allocating these board hours among the several traffic offices in the TOPS installation

The development of the force program beyond the allocation of board hours to each office is primarily the responsibility of each traffic office. After each traffic office prepares its own individual force program, the results are consolidated for the system by the force group.

Estimating total board hours for force programs is described in the section "Force planning" earlier in this chapter. In a TOPS installation with more than one traffic office, this process benefits substantially from joint consultations between the force supervisor, the in-charge managers, the facilities manager, and the system manager.

Allocating estimated board hours among the traffic offices is affected by the following factors:

- number of positions provided in each office
- availability of people
- hours of operation
- desired size of each office
- employment market for each office
- special hiring and training programs
- historical data on trends and seasonal fluctuations in work volumes

The number of positions provided in a particular office is a basic physical constraint on the allocation of board hours to that office. Consultation with the facilities manager should determine the minimum surplus of positions that is required to meet emergency position outages for each traffic office. The force group should develop a method (from history or by drawing schedules based on a tentative board hour allocation) of estimating the busy-hour occupied position requirements for any TOPS traffic office.

Weekly force allocation

This section describes the allocation of operator tours for each day of the week after the supplementary or total schedule has been drawn for the TOPS installation. The schedule must be drawn for the total system based on the total half-hourly WV-CCS offered to the TOPS installation.

Estimates of WV-CCS are translated into half-hourly operator requirements using Form FM 4915 or FM 4915A. This process is described in the section "Weekly force estimation" earlier in this chapter.

A schedule is then drawn to fit the required line as closely as possible. Once the specific tours that form the schedule have been selected, the assignment procedure in a single-traffic office TOPS installation is usually ready. In a TOPS with more than one traffic office, a second process is necessary. This process is the schedule allocation procedure that allocates operator tours to individual traffic offices.

The following factors must be considered for each traffic office in the allocation of tours:

- hours of operation
- days of operation
- availability of people
- number of installed positions

The long-range planning that determined the offices' structure can have an appreciable effect on the allocation of tours. Tours are allocated by the force group based on information provided by the traffic offices and tailored to the particular configuration of the TOPS installation and its operation.

Because of the considerable variety among large team systems, the process described in the following paragraphs outlines general principles and the use of supplementary worksheets that may need to be modified for use in a particular TOPS installation. Only the tour allocation process is described.

The exchange of information necessary to allocate the tours begins with each traffic office furnishing to the force group the information on the upper three-quarters of the worksheet titled "System Operator Requirements" (shown in the next figure).

The identifying information is completed as follows.

- Traffic office: Enter the name or unit number of the traffic office originating the form.
- Week beginning: Enter the month and the date of the Sunday that begins the week for which the process applies.
- Positions installed: Enter the number of positions installed in the office.
- Hours of operation: Enter the hours of operation for week days, Saturdays, and Sundays in the traffic office. If the hours of operation are less than 24, show the hours at which the office opens and closes.

The originating traffic office completes lines 1 through 18 on the worksheet (see the following figure). The following entries are required:

1. Total operators on payroll: Enter the total number of operators on the payroll excluding leaves of absence, transfers out, and losses on or before Sunday.
2. Operators Eng, Re-Eng, Trans In: Enter the total number of operators added to the force on or before Sunday.
3. Operators borrowed: Enter the total number of operators borrowed from another office for a full week.

4 Total operators on force: Enter the sum of items 1-3.

5 Part-time operators: Enter the total number of part-time operators expected to be on the payroll included in item four.

6 Disability: Enter the total number of operators expected to be on disability benefits.

7 Vacations: Enter the total number of operators expected to be on vacation.

8 E – weeks granted: Enter the number of full weeks of planned excused time.

9 Operators in training – Initial: Enter the number of operators in a full week of initial training.

10 Operators loaned: Enter the number of operators loaned to another office for a full week.

11 Operators unavailable: Enter the number of operators unavailable for a full week. This is the sum of items 5-10.

12 Full time operators available: Enter the total number of full time operators available. This is item 4 minus item 11.

13 Full time operator days: Enter the number of full-time operator days available. This is item 12 / 5.0.

14 Borrows and additions after Sunday: Enter for each day the number of operators borrowed for less than a week, as well as the operators who are added after the first day of the week.

15 Equivalent part-time days available: Enter for each day the equivalent days to be added for part-time operators who are available to work.

16 Loans and losses after Sunday: Enter for each day the number of operators loaned for less than a week, as well as the operators who are losses after the first day of the week.

17 Operator office requirements: Enter for each day the operator requirements for such items as excused days, miscellaneous days, vacation days, disability days, reengaged and transfer-in training days, study days, peg count days, absentee replacement days, employee interview days, and miscellaneous days required by the traffic office.

18 Position days available: Enter the total of the position days available. This is determined by the performing three calculations:

FW-xxxxx

1. Item 13 + item 14 + item 15 = x
2. Item 16 + item 17 = y
3. Position days available = x – y

Note: The centralized force group completes the bottom quarter of the worksheet for each traffic office. Entries 19 through 22 are required.

19 Line 19 – Position days required: Enter the total operators required to handle the estimated work volume each day of the week. This is the sum of basic and supplementary tours. The entry can be made only after the allocation process is completed.

20 Line 20 – Basic: Enter the total basic tours provided each weekday. This entry is posted prior to the schedule allocation. Weekend operator requirements are treated as supplementary tours.

21 Line 21 – Supplementary: Enter the number of supplementary tours is posted for each day after the allocation process is completed.

22 Line 22 – Total days (+ or –): Enter the net difference between position days available (line 18) and position days required (line 19) is entered for the total week, after the allocation process is completed.

System operator requirements worksheet

System operator requirements worksheet

Traffic office ____________ Week beginning ____________
Position installed ____________ Hours of operation ____________
Business days ____________
Saturday ____________
Sunday ____________

1. Total operators on payroll (excl. L/A) ________
2. Operators eng, re-eng, trans in. ________
3. Operators borrowed (full week) ________
4. Total operators on force ________
5. Part-time operators ________
6. Disability ________
7. Vacations ________
8. E-weeks granted ________
9. Operators in training-initial ________
10. Operators loaned (full week) ________
11. Operators unavailable (5 thru 10) ________
12. FT operators available (4 thru 11) ________

	Sun	Mon	Tue	Wed	Thr	Fri	Sat	Total
13. FT operator days (12/5.0)	-	-	-	-	-	-	-	
14. Borrow/additions after Sun.								
15. Equiv. PT days available								
16. Loans/losses after Sunday								
17. Office requirements								
18. Position days available	-	-	-	-	-	-	-	

Information furnished by force group

	Sun	Mon	Tue	Wed	Thr	Fri	Sat	Total
19. Position days required								
20. Basic								
21. Supplementary								
22. Total days (+ or - (19-18	-	-	-	-	-	-	-	

The actual allocation process is explained in the following paragraphs. An Operator Tour Schedule Worksheet has been designed for use in a TOPS installation with four traffic offices (see the next figure). Under each day of the week, columns 1–4 are for the traffic office information, and column 5 is for the total of the four traffic offices. This process is designed to accommodate a TOPS installation that rotates the weekend work among the various traffic offices.

The lines on the upper half of the worksheet are numbered and the operator tour allocation begins by completing the form as follows:

1 Operator position days available: Enter the number of operator position days available from each traffic office as obtained from line 18 on the System Operator Requirements worksheets. Make the entries and add them for the total TOPS installation under column 5.

2 Operator position days required: Enter the number of operator position days required for the total TOPS installation under column 5. This figure is the sum of operators required for each day of the week as derived from the Form FM 4915 process and the actual schedules drawn. A comparison of the required system position days with the available position days reveals whether a force surplus or shortage exists. If a force surplus exists, it can be distributed equitably to all offices. If a force shortage exists, decisions must be made as to how the shortage can be relieved and how overtime days are to be allocated among the traffic offices.

3 Basic schedule requirements: Enter the number of tours provided by the basic schedule for each traffic office, Monday through Friday. The weekend basic schedule is left blank because all weekend tours are treated as supplementary tours.

4 Operators available: Enter the number of operator position days available for those traffic offices scheduled to operate on either Saturday and Sunday (or both). The numbers are obtained from line 18 on the System Operator Requirements worksheets. Make the entries under the Sunday and Saturday columns for the particular traffic offices, as appropriate.

5 Operators available percent: The percentages are calculated for each traffic office scheduled to operate on either Sunday and Saturday (or both), based on the percentage of total operators available that each of the offices' operators are available for the particular weekend day.

6 Total supplementary tours: Enter the total number of tours to be scheduled for Sunday and Saturday for the TOPS installation. These figures are based on the operator schedules that have been drawn by the force group for these days. Make the entry for the total TOPS installation for operator position days required (line 2) and total supplementary tours (line 6) for both weekend days. The number of weekend tours allocated to each office is obtained by multiplying the percentage that each office comprises of the available force (line 5) by the total TOPS supplementary tours (line 6). Enter this number for each office that is operational on weekends.

Allocate the specific supplementary tours required by type to the weekend offices. Based on the hours of operation, the number of installed positions, and the percent of operators available, allocate the tours to the traffic offices.

Start with the tours that can be worked only by the 24-hour office, until all the tours are equitably distributed to the individual offices.

Repeat the process for both Sunday and Saturday until all the required tours are allocated to the weekend offices. The bottom of the Operator Tour Schedule Allocation worksheet can be used to record the results of this allocation of tours to traffic offices. The total tours allocated to the traffic offices must equal the system total required supplementary tours.

The process of allocating the weekday tour requirements on the Operator Tour Schedule is as follows.

1. Recalculate the operator position days available on an ABD basis by subtracting the weekend requirements from the overall operator position days available for each office and for the total system. Enter these figures for each business day for all offices and the total system.
2. Post the required operator position days for the business days for the total system. These figures represent the end result of the schedules drawn by the force group.
3. Post the number of operator tours provided by the basic schedule for the business days for each office and the total TOPS installation.
4. Calculate the operators available for each business day by subtracting the number of operator days provided by the basic schedule (line 3) from the operator position days available (line 1). Enter this figure for each office and the total system.
5. Calculate the operators available percentage on an ABD basis by determining the percentage that each office's available operators are of total operators available. Enter the percentage for each traffic office. Ensure that the percentages total 100 for the system.
6. Enter the total supplementary tours for the system for each business day. Calculate the supplementary tours to be worked in each traffic office by applying the percentage of operators available for each office (line 5) to the total supplementary tours to be assigned to each traffic office each business day.
7. Distribute the specific supplementary tours required for each business day, by type, to the traffic offices. Based on the hours of operation, the number of installed positions, and the percentage of operators available, allocate the tours to the offices. Start with the tours that only the 24-hour office can work, and continue until all the tours required are equitably distributed to the individual offices.

The bottom portion of the Operator Tour Schedule Allocation worksheet can be used to record the results of this allocation process. The total tours allocated to the traffic offices must equal the total supplementary tours required for the system.

Operator tour allocation worksheet

Operator tour allocation worksheet

		SUN.					MON.					TUES.					WED.					THUR.					FRI.					SAT.					TOTAL.				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	Operator Position Days Available																																								
2	Operator Position Days Required																																								
3	Basic Schedule Requirements																																								
4	Operators Available																																								
5	Operators Available %																																								
6	Total Supp Tours																																								
	Night Supp Tours																																								
	Late SHF Supp Tours																																								
	SHF Supp Tours																																								
	AF Supp Tours																																								
	WF Supp Tours																																								
	MA Supp Tours																																								
	Part–Time Supp Tours																																								
	Force + OR –																																								

Part-time tours are treated separately and are excluded from this allocation process. Part-time tours are allocated based on each traffic office availability and use of part-time tours.

The force group completes the bottom quarter of the system Operator Requirements worksheet for each traffic office. This worksheet, along with a listing of the tours to be assigned each day, is returned to the individual traffic offices. These sheets are used to complete the weekly force estimate form and the day-off assignment plan procedure. The traffic offices assign operators to specific tours.

A summary of the step-by-step procedure involved in operator tour allocation follows:

1 Determine operator position days available on a five-day basis to work the full week of seven days.

2 Allocate the weekend operator position days requirements.

3 Recalculate the operator position days available to work the five business days.

4 Subtract the weekday basic schedule requirements.

5 Allocate the weekday supplementary tours to the offices based on the weekday operators available.

The process can be simplified to reduce the steps required for an individual system by tailoring the general principles outlined to fit a specific system's requirements. This manual procedure is similar to a computer-assisted procedure that performs the tour allocation function.

When a basic schedule is prepared for the TOPS installation, a process that employs principles similar to those described can be used to allocate basic schedule tours among the traffic offices.

Intraday force management

The basic principles and procedures of daily force management are described in the section "Intraday force projections" earlier in this chapter. A TOPS installation with more than one traffic office uses the same principles, but with a shared responsibility for the implementation of intraday decisions.

The force supervisor plans the operator tour schedule and the necessary revisions to that schedule as the day unfolds. The data recorded on Form FM 48 show the total system status and determine the need for intraday force adjustments. A comparison of the projected force requirements against the force available indicates the direction and magnitude of intraday force decisions.

The in-charge managers determine the availability of operators. Traffic offices must keep the force administrators informed concerning changes in the number of operators available for future half hours in the day and for future days. Each traffic office must maintain a daily force memorandum as its source of information concerning the net effect of absentees and replacements in its office.

Form FM 49 is a Half-Hourly Force Projection Worksheet that would be used by the force group in a TOPS installation with seven traffic offices. Systems with a smaller or larger number of traffic offices may wish to redraft the form to reflect their particular configuration. The data recorded on Form FM 49 expand the total system data to show individual traffic office information so that intraday decisions can be made and relayed to the offices for implementation. Average occupied positions (AOP) can also be recorded for each of the traffic offices each half hour. The source of this information is the FM30 report printed at the FADS TTY.

Form FM 50, Force Data By Traffic Office, is used in a TOPS installation with seven traffic offices. Data are recorded half-hourly for each traffic office. The source of this information is the FM30 Report printed at the TADS TTY.

Form FM 51, Traffic Office Force Data, is used to record the essential force management statistics for the individual traffic offices for each half hour. These statistics contain the following information:

- operators originally scheduled (by the force group)
- operators currently available (from the daily force memorandum)
- revised operators required (as indicated by the force group)
- the plus or minus condition apparent from a comparison of operators available to operators scheduled or subsequently required, so that the original schedule can be revised for future half hours
- the AOP (from the TO30 Report)
- the final positive (+) or negative (–) condition obtained by comparing the AOP with the last projected or required number of operators.

The in-charge manager should try to maintain the AOP equal to the final projected (required) line.

Form FM 51, Traffic Office Force Data, also should be used to record half-hourly AWT, IPS or PS, and WV-CCS. This information is obtained from the TO30 Report. IPS or PS and WV-CCS must be recorded half-hourly so the period-of-the-day and total day AWT can be recalculated as follows:

– PD AWT = (SUM PD WV-CCS/100) / SUM PD IPS or PS.

– TD AWT = (SUM TD WV-CCS/100) / SUM TD IPS or PS.

Appendix: Queue length threshold tables

Queue lengths for call waiting (CW) on, CW off, and call deflection are determined by the following formulas:

$$\textbf{CWon n} = \frac{2 \bullet A \bullet T}{\bar{X}}$$

$$\textbf{CWoff n} = \frac{A \bullet T}{\bar{X}}$$

$$\textbf{Deflection n} = \frac{D \bullet T}{\bar{X}}$$

where

A = average answer time
T = team size
$\bar{X}$ = AWT
D = deflection threshold in seconds
n = the number of calls in queue (The equation is solved to find this value.)

The following example uses these formulas. The values are taken from the first table, at the row for 29 to 30 operators.

$$\textbf{CWon} = \frac{2 \bullet 2.1 \text{ seconds} \bullet 30 \text{ operators}}{15 \text{ seconds/call/operator}}$$

$$\textbf{CWoff} = \frac{2.1 \text{ seconds} \bullet 30 \text{ operators}}{15 \text{ seconds/call/operator}}$$

$$\textbf{Deflection} = \frac{30 \text{ seconds} \bullet 30 \text{ operators}}{15 \text{ seconds/call/operator}}$$

Note: The call deflection formula is valid for team sizes greater than 7. At the lower end of the range, call deflections are set higher than the formula provides. There would be too much call deflection if the smallest teams were to deflect all calls in queue longer than 30 seconds.

The chapter "Understanding how the DMS switch distributes calls," earlier in this document, explains how the DMS switch uses queue length thresholds to determine when calls are deflected. For a complete explanation, see the section "Thresholds for call deflect" in that chapter.

For specific queue thresholds, refer to the following examples of queue threshold tables. Tables in the section "Thresholds for TA" define thresholds for an ANS of 2.1 seconds, as used with TA calls. Tables in the section "Thresholds for DA" define thresholds for an ANS of 5.0 seconds, as used with DA calls.

Thresholds for TA

The 18 tables in this section define thresholds for an ANS of 2.1 seconds.

TOPS MP queue length threshold table – ANS 2.1, AWT 15 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	19
3	4	0	1	19
5	6	0	1	19
7	8	1	2	19
9	10	1	3	19
11	12	2	3	23
13	14	2	4	27
15	16	2	4	31
17	18	2	5	35
19	20	3	5	39
21	22	3	6	43
23	24	3	6	47
25	26	3	7	51
27	28	4	7	55
29	30	4	8	59
31	32	4	8	63
33	40	5	10	73
41	48	6	12	89

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 15 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
49	56	7	14	105
57	64	8	16	121
65	72	9	18	137
73	80	10	20	153
81	88	11	23	169
89	96	12	25	185
97	104	13	27	201
105	120	15	30	225
121	136	17	34	257
137	152	19	39	289
153	168	21	43	321
169	184	24	47	353
185	200	26	51	385
201	216	28	56	417
217	232	30	60	449
233	248	32	64	481
249	264	34	68	513
265	280	36	73	545
281	296	38	77	577
297	312	42	83	623
313	328	46	91	683
329	344	50	99	743
345	360	54	107	803
361	376	58	115	863
377	392	62	123	923
393	408	66	131	983
409	424	70	139	1043

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 15 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
425	440	74	147	1103
441	456	78	156	1167

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 20 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	16
3	4	0	1	16
5	6	0	1	16
7	8	1	2	16
9	10	1	2	16
11	12	1	3	19
13	14	2	3	23
15	16	2	3	26
17	18	2	4	29
19	20	2	4	33
21	22	2	5	36
23	24	3	5	36
25	26	3	6	39
27	28	3	6	43
29	30	3	7	46
31	32	4	7	49
33	40	4	8	53
41	48	5	10	61
49	56	6	12	74
57	64	7	13	88
65	72	8	15	101

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 20 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
73	80	9	17	114
81	88	9	19	128
89	96	10	21	154
97	104	11	22	168
105	120	13	25	188
121	136	14	29	214
137	152	16	32	241
153	168	18	36	268
169	184	20	39	294
185	200	21	43	321
201	216	23	46	348
217	232	25	50	374
233	248	27	53	401
249	264	29	57	428

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 25 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	12
3	4	0	1	12
5	6	0	1	12
7	8	0	1	12
9	10	1	2	12
11	12	1	2	15
13	14	1	2	18
15	16	1	3	20
17	18	2	3	23

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 25 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
19	20	2	3	25
21	22	2	4	28
23	24	2	4	31
25	26	2	4	33
27	28	2	5	36
29	30	3	5	38
31	32	3	5	41
33	40	3	6	48
41	48	4	8	58
49	56	5	9	68
57	64	5	11	79
65	72	6	12	89
73	80	7	13	100
81	88	7	15	110
89	96	8	16	121
97	104	9	17	131
105	120	10	20	147
121	136	11	22	168
137	152	13	25	188
153	168	14	28	209
169	184	15	31	230
185	200	17	33	251
201	216	18	36	272
217	232	20	39	293
233	248	21	42	314
249	264	22	45	335

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 30 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	10
3	4	0	1	10
5	6	0	1	10
7	8	0	1	10
9	10	0	1	10
11	12	1	2	12
13	14	1	2	14
15	16	1	2	17
17	18	1	3	19
19	20	1	3	21
21	22	2	3	23
23	24	2	3	25
25	26	2	4	27
27	28	2	4	29
29	30	2	4	32
31	32	2	5	34
33	40	3	5	39
41	48	3	6	48
49	56	4	8	56
57	64	4	9	65
65	72	5	10	73
73	80	5	11	82
81	88	6	12	91
89	96	7	13	99
97	104	7	14	108
105	120	8	16	121
121	136	9	18	138
137	152	10	21	155

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 30 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
153	168	11	23	172
169	184	13	25	189
185	200	14	28	206
201	216	15	30	223
217	232	16	32	241
233	248	17	34	258
249	264	18	37	275

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 35 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	9
3	4	0	1	9
5	6	0	1	9
7	8	0	1	9
9	10	0	1	9
11	12	0	1	10
13	14	1	2	12
15	16	1	2	14
17	18	1	2	16
19	20	1	2	18
21	22	1	3	20
23	24	1	3	21
25	26	2	3	23
27	28	2	3	25
29	30	2	4	27
31	32	2	4	29

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 35 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
33	40	2	4	33
41	48	3	5	40
49	56	3	6	48
57	64	4	7	55
65	72	4	8	62
73	80	5	9	70
81	88	5	10	77
89	96	6	11	84
97	104	6	12	91
105	120	7	14	102
121	136	8	16	117
137	152	9	18	131
153	168	10	19	146
169	184	11	21	160
185	200	12	23	175
201	216	13	25	190
217	232	14	27	204
233	248	15	29	219
249	264	16	31	233

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 40 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	8
3	4	0	1	8
5	6	0	1	8
7	8	0	1	8

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 40 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
9	10	0	1	8
11	12	0	1	9
13	14	1	1	11
15	16	1	2	12
17	18	1	2	14
19	20	1	2	15
21	22	1	2	17
23	24	1	2	19
25	26	1	3	20
27	28	1	3	22
29	30	2	3	23
31	32	2	3	25
33	40	2	4	29
41	48	2	5	35
49	56	3	6	41
57	64	3	6	48
65	72	4	7	54
73	80	4	8	60
81	88	4	9	67
89	96	5	10	73
97	104	5	11	79
105	120	6	12	89
121	136	7	14	101
137	152	8	15	114
153	168	8	17	127
169	184	9	19	139
185	200	10	20	152
201	216	11	22	165

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 40 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
217	232	12	24	177
233	248	13	25	190
249	264	14	27	203

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 45 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	7
3	4	0	1	7
5	6	0	1	7
7	8	0	1	7
9	10	0	1	7
11	12	0	1	8
13	14	0	1	9
15	16	1	1	11
17	18	1	2	12
19	20	1	2	14
21	22	1	2	15
23	24	1	2	16
25	26	1	2	18
27	28	1	3	19
29	30	1	3	21
31	32	1	3	22
33	40	2	3	25
41	48	2	4	31
49	56	2	5	37
57	64	3	6	42

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 45 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
65	72	3	6	48
73	80	4	7	53
81	88	4	8	59
89	96	4	9	65
97	104	5	9	70
105	120	5	10	78
121	136	6	12	90
137	152	7	13	101
153	168	7	15	112
169	184	8	16	123
185	200	9	18	134
201	216	10	19	145
217	232	10	21	157
233	248	11	22	168
249	264	12	24	179

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 50 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	2
3	4	0	1	4
5	6	0	1	5
7	8	0	1	5
9	10	0	1	6
11	12	0	1	7
13	14	0	1	8
15	16	0	1	10

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 50 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
17	18	0	1	11
19	20	1	2	12
21	22	1	2	13
23	24	1	2	15
25	26	1	2	16
27	28	1	2	17
29	30	1	2	18
31	32	1	3	20
33	40	2	3	23
41	48	2	4	28
49	56	2	4	33
57	64	3	5	38
65	72	3	6	43
73	80	3	6	48
81	88	4	7	53
89	96	4	8	58
97	104	4	8	63
105	120	5	9	70
121	136	5	11	80
137	152	6	12	90
153	168	7	13	100
169	184	7	15	110
185	200	8	16	120
201	216	9	17	130
217	232	9	19	140
233	248	10	20	150
249	264	11	21	161

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 55 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	5
3	4	0	1	5
5	6	0	1	5
7	8	0	1	5
9	10	0	1	5
11	12	0	1	7
13	14	0	1	8
15	16	0	1	9
17	18	0	1	10
19	20	0	1	11
21	22	1	2	12
23	24	1	2	13
25	26	1	2	14
27	28	1	2	16
29	30	1	2	17
31	32	1	2	18
33	40	1	3	21
41	48	2	3	25
49	56	2	4	30
57	64	2	5	34
65	72	3	5	39
73	80	3	6	43
81	88	3	6	48
89	96	3	7	52
97	104	4	8	57
105	120	4	8	64
121	136	5	10	73
137	152	5	11	82

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 55 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
153	168	6	12	91
169	184	7	13	100
185	200	7	15	109
201	216	8	16	118
217	232	8	17	127
233	248	9	18	136
249	264	10	19	145

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 60 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	5
3	4	0	1	5
5	6	0	1	5
7	8	0	1	5
9	10	0	1	5
11	12	0	1	6
13	14	0	1	7
15	16	0	1	8
17	18	0	1	9
19	20	0	1	10
21	22	0	1	11
23	24	1	2	12
25	26	1	2	13
27	28	1	2	14
29	30	1	2	15
31	32	1	2	16

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 60 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
33	40	1	3	19
41	48	2	3	23
49	56	2	4	27
57	64	2	4	31
65	72	2	5	35
73	80	3	5	40
81	88	3	6	44
89	96	3	6	48
97	104	3	7	52
105	120	4	8	58
121	136	4	9	66
137	152	5	10	75
153	168	6	11	83
169	184	6	12	91
185	200	7	13	100
201	216	7	14	108
217	232	8	15	116
233	248	8	17	124
249	264	9	18	133

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 65 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	5
3	4	0	1	5
5	6	0	1	5
7	8	0	1	5

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 65 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
9	10	0	1	5
11	12	0	1	5
13	14	0	1	6
15	16	0	1	7
17	18	0	1	8
19	20	0	1	9
21	22	0	1	10
23	24	0	1	11
25	26	1	2	12
27	28	1	2	13
29	30	1	2	14
31	32	1	2	15
33	40	1	2	17
41	48	1	3	21
49	56	2	3	25
57	64	2	4	29
65	72	2	4	33
73	80	2	5	36
81	88	3	5	40
89	96	3	6	44
97	104	3	6	48
105	120	4	7	54
121	136	4	8	61
137	152	5	9	69
153	168	5	10	76
169	184	6	11	84
185	200	6	12	92
201	216	7	13	99

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 65 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
217	232	7	14	107
233	248	8	15	115
249	264	8	16	122

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 70 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	4
3	4	0	1	4
5	6	0	1	4
7	8	0	1	4
9	10	0	1	4
11	12	0	1	5
13	14	0	1	6
15	16	0	1	7
17	18	0	1	8
19	20	0	1	9
21	22	0	1	9
23	24	0	1	10
25	26	1	2	11
27	28	1	2	12
29	30	1	2	13
31	32	1	2	14
33	40	1	2	16
41	48	1	3	20
49	56	2	3	23
57	64	2	4	27

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 70 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
65	72	2	4	30
73	80	2	5	34
81	88	3	5	37
89	96	3	5	41
97	104	3	6	44
105	120	4	7	50
121	136	4	8	57
137	152	5	9	64
153	168	5	9	71
169	184	6	10	78
185	200	6	11	85
201	216	7	12	92
217	232	7	13	99
233	248	8	14	106
249	264	8	15	113

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 75 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	4
3	4	0	1	4
5	6	0	1	4
7	8	0	1	4
9	10	0	1	4
11	12	0	1	5
13	14	0	1	6
15	16	0	1	6

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 75 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
17	18	0	1	7
19	20	0	1	8
21	22	0	1	9
23	24	0	1	10
25	26	0	1	10
27	28	1	2	11
29	30	1	2	12
31	32	1	2	13
33	40	1	2	15
41	48	1	2	18
49	56	1	3	22
57	64	2	3	25
65	72	2	4	28
73	80	2	4	31
81	88	2	5	35
89	96	3	5	38
97	104	3	6	41
105	120	3	6	46
121	136	4	7	53
137	152	4	8	59
153	168	4	9	66
169	184	5	10	73
185	200	5	11	79
201	216	6	11	86
217	232	6	12	92
233	248	7	13	99
249	264	7	14	105

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 80 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	4
3	4	0	1	4
5	6	0	1	4
7	8	0	1	4
9	10	0	1	4
11	12	0	1	4
13	14	0	1	5
15	16	0	1	6
17	18	0	1	7
19	20	0	1	8
21	22	0	1	8
23	24	0	1	9
25	26	0	1	10
27	28	0	1	11
29	30	1	2	11
31	32	1	2	12
33	40	1	2	14
41	48	1	2	17
49	56	1	3	20
57	64	2	3	23
65	72	2	4	26
73	80	2	4	29
81	88	2	4	33
89	96	2	5	36
97	104	3	5	39
105	120	3	6	43
121	136	3	7	49
137	152	3	7	56

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 80 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
153	168	4	8	62
169	184	5	9	68
185	200	5	10	74
201	216	5	11	80
217	232	6	12	86
233	248	6	12	93
249	264	7	13	99

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 85 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	3
3	4	0	1	3
5	6	0	1	3
7	8	0	1	3
9	10	0	1	3
11	12	0	1	4
13	14	0	1	5
15	16	0	1	6
17	18	0	1	6
19	20	0	1	7
21	22	0	1	8
23	24	0	1	8
25	26	0	1	9
27	28	0	1	10
29	30	0	1	11
31	32	1	2	11

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 85 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
33	40	1	2	13
41	48	1	2	16
49	56	1	3	19
57	64	1	3	22
65	72	2	3	25
73	80	2	4	28
81	88	2	4	31
89	96	2	4	33
97	104	2	5	36
105	120	3	5	41
121	136	3	6	46
137	152	3	7	52
153	168	4	8	58
169	184	4	9	64
185	200	5	9	70
201	216	5	10	75
217	232	5	11	81
233	248	6	12	87
249	264	6	12	93

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 90 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	3
3	4	0	1	3
5	6	0	1	3
7	8	0	1	3

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 90 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
9	10	0	1	3
11	12	0	1	4
13	14	0	1	5
15	16	0	1	5
17	18	0	1	6
19	20	0	1	7
21	22	0	1	7
23	24	0	1	8
25	26	0	1	9
27	28	0	1	9
29	30	0	1	10
31	32	0	1	11
33	40	1	2	12
41	48	1	2	15
49	56	1	2	18
57	64	1	3	21
65	72	2	3	23
73	80	2	3	26
81	88	2	4	29
89	96	2	4	32
97	104	2	5	34
105	120	3	5	38
121	136	3	6	44
137	152	3	7	49
153	168	4	7	55
169	184	4	8	60
185	200	4	9	66
201	216	5	9	71

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 90 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
217	232	5	10	77
233	248	5	11	82
249	264	6	12	87

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 95 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	3
3	4	0	1	3
5	6	0	1	3
7	8	0	1	3
9	10	0	1	3
11	12	0	1	4
13	14	0	1	4
15	16	0	1	5
17	18	0	1	6
19	20	0	1	6
21	22	0	1	7
23	24	0	1	8
25	26	0	1	8
27	28	0	1	9
29	30	0	1	10
31	32	0	1	10
33	40	1	2	12
41	48	1	2	14
49	56	1	2	17
57	64	1	3	20

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 95 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
65	72	1	3	22
73	80	2	3	25
81	88	2	4	27
89	96	2	4	30
97	104	2	4	32
105	120	2	5	36
121	136	3	6	41
137	152	3	6	47
153	168	3	7	52
169	184	4	8	57
185	200	4	8	62
201	216	4	9	67
217	232	5	10	72
233	248	5	10	78
249	264	6	11	83

—end—

TOPS MP queue length threshold table – ANS 2.1, AWT 100 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	3
3	4	0	1	3
5	6	0	1	3
7	8	0	1	3
9	10	0	1	3
11	12	0	1	4
13	14	0	1	4
15	16	0	1	5

—continued—

TOPS MP queue length threshold table – ANS 2.1, AWT 100 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
17	18	0	1	5
19	20	0	1	6
21	22	0	1	7
23	24	0	1	7
25	26	0	1	8
27	28	0	1	8
29	30	0	1	9
31	32	0	1	10
33	40	0	1	11
41	48	1	2	14
49	56	1	2	16
57	64	1	2	19
65	72	1	3	21
73	80	2	3	23
81	88	2	3	26
89	96	2	4	28
97	104	2	4	31
105	120	2	5	34
121	136	3	5	39
137	152	3	6	44
153	168	3	7	49
169	184	4	7	54
185	200	4	8	59
201	216	4	9	64
217	232	5	9	69
233	248	5	10	74
249	264	5	10	79

—end—

Thresholds for DA

The two tables in this section define thresholds for an ANS of 5.0 seconds.

TOPS MP queue length threshold table – ANS 5.0, AWT 20 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	1	2	3
3	4	1	3	6
5	6	2	4	9
7	8	2	5	12
9	10	3	6	15
11	12	3	7	18
13	14	4	8	21
15	16	4	9	24
17	18	5	10	27
19	20	5	11	30
21	22	6	12	33
23	24	6	13	36
25	26	7	14	39
27	28	7	15	42
29	30	8	16	45
31	32	8	17	48
33	40	10	21	60
41	48	12	25	72
49	56	14	29	84
57	64	16	33	96
65	72	18	37	108
73	80	20	41	120
81	88	22	45	132
89	96	24	49	144
97	104	26	53	156
105	120	30	61	180

—continued—

TOPS MP queue length threshold table – ANS 5.0, AWT 20 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
121	136	34	69	204
137	152	38	77	228
153	168	42	85	252
169	184	46	93	276
185	200	50	101	300
201	216	54	109	324
217	232	58	117	348
233	248	62	125	372
249	264	66	133	396

—end—

TOPS MP queue length threshold table – ANS 5.0, AWT 100 seconds

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
1	2	0	1	2
3	4	0	1	2
5	6	0	1	2
7	8	0	1	2
9	10	1	2	3
11	12	1	2	4
13	14	1	2	4
15	16	1	2	5
17	18	1	2	5
19	20	1	3	6
21	22	1	3	7
23	24	1	3	7
25	26	1	3	8
27	28	1	3	8

—continued—

TOPS MP queue length threshold table – ANS 5.0, AWT 100 seconds (continued)

OPRANGE from	OPRANGE to	CW indicator off	CW indicator on	Calls deflected at
29	30	2	4	9
31	32	2	4	10
33	40	2	5	12
41	48	2	5	14
49	56	3	6	17
57	64	3	7	19
65	72	4	8	22
73	80	4	9	24
81	88	4	9	26
89	96	5	10	29
97	104	5	11	31
105	120	6	13	36
121	136	7	14	41
137	152	8	16	46
153	168	8	17	50
169	184	9	19	55
185	200	10	21	60
201	216	11	22	65
217	232	12	24	70
233	248	12	25	74
249	264	13	27	79

—end—

List of terms

Access (ACS)

Header displayed at all in-charge positions and at the FMCRT. Indicates that a loop has been seized by an operator, and neither calling nor called party is attached. Query capabilities at the in-charge position may be used to determine the operator IDs associated with this condition.

ACD

Automatic call distribution

ACS

Access

AMA

Automatic message accounting

ANI

Automatic number identification

ANIF

Automatic number identification failure

ANS

Average speed of answer

AOP

Average occupied positions

AOPIDLT

Average occupied position idle time

AOPWV

Average occupied position work volume

AQ

Autoquote

Assistance position

See service assistance (SA) position.

Automatic call distribution (ACD)

System of distributing calls to operator queues in TOPS, distinguished from Queue Management System (QMS). TOPS ACD system has 9 queues to which calls can be distributed; QMS has 255 queues.

Automatic message accounting (AMA)

An automatic recording system that documents all the necessary billing data for long distance calls.

Automatic number identification (ANI)

A system that automatically identifies a calling number and transmits the number to the automatic message accounting (AMA) equipment billing.

Automatic number identification failure (ANIF)

The situation in which the number identification of the calling station fails.

Autoquote (AQ)

A service provided for hotels and motels whereby guest billing information is automatically transmitted over a dedicated facility to a receive-only teletypewriter located at the hotel.

Average occupied positions (AOP)

The average number of positions occupied over a measured period of time. This is calculated by dividing the work volume plus idle time by the time period. For TOPS ACD, work volume and idle time are measured at the end of the occurrence. For QMS, an audit is done at the end of each measured period, and work volume and idle time are measured for that period rather than at the end of the occurrence. (When the measured period of time is 30 minutes, AOP is equivalent to board half hours.)

Average occupied position idle time (AOPIDLT)

The average time an operator spends at the position, waiting for a call to arrive. This is a QMS measurement based on an audit performed at the end of a measured period of time.

Average occupied position work volume (AOPWV)

The average time that occupied operator positions are handling calls or are otherwise unavailable to handle new calls during a measured period. This is a QMS measurement based on an audit performed at the end of a measured period of time.

Average speed of answer (ANS)

The number of seconds that the average call waits for position attachment during a given period. The average amount of time it took for an operator to answer a call from a particular queue. The total call waiting time associated with a queue, divided by the total number of position seizures associated with the queue. The formula for ANS is CW-CCS/PS.

Average work time (AWT)

The time in seconds required to handle the average call (including all operator unavailable time). The calculation for TOPS ACD is CBWV+NCWV CCS/IPS. The calculation for QMS TOPS is CBWV/(IPS+RPS+TPS). QMS basic statistics do not use NCWV to figure AWT.

AWT

Average work time

BC

Bellcore

BCFMT

Bellcore AMA format

BDH

Board hours

Bellcore (BC)

Bell Communications Research

Bellcore AMA format (BCFMT)

The format of the output AMA recording data, as specified by Bellcore.

Bell Communications Research (Bellcore)

The independent research agency for the BOC.

Bell operating company (BOC)

See Operating company

Board half hours

The average number of occupied positions during the half hour. Board half hours are the same as AOP.

Board hours (BDH)

The total average number of occupied positions during two half hours. In other words, the average number of occupied positions during the hour. This information is not available as part of QMS basic statistics, but must be manually calculated.

BOC

Bell operating company

Call and agent manager (CAM)

Module of QMS that stores call agent queues and queue priorities and allocates and manages the call and agent resources according to instructions from the call processing applications module of QMS.

Call-busy work volume (CBWV)

Work volume generated when an occupied position is handling a call (that is, the total amount of time an operator spends actively handling a call). For TOPS ACD, CBWV is pegged against the transfer type of the call (GEN, XFR1, or XFR2). System (SYST) total work volume includes CBWV plus NCWV. For TOPS QMS, work volume is pegged against both a service and a queue.

Call processing cluster

A group of keys containing a dial pad, standard call processing hardkeys, and customer-definable keys.

Call processing hardkeys

Keys used to perform the most frequent call processing activities.

Calls deflected (CD)

The threshold at which calls are routed to treatment instead of placed in queue. When this threshold is reached, a calls-deflected indicator is displayed at the FMCRT and in-charge positions. For TOPS ACD, the message `CD` is associated with the General queue and each active transfer queue. For TOPS QMS, the indicator `QCD` is associated with all queues, and a system query is required to determine which queues are affected.

Calls waiting (CW)

The total amount of time that subscribers wait for attachment to an operator position. In TOPS ACD, the message `CW` appears on administrative screens to indicate impending or existing traffic overloads, if the parameter TOPS_DISPLAY_CW in Table OFCVAR is datafilled as yes. In TOPS QMS, the calls-waiting display message is `QCW`.

Calls-waiting hundred call seconds (CW-CCS)

Calls-waiting time, expressed in hundred call seconds.

Calls-waiting queue

The queues to which calls are sent when no idle operator position is available. A call is time-stamped when it is placed in a calls-waiting queue, ringing is applied, and the call waits in the queue until an operator is available.

CAM

Call and agent manager

CAMA

Centralized automatic message accounting

Capacity table

Tables used to read in actual work volume CCS along with AWT, and read out the required number of operators.

Cathode-ray tube (crt)

A video display terminal.

CBWV

Call-busy work volume

CCS (hundred call seconds)

A unit of time equal to 100 seconds.

CCS per board hour

A total day calculated value for use in force programs (total day work volume CCS divided by total day board hours).

CD

Calls deflected

Central office (CO)

A switching office arranged for terminating subscriber lines and provided with switching equipment and trunks for establishing connections to and from other switching offices. Synonymous with class 5 office, end office, and local office.

Centralized automatic message accounting (CAMA)

A system that produces itemized billing details for subscriber-dialed long distance calls. Details are recorded at a central facility serving a number of exchanges. In exchanges not equipped for automatic number identification, calls are routed to a CAMA operator who obtains the calling number and keys it into the computer for billing.

CI

Command interpreter

Command interpreter (CI)

A support operating system component that functions as the main interface between machine and user. Its principal roles are:

1 to read lines entered by a terminal user

2 to break each line into recognizable units
3 to analyze the units
4 to recognize command item-numbers on the input lines
5 to invoke these commands

Controlled traffic (CT)
Call distribution based on a limited set of calls. For TOPS ACD, controlled traffic is based on the fifteen call types from the force management reports. For TOPS QMS, controlled traffic is based on a maximum of 126 defined call categories. The CT display on the in-charge position and FMCRT shows the number of positions occupied by operators who have been placed in controlled traffic mode.

crt
Cathode-ray tube

CT
Controlled traffic

Customer-definable key
Hardkeys used to perform call processing functions that are defined by the customer.

CW
Calls waiting

CW-CCS
Calls-waiting CCS

DA
Directory assistance

Data modification order (DMO)
A procedure to change operating company data.

Dial pad
A 0–9 numeric keypad used to enter numeric information at the TOPS positions.

Digital multiplex system (DMS)
A central office switching system in which all external signals are converted to digital data and stored in assigned time slots. Switching is performed by reassigning the original time slots.

Directory assistance (DA)
Telephone company information service; operators help callers who cannot find the telephone numbers they wish to call.

DMO
Data modification order

DMS
Digital multiplex system

FADS
Force administration data system

FADS TTY
Force administration data system teletypewriter

FIFO
First in, first out

First in, first out (FIFO)
Order in which calls are routed to the calls-waiting queue.

Flat rate (1FR)
A service-related telephony feature that, for a fixed monthly charge, permits an unlimited number of completed calls from a local noncoin line to a group of specified destinations. This group is referred to as a flat rate area and is usually located within a geographic boundary surrounding the central office. Two or more flat rate areas may be specified for a central office with some destinations assigned to more than one flat rate area.

FM
Force management

FMC
Force management center

FMCRT
Force management cathode-ray tube

FM15
The force management quarter-hourly output report.

FM30
The force management half-hourly output report.

Force administration data system (FADS)

Software and hardware configurations that perform the force data collection, storage, manipulation, and display functions for a multitraffic office TOPS MP.

Force administration data system TTY (FADS TTY)

The TTY that is used in multitraffic office TOPS MP (in an ACD environment), and is located in the FMC. It provides a printed record of force management statistics for each of the traffic offices and for the TOPS MP as a whole. It also serves as an input and output terminal for various other input commands and output reports.

Force management (FM)

A reference to all of the functions and responsibilities associated with the management and administration of an operator work force.

Force management cathode-ray tube (FMCRT)

A specially configured TOPS terminal used to display TOPS MP force management statistical data for each traffic office.

Force management center (FMC)

The physical location of force management administrative personnel. The management personnel in the FMC are the system manager, the force supervisor, and the facilities manager.

Force supervisor

The manager responsible for overall force management in a TOPS MP with more than one traffic office. The force supervisor is located in the force management center.

GEN

General

General call queue (GEN)

In the TOPS ACD environment, call queue assignment for all calls except transfer queue calls and CAMA calls.

HADS TTY

HOBIC administration data system teletypewriter

HOBIC

Hotel billing information center

HOBIC administration data system teletypewriter (HADS TTY)

A send/receive teletypewriter located in the HOBIC (in an ACD environment). Its functions include the following:

- enabling HOBIC operators to enter billing information to be relayed to the AQ, VQ, or REC TTY
- permitting HOBIC personnel to place any AQ, VQ, or REC teletypewriter in or out of service
- receiving hotel charge-adjust (credit) messages generated by the TOPS MP operators
- receiving teletypewriter service alarm messages
- receiving HOBIC operational measurements information

Hotel billing information center (HOBIC)

A centralized operator-attended location that provides the following quotation of call details to hotels for guest-dialed long distance calls, quotation of time and charges to guests upon request, and a centralized location for the reporting of hotel equipment problems and billing inquiries (optional).

Hundred call seconds (CCS)

A unit of time equal to 100 seconds. Reporting unit for calls waiting and work volume in the TOPS ACD environment.

IC manager

In-charge manager

IC position

In-charge position

Idle time (IDLT)

The time an operator spends at the position waiting for a call to arrive.

IDLT

Idle time

In-charge manager (IC manager)

The manager responsible for force management in one traffic office. In a single-traffic office TOPS MP, the in-charge manager also performs the duties that a force supervisor performs in a multitraffic office TOPS MP.

In-charge position (IC position)

A position used by the in-charge manager. Although it has the same hardware as an operator position, the in-charge position has a more extensive set of displays that allow the in-charge manager to monitor the overall status of the traffic office. In an ACD environment these displays are updated every ten seconds to reflect the present status of the traffic office. In a QMS environment they are updated in real time.

Initial position seizures (IPS)

A count of calls that are presented to an operator for the first time. This count excludes position reseizures (for example, notify and coin overtime) and operator-originated calls (for example, subsequent attempts).

INTC

Intercept call

Intercept call (INTC)

A call that is stopped and diverted to an operator or to a number other than the one dialed.

IPS

Initial position seizures

Keyboard send/receive

An input/output printer that is equipped with a keyboard for transmitting as well as receiving information.

Made-busy (MB)

An occupied operator position that is not in the idle position queue for either of the following reasons:

- The headset has been seated, but the **Start** key has not yet been pressed (that is, logon is not complete).
- **{Make-Busy}** has been selected from the functions menu subsequent to completion of the logon procedure.

Maintenance and administration position (MAP)

A group of components that provide a man-machine interface between operating company personnel and the DMS-100 Family systems. A MAP consists of a visual display unit and keyboard, a voice communications module, and test facilities.

Maintenance-busy

An operator position that has been removed from service either automatically by the DMS, or by a command entered from the MAP and TAMI.

MAP

Maintenance and administration position

MB

Made busy

Mechanized force administration data system (MFADS)

A minicomputer system that extracts FM measurements from a pollable port in TOPS MP (in an ACD environment), and calculates summaries of service and force statistics.

MFADS

Mechanized force administration data system

Multitraffic office

An operator work force divided into geographically separate groups.

NCWV

Noncall work volume

Network operator trouble information system (NOTIS)

Facilities, provided at a TOPS position, that enable an operator to report trouble conditions by keying a previously defined 1-digit or 2-digit code. This code is then translated into an output message through an operating company client-controlled table, and the trouble condition is logged.

Noncall work volume (NCWV)

Work volume generated when an occupied position is not already handling a call, but is otherwise unavailable to handle a new call. For operators who can handle only nontransfer (GEN) calls, NCWV is pegged against nontransfer totals, and the system total, but is not included in the general totals. System (SYST) total WV includes CBWV plus NCWV.

Nonqueue work volume (NQWV)

Type of work volume measurement when an operator does not perform a logon during the current FM measurement period and NCWV cannot be applied to queues.

Nontransfer operators

Operators not capable of receiving transferred calls from other TOPS MP operators. These operators may, however, initiate a transfer.

Northern Telecom AMA format (NTFMT)

The format of the output AMA recording data, as specified by Northern Telecom.

NOTIS

Network operator trouble information system

NQWV

Nonqueue work volume

NTFMT

Northern Telecom AMA format

Occupied position (POS OCC)

An operator position is considered occupied if a headset is plugged into the headset jack and the position is in an operating mode.

Occupied position CCS

Time (in CCS units) when operator positions are occupied and in the operating mode.

OC

Occupied position

OD

Out of order

Occupied position (OC)

An operator position that has a headset seated. The OC indicator on the FMCRT and in-charge position screens shows the number of occupied positions for the whole system (all traffic offices).

OGT

Outgoing trunk

OM

Operational measurements

Operating company

The owner/operator of a DMS switch.

Operational measurements (OM)

The hardware and software resources of the DMS-100 Family systems that control the collection and display of measurements taken of an operating system. OMs organize the measurement data and manage its transfer to displays and records on which maintenance, traffic, accounting and provisioning decisions are based.

Operator

Person who operates a TOPS MP position.

Operator centralization

An extension of the operator services provided by TOPS. OC enables the operating company to handle traffic in several remote toll centers as though they were operating centers.

Operator number identification

The equipment used to bring an operator into the circuit to check the calling number when a subscriber has direct-dialed a long distance call that is to be charged on an itemized bill basis by CAMA equipment.

Operator position

An interactive terminal used to handle calls requiring operator assistance. Consists of a microprocessor-based controller, a keyboard, and a cathode-ray tube (crt).

Operator profile

A list specifying the TOPS call queues and service names that apply to a particular operator ID, and the team to which the operator belongs. The operator profile can also be used to assign controlled traffic queues to an operator.

Out of order (OD)

A position that has been removed from service by the system or by maintenance personnel. The OD indicator on the FMCRT and in-charge position screens shows the number of positions that are out of service, either because a command has been entered from the MAP or because the DMS has automatically removed the position from service.

Outgoing trunk (OGT)

A trunk used to route outgoing traffic. In the operator services environment, these may be used to route calls to the assistance and in-charge positions, to programmed numbers, and to transfer queues. They may also be used to mark calls for transfer or recall and to route calls to a senior operator. There are six kinds of outgoing trunks in TOPS: language, dual-language (QMS only), transfer, outtrunk, assistance, and senior operator (QMS only).

Peg count

Single measured events.

Percent occupancy (%OCC)

Ratio of the portion of operator time spent handling calls to the total time operators are assigned TOPS MP positions for the purpose of handling calls.

Percent transfer (%XFR)

The percentage of transfer calls in relation to nontransfer calls (appears only if the call transfer feature is active in the office).

%OCC
Percent occupancy

%XFR
Percent transfer

POS
Position

POS OCC
Occupied position

Position (POS)
The part of a TOPS MP normally controlled by an operator.

Position seizure (PS)
Extended MFADS measurement of the number of calls per type of operator service in an FM reporting period. Position seizure values are based on IPS + TPS + RPS.

PS
Position seizure

QCD
Queue Management System calls deflected

QCQ
Queue Management System call queue

QCW
Queue Management System calls waiting

QFADS TTY
Queue management system force administration data system teletypewriter

QMFADS TTY
Queue management system mechanized force administration data system teletypewriter

QMS
Queue Management System

QTADS TTY
Queue management system traffic administration data system teletypewriter

Queue
A series of customer calls waiting for attachment to operator positions.

Queue length

The number of subscribers waiting at a given instant to be attached to an operator position.

Queue Management System (QMS)

A software package that provides enhanced capabilities for the management of call and agent queues. QMS is a generic ACD system that can handle multiple ACD applications, of which TOPS is the first.

Queue Management System calls deflected (QCD)

An alarm condition that occurs when the calls deflect threshold has been met for one or more QMS call queues or when the defined call queue elements have been exceeded. The `QCD` display appears on the FMCRT and in-charge position screens and is updated on a 10-second basis. A TTY command is used to query which queue is affected.

Queue Management System call queue (QCQ)

An alarm condition that occurs when there are no operators logged on to handle a call in one or more QMS call queues. The `QCQ` display appears on the FMCRT and in-charge position screens when calls are assigned to a queue that is not named in any logged-in operator’s profile.

Queue Management System calls waiting (QCW)

An alarm condition that occurs when the calls deflect threshold has been met for one or more QMS call queues. The `QCW` display appears on the FMCRT and in-charge position screens and is updated on a 10-second basis. A TTY command is used to query which queue is affected.

Queue Management System force administration data system teletypewriter (QFADS TTY)

A TTY located in the force management center of a TOPS office with QMS. It provides a printed record of FM statistics for each traffic office and for TOPS QMS as a whole. It also serves as an input and output terminal for various other input commands and output reports.

Queue Management System mechanized force administration data system teletypewriter (QMFADS TTY)

A minicomputer system that extracts QMS FM measurements from a pollable port in TOPS, and calculates summaries of service and force statistics.

Queue Management System traffic administration data system teletypewriter (QTADS TTY)

A TTY located in each traffic office of a TOPS office with QMS. It provides a printed record of force management statistics for the traffic office in which it is located, and serves as an input and output terminal for various other input commands and output reports.

RCAMA

Remote centralized automatic message accounting

Ready-to-serve time

The time during which an operator is waiting to answer incoming calls. This time is provided in the capacity table and is necessary if the operator team is to provide objective speed of answer.

REC TTY

Record TTY

Recall

To bring an operator into an already established circuit.

Recall position seizures (RPS)

Position seizure measurement that tracks the number of operator recalls in an FM reporting period.

Record TTY (REC TTY)

A receive-only teletypewriter located in the HOBIC. It receives a duplicate copy of messages sent to AQ and VQ TTYs as well as charge-adjust messages sent to the HOBIC administrative teletypewriter.

Register

A storage device having a specified storage capacity such as a bit, a byte, or a computer word, and usually intended for a special purpose.

Remote centralized automatic message accounting (RCAMA)

See CAMA. RCAMA calls are remote calls that go to an operator at a host switch for operator number identification.

RPS

Recall position seizures

SA

Service assistance

SAWT

Service average work time

SADS

System administration data system

SADS TTY

System administration data system TTY

SA position

Service assistance position

Scan

To periodically sample the voltages that exist at like points in a number of similar circuits. By reading the current, the scanning device can determine whether the scan point is busy, and record the total busy counts in a register. If the group is scanned once every ten seconds, the register indicates XCS (ten call seconds).

Senior operator

An operator in a TOPS QMS environment who is assigned to provide assistance to other operators as well as handle incoming traffic.

Service assistance position (SA position)

A position used by service assistants. Although it has the same hardware as an operator position, the assistance position has a limited set of displays that reflect the general status of the traffic office to which it belongs. In addition, it can be used to answer assistance requests from operators and to initiate outgoing calls. These positions are restricted from call completion.

Service assistant

The person who uses the service assistance position.

Service average work time (SAWT)

The time in seconds required to handle the average call within a specified service. The calculation for QMS TOPS is: CBWV/(IPS+TPS+RPS) for the specified service.

Service initiations (SI)

In TOPS ACD, measurement of the number of service calls (TA, DA, or INTC); used to calculate AWT. In TOPS QMS, measurement of the number of times a service is associated with a call, for both initial and subsequent assignments (such as switching from one service to another or applying the same service to a call to generate an AMA record); used to calculate SAWT.

Service work volume (SWV)

Work volume accumulated for services, pegged by service type and the operator’s team.

SI

Service initiations

Single-traffic office

An entire operator work force contained in one location.

Sonalert

A special tone generated by the administrative positions (not in the headset) that alerts supervisors of special situations that require immediate attention.

ST

Study registers

Standard board half hours

The number of operators required in a half hour to handle the standard work volume CCS as read from the standard capacity table.

Standard board hours

The total of two standard board half hours, divided by two. In other words, the average number of occupied positions during the hour.

Standard work time (SWT)

The work time per call based on the local mix of calls equated with multipliers per type of call or call activity. These multipliers, developed during work time studies in a cross section of TOPS MP include average allowances for inexperienced operators and operator unavailable time.

Standard work volume CCS

The product of half-hourly IPS or PS multiplied by the SWT per call and divided by 100 to convert to CCS.

Study registers (ST)

Software registers used to accumulate data associated with an operator ID, when that operator is logged on to a TOPS operator workstation.

Subscriber

The individual user of a telephone station set that is connected to a DMS-100 Family switch.

SWT

Standard work time

SWV

Service work volume

System administration data system (SADS)

Refers to the system that records data derived from TOPS MP operational measurements used for management of a single-office operation.

System administration data system teletypewriter (SADS TTY)

The TTY that is used in single-traffic office TOPS MP (in an ACD environment) and is located in the traffic office. It provides a printed record of force management data, and also serves as an input and output terminal for various other input commands and output messages.

TA

Toll and assistance

T&C

Time and charges

Table editor

In DMS, software that supports an enhanced set of table control functions at the man-machine interface, using data dictionary, formatter, and table control. A user is enabled to modify or add tuples to a table.

TADS TTY

Traffic administration data system teletypewriter

TAMI

TPC administration and maintenance interface

Teletypewriter

An electric typewriting device that generates a coded signal corresponding to each typed character. TTY also receives and converts coded signals into typewritten copy.

Ten call seconds (XCS)

A unit of time equal to ten seconds.

Time and charges (T&C)

A service provided provided by operators whereby the duration of and charges for a long distance call are quoted to a subscriber upon request.

TO

Traffic office

TO15

The force management quarter-hourly output report, which is provided separately to each traffic office in a multitraffic office TOPS MP.

TO30

The force management half-hourly output report, which is provided separately to each traffic office in a multitraffic office TOPS MP.

Toll and assistance
Base service defined in the TOPS environment to include operator call handling of local and toll calls as well as non-call completion functions performed for the customer.

TOPS MP
Traffic Operator Position System Multipurpose

TOPS position controller (TPC)
A control unit that functions as a workstation-based microcomputer with networking capabilities.

TPC
TOPS position controller

TPS
Transfer position seizures

Traffic administration data system teletypewriter (TADS TTY)
The TTY used in multitraffic office TOPS MP. One TADS TTY is located in each traffic office. It provides a printed record of force management data that is separate for the traffic office in which it is located. It serves as an input/output terminal for various other input commands and output messages.

Traffic office (TO)
A grouping of operator positions for which the DMS provides separate administrative data.

Traffic office teletypewriter TTY (TADS TTY)
The TTY that is used in multitraffic office TOPS MP. One TADS TTY is located in each traffic office. It provides a printed record of separate force management statistics for the traffic office in which it is located, and serves as an output terminal for various other output reports.

Traffic Operator Position System Multipurpose (TOPS MP)
A call-processing system made up of a number of operator positions. Each operator position consists of a cathode-ray tube (crt), a controller, a keyboard, and a headset. TOPS is a trademark of Northern Telecom.

Transfer queues
Queues containing calls transferred from the general queue. Transfer queues may be designated as transfer 1 (XFR1), transfer 2 (XFR2), or transfer 3 (XFR3).

Transfer operators

Operators capable of receiving transferred calls from other TOPS MP operators. Transfer operators may be designated as transfer 1 (XFR1), transfer 2 (XFR2), or transfer 3 (XFR3).

Transfer position seizures (TPS)

A count of customer calls that are transferred by an operator.

Trunk test position (TTP)

A maintenance and administration position that is specially equipped to perform trunk-testing.

TTP

Trunk test position

TTY

Teletypewriter

Tuple

A row in a DMS table.

UCD

Unoccupied position with a call disconnected

UCP

Unoccupied position with a call in progress

Unoccupied position with a call disconnected (UCD)

A position state that occurs when a call is held at the position, the operator logs off, and one or both of the call participants goes on-hook. The indicator `UCD` displays on the FMCRT and in-charge position screens to show the number of unoccupied positions with a call that has terminated.

Unoccupied position with a call in progress (UCP)

A position state that occurs when a call is held at the position, the operator logs off, and one or both of the call participants goes on-hook. The indicator `UCP` displays on the FMCRT and in-charge position screens to show the number of unoccupied positions with a call in progress.

Usage counts

Sampled measurements (states), used to determine the degree of usage of switching hardware and software.

Voicequote (VQ)
A service provided for hotels or motels not equipped with autoquote, whereby guest billing information is automatically transmitted over a dedicated facility to a receive-only teletypewriter located at the hotel. The operator telephones the hotel and verbally quotes call details.

VQ
Voicequote

Work volume (WV)
Time that occupied operator positions are handling calls or are otherwise unavailable to handle a new call. In the TOPS ACD environment, measured in XCS and reported in CCS; in TOPS QMS, measured in tenths of seconds and reported in seconds.

Work volume hundred call seconds (WV-CCS)
Work volume, expressed in hundred call seconds.

WV
Work volume

WV-CCS
Work volume hundred call seconds

XCS
Ten call seconds

XFR
Transfer

XFR1
Transfer one

XFR2
Transfer two

XFR3
Transfer three

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DMS-100 Family

TOPS MP

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