CA MICS® Resource Management

Analyzer for TSO Guide

Release 12.9

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Chapter 1: OVERVIEW

The CA MICS TSO Analyzer processes information gathered by CA TSO/MON. CA MICS automatically integrates TSO Analyzer data with any other data that CA MICS maintains. This is possible because CA MICS stores data in a format that is common to all CA MICS products.

In today's computer installations, the systematic planning, control, and evaluation of the use of IBM's Time Sharing Option (TSO) has become increasingly vital. TSO/MON supports these activities by offering a unified and easily understood approach to the management of TSO. TSO/MON collects performance and utilization information at the system, command, and user levels, and writes that information to SMF.

Based on information gathered by TSO/MON, the CA MICS TSO Analyzer provides a series of management and operational reports, as well as the capability to display information for selected users, user groups, and other criteria and categories of activity. The TSO Analyzer gives you the ability to tailor reports for all levels of management, to track user-based problems, and to perform an in-depth audit of a user's use of TSO. It also offers online data access through the CA MICS Information Center Facility (MICF), a full-screen, menu-based system that enables you to perform data analysis, retrieval, and report functions.

The CA MICS TSO Analyzer is one of the many Data Integration Applications of the CA MICS I/S Management Support System. Like the other Data Integration Applications, it processes raw data for analyzing and managing specific technologies.

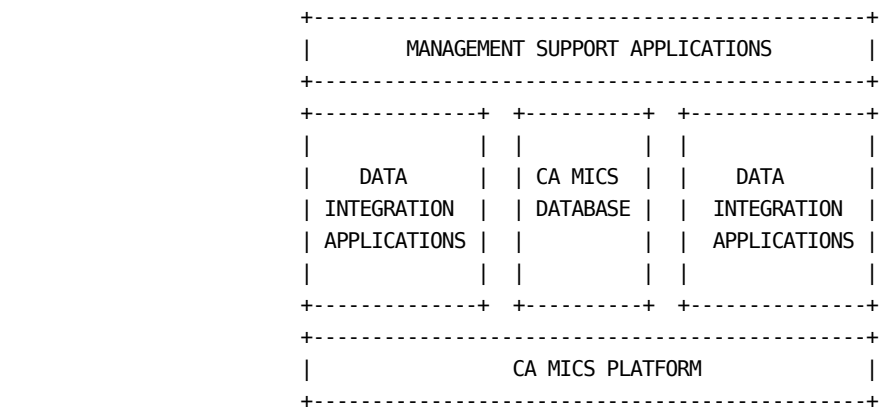


Figure 1-1. The CA MICS I/S Management Support System

The CA MICS I/S Management Support System is a comprehensive, flexible application system that applies standard management practices to the management of the I/S organization. The CA MICS I/S Management Support System, designed with a formal architecture, uses integrated applications analogous to the integrated financial applications that are now indispensable to corporate financial management.

This section contains the following topics:

1.1 Primary Areas of Application

The CA MICS TSO Analyzer provides data and reporting capabilities that aid in the management of TSO in the following areas:

- Availability and Reliability - You can monitor TSO downtime to report availability information. At a lower level, you can use program and CLIST termination information to measure online system reliability.

- Capacity Planning - The TSO Analyzer maintains a database of historical TSO usage and performance data. This greatly facilitates growth/trend projections at the system, application and user level.

- Control of ISPF - The TSO Analyzer helps you to account for activity that occurs under IBM's Interactive System Productivity Facility (ISPF). It shows who is using ISPF, how ISPF is being used, which users are accessing sensitive applications, and what programs and CLISTs are being run under ISPF.

- Performance Management - You can examine and analyze specific TSO workloads to pinpoint system and user problems. Identifying and correcting such problems can result in significant improvement in system performance and user productivity.

- Standards Enforcement and Security - The TSO Analyzer reports on which TSO CLISTs, commands, and programs are being utilized by specific users. This capability helps you to establish and enforce standards and security.

- Management Reporting - You may establish system and user service objectives, such as response time and TSO availability, then generate reports that compare actual service against the objectives.

- Network Management - You may monitor general TSO network activity and TSO network use by specific terminal. Such information is invaluable in tracking network operation, identifying problems, evaluating performance, and planning for future requirements.

1.2 Major Features

The major features of the CA MICS TSO Analyzer can be grouped into the following categories:

- Report facilities
- Use of TSO/MON data
- General product flexibility
- Interface capabilities

Report Facilities

The TSO Analyzer provides the following reports:

- Exception Analyzer Reports allow you to define, capture, and report on conditions that deviate from the expected norm or from installation objectives so that you can determine whether those deviations require special attention.
- Management Reports are run on a daily, weekly, and/or monthly basis as part of the standard CA MICS processing. These reports summarize the activities of the I/S organization. They are designed to assist with tracking TSO service and performance, monitoring resource usage, and planning for future resource requirements.
- Standard Analysis Reports provide concise information in the form of graphs, tables, charts, or plots. A number of reports on TSO activity, such as a listing of the top 20 TSO resource consumers, can be used for exploring service-level problems, analyzing performance and availability, or examining throughput issues. Typically, standard analysis reports are run on an as-needed basis.
- Ad Hoc Reporting Facilities allow you to access information in the CA MICS database either interactively or in batch via the CA MICS Information Center Facility (MICF), a panel-oriented productivity tool.

Use of TSO/MON Data

Another feature of the TSO Analyzer is its comprehensive use of TSO/MON data. The TSO Analyzer:

- Consolidates data from multiple systems into an information database and then provides a common access method for reporting on TSO activity

- Interprets encoded values in the TSO/MON input data so that information is immediately usable in a logical form, without further conversion and/or translation

- Allows you to classify information by cost center, and to link individual TSO activities with the responsible cost center or organizational unit

- Derives, groups, and computes response measures provided by TSO/MON, including response distributions

- Supports the TSO/MON detail command recording facility, thus allowing in-depth analysis of selected TSO commands in terms of service levels and resource utilization

- Supports the TSO/MON interval accounting facility, which allows you to reduce data lost due to system outages and allows you to identify resource consumption at a more detailed level than is otherwise possible

- Consolidates data:

  - Consolidates usage and resource consumption data, at both the system and user levels

  - Consolidates terminal activity and internal response measurement data

  - Consolidates data set access event data, thus allowing analysis of ISPF data set access at the individual TSO user level

General Product Flexibility

The TSO Analyzer also offers a number of flexibility features such as the following:

- Usage guidelines for the application of TSO management information

- A wide range of standard exits to allow you to tailor the product to your specific needs

- Calculation and derivation of useful measurement statistics that are not directly available from TSO/MON, so that you can further characterize TSO response, service, and utilization

- A Data Encyclopedia that describes the information found in the CA MICS TSO Information Area files and explains how that information was derived

Interface Capabilities

The TSO Analyzer integrates into the CA MICS database the TSO activity and utilization data collected by TSO/MON, thus providing an interface with a number of other CA MICS products including:

- CA MICS Accounting and Chargeback - The data provided to CA MICS Accounting and Chargeback supports accounting for consumed resources as well as for individual TSO transactions.

- CA MICS Capacity Planner - The TSO Analyzer maintains a database of both detailed and summarized TSO usage and performance data. The CA MICS Capacity Planner can use the information to make growth/trend projections at the system, application and user level.

- CA MICS MVS Performance Manager - The TSO Analyzer provides data for MVS systems tuning. The CA MICS MVS Performance Manager's workload characterization tools and methodology can be used to analyze the TSO workload information.

CA MICS database files are summarized in the same manner across all products. Therefore, you can combine TSO information with information from other data sources. Combining data from multiple data sources allows you to compare and correlate TSO information with both system and application- specific data such as that from RMF, CICS, IMS, batch, etc.

1.3 Reporting and Inquiry Facilities

The CA MICS TSO Analyzer reports and online inquiries provide concise, comprehensive information to help you manage your TSO environment.

The TSO Analyzer provides management, standard analysis, and exception reports that you can use as delivered or can tailor to your specific requirements. In addition, you may use the MICF and standard SAS language interface to create ad hoc reports and inquiries.

Each type of report and reporting facility provided by the TSO Analyzer is described below.

Management Reports

The management reports distributed with the TSO Analyzer provide a concise graphical or tabular representation of the installation's processing objectives and how well they have been met. You define objectives through a series of parameters, then produce reports during normal daily, weekly, and monthly CA MICS processing. You can activate or deactivate the reports for any given time-span (daily, weekly, or monthly).

The TSO management reports described below are delivered with the TSO Analyzer.

Management Report	Function
TSO Service (Short, Medium, and All)	Quantifies TSO transaction response time in a separate report for each transaction classification (short, medium, and all transactions). Vertical bars represent the percentage of transactions of a given type that complete within a user-specified time. Each bar represents an hour of day, an hour of day within week, or a user-defined shift (zone) within month. A line across the chart indicates management's objective for that type of transaction.
TSO Outage	Quantifies the length of time that a TSO

Availability	outage occurred and plots the outage time by hour of day or by hour of day within week.
TSO Available Hours	Quantifies the number of hours that TSO was available and plots that number by user-defined shift (zone) within month.
TSO Resource Consumption	Quantifies the amount of service units consumed by all TSO users and charts that number by hour of day, hour of day within week, or by user-defined shift (zone) within the month.
TSO Throughput	Quantifies the number of TSO commands invoked by all TSO users, and produces a vertical bar chart of that number by hour of the day, by hour of the day within the week, or by user-defined shift (zone) within the month.
System IPL	Quantifies the number of IPLs that were incurred and charts that number by user-defined shift (zone) within month.

Standard Analysis Reports

Standard analysis reports are produced on an as-needed basis. They provide concise information in the form of reports, graphs, charts, and plots. Standard analysis reports are generally used when data is not in a form suitable for a management or an exception report, or when more in-depth analysis is required.

The standard analysis reports described in the following charts are delivered with the TSO Analyzer.

Standard Analysis Report	Function
TSO System Summary	Represents TSO workload and service for a four-month period, covering service, load, and availability. Four columns show days

	for specific months. A fifth column shows the percentage of change between the most recent month and a user-specified base month.
TSO User Summary	Shows TSO service received, resource consumption, and TSO access data for individual TSO users for a four-month period, which allows you to analyze trends and to evaluate the workload patterns of individual users.
TSO Group Summary	Displays TSO service received, resource consumption, and TSO access data for user ID groups for a four-month period, and allows you to evaluate workload patterns.
TSO Application Summary	Shows TSO service received, load, and access for a predefined interactive application for the current month and for the three previous months. This report helps you to analyze trends, evaluate TSO application service and resource consumption, quantify TSO application utilization, and identify TSO application usage patterns.

Standard Analysis Report	Function
TSO Activity Report	Summarizes daily TSO operations and helps identify, by performance group or workload manager service class, problem areas and periods of degraded response. Also used to examine TSO operations as a function of command load.
TSO Profile Report	Summarizes weekly TSO operations and helps to identify patterns in the TSO workload and within each performance group or workload manager service class.
TSO Network Activity Report	Summarizes daily communications network activity for TSO terminals to assist in performance and network analysis.
TSO Network	Summarizes weekly communications network

Profile Report	activity for TSO terminals. Helps identify workload patterns in the entire network and in subsets of the network.
TSO Workload Response Report	Summarizes the daily service provided and resources consumed.
TSO Workload Paging Report	Summarizes daily TSO paging activity statistics.
TSO Workload Swapping Report	Summarizes daily TSO swapping activity statistics.
TSO Command Use Counts Report	Lists the count of TSO commands and subcommands in order by frequency of use within a selected period.
TSO User Ranking Report	Identifies the top or bottom users in any of several categories such as average total response time, total swaps, total EXCPs, etc.
TSO Terminal Ranking Report	Identifies the top or bottom TSO terminals in any of several categories such as average number of characters read per second by TGET, total number of TGETs issued, average total short response time, average total response time, etc.

Standard Analysis Report	Function
TSO Command Activity Report	Provides daily and weekly detail and summary information on selected TSO commands. Can identify command and user resource consumption and potential problems with specific commands.
TSO Program Activity Report	Provides daily or weekly detail and summary information on interactive applications. Can identify users and applications that use the most resources.
TSO User Session Trace Report	Shows what a user did, the kind of service received, and resources consumed during a TSO/MON recording interval.

TSO User Interactive Trace Report	Displays command records generated during a TSO user session, including response times and distributions, resources consumed, program invoked, and the data set accessed.
Functional Session Trace Report	Identifies TSO commands executed and the number of commands executed during a TSO session and helps to track unauthorized access and misuse of system resources.

Standard analysis reports include a series of predefined MICF inquiries that, like the reports listed above, are designed to be run on an as-needed basis. You can also use them as templates to design your own inquiries. The predefined MICF inquiries described in the following chart are delivered with the TSO Analyzer.

Inquiry Name	Function
Daily Top 20 TSO Resource Consumers	Produces a table, in descending frequency, of the TSO users who used the highest number of service units on the previous day. This inquiry can identify users who are utilizing resources inefficiently and/or inappropriately.
8am - 5pm TSO Service by Type	Produces a color graphics vertical bar chart of response time for each hour from 8am to 5pm. Each bar is composed of the three different types of TSO transactions. The lowest part of the bar represents average short response time for the hour; the middle part represents medium response time; the upper part represents long response time.
TSO Workload	Produces a vertical bar chart for either a day, a week, or a month of activity, portraying the number of TSO commands being executed. Each bar represents the number of commands per hour of day, hour of day within week, or user-defined shift (zone) within month. This report is similar to the TSO Throughput Management

	Objective Report.
TSO Service	Provides several different vertical bar charts that quantify TSO service in terms of response time for a day, week, or month of activity. Different reports chart average short, medium, and total response time, and the percentage of responses completing within a predefined limit. Vertical bars represent the information by hour of day, hour of day within week, and user-defined shift (zone) within month.

Inquiry Name	Function
TSO Availability	A vertical bar chart is produced for a day, a week, or a month indicating the amount of down-time for TSO. Each bar represents downtime in minutes by hour of day or by hour of day within week. The monthly availability inquiry charts the number of hours per user-defined shift (zone) that TSO was available.
Resource Consumption	Charts total TSO resource consumption in terms of service units for a day, week, or month. A bar representing service units consumed is produced either for each hour of day, each hour of day within week, or each user-defined shift (zone) within month.

Exception Analyzer Reports

The CA MICS Platform provides an Exception Analyzer that works with CA MICS Data Integration Applications to provide consolidated reporting of exception conditions across systems and data sources.

An "exception" is any condition that deviates from the expected norm, or any missed objective in system performance or service.

CA MICS Data Integration Applications detect exceptions by

testing daily data against user-defined thresholds. Each application has an exception value analyzer to help determine those thresholds. Each detected exception is assigned a severity level and is associated with a management area.

The TSO Analyzer is delivered with several exceptions tests, and you can easily add your own tests. The exception reports produce increasing levels of detail to address the needs of different audiences and, when combined with exceptions from other CA MICS applications, comprise a powerful diagnostic tool for your organization.

Exception Report	Function
Exception Management Overview	Provides a concise, high-level summary of the exceptions reported for the previous day. The report lists the number of exceptions for each defined management area, in terms of severity. It allows upper management to quickly assess the operation's stability.
Management Area Overview	Provides an hourly summary of exceptions encountered for a management area, and the number and severity of each exception type that occurred during an hour.
Severity Level Exception	Provides an hourly summary of exceptions encountered for a given severity level, thus allowing a quick assessment of the different types of exceptions in each level. It gives first-level managers, performance analysts, and system programmers an integrated report of the different problems that may have affected the installation in any given hour.

Exception Report	Function
Detail Exception	Provides a detailed list, in order of occurrence, of exceptions that have been detected. This report is produced from the

CA MICS Information Center Facility (MICF). You may selectively produce it online using a number of different selection criteria including a date and time range, severity level, management area, etc. You can use this report on an as-needed basis to obtain the necessary background detail for effective analysis of the reported exceptions.

Ad Hoc Reporting Facilities

The need for specific types of information to manage an I/S organization changes daily. CA MICS addresses those needs with interactive capabilities that allow fast response to the most complex requests for information. The interactive capabilities are:

- The CA MICS Information Center Facility (MICF) - MICF is an ISPF-based panel-oriented productivity tool that allows you to access information in the CA MICS Data Base. When you define input, selection criteria, and report options, MICF fulfills your request by executing the program either in batch or interactive mode. Then, according to your specifications, MICF either prints the results of your request, displays the results at your terminal, or catalogs the results for later viewing.

- The Standard SAS Language Interface - An advanced analysis language enhances your staff's analytical capabilities and improves the sophistication of decision-making. The advanced analysis language used in the CA MICS I/S Management Support System is SAS(R), a powerful fourth-generation language that allows easy data manipulation, statistical analysis, and coding facilities for programmers who are conducting extensive analysis or who are designing new reports for I/S business applications.

  The CA MICS Workstation Facility (MWF) provides an online environment in which SAS can be used both interactively or in batch mode. CA MICS uses the SAS System both for data management and as an advanced analysis language.

1.4 Files Overview

The CA MICS TSO Analyzer builds the TSO Information Area from the TSO/MON System records (SMF type 200) and Command records (SMF type 199), where

System records provide system and user-level statistics

Command records provide information on the performance and required resources of individual commands

The files in the TSO Information area are listed below.

TSO Data Set Name File (TSOTSA)

The TSOTSA file provides a log of data sets (and members of partitioned data sets) accessed under selected functions. This file is derived from the TSO/MON command record.

TSO System Activity File (TSOTSO)

The TSOTSO file quantifies the activity of all TSO users for defined time intervals. It contains resource consumption, service (total, short, medium, and long response), availability, and performance measurement information. The TSOTSO file is derived from the TSO/MON system record, SCB and UCB segments.

TSO Terminal Activity File (TSO_TA)

The TSO_TA file quantifies the VTAM/TCAM terminal service (response), load, and access for defined time intervals. The TSO_TA file is derived from the TSOTSU detail file.

TSO User Activity File (TSOTSU)

The TSOTSU file quantifies the total activity of a TSO user ID for defined time intervals. It contains resource consumption, service (total, short, medium, and long response) terminal access, and performance measurement information. The TSOTSU file is derived from the TSO/MON system record, UCB segments.

TSO User Command Counts File (TSOTSC)

The TSOTSC file identifies TSO commands and subcommands used by a specific user ID. This file is derived from the TSO/MON system record, UCB and CCB segments.

TSO User Interactive Usage File (TSOTSI)

The TSOTSI file quantifies the resource consumption and use of installation-defined commands and programs executed interactively under TSO. This file is derived from the TSO/MON command record.

TSO Batch User Command Counts File (TSO_BC)

The TSO_BC file identifies TSO commands and subcommands used by a specific batch TSO job. This file is derived from the TSO/MON system record, UCB and CCB segments.

TSO Batch Data Set Name File (TSO_BD)

The TSO_BD file provides a log of data sets (and members of partitioned data sets) accessed under selected functions during the execution of a batch TSO job. This file is derived from the TSO/MON command record.

TSO Batch Command Information File (TSO_BI)

The TSO_BI file quantifies the resource consumption and use of installation-defined commands and programs executed by batch TSO jobs. This file is derived from the TSO/MON command record.

TSO Batch User Activity File (TSO_BU)

The TSO_BU file quantifies the total activity of a batch TSO job for defined intervals of time. It contains resource consumption, service (total, short, medium, and long response), and performance measurement information. The TSO_BU file is derived from the TSO/MON system record, UCB segments.

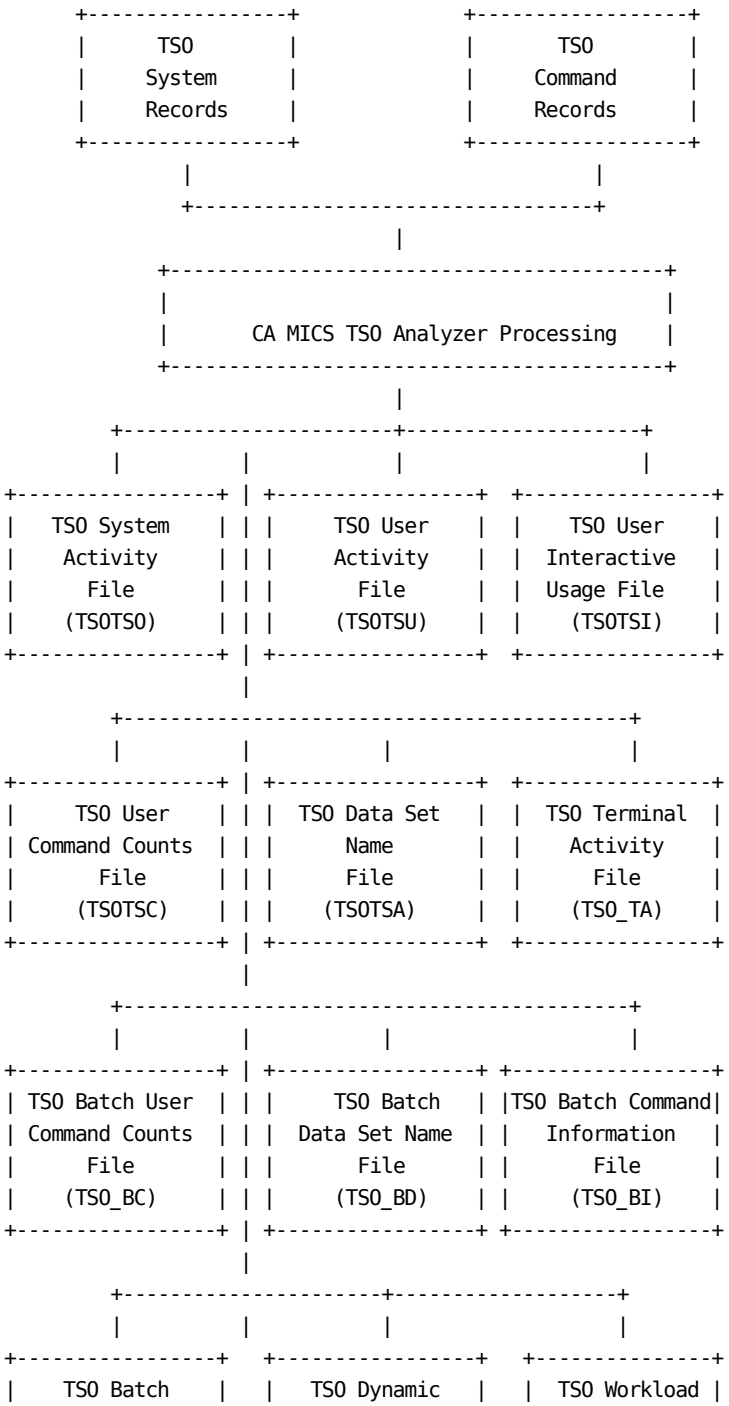
TSO Dynamic Resource Usage File (TSODRU)

The TSODRU file quantifies the resource consumption and use of all commands and programs executed interactively under TSO. This file is derived from the TSO/MON system record, DRU segments.

TSO Workload Manager File (TSOTSW)

The TSOTSW file quantifies MVS/ESA SP 5.1 Workload Manager information when the Workload Manager is operating in goal mode. It is derived from the TSO/MON system record, WSCB segments.

Figure 1-2 illustrates the data sources and files of the TSO Information Area.



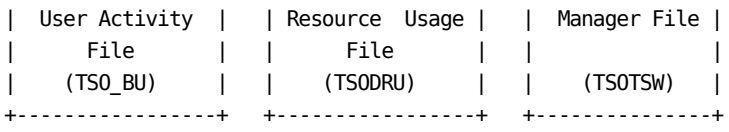


Figure 1-2. TSO Information Area Structure

1.5 Product Prerequisites

The CA MICS TSO Analyzer operates in a CA MICS environment under MVS/370, MVS/XA, or MVS/ESA. In addition, you must have CA TSO/MON product at Version 5.0 or higher active on your system.

1.6 Benefits

The CA MICS TSO Analyzer contributes to the overall benefits that the CA MICS I/S Management Support System provides. Those benefits fall into the following broad categories:

- Improves day-to-day I/S management
- Reduces risk to the enterprise
- Controls and/or helps reduce costs
- Improves return on the I/S investment
- Increases productivity
- Improves planning

The material below explains how the TSO Analyzer contributes to these benefits.

Improves Day-to-Day I/S Management

- Allows managers to track TSO usage and plan corrective actions to ensure smooth operations
- Allows problems to be identified faster and more accurately and allows you to assess or quantify the impact of a problem in terms of the root cause and what can be done to resolve it
- Allows you to measure and track the service levels that are being delivered for TSO workloads

Reduces Risk to the Enterprise

- Allows I/S to define exceptional conditions and assess their impact
- Supports TSO/MON interval recording, which means that the amount of measurement data lost due to system outages is substantially reduced
- Provides auditing and control capabilities for TSO activity

Controls and/or Helps Reduce Costs

- Provides a means to equitably charge users for the amount of resources used
- Helps you to identify unused resources
- Can replace other TSO reporting products, thus eliminating the costs maintaining separate products

Improves Return on the I/S Investment

- Allows managers to gauge the quality of service that is being provided to TSO users
- Provides a basis for chargeback of TSO system and hardware resource usage either through CA MICS Accounting and Chargeback or a user-developed costing process
- Improves your ability to understand, report on, control, and, if necessary, reduce TSO expenses

Increases Productivity

- Makes it easier for less knowledgeable users to interpret the results of reports and use information in the data base
- Provides the opportunity to learn about the characteristics and use of TSO data via the comprehensive Data Encyclopedia and reports documentation
- Reduces the task of coordinating information from multiple sources, so that you can report or analyze information at the enterprise level in addition to the system level

Improves Planning

- Allows managers to anticipate problems before the system is affected
- Provides the raw data and a common frame of reference for other analyses such as capacity and hardware planning, workload balancing, and performance management
- Allows trend analysis through the use of summarized

historical data

Chapter 2: USAGE GUIDELINES

The TSO Analyzer provides for consistent analysis of TSO activity across all operating systems.

The following sections describe special issues associated with using the product, and the interfaces provided to other CA MICS products:

1 - Data Source Concepts
2 - Data Analysis
3 - Accounting and Chargeback Product Interface
4 - Capacity Planning Component Interface

This section contains the following topics:

2.1 Data Source Concepts

This section is an overview of the TSO/MON data recording concepts behind the key TSO/MON response and command measurements.

TSO/MON DATA RECORDING

TSO/MON data is recorded in two SMF records, the System Record and the Command Record.

The System Record is written to SMF on a user-defined time interval (normally every five minutes). This interval is referred to as the TSO/MON recording interval. Each System Record contains TSO response, service consumption, performance, terminal, and command count data for each TSO user that was logged on during the recording interval. TSO system information is reported by aggregating the individual user measurements.

A Command Record is written to SMF after every unique execution of a TSO command for which an installation has requested detailed measurement data. The user-selective process of writing Command Records to SMF is termed "command recording." Each Command Record contains TSO response, service, performance, terminal, program name, user identification, and data set name information for the unique execution of a TSO command that prompted the generation of the Command Record.

The System Record

The method that TSO/MON uses to record TSO measurement data is focused heavily on data accuracy and reliability. TSO/MON ensures data reliability of the System Record by using the recording interval concept. This minimizes the loss of TSO/MON TSO data caused by an SMF problem or an MVS system failure.

If the System Record for a TSO/MON recording interval is larger than the SMF physical record size, it is split into multiple System Records by TSO/MON, each of which will fit in an SMF physical record. This reduces data loss due to possible data management problems with post-processing of SMF data as well as VSAM problems associated with the processing of SMF records that exceeds the physical record size of the SMF files.

The Command Record

TSO/MON provides a facility to write periodic copies of Command Records for long running TSO commands. This feature is termed "command checkpointing" and it serves as a protection against data loss due to an MVS system failure.

TSO/MON DATA MEASUREMENT

It is important to understand the basic TSO/MON response time, response event, and command measurements. Although these particular measurements represent a small subset of the TSO/MON data that is available, they are probably the most misinterpreted data elements.

TSO/MON Response Time

The TSO/MON response time measure is termed a "response event." TSO/MON response events are those events associated with user interactions at a TSO terminal. In other words, there is a one-to-one relationship between a terminal interaction (ENTER, PF KEY, etc.) and a TSO/MON response event.

A response event begins when a TSO user presses the ENTER key or a function key. It ends when the TSO terminal keyboard "unlocks." (Normally, when ENTER is pressed, the keyboard becomes disabled for input from the TSO user, or "locked.")

A response event is made up of several data elements that are individually measured and separately maintained by TSO/MON. Refer to Figure 2-1 for a detailed representation of a TSO/MON response event.

A.

User interaction at terminal depresses the ENTER or PK key

Host receives terminal interaction from user

TSO terminal user scheduled for Swap In

Swap In begins

Swap In ends and User Address Space starts running

VTAM Output written to VTAM buffers (terminal put)

Terminal Keyboard accepts output unlocks

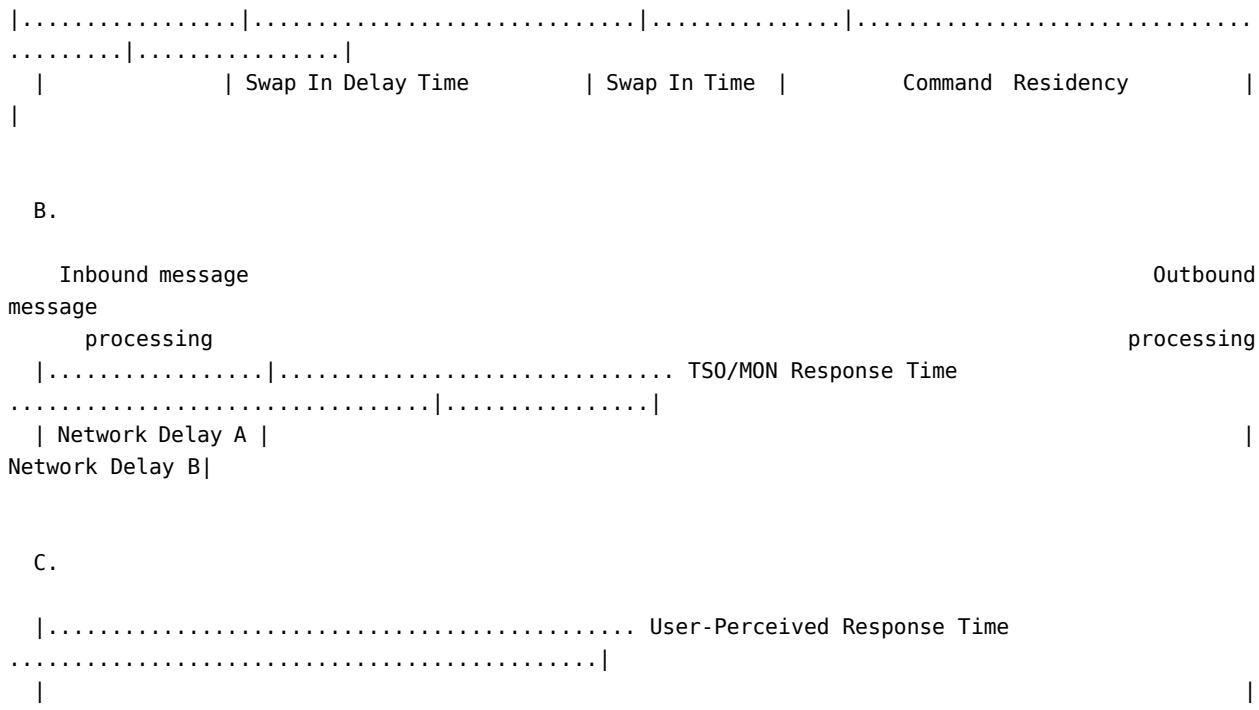


Figure 2-1. Components of Response Time

Part A of Figure 2-1 shows each component of response time from the time a TSO user begins a Terminal Interaction by pressing a function key or the ENTER key (locking the keyboard) until the keyboard finally "unlocks," allowing the TSO user to prepare for the next Terminal Interaction. When the host CPU receives the message associated with a Terminal Interaction, the TSO user is scheduled to be swapped in to execute the TSO user's request.

The time it takes to start the swap in process (called Swap In Delay), and the time it takes to swap in the TSO user (called Swap In Time), are significant performance measurements. Swap In Delay indicates how well the TSO first period domain and multiprogramming level (MPL--how many TSO users are in memory and executing concurrently) constraints are tuned. It also indicates what effect the system-wide MPL level has on all the TSO domains. Swap In Time is a measure of how well the swap data sets are performing and/or configured.

The next element of response is the time it takes to execute

the TSO command requested by the TSO user. During execution of the TSO command, messages may be written to the TSO terminal. Finally, the TSO terminal keyboard is unlocked, terminating the Terminal Interaction.

Part B of Figure 2-1 breaks down response time into the time a Terminal Interaction spends in the TSO terminal network (termed Network Delay) and the time spent in the host CPU actually executing the TSO user's request. Note that Network Delay occurs before and after the CPU portion of response time. The TSO/MON Response Time measure is equal to the amount of time a TSO Terminal Interaction spends in the host CPU.

Part C of Figure 2-1 details the time is takes to execute a TSO Terminal Interaction as perceived by the TSO user sitting at the terminal. This is called User-Perceived Response. User-Perceived Response starts when the user presses the ENTER or a FUNCTION key and ends when the keyboard unlocks at the termination of the TSO command; it includes both network delay time and host processing time.

Because of the detail of TSO/MON's response-related measurements, response time problems caused by excessive delays in the network, MVS swapping, or system load can be easily isolated and dealt with effectively.

THE TSO NETWORK DELAY MEASUREMENT

TSO/MON has the unique ability to capture and report TSO network delay measurements. TSO Network Delay is sampled when a unique series of events occur in MVS. TSO Network Delay measurements are maintained at the TSO user and TSO terminal level of identification. Network delay added to TSO/MON response time measurements equals user-perceived response time. Network delay indicates how well the TSO terminal network is performing. By examining network delay times, reported response problems can be isolated to individual terminals, terminal clusters, or communication links.

CATEGORIZING RESPONSE EVENTS

To further aid service objective reporting, TSO/MON types TSO response events by the short, medium, and long categories. This is called "response typing." TSO response events are categorized as short, medium, or long according to the number

of service units consumed during the life of each response event (referred to as "service unit response typing").

STATISTICAL RESPONSE DISTRIBUTIONS

TSO/MON maintains a statistical distribution of TSO response times. An installation can define up to seven response distribution threshold values to TSO/MON. TSO/MON will then maintain response event distributions to those specifications at the system, user, terminal, and command levels for short, medium, and long response event types. Response distributions provide a means to determine the consistency of delivered TSO response time. Response distributions also are extremely useful for tracking management response time objectives that are based on percentages of response events completed within a specific response time (e.g., 95% of all the short response events completed within one second).

THINK TIME MEASUREMENTS

TSO/MON defines TSO user think time as time that is not spent in a response event. Think time from another viewpoint is the time a terminal keyboard remains unlocked. Think time statistics are tremendously useful in tuning TSO logical swap specifications and performing TSO workload analysis based on TSO user activity. TSO users who log on but remain idle for extended periods of time can be identified.

COMMAND COUNTS

TSO/MON counts TSO commands, subcommands, CLIST names, ISPF Dialog Manager programs and panels, and ISPF/PDF functions invoked by a TSO user. The unique name and the number of times each one is executed is maintained in the System Record for each TSO user.

PROGRAM NAME AND DATA SET NAME RECORDING

The TSO/MON Command recording feature enables you to record the name of the program invoked by a TSO command for which Command recording is enabled. TSO/MON defines a "program name" as the member of a partitioned data set (PDS) that was invoked or accessed by a TSO command. For example, a program name can be a member of a PDS that was invoked as a program by the TSO CALL command, executed as a CLIST by the TSO EXEC command, deleted by the TSO DELETE command, etc. Program

names are provided only in the Command Record.

The data set name recording option provides the name of the data set accessed by a TSO command for which Command recording is enabled. Data set information is provided only in the Command Record.

If detailed command recording is specified for the PDF Edit, Browse, or Utility functions, then TSO/MON and SPFI will capture the data set names and member names edited, browsed, or manipulated by the TSO user. The number of data set names and member names captured can be controlled by a TSO/MON option. PDF suboption codes (C for Catalog, R for Rename, etc.) are also captured for PDF Utility functions, if appropriate, and carried with the corresponding member name.

Data set and program name information is very useful for identifying the names and locations of programs or TSO applications that are heavy consumers of system resources, performing TSO application studies, and answering questions such as, "Which TSO user accessed what program from where?", or "Who deleted a member from this data set and when?"

2.2 Data Analysis

The TSO Analyzer provides several reporting options for one page summary reports (TSO Summary Reports) for data center management. These reports include system, application, user group, and user reports that quantify the utilization and performance of TSO service, key users, and user-defined applications. They provide summarized information that can report one to four months of time. This permits management to evaluate and track TSO's performance on a month-to-month basis. These reports provide:

- Indicators that pertain to the operation and performance of TSO service, system load, user access, and system availability.
- Summarized reporting on selected installation-defined TSO applications. These reports produce indicators for service, resource load, and access to the application system.
- Summarized reporting on selected users or user groups of the TSO service, or all users of the service. These reports produce indicators for service, user load, and access.
- Trend analysis of TSO on a month-to-month, month-to-quarter, and/or year-to-year basis.

The reports have similar formats and each one is logically divided into three management categories. The system report categories are service, system load, and system availability. The application, user group, and user summary categories are service, system load, and system access.

2.3 Accounting and Chargeback Interface

The TSO Analyzer provides data elements that CA MICS Accounting and Chargeback can use to bill data center resource consumers. The elements that can be billed per measurement unit are:

Element	Measurement Unit
TSO Command Count	Commands
TSO Service Units	1000 SUs
TSO CPU Instructions Executed	1 Million
TSO CPU Time Consumed	TCB+SRB Seconds
TSO TCB CPU Time Consumed	TCB Seconds
TSO SRB CPU Time Consumed	SRB Seconds
TSO I/O (EXCPS) Generated	1000 EXCPs
TSO Long Commands Processed	Commands
TSO Medium Commands Processed	Commands
TSO Short Commands Processed	Commands
TSO Total Commands Processed	Commands
TSO Terminal TGET I/O	Terminal I/O
TSO Terminal TPUT I/O	Terminal I/O
TSO Total Terminal (TGET/TPUT) I/O	Terminal I/O
TSO Terminal TGET Characters	1000 Characters
TSO Terminal TPUT Characters	1000 Characters
TSO Total Terminal(TGET/TPUT) Character	1000 Characters
TSO Connect Time	Hours
TSO Number of Logons	Logons
TSO Number of Executions	Transaction

When CA MICS Accounting and Chargeback produces invoices for data center users, those users that have used TSO resources will be charged for their resources according to an algorithm that uses the data available from these elements.

2.4 Capacity Planning Interface

TSO Analyzer elements that are useful for ad hoc analyses include:

CPUMODEL	CPU Model Identification
DURATION	Recording Interval Time
ENDTS	End Time Stamp
INTERVLS	Number of Recording Intervals
MICSVER	CA MICS Version Number
MONTH	Month of Year
ORGSYSID	Originating System Identification
STARTTS	Start Time Stamp
SYSID	System Identifier
TSMERESP	Excessive Response Time Threshold
TSMNODST	Number Of Distribution Values
TSMONVER	CA TSO/MON PM Version Number
TSMRVALx	Response Distribution Limit x
TSOAVCTM	Avg TSO Session Time
TSOAVKTM	Avg User Think Time
TSOAVLTM	Avg Long Response Time
TSOAVMTM	Avg Medium Response Time
TSOAVSTM	Avg Short Response Time
TSOAVTTM	Avg Response Time All Functions
TSOAVUSR	Avg Concurrent User Load
TSOCONTM	Terminal Connect Time
TSOCPUTM	CPU Time Consumed
TSOEXCPS	I/O (EXCPs) Generated
TSOLDSTx	Count Long Responses within Limit x
TSOLRESC	Long Response Event Count
TSOLRSTM	Long Response Time Total
TSOMDSTx	Count Medium Responses within Limit x
TSOMRESC	Medium Response Event Count
TSOMRSTM	Medium Response Time Total
TSOMXUSR	Max Concurrent User Load
TSONOIPL	Number of IPLs
TSONOLOG	User Logons
TSOPCCPU	Pct CPU Usage
TSOPCLRx	Cumm Pct Long Resp within Limit x
TSOPCMRx	Cumm Pct Medium Resp within Limit x
TSOPCSRx	Cumm Pct Short Resp within Limit x
TSOPCTRx	Cumm Pct All Resp within Limit x
TSOPCSRx	Cumm Pct Short Resp within Limit x
TSOPCTRx	Cumm Pct All Resp within Limit x
TSOSDSTx	Count Short Responses within Limit x
TSOSERVU	Service Units
TSOSICNT	Swap-In Time Event Count
TSOSIDTM	Swap-In Delay Time
TSOSRESC	Short Response Event Count

```
TSOSRSTM  Short Response Time Total
TSOSWAPS  Swap-Out Count
TSOTCOM   Total Commands Processed
TSOTDSTx  Count Total Responses within Limit x
TSOTHCNT  Think Event Count
TSOTHKTM  Think Time Total
TSOTRESC  Total Response Event Count
TSOTRSTM  Total Response Time All Functions
TSOUPTM   TSO Availability Time
TSOUSRCT  Total Count of Active Users
TSOXBLDN  Intvls When BLDL Not in Use
TSOXCPDY  Intvls When Common Page Duplexing in Use
TSOXGTFY  Intvls When GTF in Use
TSOXOLTY  Intvls When OLTEP in Use
TSOXPAGY  Intvls When I/O Errors on Paging Ops
TSOXRPLX  Intvls When Catalog RPLs Less Than 5
TSOXSTRX  Intvls When Supervisor Trace Too Small
YEAR      Year of Century
ZONE      Time Zone
```

Chapter 3: REPORTS

The TSO Analyzer produces reports using the batch and interactive reporting facilities of the CA MICS IS Management Support System. The following types of reports are available:

- Standard Analysis
- MICF Inquiry
- Management Objective
- Exception

Standard Analysis reports provide a concise representation of an installation's workload, resource use, and response to the workload.

MICF Inquiries are precomposed printer reports and color graphics that you can access via the CA MICS Information Center Facility (MICF). MICF inquiries help you to produce meaningful reports quickly and easily from the CA MICS Data Base data. They also provide you with the flexibility to code and save your own report formats.

Management reports provide a concise graphic or tabular representation of the installation's processing objectives and how well they have been met.

Exception reports provide an integrated and itemized list of the problems impacting an installation's effectiveness in terms of availability, service, workload, standards, security, and performance. Chapter 4 discusses Exception reports in detail.

PRODUCING TSO REPORTS

The TSO Analyzer product produces reports using the standard reporting capabilities of the CA MICS I/S Management Support System (CA MICS I/S MSS). You can tailor the content of the reports to match your requirements.

You can produce standard analysis reports either through batch facilities or with the CA MICS Information Center Facility (MICF). MICF is a menu-based system that operates under IBM's Interactive System Productivity Facility (ISPF). Those familiar with ISPF commands will find that MICF menus are similar to standard ISPF menus. The major features of MICF include the following:

- Structured inquiry composition
- Logical inquiry modification
- Direct inquiry composition
- Execution-time specifications
- Output replay
- Facilities for expert users
- Distributed inquiries
- User-written reports

The standard operational reporting jobs DAILYRPT, WEEKRPT, and MONTHRPT produce management objective and exception reports. You can submit these jobs for execution either manually or through the corresponding data base update job. The dynamic execution options (EXECDEF) member in the unit level PARMS library controls which report sets to produce. Section 2.3.5 of the CA MICS Planning, Installation, Operation, and Maintenance Guide describes the EXECDEF member. Refer to Chapter 4 of this guide for information on tailoring exception reports.

Interactive access to SAS with CA MICS is provided through the MSAS dialog from the CA MICS Workstation Facility (MWF). The MSAS dialog, running under ISPF, allows experienced SAS users to exercise a flexible set of options for invoking interactive full-screen SAS in the CA MICS environment. The MSAS dialog supports several types of interactive reporting, including:

- read-only access to a single unit database
- read-only access to multiple unit databases
- SAS without any unit databases

To support the interactive use of SAS with CA MICS, MSAS allocates the required SAS files, work files, user files, sort files, CA MICS libraries, and, optionally, the CA MICS database. In addition to allocating CA MICS database files, MSAS uses the standard CA MICS DDNAMEs (for example, SOURCE, INCLLIB, and USOURCE) to allocate the CA MICS library data sets. This lets you select SAS statements from the CA MICS libraries, modify and execute these statements under SAS/DMS, and then save the program for future use.

MSAS is a MICF application running under your private MICF options. Through MICF Options, you can control the set up of SAS execution parameters and temporary data set allocations. You can also control the allocation of additional data sets for one-time or repeated use.

To use MSAS, see Chapter 3 of this guide.

This section contains the following topics:

3.1 Standard Analysis Reports

This section provides the primary reference information for the CA MICS TSO Analyzer product's standard analysis reports.

1 - TSO Summary Reports
2 - TSO Tracking Reports
3 - TSO Audit Reports

3.1.1 TSO Summary Reports

The CA MICS TSO Summary Report program produces the TSO System Summary, TSO User Summary, TSO User/Group Summary, and TSO Application Summary Reports. The reports offer the following features:

- Management indicators that describe TSO load, user access, system availability, and the level of service provided
- Reports that summarize TSO use for selected users or groups of users
- The ability to tailor reports for different management levels
- Options that allow summarization of information from two or more TSO systems

PROGRAM FLOW

The TSO Summary Report program is a one step process that uses the MONTHS time-span of the TSO System Activity File (TSOTSO), TSO User Activity File (TSOTSU), and TSO User Interactive Activity File (TSOTSI) to process the SUMMARY report statements. The reporting process has seven logical steps:

1. Check SUMMARY statement syntax.
2. Select system data from the TSOTSOnn files.
3. Generate the TSO System Summary Report.
4. Select user data from the TSOTSUnn files.
5. Generate the TSO User/Group Report(s).
6. Select user data from the TSOTSInn files.
7. Generate the TSO Application Report(s).

The TSO Summary Report program generates code to tailor the reports according to the report options specified in the input. The generated code reads the required data from the TSOTSOnn, TSOTSUnn, and TSOTSInn cycles and creates the requested reports.

Please note that the TSOTSI file may not be active in the MONTHS time-span at your site. The TSO Application Summary Report will be produced only if the TSOTSI file is active.

A description and example of each of the available reports

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appears in the following subsections:

    1 - TSO System Summary Report
    2 - TSO User/Group Summary Report
    3 - TSO Application Summary Report
```

3.1.1.1 TSO System Summary Report

The TSO System Summary Report is a management report that describes TSO workload and service over a four month span. More than 30 indicators describing TSO are available. These indicators are divided into three main categories:

- Service
- Load
- Availability

This report allows an installation to quickly track TSO service and performance on a monthly basis. In summarizing the data into zones, you can easily identify and track TSO usage patterns.

In addition, you can select any or all of the service and performance indicators to ensure that your reports include only those indicators that are most meaningful to management.

The available report options include:

- Selection by month
- Selection by time zone
- Summarization of time zones
- Definition of response distribution time
- Definition of monthly TSO availability
- Selection of report elements

Figure 3-1 shows an example of the TSO System Summary Report.

YOUR COMPANY NAME
TSO SUMMARY FOR SYSTEM (PROD)
CURRENT DATE/TIME: MONDAY, AUGUST 28, 1989 (89240)/ 8:04 ZONE: SECOND SHIFT

MANAGEMENT INDICATOR CATEGORIES	JULY 1989 SUMMARY	JUNE 1989 SUMMARY	MAY 1989 SUMMARY	APRIL 1989 SUMMARY	PERCENT CHANGE FROM MAY 1989
SERVICE FACTORS					
AVG RESPONSE TIME (ALL FUNCTIONS)	1.17	1.28	1.63	1.87	-28.5%
WITHIN 2.00 (SS.HH)	85.7%	84.4%	84.4%	82.7%	1.3%
WITHIN 3.00 (SS.HH)	90.3%	89.6%	89.2%	87.3%	1.2%
AVG RESPONSE TIME (SHORT)	0.71	0.74	1.01	1.28	-30.2%
WITHIN 2.00 (SS.HH)	91.1%	90.5%	90.4%	90.4%	0.8%
WITHIN 3.00 (SS.HH)	95.6%	94.8%	94.4%	94.0%	1.1%
AVG RESPONSE TIME (MEDIUM)	1.28	1.58	2.07	2.26	-38.2%
WITHIN 2.00 (SS.HH)	82.6%	79.3%	79.7%	77.3%	2.9%
WITHIN 3.00 (SS.HH)	87.6%	85.7%	85.4%	82.7%	2.2%
AVG RESPONSE TIME (LONG)	1.89	1.86	1.90	2.39	-0.9%
WITHIN 2.00 (SS.HH)	82.4%	83.0%	83.0%	78.0%	-0.6%
WITHIN 3.00 (SS.HH)	86.4%	87.3%	86.8%	82.5%	-0.5%
AVG USER THINK TIME	31.10	30.85	29.91	28.56	4.0%
SAMPLED NETWORK DELAY TIME	0.75	0.82	0.81	0.80	-7.4%
SYSTEM LOAD					
NUMBER OF COMMANDS	262,988	327,362	269,896	134,851	-2.6%
NUMBER OF SHORT RESPONSES	78,656	110,736	96,040	50,204	-18.1%
NUMBER OF MEDIUM RESPONSES	102,736	124,374	114,015	61,680	-9.9%
NUMBER OF LONG RESPONSES	34,142	39,026	35,046	11,710	-2.6%
COMMAND TCB CPU TIME (HH:MM)	7:21	9:38	8:21	4:28	-12.0%
COMMAND SRB CPU TIME (HH:MM)	0:34	0:46	0:42	0:20	-18.1%
COMMAND RESIDENCY TIME (HH:MM)	137:27	169:45	171:59	86:21	-20.1%
NON-TERMINAL I/O (EXCPS)	5,818,912	7,292,076	6,775,007	3,455,288	-14.1%
TERMINAL I/O (TGET/TPUT)	1,241,212	1,486,136	1,278,113	620,332	-2.9%
NUMBER OF ENDED SRM TRANSACTIONS	340,214	449,990	405,811	197,431	-16.2%
COMMANDS PER HOUR	776	845	785	1,171	-1.1%
ENDED SRM TRANSACTIONS PER HOUR	1,004	1,161	1,180	1,715	-14.9%
SERVICE UNITS PER HOUR	715,427	810,713	804,851	1,272,332	-11.1%
NON-TERMINAL I/O PER HOUR	17,173	18,817	19,695	30,016	-12.8%
CPUTIME PER HOUR(TCB+SRB) (MM:SS)	1:24	1:36	1:34	2:30	-11.1%
SYSTEM AVAILABILITY					
TARGET AVAILABLE HOURS (HH:MM)	138:00	132:00	120:00	132:00	15.0%
ACTUAL AVAILABLE HOURS (HH:MM)	138:00	132:00	120:00	115:07	-1.5%
AVAILABILITY	100.0%	100.0%	100.0%	87.2%	-12.8%
NUMBER OF SYSTEM IPLS	34	19	4	11	750.0%
NUMBER OF USER LOGONS	3498	4950	4254	2107	-17.8%
TERMINAL CONNECT HOURS (HH:MM)	2660:45	3536:10	3246:11	1491:37	-18.0%
AVERAGE NUMBER OF CONCURRENT USERS	8	9	9	13	-19.4%
MAXIMUM NUMBER OF CONCURRENT USERS	42	111	58	99	-27.6%

Figure 3-1. TSO System Summary Report

3.1.1.2 TSO User/Group Summary Reports

The TSO User and Group Summary Reports are intended for data center and user management. These reports display TSO service received, resource consumption, and TSO access data for individual TSO userids and groups of userids. Data is available over a four month span to establish a basis for evaluating trends.

The User/Group Summary Report contains all the resource usage and service elements that the TSO System Summary Report contains, and displays the workload patterns of an individual user or a group of users.

The available report options include:

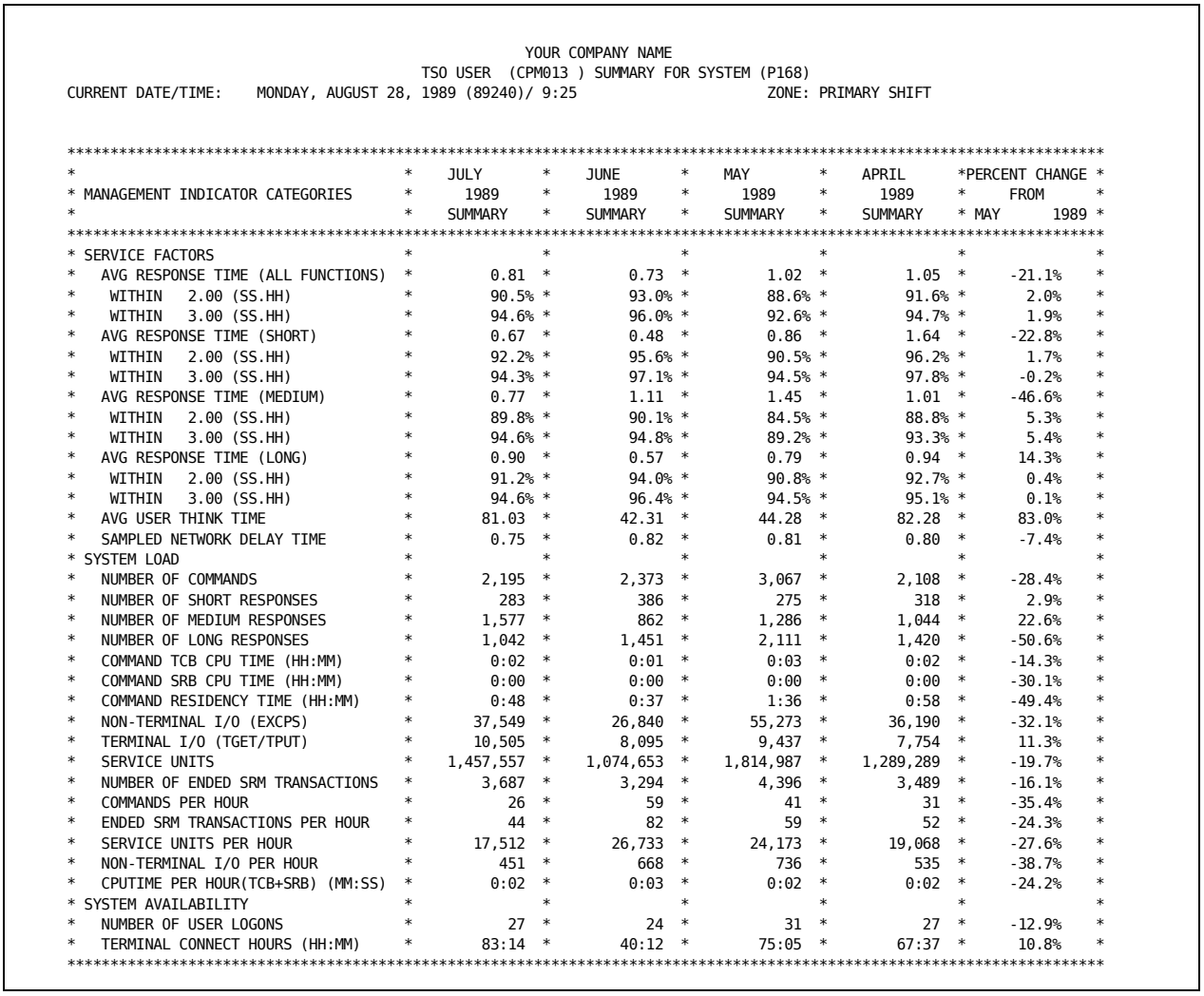
- Selection by month
- Selection by time zone
- Selection by userid or userid groups
- Summarization of time zones
- Definition of response distribution time
- Selection of report elements

Figure 3-2 shows an example of the TSO Group Summary Report.
Figure 3-3 shows an example of the TSO User Summary Report.

YOUR COMPANY NAME
TSO GROUP (CPM) SUMMARY FOR SYSTEM (P168)
CURRENT DATE/TIME: MONDAY, AUGUST 28, 1989 (89240)/ 9:22 ZONE: SECOND SHIFT

MANAGEMENT INDICATOR CATEGORIES	JULY 1989 SUMMARY	JUNE 1989 SUMMARY	MAY 1989 SUMMARY	APRIL 1989 SUMMARY	PERCENT CHANGE FROM MAY 1989
SERVICE FACTORS					
AVG RESPONSE TIME (ALL FUNCTIONS)	0.95	1.00	1.80	1.82	-47.4%
WITHIN 2.00 (SS.HH)	89.7%	89.1%	87.0%	86.7%	2.7%
WITHIN 3.00 (SS.HH)	93.3%	93.5%	91.2%	90.4%	2.0%
AVG RESPONSE TIME (SHORT)	0.65	0.68	4.10	1.11	-84.0%
WITHIN 2.00 (SS.HH)	92.2%	90.5%	90.3%	91.2%	1.9%
WITHIN 3.00 (SS.HH)	95.9%	94.0%	94.2%	94.2%	1.7%
AVG RESPONSE TIME (MEDIUM)	0.99	1.08	1.64	1.92	-39.6%
WITHIN 2.00 (SS.HH)	89.2%	88.9%	86.5%	87.0%	2.7%
WITHIN 3.00 (SS.HH)	93.1%	93.6%	91.0%	90.7%	2.1%
AVG RESPONSE TIME (LONG)	1.00	0.95	1.21	1.91	-16.9%
WITHIN 2.00 (SS.HH)	89.7%	89.3%	86.8%	83.5%	3.0%
WITHIN 3.00 (SS.HH)	92.3%	93.0%	90.6%	87.5%	1.7%
AVG USER THINK TIME	41.43	45.99	45.81	59.52	-9.6%
SAMPLED NETWORK DELAY TIME	0.75	0.82	0.81	0.80	-7.4%
SYSTEM LOAD					
NUMBER OF COMMANDS	7,857	11,231	9,337	6,196	-15.9%
NUMBER OF SHORT RESPONSES	1,554	1,953	1,933	1,219	-19.6%
NUMBER OF MEDIUM RESPONSES	7,148	10,997	9,954	6,879	-28.2%
NUMBER OF LONG RESPONSES	2,545	3,556	4,854	2,457	-47.6%
COMMAND TCB CPU TIME (HH:MM)	0:17	0:20	0:30	0:16	-41.6%
COMMAND SRB CPU TIME (HH:MM)	0:01	0:01	0:02	0:01	-43.7%
COMMAND RESIDENCY TIME (HH:MM)	3:49	5:40	7:47	8:01	-50.9%
NON-TERMINAL I/O (EXCPS)	218,897	250,059	357,368	204,202	-38.7%
TERMINAL I/O (TGET/TPUT)	44,662	52,692	54,323	35,236	-17.8%
SERVICE UNITS	9,601,169	11,116,166	16,323,503	9,077,903	-41.2%
NUMBER OF ENDED SRM TRANSACTIONS	14,316	20,293	20,819	13,569	-31.2%
COMMANDS PER HOUR	48	51	33	29	46.6%
ENDED SRM TRANSACTIONS PER HOUR	87	92	72	63	19.8%
SERVICE UNITS PER HOUR	58,260	50,224	56,837	42,099	2.5%
NON-TERMINAL I/O PER HOUR	1,328	1,130	1,244	947	6.7%
CPUTIME PER HOUR(TCB+SRB) (MM:SS)	0:06	0:06	0:06	0:05	1.5%
SYSTEM AVAILABILITY					
NUMBER OF USER LOGONS	61	85	88	48	-30.7%
TERMINAL CONNECT HOURS (HH:MM)	164:48	221:20	287:12	215:38	-42.6%

Figure 3-2. TSO Group Summary Report



YOUR COMPANY NAME
TSO USER (CPM013) SUMMARY FOR SYSTEM (P168)
CURRENT DATE/TIME: MONDAY, AUGUST 28, 1989 (89240)/ 9:25 ZONE: PRIMARY SHIFT

MANAGEMENT INDICATOR CATEGORIES	JULY 1989 SUMMARY	JUNE 1989 SUMMARY	MAY 1989 SUMMARY	APRIL 1989 SUMMARY	PERCENT CHANGE FROM MAY 1989
SERVICE FACTORS					
AVG RESPONSE TIME (ALL FUNCTIONS)	0.81	0.73	1.02	1.05	-21.1%
WITHIN 2.00 (SS.HH)	90.5%	93.0%	88.6%	91.6%	2.0%
WITHIN 3.00 (SS.HH)	94.6%	96.0%	92.6%	94.7%	1.9%
AVG RESPONSE TIME (SHORT)	0.67	0.48	0.86	1.64	-22.8%
WITHIN 2.00 (SS.HH)	92.2%	95.6%	90.5%	96.2%	1.7%
WITHIN 3.00 (SS.HH)	94.3%	97.1%	94.5%	97.8%	-0.2%
AVG RESPONSE TIME (MEDIUM)	0.77	1.11	1.45	1.01	-46.6%
WITHIN 2.00 (SS.HH)	89.8%	90.1%	84.5%	88.8%	5.3%
WITHIN 3.00 (SS.HH)	94.6%	94.8%	89.2%	93.3%	5.4%
AVG RESPONSE TIME (LONG)	0.90	0.57	0.79	0.94	14.3%
WITHIN 2.00 (SS.HH)	91.2%	94.0%	90.8%	92.7%	0.4%
WITHIN 3.00 (SS.HH)	94.6%	96.4%	94.5%	95.1%	0.1%
AVG USER THINK TIME	81.03	42.31	44.28	82.28	83.0%
SAMPLED NETWORK DELAY TIME	0.75	0.82	0.81	0.80	-7.4%
SYSTEM LOAD					
NUMBER OF COMMANDS	2,195	2,373	3,067	2,108	-28.4%
NUMBER OF SHORT RESPONSES	283	386	275	318	2.9%
NUMBER OF MEDIUM RESPONSES	1,577	862	1,286	1,044	22.6%
NUMBER OF LONG RESPONSES	1,042	1,451	2,111	1,420	-50.6%
COMMAND TCB CPU TIME (HH:MM)	0:02	0:01	0:03	0:02	-14.3%
COMMAND SRB CPU TIME (HH:MM)	0:00	0:00	0:00	0:00	-30.1%
COMMAND RESIDENCY TIME (HH:MM)	0:48	0:37	1:36	0:58	-49.4%
NON-TERMINAL I/O (EXCPS)	37,549	26,840	55,273	36,190	-32.1%
TERMINAL I/O (TGET/TPUT)	10,505	8,095	9,437	7,754	11.3%
SERVICE UNITS	1,457,557	1,074,653	1,814,987	1,289,289	-19.7%
NUMBER OF ENDED SRM TRANSACTIONS	3,687	3,294	4,396	3,489	-16.1%
COMMANDS PER HOUR	26	59	41	31	-35.4%
ENDED SRM TRANSACTIONS PER HOUR	44	82	59	52	-24.3%
SERVICE UNITS PER HOUR	17,512	26,733	24,173	19,068	-27.6%
NON-TERMINAL I/O PER HOUR	451	668	736	535	-38.7%
CPUTIME PER HOUR(TCB+SRB) (MM:SS)	0:02	0:03	0:02	0:02	-24.2%
SYSTEM AVAILABILITY					
NUMBER OF USER LOGONS	27	24	31	27	-12.9%
TERMINAL CONNECT HOURS (HH:MM)	83:14	40:12	75:05	67:37	10.8%

Figure 3-3. TSO User Summary Report

3.1.1.3 TSO Application Summary Report

The TSO Application Summary Report is intended for data center and user management. These reports display TSO service received, resource consumption, and TSO access data for user-defined applications. Data is available over a four month span to establish a basis for evaluating trends.

The Application Summary Report contains all the resource usage and service elements that the TSO System Summary Report contains, and displays the workload patterns of an application or a group of applications.

The available report options include:

- Selection by month
- Selection by application
- Summarization at the MONTHs level since ZONE does not exist in the TSOTSI file at the MONTHs time-span (See NOTE below.)
- Definition of response distribution time
- Selection of report elements

NOTE: The TSOTSI file is not summarized at the ZONE level as distributed. If this is a requirement, you may tailor the file through the Data Base Tailoring Facility of the CA MICS Component Generator. You should use caution because this will expand the size of the file.

Figure 3-4 shows an example of a TSO Application Summary Report.

YOUR COMPANY NAME
TSO APPL( )SUMMARY FOR SYSTEM(TSOP)
CURRENT DATE/TIME: TUE OCT 17 1989 (89.290)/ 8:59

MANAGEMENT INDICATOR CATEGORIES	SEPTEMBER 1989 SUMMARY	AUGUST 1989 SUMMARY	JULY 1989 SUMMARY	JUNE 1989 SUMMARY	PERCENT CHANGE FROM JUNE 1988
SERVICE FACTORS					
AVG RESPONSE TIME (ALL FUNCTIONS)	1.01	0.71	1.25	1.38	26.8-
WITHIN 2.00 SECONDS	89.4%	92.1%	90.2%	91.6%	2.2-
WITHIN 3.00 SECONDS	93.2%	95.0%	93.9%	94.2%	1.0-
AVG RESPONSE TIME (SHORT)	1.00	0.56	1.53	0.69	44.9
WITHIN 2.00 SECONDS	89.5%	94.1%	90.0%	94.0%	4.5-
WITHIN 3.00 SECONDS	93.4%	96.4%	93.8%	97.0%	3.6-
AVG RESPONSE TIME (MEDIUM)	0.93	0.72	1.17	1.33	30.0-
WITHIN 2.00 SECONDS	90.1%	91.9%	90.5%	91.5%	1.4-
WITHIN 3.00 SECONDS	93.9%	94.8%	94.1%	94.0%	0.1-
AVG RESPONSE TIME (LONG)	2.98	1.46	1.69	7.34	59.4-
WITHIN 2.00 SECONDS	71.5%	83.3%	87.6%	78.9%	7.4-
WITHIN 3.00 SECONDS	77.1%	88.7%	91.5%	84.8%	7.7-
SYSTEM LOAD					
NUMBER OF DIALOG MANAGER PANELS	1508	2009	1536	1093	37.9
NUMBER OF SHORT RESPONSES	1524	2104	1594	1172	30.0
NUMBER OF MEDIUM RESPONSES	10987	11794	8393	6560	67.4
NUMBER OF LONG RESPONSES	464	222	566	185	150.8
TCB CPU TIME (HH:MM)	0:15	5:09	3:42	0:09	65.5
SRB CPU TIME (HH:MM)	0:01	0:01	0:01	0:01	74.9
RESIDENCY TIME (HH:MM)	4:24	3:24	4:30	3:09	39.4
NON-TERMINAL I/O (EXCPS)	197271	178336	166304	112704	75.0
TERMINAL I/O (TGET/TPUT)	48348	56590	40903	28344	70.5
SERVICE UNITS	8193495	7594146	7509271	4876965	68.0
NUMBER OF ENDED SRM TRANSACTIONS	16188	16506	12676	9549	69.5
INVOCATIONS PER HOUR	28	21	19	29	3.4-
ENDED SRM TRANSACTIONS PER HOUR	109	113	87	83	31.3
SERVICE UNITS PER HOUR	55327	52304	52107	42784	29.3
NON-TERMINAL I/O PER HOUR	1332	1228	1154	988	34.8
CPUTIME PER HOUR (TCB+SRB) (MM:SS)	0:07	2:08	1:52	0:05	27.9
SYSTEM AVAILABILITY					
NUMBER OF INVOCATIONS	50	42	38	30	60.0
APPLICATION ELAPSED HOURS (HH:MM)	148:05	145:11	144:06	113:59	29.9

* INCLUDES ACTIVITY FOR APPLICATION APL

Figure 3-4. TSO Application Summary Report

3.1.1.4 Replacing the TSO/MON Summary Subsystem

The CA MICS TSO Summary Reports can replace the TSO/MON Summary Subsystem. This eliminates the need to operate both the CA MICS Data Base and the TSO/MON TSO Utilization File (TUF) updates.

DIFFERENCES BETWEEN THE CA MICS TSO SUMMARY REPORTS AND THE TSO/MON SUMMARY REPORT SUBSYSTEM

The following summarizes the major differences between the CA MICS TSO Summary Reports and the TSO/MON Summary Report Subsystem:

- CA MICS zone processing supports up to nine zones.
- CA MICS performs all calculations using double precision floating point arithmetic rather than fixed point.
- In order to operate from the CA MICS Data Base, there are some changes in the report options control statement and abbreviations.
- The CA MICS reports can only be one page long, which restricts the number of short, medium, and long response distribution values that the reports display.
- Because the SAS implementation requires two sorts to produce each of the TSO System Summary and User/Group Summary Reports, report generation will require more processing time when you request a large number of userids.
- Two elements from the TSO/MON reports, the number of TSO/MON start ups and the number of TSO/MON ABENDs, are not available on the CA MICS reports.
- Time zones must start on an hour.

TSO PERFORMANCE STATISTICS

This section details the procedures you must follow to use the TSO Summary Reports.

You should generate a TSO System Summary Report for the previous four months. To ensure consistent reporting of data, the report should cover your prime shift TSO usage and

report the TSO response distributions for two seconds and five seconds.

If you are using the default TSO/MON distribution values and ZONE 1 is your primary TSO service period, no options are required to produce the required report. The following statement:

```
SYSTEM=Y
```

is all you need to supply.

If your prime TSO service period is not defined by ZONE 1, or the two and five second distribution values are not the first two defined by TSO/MON, you must explicitly specify these parameters. The following statements illustrate how this is done:

```
SYSTEM=Y SHORT=2,5 MEDIUM=2,5 LONG=2,5

SYSTEM=Y SHORT=2,5 MEDIUM=2,5 LONG=2,5 /
   ZONE1=Y ZONE2=Y ZONEADD=Y
```

3.1.1.5 Running the TSO Summary Reports

This section describes the areas you should consider when generating the various TSO Summary Reports. These are:

1 - JCL Requirements
2 - Report Options and Control Statements

3.1.1.5.1 JCL Requirements

The TSO Summary Report program parallels, as closely as possible, a report request made using the TSO/MON Summary Subsystem.

The TSO Summary Reports are produced as a part of the regular monthly reports. The JCL resides in the MONTHRPT member of prefix.MICS.CNTL.

The three SAS MACROs that control the TSO Summary Report execution are:

1 System Summary Report:

- _TSOTSO - This defines the input range for the TSO System Summary Report. The default is to use cycles 1-4. Thus, the default report describes the previous four months.

2 User Summary Report:

- _TSOTSU - This defines the input range for the TSO User and Group Summary Reports. The report is delivered turned off (USER=N). When activated, the report defaults to cycle 0. Thus, the default time selection is the current month to date file.

3 Application Summary Report:

- _TSOTSI - This defines the input range for the TSO Application Summary Report. The report is delivered turned off (APPL=N). When activated, the report defaults to cycle 0. Thus, the default time selection is the current month to date file.

These 3 macros are in sharedprefix.MICS.INCLLIB member name MONTH400 and may be changed as needed. When specifying _TSOTSO, _TSOTSU, or _TSOTSI, you should specify only the cycles that will be used in the report. For example, a TSO System Summary Report for August, 1987 through November, 1987, where May 1987 is the base and November 1987 is TSOTSO02, would use the following definition:

```
MACRO _TSOTSO
&TSOM..TSOTSO02 &TSOM..TSOTSO03 &TSOM..TSOTSO04
&TSOM..TSOTSO05 &TSOM..TSOTSO08 %
```

If the cycles to be reported are not online, the monthly archive tape may be used by overriding the MONTHS DD card in the MICSSHRx procedure as shown below:

```
//MICS.MONTHS DD DSN=tapeprefix.MICS.HISTM.TSOTSO(0),DISP=SHR
```

3.1.1.5.2 Report Options and Control Statements

You specify report options through a summary statement that resides in the data set specified via the SUMIN DD card (generally, prefix.MICS.PARMS(TPSPARMS)). Syntax rules for the summary statement are:

1. A summary statement is composed of keywords, subkeywords, value parameters, and lists.

2. The input is free-form, using the SAS NAMED INPUT rules. Blanks are delimiters while commas, quotes, and parentheses are not.

3. Columns 1-72 are scanned for input, and columns 73-80 are ignored.

4. Keywords may not be abbreviated.

5. Comments may not appear in the summary statement input.

6. A summary statement can contain as many lines as required; however, a keyword value or list must fit on one line.

7. A continued line must end with a slash (/).

SUMMARY CONTROL STATEMENTS

The basic report statement is: SYSTEM=Y

Each execution of the TSO Summary Report program processes one summary statement, which may produce a TSO System Summary Report, a set of TSO User or Group Summary Reports, or a set of TSO Application Summary Reports. This section defines the report options and gives an example of their use.

The following list gives the keywords available with the summary statement and their use.

KEYWORD	DESCRIPTION
APPL	Specifies that the TSO Application Summary Reports are to be run.
BASE	Specifies the month to use for computing the percentage change values.

BREAK	Specifies the length of the userid prefix to be used in user/group summarization.
DROP	Specifies report lines to be excluded.
LONG	Specifies which long response distribution values are to be reported.
MONTH	Selects the starting month and year.
MEDIUM	Specifies which medium response distribution values are to be reported.
ABBR	Selects the abbreviated form of the report.
SYSID	Specifies the SYSID for reporting.
SYSTEM	Selects the TSO System Summary Report.
SHORT	Specifies which short response distribution values are to be reported.
USER	Specifies that a report for all TSO users is to be generated.
ZONEADD	Specifies that the report is to accumulate the selected time zones.
ZONE1,ZONE2, ZONE3,ZONE4, ZONE5,ZONE6, ZONE7,ZONE8, ZONE9	Specifies the standard time zones to be reported.

KEYWORD SYNTAX

The following table summarizes the options and syntax of each keyword.

KEYWORD	DEFAULT	NOTE
ABBR=Y or N	Generate the long form report	
APPL=macro_name or Y	No application reports	1
BASE=monyy	The 3rd previous month	2
BREAK=value	8	
DROP=list	No	
LONG=list	Use 1st and 2nd values	

```
 MONTH=monyy              Use the 1st month found         2
 MEDIUM=list              Use 1st and 2nd values
 SYSID=sysid              Report all systems
 SYSTEM=Y or N            Default report
 SHORT=list               Use 1st and 2nd values
 USER=macro_name or Y     No user selection               1
 ZONEADD=Y or N           No
 ZONE1=Y or N             Include zone 1
 ZONE2=Y or N             Include zone 2
 ZONE3=Y or N             Include zone 3
 ZONE4=Y or N             Include zone 4
 ZONE5=Y or N             Include zone 5
 ZONE6=Y or N             Include zone 6
 ZONE7=Y or N             Include zone 7
 ZONE8=Y or N             Include zone 8
 ZONE9=Y or N             Include zone 9

_____________________________________________

NOTES:  1. Macro_name refers to a SAS macro coded by the
           user.
        2. monyy is a SAS date format of month and year.


SYNTAX SPECIFICATIONS

ABBR=Y or N
This keyword specifies the short form of the selected
reports.  The standard report format contains the current and
the three previous months.  The short form displays data for
the starting and base months only.

EXAMPLE:  ABBR=Y


APPL=Y or macro_name
This keyword specifies Application Summary Reports.


BASE=monyy
The BASE keyword specifies which months from the data base to
use as the base for calculating the percentage of change from
the current month.  You enter the base value in a month year
format.  The year value may range from 70-99.  The month
value uses a three character abbreviation of standard SAS
formats.

When you do not specify the base, the report will use the
third previous month as the base month.
```

Note: If the input does not include the base month specified, the report will not perform the percentage change calculation.

EXAMPLE: BASE=JUN86

BREAK=n

This keyword specifies that a single report combine all userids with a common prefix of n characters. You may specify BREAK (as an integer from 1-8) with the USER keyword when you do not require specific user selection. You do not use the BREAK value if the USER keyword has a macro name instead of just Y.

EXAMPLE: BREAK=4 USER=Y specifies that the system will select all userids and group them by the first four characters of the userid.

DROP=list

You use the DROP keyword to tailor the output of the summary reports by specifying which MANAGEMENT INDICATOR elements the report should not display. The system assigns a number to each line or line group in the summary reports as defined in the table below.

MANAGEMENT INDICATOR NUMBER TABLE

01	AVG RESPONSE TIME (ALL FUNCTIONS)
02	ALL FUNCTIONS RESPONSE WITHIN n SECONDS
03	AVG RESPONSE TIME (SHORT)
04	SHORT RESPONSE WITHIN n SECONDS
05	AVG RESPONSE TIME (MEDIUM)
06	MEDIUM RESPONSE WITHIN n SECONDS
07	AVG RESPONSE TIME (LONG)
08	LONG RESPONSE WITHIN n SECONDS
09	AVG USER THINK TIME
10	SAMPLED NETWORK DELAY TIME
15	NUMBER OF COMMANDS
16	NUMBER OF SHORT RESPONSES
17	NUMBER OF MEDIUM RESPONSES
18	NUMBER OF LONG RESPONSES
19	COMMAND TCB CPU TIME (HH:MM)
20	COMMAND SRB CPU TIME (HH:MM)
21	COMMAND RESIDENCY TIME
22	NON TERMINAL I/O (EXCPS)

```
      23  TERMINAL I/O (TGET/TPUT)
      24  SERVICE UNITS
      25  NUMBER OF ENDED SRM TRANSACTIONS
      29  COMMANDS PER HOUR
      30  ENDED SRM TRANSACTIONS PER HOUR
      31  SERVICE UNITS PER HOUR
      32  NON TERMINAL I/O PER HOUR
      33  CPUTIME PER HOUR(TCB+SRB) (MM:SS)
      41  TARGET AVAILABLE HOURS    (HH:MM)
      42  ACTUAL AVAILABLE HOURS    (HH:MM)
      43  AVAILABILITY
      44  NUMBER OF SYSTEM IPLS
      47  NUMBER OF USER LOGONS
      48  TERMINAL CONNECT HOURS    (HH:MM)
      49  AVG NUMBER OF CONCURRENT USERS
      50  MAX NUMBER OF CONCURRENT USERS

EXAMPLES:   DROP=3,4,7,8,23,24,25


SHORT=list
MEDIUM=list
LONG=list
These keywords allow selection of response distribution
values other than the default slots (first and second
values).  You may select from the distributions specified
when TSO/MON was installed.  The data has been collected
based on those distributions, and any attempt to refit the
data into new user-specified distributions will result in
erroneous data.  You may enter up to seven values for any of
the response types, but the total number of response values
cannot exceed 13.  Note that the SHORT keyword also specifies
the number of distribution values to print for the total
response category.  If you exceed this limit, the system will
give a diagnostic (user ABEND 998).

EXAMPLE:
If you do not define your prime TSO service period by zone 1,
or if the two and five second distribution values are not the
first two that TSO/MON defines, you must explicitly specify
these parameters.  The following statements illustrate how
this is done:

     SYSTEM=Y SHORT=2,5 MEDIUM=2,5 LONG=2,5

     SYSTEM=Y SHORT=2,5 MEDIUM=2,5 LONG=2,5 /
        ZONE1=Y ZONE2=Y ZONEADD=Y
```

```
MONTH=monyy
The MONTH keyword specifies the month to use as the starting
month.  This month and the previous three months will be
selected from the monthly cycles defined by variables
&TSOTSO, &TSOTSU, and &TSOTSI as input.  The default value is
the current previous month when run.

EXAMPLES:  MONTH=SEP85
           MONTH=DEC86


SYSID=xxxx
This keyword specifies that the report show the CA MICS
logical system id 'xxxx'.  Use of the default will produce a
report for each logical SYSID in the MONTHs time-span.

EXAMPLE:   SYSID=PROD


SYSTEM=Y or N
This keyword specifies generation of the TSO System Summary
Report.  Since this is the default, it is necessary to
specify this keyword only if you specify the user or group
option and you do not wish to generate the TSO System Summary
Report.

EXAMPLE:   USER=Y SYSTEM=N


USER=Y or macro_name
This keyword specifies generation of a TSO User Summary
Report for all userids in the data base.


ZONE Specification:  ZONEn, ZONEADD

The ZONE keyword specifies which time zones to report.  The
default is to report time zone 1.  When you select specific
time zones, the output will show only those zones.

ZONEADD specifies accumulation of statistics for the
specified zones.  If you do not specify any zones, all time
zones defined by CA MICS will be accumulated.

EXAMPLES:  ZONE1=Y
           ZONEADD=Y ZONE1=Y ZONE2=Y
```

3.1.2 TSO Tracking Reports

The TSO Tracking Reports provide technical personnel with individual TSO terminal, user, or system information to meet daily activity tracking and performance measurement needs. These reports provide information to quantify TSO performance, measure the results of tuning changes, identify TSO problem areas, and analyze user problems. They are run using the CA MICS Information Center Facility (MICF). All these reports use multiple run-time parameters. You can customize each run of the report or save the parameters in anticipation of future runs.

DIFFERENCES BETWEEN THE CA MICS TSO TRACKING REPORTS AND TSO/MON TRACKING REPORTS

While the CA MICS TSO Tracking Reports replicate the TSO/MON Tracking Reports as closely as possible, there are certain differences.

- Instances of No Activity

  The TSO/MON reports that list their data in a tabular format by time periods include a line of zeros when there is no activity to report during the reporting increment. The CA MICS TSO Analyzer, however, prints a line of data only when there is data to report. This will cause the CA MICS version of the report to appear to be different from the TSO/MON version of the report even though the report contains the same data.

- Data Differences

  - TIOC Values

    The CA MICS TSO TIOC value is always reported from the system level (TSOMTIOC), and cannot be recomputed at the user level.

  - Maximum Users, Think Time, and Total Time

    The TSOTSU file does not retain observations that contain no resource usage. For this reason, a user who is logged on but does not use the enter key at least once during the interval will not have an observation on the file for that interval. This can affect the report data in several ways as noted below.

The maximum user count, when reported from the system level (TSOTSO file, TSOMXUSR), gives a true high-water mark value. The Activity Report that inquiry TSOLX1 produces, and the Profile Report that inquiry TSOLD2 produces report a true high-water mark from the TSOTSO file. However, all of the other reports, which show a count of users, do so from the user level (TSOTSU file) and, therefore, report only a count of the users who were active on the system.

The TSOTSU file cannot accurately do any reporting that requires total think time or the total amount of time that a terminal was in use. This means that ranking reports cannot be produced that rank by characters per second, think time, or length of time the terminal was active. This also means that ranking reports will not report think time, active index, and characters per second by TGET and TPUT. The average medium and average total response times have been added to the network activity, network profile, and user ranking reports in place of the think time and active index values. CPU time and EXCP counts have also been added to the user ranking report in place of the characters per second by TGET and TPUT.

o Report Parameters

When the inquiry executes, it writes customer-specified run-time parameters to both the MICSLOG and SAS LOG. The report footnotes also identify the run-time options that you select.

The paired INCLUDE and EXCLUDE parameter specifications in the CA MICS inquiries are NOT mutually exclusive as they are with TSO/MON. For instance, you can now specify a group of users to be included on the report and, at the same time, identify an individual user(s) to be excluded from the selected group. This capability is available for selection of the following:

- command names
- library names
- program names
- terminal IDs
- users IDs

Example - You might wish to include all users whose user IDs begin with ABC0 and, at the same time,

```
                    exclude users ABC0300 and ABC0301.  You do this
                    by specifying:

                          Users to be included
                                 ABC0:
                          Users to be excluded
                                ABC0300 ABC0301


          The following sections contain descriptions of the reports:

              1 - TSO Activity Report
              2 - TSO Profile Report
              3 - TSO Network Activity Report
              4 - TSO Network Profile Report
              5 - TSO Command Use Counts Report
              6 - TSO User Ranking Report
              7 - TSO Terminal Ranking Report
              8 - TSO Command Activity Report
              9 - TSO Program Activity Report
             10 - TSO Workload Response Report
             11 - TSO Workload Paging Report
             12 - TSO Workload Swapping Report
```

3.1.2.1 TSO Activity Report

The TSO Activity Report summarizes daily TSO operations. You can use the report to quantify TSO utilization and performance, compare the service given by different performance groups or workload manager service classes, identify peak load periods, and provide a base for evaluation of system performance messages.

The TSO Activity Report shows daily and weekly TSO system performance as a function of time. The summary lines at the end of the report display the daily or weekly values for each of the columns in the report.

You must run one daily activity report with a standard increment and report format. The standard report must have a reporting increment of 15 minutes or greater. Once you choose a reporting increment, the standard report options must remain constant to insure meaningful day to day comparison of workloads. In this standard format, you can use the daily activity report to identify periods of degraded response by performance group or workload manager service class, to examine TSO operations as a function of command load, and to identify TSO problem areas.

Note: The report displays the daily values for each column in a summary line at the end of the report. You can also specify that the report run with a larger reporting increment (i.e., one hour) to give a more concise summary of daily TSO operations.

Figure 3-5 illustrates a sample TSO Activity Report. Figure 3-6 illustrates a sample TSO Activity Report by USER/ TERMINAL/ PERFGRP.

```
INQUIRY ID:

   TSOLX1:  TSO Activity Report
   TSOLX2:  TSO Activity Report by USER/TERM
   TSOLX3:  TSO Activity Report by USER/TERM/PERFGRP

DATA SOURCE (File/Timespan):

   TSOLX1:  TSOTSO/TSO_BU - DETAIL
   TSOLX2:  TSOTSO/TSOTSU/TSO_BU - DETAIL
   TSOLX3:  TSOTSO/TSOTSU/TSO_BU - DETAIL
```

RUNNING THE REPORT

Run this report under MICF using the panel defaults and/or specifying the following run-time parameters:

TSOLX1: TSO Activity Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSOLX2: TSO Activity Report by USER/TERMINAL

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- terminal IDs to be included
- terminal IDs to be excluded
- SYSID values, to be included
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSOLX3 - TSO Activity Report by USER/TERM/PERFGRP

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- terminal IDs to be included
- terminal IDs to be excluded
- performance group numbers or workload manager service

classes to be included
- performance group numbers or workload manager service classes to be excluded
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSO Activity Report
YOUR COMPANY NAME

INQUIRY: TSOLX1 RUN DATE: 16JUN08

System = TSOP
For FEBRUARY 1, 2008

Time Period	Max Activ Users	Average Response Time (sec) Total	Terminal Short	Terminal Medium	Terminal Long	Response Distribution Short(sec) 5	Short(sec) 10	Medium(sec) 5	Medium(sec) 10	Command Count	Avg. Net. Delay	Swapping (1K Bytes) Avg	Swapping (1K Bytes) Max	Swapping (1K Bytes) Count	Service Units
0:00- 0:30	9	0.04	0.04	0.00	0.00	100.0	100.0	0.0	0.0	1	0.00	148	212	11	1855
0:30- 1:00	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	121	152	8	69
1:00- 1:30	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	121	152	8	70
1:30- 2:00	8	3.44	2.73	4.16	0.00	100.0	100.0	100.0	100.0	4	1.09	132	176	10	1751
2:00- 2:30	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	131	168	8	69
2:30- 3:00	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	121	152	8	70
3:00- 3:30	11	2.43	0.26	4.32	18.76	100.0	100.0	50.0	87.5	86	0.96	369	1404	16	78099
3:30- 4:00	11	0.88	0.52	4.15	0.00	98.9	100.0	70.0	100.0	28	3.20	387	1008	23	43169
4:00- 4:30	16	1.14	0.24	3.15	10.90	100.0	100.0	82.8	100.0	169	1.07	618	1376	63	385107
4:30- 5:00	16	0.61	0.17	2.61	7.01	100.0	100.0	86.7	98.3	68	2.14	569	1304	56	271286
5:00- 5:30	16	0.53	0.16	1.77	8.09	100.0	100.0	95.0	100.0	44	1.06	460	1276	34	183701
5:30- 6:00	16	0.75	0.18	3.01	6.99	100.0	100.0	88.9	97.8	65	6.31	461	984	51	179519
6:00- 6:30	17	0.58	0.18	2.54	0.00	100.0	100.0	88.1	100.0	44	1.47	559	1316	46	192178
6:30- 7:00	19	1.62	0.19	3.12	57.15	100.0	100.0	77.8	100.0	142	1.80	539	1124	55	674887
7:00- 7:30	25	1.07	0.20	2.73	10.85	100.0	100.0	81.1	99.1	268	2.43	568	1816	99	1146106
7:30- 8:00	30	1.91	0.24	2.68	11.69	100.0	100.0	83.7	99.0	188	1.74	615	1544	106	3802555
8:00- 8:30	39	2.49	0.37	3.69	24.74	99.9	100.0	82.4	97.0	529	1.16	620	1552	186	4959219
8:30- 9:00	54	1.08	0.32	2.88	18.58	100.0	100.0	84.5	98.2	1535	1.25	552	1832	393	2641644
9:00- 9:30	73	1.41	0.37	3.74	21.86	99.9	100.0	75.1	93.6	2721	0.98	557	1528	566	3967477
9:30-10:00	75	2.20	0.44	3.77	61.95	99.8	100.0	76.9	93.3	2548	0.94	554	1372	732	4938043
10:00-10:30	75	1.88	0.55	3.81	31.04	99.2	99.5	74.4	94.9	1389	1.20	567	1244	621	5342618
10:30-11:00	77	1.44	0.45	3.49	18.78	99.6	100.0	75.7	95.9	2235	1.68	545	1388	622	5522018
11:00-11:30	81	2.43	0.45	4.27	41.87	99.7	99.9	71.4	92.1	3053	0.96	538	2460	729	12681911
11:30-12:00	78	2.90	0.36	2.89	56.35	99.9	100.0	83.2	98.3	2802	0.88	569	2700	542	12518960
12:00-12:30	73	1.13	0.30	3.14	18.93	99.9	100.0	82.5	96.5	1638	1.06	594	1608	344	3170213
12:30-13:00	65	1.10	0.41	2.86	11.26	100.0	100.0	87.3	97.4	966	1.27	504	1376	247	2402684
13:00-13:30	62	1.20	0.45	3.02	15.48	100.0	100.0	83.6	98.1	1808	1.20	577	1496	378	4705331
13:30-14:00	65	0.97	0.34	3.22	17.18	100.0	100.0	79.7	97.9	2418	1.20	558	1476	474	3785376
14:00-14:30	67	1.31	0.44	3.31	12.75	99.6	100.0	77.5	97.0	2482	1.25	573	1852	630	4541044
14:30-15:00	71	1.10	0.40	3.33	11.03	99.9	100.0	76.9	96.2	1553	1.02	538	1624	560	2871300
15:00-15:30	74	1.52	0.50	3.89	27.17	99.9	100.0	70.5	95.2	1537	1.11	550	1284	634	4511694
15:30-16:00	72	1.53	0.44	3.43	25.85	99.9	100.0	79.9	95.5	2639	1.12	564	2360	710	5224847
16:00-16:30	76	1.77	0.51	3.71	35.51	99.8	100.0	77.5	94.2	2115	0.96	544	1488	830	7316617
16:30-17:00	72	1.62	0.59	3.45	29.16	99.8	100.0	77.1	97.2	1951	1.09	532	1380	593	4549649

Data Level: 51 Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=30,DISTRIBUTION=(5,10) Figure 3-5. TSO Activity Report

TSO Activity Report
YOUR COMPANY NAME

INQUIRY: TSOLX3 RUN DATE: 16JUN08

System = TSOP
For FEBRUARY 1, 2008

Time Period	Perf Group	Max Activ User	Average Response Time (sec) Total	Terminal Response Time (sec) Short	Terminal Response Time (sec) Medium	Terminal Response Time (sec) Long	Response Distribution Short(sec) 0.1	Response Distribution Short(sec) 3.7	Response Distribution Medium(sec) 0.1	Response Distribution Medium(sec) 3.7	Event Count	Min TIOC	Swapping (1K Bytes) Avg	Swapping (1K Bytes) Max	Swapping (1K Bytes) Count	Service Units
10:00-10:10	2	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	100	100	1	242
		1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	100	100	1	242
10:10-10:20	2	2	1.56	1.56	0.00	0.00	0.0	100.0	0.0	0.0	1	32767	218	328	2	209
		2	1.56	1.56	0.00	0.00	0.0	100.0	0.0	0.0	1	32767	218	328	2	209
10:20-10:30	2	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	268	268	1	11
		1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	268	268	1	11
10:30-10:40	2	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	100	100	1	7
		1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	100	100	1	7
10:40-10:50	2	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	108	108	1	8
		1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	32767	108	108	1	8
10:50-11:00	2	3	0.82	0.24	3.41	0.00	0.0	100.0	0.0	25.0	22	32767	395	444	6	10530
		3	0.82	0.24	3.41	0.00	0.0	100.0	0.0	25.0	22	32767	395	444	6	10530
11:00-11:10	2	2	3.22	1.04	3.30	20.30	0.0	100.0	0.0	25.0	13	32767	248	396	5	22846
		2	3.22	1.04	3.30	20.30	0.0	100.0	0.0	25.0	13	32767	248	396	5	22846
11:10-11:20	2	2	2.71	0.56	10.37	6.72	0.0	100.0	0.0	50.0	12	32767	590	1124	7	24955
		2	2.71	0.56	10.37	6.72	0.0	100.0	0.0	50.0	12	32767	590	1124	7	24955
11:20-11:30	2	1	1.00	1.00	0.00	0.00	0.0	75.0	0.0	0.0	8	32767	544	700	5	2861
		1	1.00	1.00	0.00	0.00	0.0	75.0	0.0	0.0	8	32767	544	700	5	2861

Data Level: 51 Options: DATES=01FEB89,TIME=(10:00-11:35),PERFORM,INCREMENT=10,DISTRIBUTION=(0.1,3.7),TIOC,EVENTS
INCLUDE=USER=ABCX1:
INCLUDE=PGN=2

Figure 3-6. TSO Activity Report by User/Terminal/Performance Group

3.1.2.2 TSO Profile Report

The TSO Profile Report summarizes daily TSO operations. It is particularly useful in identifying regular patterns in the entire TSO workload. You can use the report to quantify TSO utilization and performance, identify varying service provided by different performance groups or workload manager service classes, identify usage patterns, and quantify the workload profile.

Designed to be run on a weekly basis, the report displays information in the same format as the TSO Activity Report, with the detail data for the week sorted into time order. A single report line shows activity for the entire week, using the specified reporting increment (such as one hour). The summary lines at the end of the report display the daily or weekly values for each of the columns in the report.

This format is particularly useful in identifying regular patterns in the entire TSO workload and within each performance group or workload manager service class. For example, if at 4 p.m. total response time is always poorer than at other times due to an increase in long response time, the cause may be a user application degrading TSO.

Figure 3-7 illustrates a sample TSO Profile Report.

Figure 3-8 illustrates a sample TSO Profile Report by USER/TERMINAL/PERFGRP.

```
INQUIRY ID:

   TSOLD2:  TSO Profile Report
   TSOLD3:  TSO Profile Report by USER/TERM
   TSOLD4:  TSO Profile Report by USER/TERM/PERFGRP


DATA SOURCE (File/Timespan):

   TSOLD2:  TSOTSO/TSO_BU- DAYS
   TSOLD3:  TSOTSO/TSOTSU/TSO_BU - DAYS
   TSOLD4:  TSOTSO/TSOTSU/TSO_BU - DAYS


RUNNING THE REPORT

Run this report under MICF, selecting the run-time parameters
described.
```

TSOLD2 - TSO Profile Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- range of hours to be processed
- zone values
- report increment in hours
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSOLD3 - TSO Profile Report BY USER/TERM

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- terminal IDs to be included
- terminal IDs to be excluded
- SYSID values to be included
- range of dates to be processed
- range of hours to be processed
- zone values
- report increment in hours
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSOLD4 - TSO Profile Report BY USER/TERM/PERFGRP

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- User IDs to be excluded
- Terminal IDs to be included
- Terminal IDs to be excluded
- Performance group numbers or workload manager service classes to be included
- Performance group numbers or workload manager service classes to be excluded
- SYSID values to be included
- range of dates to be processed
- range of hours to be processed
- zone values

- report increment in hours
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count

TSO Profile Report
YOUR COMPANY NAME

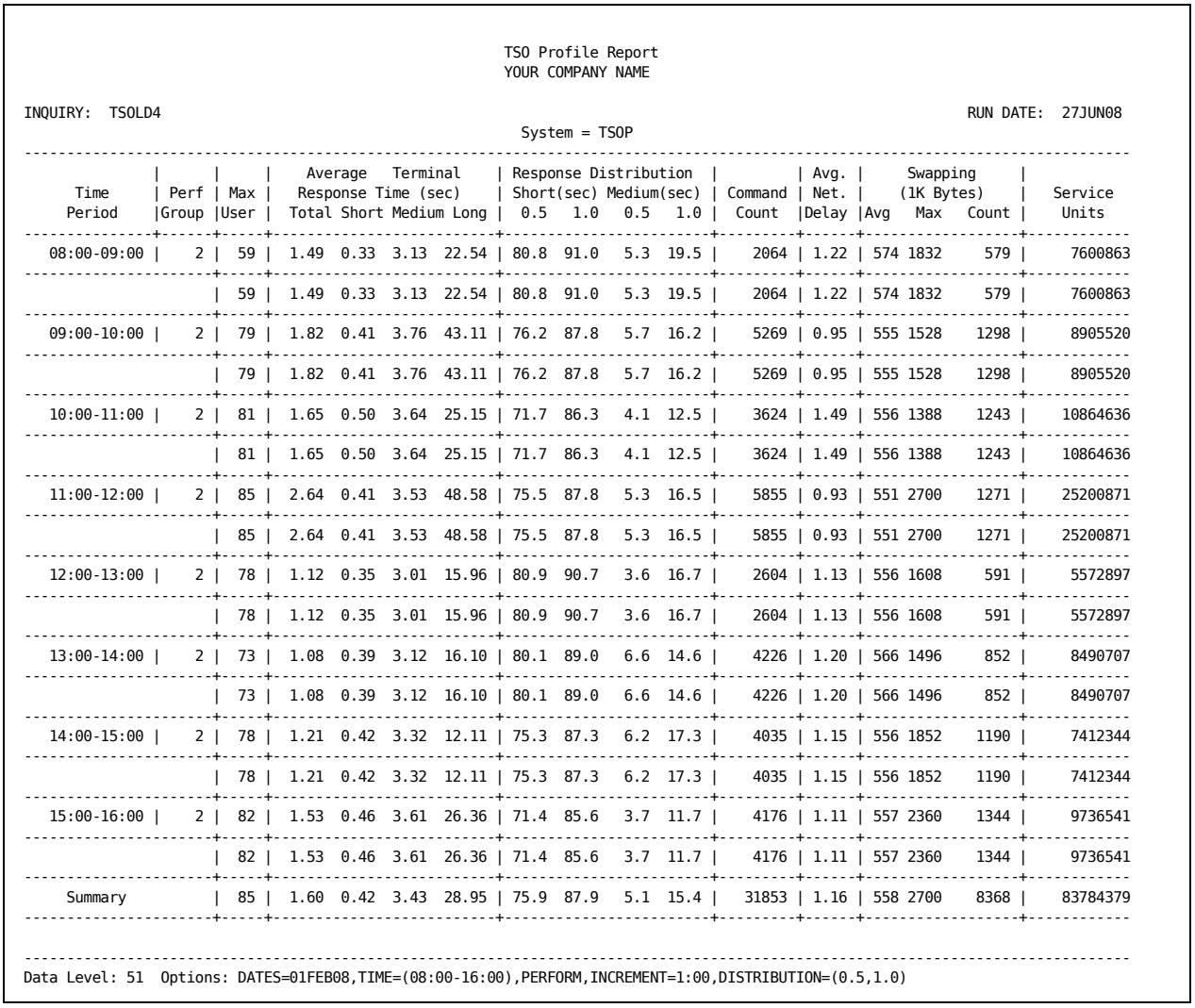
INQUIRY: TSOLD2 RUN DATE: DDMMMYY

System = TSOP

Time Period	Max Users	Average Response Time (sec) Total	Short	Medium	Long	Response Distribution Short(sec) 0.5	1.0	Medium(sec) 0.5	1.0	Command Count	Avg. Net. Delay	Swapping (1K Bytes) Avg	Max	Count	Service Units
00:00-01:00	9	0.04	0.04	0.00	0.00	100.0	100.0	0.0	0.0	1	0.00	136	212	19	1924
01:00-02:00	8	3.44	2.73	4.16	0.00	0.0	0.0	0.0	0.0	4	1.09	127	176	18	1821
02:00-03:00	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	126	168	16	139
03:00-04:00	11	1.25	0.47	4.22	18.76	76.3	83.3	5.6	5.6	114	2.92	380	1404	39	121268
04:00-05:00	16	0.85	0.20	2.88	10.47	88.9	96.0	6.8	12.7	237	1.64	595	1376	119	656393
05:00-06:00	16	0.64	0.17	2.43	7.73	90.2	97.3	3.5	16.5	109	5.26	461	1276	85	363220
06:00-07:00	19	1.15	0.18	2.84	57.15	91.7	96.2	1.1	14.9	186	1.71	548	1316	101	867065
07:00-08:00	30	1.46	0.22	2.71	11.44	87.5	94.9	11.9	26.7	456	2.06	592	1816	205	4948661
08:00-09:00	54	1.49	0.33	3.13	22.54	80.8	91.0	5.3	19.5	2064	1.22	574	1832	579	7600863
09:00-10:00	75	1.82	0.41	3.76	43.11	76.2	87.8	5.7	16.2	5269	0.95	555	1528	1298	8905520
10:00-11:00	77	1.65	0.50	3.64	25.15	71.7	86.3	4.1	12.5	3624	1.49	556	1388	1243	10864636
11:00-12:00	81	2.64	0.41	3.53	48.58	75.5	87.8	5.3	16.5	5855	0.93	551	2700	1271	25200871
12:00-13:00	73	1.12	0.35	3.01	15.96	80.9	90.7	3.6	16.7	2604	1.13	556	1608	591	5572897
13:00-14:00	65	1.08	0.39	3.12	16.10	80.1	89.0	6.6	14.6	4226	1.20	566	1496	852	8490707
14:00-15:00	71	1.21	0.42	3.32	12.11	75.3	87.3	6.2	17.3	4035	1.15	556	1852	1190	7412344
15:00-16:00	74	1.53	0.46	3.61	26.36	71.4	85.6	3.7	11.7	4176	1.11	557	2360	1344	9736541
16:00-17:00	76	1.70	0.54	3.59	32.98	69.0	82.3	4.3	12.9	4066	1.02	539	1488	1423	11866266
17:00-18:00	60	0.97	0.38	3.41	17.86	78.8	89.6	3.9	12.4	1079	1.99	498	1532	638	4997535
18:00-19:00	39	1.13	0.35	7.17	12.95	85.6	93.1	2.0	13.1	578	1.08	471	1564	286	1677817
19:00-20:00	20	0.79	0.22	2.12	9.62	87.0	94.4	16.2	35.1	385	1.18	457	2244	139	2019421
20:00-21:00	11	4.72	4.30	3.58	65.28	75.8	90.1	5.0	15.0	61	0.88	319	792	45	132671
21:00-22:00	12	5.79	0.23	30.97	19.96	84.1	94.5	5.3	15.8	279	5.58	379	788	72	383340
22:00-23:00	13	2.84	0.20	14.08	85.26	86.9	95.5	0.0	7.7	266	0.95	476	1500	137	509227
23:00-24:00	12	0.67	0.26	3.38	0.00	81.2	90.1	3.3	13.3	143	1.14	400	1012	67	131880
Summary	81	1.55	0.42	3.86	27.27	76.9	88.3	5.0	15.3	39817	1.31	543	2700	11777	112463027

Data Level: 51 Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=1:00,DISTRIBUTION=(0.5,1.0)

Figure 3-7. TSO Profile Report



TSO Profile Report
YOUR COMPANY NAME

INQUIRY: TSOLD4 RUN DATE: 27JUN08

System = TSOP

Time Period	Perf Group	Max User	Average Terminal Response Time (sec) Total	Short	Medium	Long	Response Distribution Short(sec) 0.5	1.0	Medium(sec) 0.5	1.0	Command Count	Avg. Net. Delay	Swapping (1K Bytes) Avg	Max	Count	Service Units
08:00-09:00	2	59	1.49	0.33	3.13	22.54	80.8	91.0	5.3	19.5	2064	1.22	574	1832	579	7600863
		59	1.49	0.33	3.13	22.54	80.8	91.0	5.3	19.5	2064	1.22	574	1832	579	7600863
09:00-10:00	2	79	1.82	0.41	3.76	43.11	76.2	87.8	5.7	16.2	5269	0.95	555	1528	1298	8905520
		79	1.82	0.41	3.76	43.11	76.2	87.8	5.7	16.2	5269	0.95	555	1528	1298	8905520
10:00-11:00	2	81	1.65	0.50	3.64	25.15	71.7	86.3	4.1	12.5	3624	1.49	556	1388	1243	10864636
		81	1.65	0.50	3.64	25.15	71.7	86.3	4.1	12.5	3624	1.49	556	1388	1243	10864636
11:00-12:00	2	85	2.64	0.41	3.53	48.58	75.5	87.8	5.3	16.5	5855	0.93	551	2700	1271	25200871
		85	2.64	0.41	3.53	48.58	75.5	87.8	5.3	16.5	5855	0.93	551	2700	1271	25200871
12:00-13:00	2	78	1.12	0.35	3.01	15.96	80.9	90.7	3.6	16.7	2604	1.13	556	1608	591	5572897
		78	1.12	0.35	3.01	15.96	80.9	90.7	3.6	16.7	2604	1.13	556	1608	591	5572897
13:00-14:00	2	73	1.08	0.39	3.12	16.10	80.1	89.0	6.6	14.6	4226	1.20	566	1496	852	8490707
		73	1.08	0.39	3.12	16.10	80.1	89.0	6.6	14.6	4226	1.20	566	1496	852	8490707
14:00-15:00	2	78	1.21	0.42	3.32	12.11	75.3	87.3	6.2	17.3	4035	1.15	556	1852	1190	7412344
		78	1.21	0.42	3.32	12.11	75.3	87.3	6.2	17.3	4035	1.15	556	1852	1190	7412344
15:00-16:00	2	82	1.53	0.46	3.61	26.36	71.4	85.6	3.7	11.7	4176	1.11	557	2360	1344	9736541
		82	1.53	0.46	3.61	26.36	71.4	85.6	3.7	11.7	4176	1.11	557	2360	1344	9736541
Summary		85	1.60	0.42	3.43	28.95	75.9	87.9	5.1	15.4	31853	1.16	558	2700	8368	83784379

Data Level: 51 Options: DATES=01FEB08,TIME=(08:00-16:00),PERFORM,INCREMENT=1:00,DISTRIBUTION=(0.5,1.0)

Figure 3-8. TSO Profile Report by User/Terminal/Performance Group

3.1.2.3 TSO Network Activity

The TSO Network Activity Report summarizes daily and weekly TCAM or VTAM performance communications network activity for TSO terminals.

Additional uses for this report include the following:

- Measuring the results of TSO network tuning efforts.
- Identifying excessive TSO network traffic by time-of-day (peak load effects).
- Detecting wide fluctuations in TSO network load.
- Isolating unused communications paths or TSO terminals.
- Providing data to be used in adjusting host/NCP/cluster buffer sizes.
- Determining actual TSO communications path speeds.

You must run daily TSO Network Activity Reports with the TSO Activity Report, using a standard increment of 15 minutes or more. Used together, the TSO Network Activity Report and the TSO Activity Report can aid in network problem determination and performance management efforts. For example, by comparing standard daily reports to one another, you can identify and investigate periods of degraded TSO response and high workload in the network.

Note: The Network Activity Report displays averages, peaks, average as a percentage of peak, and session averages for each column at the end of the daily report.

Figure 3-9 illustrates a sample Network Activity Report, displaying both detail and summary information.

INQUIRY ID:

TSOLX7 - TSO Network Activity (Detail & Summary)
TSOLX8 - TSO Network Activity (Detail)
TSOLX9 - TSO Network Activity (Summary)

DATA SOURCE (File/Timespan):

TSOTSU - DETAIL

RUNNING THE REPORT

Run these reports under MICF using the run-time parameters

below. The parameters listed below apply to both reports.

- database ID to be processed
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- terminals to be included
- terminals to be excluded
- user IDs to be included
- user IDs to be excluded
- report increment in minutes

TSO Network Activity Detail Report
YOUR COMPANY NAME

INQUIRY: TSOLX7 RUN DATE: 30JUN08

DATE = 01FEB08 SYSID = TSOP

Time Period	Terminals By Type	Users	Characters Per Second TGET	Characters Per Second TPUT	Total Characters TGET	Total Characters TPUT	Terminal I/O TGET	Terminal I/O TPUT	Connect Time	Average Network Delay	Average Short Response	Average Medium Response	Average Total Response
10:00-10:15	32XX 60	2	33	1294	30059	1164724	1382	1539	12:39	1.42	0.66	4.04	1.93
10:15-10:30	32XX 58	5	12	586	21461	1055400	1270	1397	16:42	0.95	0.44	3.55	1.82
10:30-10:45	32XX 64	5	12	491	28580	1179116	1448	1697	18:48	1.20	0.47	3.71	1.21
10:45-11:00	32XX 76	1	9	432	22721	1036774	1290	1689	24:57	1.98	0.43	3.28	1.70
11:00-11:15	32XX 68	7	38	1178	34245	1059960	1350	1583	14:00	0.94	0.50	4.72	3.00
11:15-11:30	32XX 69	5	17	581	30279	1046365	1513	1653	18:28	0.99	0.41	3.79	1.91
11:30-11:45	32XX 66	4	10	339	23193	812614	1095	1172	18:11	0.91	0.35	2.57	3.44
11:45-12:00	32XX 77	4	9	410	22347	985120	1236	1396	25:09	0.86	0.37	3.28	2.43
12:00-12:15	32XX 62	4	20	863	18163	776591	1095	1240	11:34	1.04	0.29	3.13	1.22
12:15-12:30	32XX 45	2	9	429	16834	772334	967	1054	13:24	1.07	0.32	3.15	1.03
12:30-12:45	32XX 51	0	4	258	10222	619040	746	1298	18:27	1.39	0.29	2.83	1.06
12:45-13:00	32XX 62	4	5	259	11990	622449	664	997	20:34	1.05	0.55	2.89	1.15
13:00-13:15	32XX 53	7	19	1089	16797	979819	1099	1479	9:40	1.30	0.42	3.05	1.16
13:15-13:30	32XX 49	1	12	569	22000	1024987	1294	1335	14:09	1.01	0.47	2.99	1.23
13:30-13:45	32XX 55	5	10	412	23889	988261	1263	1334	16:10	1.29	0.37	3.32	1.06
13:45-14:00	32XX 67	4	9	459	22461	1101981	1305	1752	20:59	1.09	0.32	3.13	0.89

OPTIONS: DATES=01FEB08,TIME=(10:00,14:00),ACTIVITY=NETWORK
SELECT BY: SYSID=NO,ZONE=NO,TERMINAL=NO,USER=NO

Figure 3-9. TSO Network Activity Report (Part 1 of 2)

```
                                     TSO Network Activity Summary Report
                                              YOUR COMPANY NAME

INQUIRY:  TSOLX7                                                                                           RUN DATE:  30JUN08
                                                SYSID = TSOP
-----------------------------------------------------------------------------------------------------------------------------
              |             |      |  Characters  |       Total      |  Terminal  |          |              Average
              |  Terminals  |Users |  Per Second  |    Characters    |    I/O     | Connect  |  Network   Short  Medium    Total
              |   By Type   |      |  TGET  TPUT  |  TGET      TPUT  | TGET  TPUT |   Time   |   Delay          Response
--------------+-------------+------+--------------+------------------+------------+----------+-----------------------------------
   AVERAGE    | 32XX     61 |    4 |    14    603 |  22203    951596 | 1189  1413 |    17:07 |    1.16     0.42    3.34     1.64
---------------------------+------+--------------+------------------+------------+----------+-----------------------------------
   MAXIMUMS   | 32XX     77 |    7 |    38   1294 |  34245   1179116 | 1513  1752 |    25:09 |    1.98     0.66    4.72     3.44
---------------------------+------+--------------+------------------+------------+----------+-----------------------------------
AVERAGE/PEAK% | 32XX     79 |   57 |    37     47 |     65        81 |   79    81 |    68:00 |   58.29    62.97   70.80    47.71
---------------------------+------+--------------+------------------+------------+----------+-----------------------------------
   SESSION    | 32XX     60 |    1 |     0     15 |   5921    253759 |  317   377 |     4:34 |    1.21     0.43    3.39     1.70
---------------------------+------+--------------+------------------+------------+----------+-----------------------------------


-----------------------------------------------------------------------------------------------------------------------------
OPTIONS:     DATES=01FEB08,TIME=(10:00,14:00),ACTIVITY=NETWORK
SELECT BY:   SYSID=NO,ZONE=NO,TERMINAL=NO,USER=NO
```

Figure 3-9. TSO Network Activity Report (Part 2 of 2)

3.1.2.4 TSO Network Profile

The TSO Network Profile Report summarizes daily and weekly TCAM or VTAM performance for TSO Terminals. You can use it to do the following:

- Quantify TSO network capacity and usage growth trends
- Measure the results of TSO network tuning efforts
- Identify excessive TSO network traffic by time-of-day (peak load effects)
- Establish a TSO network usage profile
- Isolate unused communications paths or TSO terminals
- Provide data to be used in adjusting host/NCP/cluster buffer sizes
- Determine actual TSO communications path speeds

The report runs on a weekly basis and displays information in the same format as the TSO Network Activity report, but with the detail data sorted into time order without regard to day. A single report line shows data for the entire week, broken out by the reporting increment specified (e.g., one hour).

This format is very useful in identifying regular patterns in the workload of the TSO network either as a whole or for network subsets. You can establish baseline measurements of TSO network performance across several days or weeks, and compare them to the standard daily reports during network problem diagnosis. By using the terminal INCLUDE or EXCLUDE sub-keywords, you can use this report to determine how much a given terminal used TSO during the week.

The report shows daily and weekly communications network performance for TSO terminals as a function of time. At the end of each daily or weekly report, the network reports display averages, peaks, averages as a percentage of peak, and session averages for each column.

Figure 3-10 illustrates a sample Network Profile Report, displaying both detail and summary information.

INQUIRY ID:

TSOLD5 - TSO Network Profile (Detail & Summary)
TSOLD6 - TSO Network Profile (Detail)
TSOLD7 - TSO Network Profile (Summary)

DATA SOURCE (File/Timespan):

TSO_TA - DAYS

RUNNING THE REPORT

Run these reports under MICF, using the run-time parameters below. The parameters listed below apply to all reports.

- database ID to be processed
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- terminals to be included
- terminals to be excluded
- report increment in hours

TSO Network Profile Report
YOUR COMPANY NAME

INQUIRY: TSOLD5 RUN DATE: 30JUN08

SYSID = TSOP

Time Period	Terminals By Type	New Logons	Characters Per Second TGET	Characters Per Second TPUT	Total Characters TGET	Total Characters TPUT	Terminal I/O TGET	Terminal I/O TPUT	Connect Time	Average Response Short	Average Response Medium	Average Response Total	Average Network Delay
00:00-01:00	32XX 7	0	10	0	36507	584	24	23	6:08	0.05	0.00	1.26	0.00
01:00-02:00	32XX 6	0	0	0	0	0	0	0	6:00	0.00	0.00	0.00	0.00
02:00-03:00	32XX 6	0	0	0	0	0	0	0	6:00	0.00	0.00	0.00	0.00
03:00-04:00	32XX 8	2	0	28	1471	100846	130	160	7:10	0.48	4.22	149.47	2.92
04:00-05:00	32XX 12	4	2	139	7379	501461	539	598	11:16	0.20	3.00	432.56	1.64
05:00-06:00	32XX 12	0	1	141	3190	506162	453	475	12:00	0.17	2.43	290.74	5.26
06:00-07:00	32XX 14	3	2	114	6634	408771	516	552	12:36	0.17	2.69	580.81	1.67
07:00-08:00	32XX 26	12	4	231	15901	831143	948	1058	20:11	0.21	2.69	1419.50	2.06
08:00-09:00	32XX 55	31	25	751	90001	2702058	3033	3396	36:40	0.33	3.07	4568.37	1.13
09:00-10:00	32XX 76	30	56	1255	202939	4518156	5404	6035	65:11	0.41	3.81	9989.71	0.94
10:00-11:00	32XX 77	12	28	1215	101476	4372595	5336	6255	70:02	0.50	3.64	8823.06	1.47
11:00-12:00	32XX 82	18	30	1067	109506	3842312	5127	5732	72:27	0.41	3.53	13610.9	0.93
12:00-13:00	32XX 75	10	16	773	56850	2781584	3448	4314	61:54	0.34	3.02	3846.24	1.13
13:00-14:00	32XX 71	17	24	1135	85088	4087552	4949	5699	58:58	0.39	3.12	5348.62	1.20
14:00-15:00	32XX 73	18	48	1249	171802	4497729	5145	6551	64:56	0.42	3.31	6241.27	1.15
15:00-16:00	32XX 80	15	79	1273	284475	4583556	5957	6878	69:11	0.46	3.61	9092.23	1.11
16:00-17:00	32XX 80	19	74	1467	265725	5280159	6830	7858	68:17	0.54	3.59	11626.3	1.02
17:00-18:00	32XX 62	5	33	824	119992	2966542	4503	5339	47:48	0.38	3.41	4334.41	1.99
18:00-19:00	32XX 37	2	11	690	40125	2482758	2875	3312	27:00	0.35	7.18	3220.17	1.07

OPTIONS: DATES=01FEB08,TIME=(00,24),PROFILE=NETWORK,INCR=1
SELECT BY: SYSID=YES,ZONE=NO,TERMINAL=YES

Figure 3-10. TSO Network Profile (Part 1 of 2)

```
-----------------------------------------------------------------------------------------------------------------------------
                                                    TSO Network Profile Report
                                                         YOUR COMPANY NAME

INQUIRY:  TSOLD5                                                                                           RUN DATE:  30JUN08
                                                          SYSID = TSOP
-----------------------------------------------------------------------------------------------------------------------------
              |             |      |  Characters  |      Total       |  Terminal  |          |             Average
              |  Terminals  | New  |  Per Second  |   Characters     |    I/O     | Connect  |         Response           Network
              |   By Type   |Logons|  TGET  TPUT  |  TGET      TPUT  | TGET  TPUT |   Time   |  Short   Medium   Total     Delay
--------------+-------------+------+--------------+------------------+------------+----------+------------------------------------
   AVERAGE    | 32XX     38 |    9 |    22    542 |  80538  1942777  | 2413  2813 |    32:08 |   0.46     4.61   3760.27      1.52
--------------------------- +------+--------------+------------------+------------+----------+------------------------------------
   MAXIMUMS   | 32XX     82 |   31 |    83   1467 | 299425  5280159  | 6830  7858 |    72:27 |   4.30    30.97  13610.94      5.58
----------------------------+------+--------------+------------------+------------+----------+------------------------------------
AVERAGE/PEAK% | 32XX     46 |   29 |    26     37 |     27        37 |   35    36 |    44:00 |  10.68    14.88     27.63     27.20
----------------------------+------+--------------+------------------+------------+----------+------------------------------------
   SESSION    | 32XX    210 |    1 |     1     17 |   9204   222032  |  276   321 |     3:40 |   0.42     3.88      1.56      1.29
----------------------------+------+--------------+------------------+------------+----------+------------------------------------

-----------------------------------------------------------------------------------------------------------------------------
OPTIONS:    DATES=01FEB08,TIME=(00,24),PROFILE=NETWORK,INCR=1
SELECT BY:  SYSID=YES,ZONE=NO,TERMINAL=YES
```

Figure 3-10. TSO Network Profile (Part 2 of 2)

3.1.2.5 TSO Command Use Counts

The TSO Command Use Counts Report shows the command and subcommand count for each CLIST, command, and subcommand name, command type, dialog panels and program names, as well as the number of executions of the command, CLIST, dialog program, or panel. You can use it to do the following:

- Identify the most frequently used commands and subcommands.
- Display user-selected response categories as defined in the Command Table.
- Identify commands as primary or subcommand when no Command Table entry exists.

The report lists the count of TSO commands and subcommands in the order of their frequency of use within the selected reporting period. You can produce a separate report for each of the following categories that have statistics to report.

- Command Use Counts for TSO
- Command Use Counts for EDIT
- Command Use Counts for TEST
- Command Use Counts for SPF (with SPF Interface - SPFI)
- Program Use Counts for SPF Dialog Manager (with SPFI)
- Panel Use Counts SPF Dialog Manager (with SPFI)

Each of these reports lists the commands in the sequence you select.

Figure 3-11 illustrates a sample TSO Command Use Count Report.

INQUIRY ID:

TSOLX6 - TSO Command Use Counts

DATA SOURCE (File/Timespan):

TSOTSU/TSO_BU/TSOTSC/TSO_BC - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

TSOLX6 - TSO Command Use Counts Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- SYSID values
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds
- select average network delay or minimum TIOC count
- select command count or response events count
- report sequenced by count or command

TSO Activity Report
YOUR COMPANY NAME

INQUIRY: TSOLX6 RUN DATE: 23JUN08

System = TSOP
For FEBRUARY 1, 2008

Time Period	Max Actv Usrs	Average Response Time (sec) Total	Short	Medium	Long	Terminal Response Time (sec) Short(sec) 0.5	1.0	Medium(sec) 0.5	1.0	Command Count	Avg. Net. Delay	Swapping (1K Bytes) Avg	Max	Count	Service Units
6:00- 7:00	1	5.94	0.00	5.94	0.00	0.0	0.0	0.0	0.0	12	0.00	240	240	1	4883
7:00- 8:00	2	1.78	0.53	2.91	6.28	51.7	72.4	37.5	37.5	48	0.00	626	1816	21	200053
8:00- 9:00	2	0.81	0.39	2.71	0.00	71.7	84.9	0.0	0.0	32	0.81	439	704	25	35859
9:00-10:00	2	1.05	0.26	2.30	17.57	86.4	94.4	21.1	37.8	108	1.50	471	1528	58	571175
10:00-11:00	2	3.05	0.22	2.75	18.18	89.2	94.3	29.7	32.4	55	1.85	567	1240	45	1563372
11:00-12:00	2	4.90	0.33	2.82	47.80	77.5	90.2	26.1	34.8	15	1.67	490	1128	32	812607
12:00-13:00	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0	0.00	166	168	2	1063
13:00-14:00	2	0.82	0.29	3.70	8.67	80.5	91.2	8.3	12.5	32	1.32	602	1432	54	366349
14:00-15:00	2	0.71	0.35	4.05	0.00	82.8	91.4	0.0	0.0	20	1.27	545	960	47	112206
15:00-16:00	2	2.59	0.28	3.01	14.97	83.1	92.0	12.2	26.8	42	1.25	747	1436	63	1702734
16:00-17:00	2	5.57	0.29	1.66	28.09	87.3	92.8	25.9	48.3	34	1.14	766	1396	63	3354931
17:00-18:00	2	2.24	0.40	2.61	21.51	83.0	92.8	17.2	20.7	29	1.34	640	1184	34	1179300
18:00-19:00	1	0.32	0.19	4.34	0.00	91.7	95.3	0.0	0.0	32	0.75	368	532	19	100449
19:00-20:00	1	1.20	0.18	3.05	5.08	88.0	96.0	6.3	37.5	31	0.93	746	1368	5	400463
Summary	2	2.02	0.28	2.70	21.24	84.9	92.8	18.5	30.1	490	1.31	595	1816	469	10405444

Data Level: 51 Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
INCLUDE=USER=ABCY06 ABCY45

Figure 3-11. Command Use Counts (Part 1 of 3)

```
                                        Command Use Counts for TSO
                                            YOUR COMPANY NAME

INQUIRY:  TSOLX6                                                                                          RUN DATE:  23JUN08
-------------------------------------------------------------------------------------------------------------------------------
  ALLOCATE      47   | SUBMIT        21   | EXEC          18   | FREE          14   | SPF            7   | SASCP          4
  LOGON          3   | PERMALOC       3   | PROFILE        3   | LOGOFF         2   | CALL           1   | FREEALL        1
  IEBCOPY        1   | TERMINAL       1   |                .   |                .   |                .   |                .
-------------------------------------------------------------------------------------------------------------------------------
                                                                                                                        126
-------------------------------------------------------------------------------------------------------------------------------
Data Level: 51  Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
 INCLUDE=USER=ABCY06 ABCY45



-------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------
                                        Command Use Counts for CLISTs
                                            YOUR COMPANY NAME

INQUIRY:  TSOLX6                                                                                          RUN DATE:  23JUN08
-------------------------------------------------------------------------------------------------------------------------------
  ASIGNON        3   | CSS            3   | MSIGNON        3   | MSYSPROC       3   | MWF            3   | MWFLDEF        2
  FTTSO210       1   |                .   |                .   |                .   |                .   |                .
-------------------------------------------------------------------------------------------------------------------------------
                                                                                                                         18
-------------------------------------------------------------------------------------------------------------------------------
Data Level: 51  Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
 INCLUDE=USER=ABCY06 ABCY45



-------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------
                                        Command Use Counts for SPF
                                            YOUR COMPANY NAME

INQUIRY:  TSOLX6                                                                                          RUN DATE:  23JUN08
-------------------------------------------------------------------------------------------------------------------------------
  RFIND         68   | FIND          40   | DELETE        34   | SPFEDIT       26   | SUBMIT        24   | CANCEL        15
  AFTER         11   | INSERT        11   | MOVCOP$        8   | COPY           6   | SAVE           5   | FIRST          4
  CSS            3   | EDRECUR        3   | BROWSE         2   | MOVE           2   | REPEAT         2   | COLSHIFT       1
  EXCLUDE        1   | LIBUTIL        1   | UTILMC         1   |                .   |                .   |                .
-------------------------------------------------------------------------------------------------------------------------------
                                                                                                                        268
-------------------------------------------------------------------------------------------------------------------------------
Data Level: 51  Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
 INCLUDE=USER=ABCY06 ABCY45
```

Figure 3-11. Command Use Counts (Part 2 of 3)

```
                                    Program Use Counts for SPF Dialog Manager
                                              YOUR COMPANY NAME

INQUIRY:  TSOLX6                                                                                                RUN DATE:  23JUN08
-------------------------------------------------------------------------------------------------------------------------------
  MADA          75   | IOFSPF        17   | BLGINIT1       3   | MADMI          1   |               .   |                .
-------------------------------------------------------------------------------------------------------------------------------
                                                                                                                          96
-------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------
Data Level: 51  Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
 INCLUDE=USER=ABCY06 ABCY45



-------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------
                                     Panel Use Counts for SPF Dialog Manager
                                              YOUR COMPANY NAME

INQUIRY:  TSOLX6                                                                                                RUN DATE:  23JUN08
-------------------------------------------------------------------------------------------------------------------------------
  VIOFSCRN    1235   | BLG#PRIM     138   | ICFC100       88   | ICFP002       80   | ICFX000       76   | ICFS230       49
  ICFS230J      33   | ICFQ100       29   | ICFE130       27   | ICFE004       26   | ICFS130       22   | ICFE001       21
  ICFS230E      20   | ICFS230A      18   | ICF@PRIM      16   | ICFB300       16   | MWF@PRM1      14   | ICFS140       12
  ICFP000        9   | ICFS050        8   | ICFS165        7   | PMRT100        6   | ICFB100        5   | ICFS230G       5
  ICF@ADMN       4   | ICFAP00        4   | ICFS230F       4   | MAF#PRM2       3   | ICFS100        2   | ICFS230B       2
  ICFS230C       2   | ICFS230H       2   | MAF#PRIM       2   | MAF#PRM0       2   | MWFSASP        2   | MWFSASU        2
  VIOFPCM        2   | ICFAK100       1   | ICFC000I       1   | ICFS120        1   |               .   |                .
-------------------------------------------------------------------------------------------------------------------------------
                                                                                                                       1996
-------------------------------------------------------------------------------------------------------------------------------
Data Level: 51  Options: DATES=NONE,TIME=(00:00-24:00),INCREMENT=60,DISTRIBUTION=(0.5,1.0)
 INCLUDE=USER=ABCY06 ABCY45
```

Figure 3-11. Command Use Counts (Part 3 of 3)

3.1.2.6 TSO User Ranking Report

The TSO User Ranking Report identifies the 'top' or 'bottom' 'n' TSO users by reporting increment (e.g., fifteen minutes) in any one of the following categories:

- Average total response time
- Average short response time
- Average medium response time
- Average long response time
- Total response events
- Total CPU time
- Total EXCPs
- Total terminal I/O
- Total swaps
- Total commands
- Total service units
- Total transactions

Note: 'Top' means highest numerically
'Bottom' means lowest numerically

For example, this report can display the three TSO users who received the highest average short response time in each fifteen minute reporting interval in a particular time range on a specific date.

You can use this report to do the following:

- Identify those userids consuming the most resources in any of twelve categories.
- Isolate problem time periods, the userids within that period, and the resources each consumed.
- Provide a base for evaluating system performance changes.
- Display the total number of userids existing within the reporting increment, even if all are not listed.

Figure 3-12 illustrates a sample TSO User Ranking by Response Report.

INQUIRY ID:

TSOLXQ - TSO User Ranking by Response/Time
TSOLXR - TSO User Ranking by Resource/Activity

DATA SOURCE (File/Timespan):

TSOTSU - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the appropriate
run-time parameters.

TSOLXQ - TSO User Ranking by Response

- database ID to be processed
- range of CA MICS file cycles to be processed
- ranking by total response time, short response time, medium response time, long response time, or CPU time
- ranking order: top or bottom "n" items
- number of rankings
- user IDs to be included
- user IDs to be excluded
- terminals to be included
- terminals to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service classes to be excluded
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- response distribution limits
  - SHORT response in seconds
  - MEDIUM response in seconds
  - LONG response in seconds
  - TOTAL response in seconds

TSOLXR - TSO User Ranking by Resource/Activity

- database ID to be processed
- range of CA MICS file cycles to be processed
- ranking by commands, events, EXCPs, terminal I/O, transactions, service units, or swaps
- ranking order: top or bottom "n" items
- number of rankings
- user IDs to be included
- user IDs to be excluded
- terminals to be included
- terminals to be excluded
- performance group numbers or workload manager service classes to be included

- o performance group numbers or workload manager service classes to be excluded
- o SYSID values to be included
- o range of dates to be processed
- o time range to be processed
- o zone values
- o report increment in minutes
- o response distribution limits
  - SHORT response in seconds
  - MEDIUM response in seconds
  - LONG response in seconds
  - TOTAL response in seconds

```
                                          TOP 3 USERS BY TOTAL RESPONSE
                                               YOUR COMPANY NAME

INQUIRY:  TSOLXQ                                                                                          RUN DATE:  12JUN08
                                                System = TSOP
                                           For   FEBRUARY 1, 2008
-----------+-------+---+-----+--------------------------------+-------------------------------------------------------------
           |       |   |     |                                |TOP LINE IS QUANTITY / BOTTOM LINE IS PCT OF TIME PERIOD TOTAL
           |       |   |RESP | RESPONSE AVERAGE / DISTRIBUTION|---------+--------------+--------------+--------+----------------
TIME       |USERID |PGN|EVENT|  TOTAL  SHORT   MEDIUM   LONG  | CPUTIME | EXCPS  TERMIO| SWAPS   CMDS |SERVICE | TRANS
------+----+-------+---+-----+--------------------------------+---------+--------------+--------------+--------+----------------
 8:00- 9:00|       |   |     |                                |         |              |              |        |
  59 USERS |ABCX51 |  2|    2| 0:11.46 0:00.00 0:11.46 0:00.00|   0:01.9|    518     26|      2     20|   16252|    18
IN INTERVAL|       |   |     |    0.0%    0.0%    0.0%    0.0%|     0.0%|   0.0%   0.0%|   0.0%   0.1%|    0.0%|   0.0%
           |       |   |     |                                |         |              |              |        |
           |ABCX67 |  2|    3| 0:10.80 0:00.75 0:00.00 0:30.90|   0:03.1|    901      8|      2     35|   22622|    36
           |       |   |     |   66.7%   50.0%    0.0%    0.0%|     0.4%|   1.1%   0.1%|   0.3%   1.7%|    0.3%|   0.9%
           |       |   |     |                                |         |              |              |        |
           |ABCY20 |  2|   66| 0:10.38 0:00.35 0:02.53 3:19.83|   0:13.5|   4268    132|     26     19|  160113|    68
           |       |   |     |   90.9%   91.2%   58.6%    0.0%|     1.9%|   5.0%   2.0%|   4.5%   0.9%|    2.1%|   1.7%
-----------+-------+---+-----+--------------------------------+---------+--------------+--------------+--------+----------------
 9:00-10:00|       |   |     |                                |         |              |              |        |
  79 USERS |ABCX35 |  2|   66| 0:17.71 0:00.42 0:03.54 8:44.11|   0:33.0|  33875    140|     11     41|  364885|    94
IN INTERVAL|       |   |     |   87.9%   94.1%   43.3%    0.0%|     3.5%|  17.3%   1.2%|   0.8%   0.8%|    4.1%|   1.4%
           |       |   |     |                                |         |              |              |        |
           |ABCY22 |  2|    4| 0:12.96 0:00.01 0:14.20 0:23.45|   0:04.1|   1185     18|      7     30|   35185|    34
           |       |   |     |   25.0%  100.0%    0.0%    0.0%|     0.4%|   0.6%   0.2%|   0.5%   0.6%|    0.4%|   0.5%
           |       |   |     |                                |         |              |              |        |
           |ABCY79 |  2|  199| 0:08.28 0:00.26 0:04.22 3:38.79|   2:44.2|  38814    414|     15    102| 1704513|   256
           |       |   |     |   94.0%   93.7%   29.4%    0.0%|    17.5%|  19.9%   3.5%|   1.2%   1.9%|   19.1%|   3.9%
-----------+-------+---+-----+--------------------------------+---------+--------------+--------------+--------+----------------
10:00-11:00|       |   |     |                                |         |              |              |        |
  81 USERS |ABCX57 |  2|   40| 0:09.70 0:00.55 0:02.80 0:21.33|   1:46.3|   2024     86|     21      7| 1123294|    44
IN INTERVAL|       |   |     |   67.5%   77.8%   46.7%   37.5%|     9.6%|   1.3%   0.7%|   1.7%   0.2%|   10.3%|   0.7%
           |       |   |     |                                |         |              |              |        |
           |ABCY06 |  2|   76| 0:08.18 0:00.31 0:02.52 0:18.18|   2:17.3|   4549    176|     18     21| 1526078|    90
           |       |   |     |   72.4%   88.9%   60.7%   46.7%|    12.4%|   3.0%   1.5%|   1.4%   0.6%|   14.0%|   1.5%
           |       |   |     |                                |         |              |              |        |
           |ABCX47 |  2|  102| 0:05.17 0:00.54 0:01.00 0:17.67|   2:31.4|   3766    226|     45     14| 1640028|   113
           |       |   |     |   84.3%   76.4%   80.0%   40.7%|    13.7%|   2.5%   1.9%|   3.6%   0.4%|   15.1%|   1.9%
-----------+-------+---+-----+--------------------------------+---------+--------------+--------------+--------+----------------

--------------------------------------------------------------------------------------------------------------------------------
DATES=NONE,TIME=(08:00-17:00),INCREMENT=60,TOTAL=5.00,SHORT=1.00,MEDIUM=2.00,LONG=5.00
```

Figure 3-12. TSO User Ranking Report

3.1.2.7 TSO Terminal Ranking

The TSO Terminal Ranking Report provides a unique tracking and TSO network tuning capability for CA TSO/MON PM installations. It permits identification of the 'top' or 'bottom' 'n' TSO terminals by reporting increment (e.g., 15 minutes) in any one of the following categories:

- o total number of characters read via TGET
- o total number of characters written via TPUT
- o total number of characters transmitted by TGET and TPUT
- o total number of TGETs issued
- o total number of TPUTs issued
- o total number of TGETs and TPUTs issued
- o total TSO terminal connect time
- o average total response time
- o average short response time

Note: 'Top' means highest numerically
'Bottom' means lowest numerically

For example, this report can display the ten TSO terminals that received the highest average short response time in each 15 minute reporting increment during a selected time range on a specified date.

You can use the report to do the following:

- o Identify the highest or lowest resource-consuming terminal locations.
- o Isolate problem time periods, the terminal IDs and user IDs within that time period, and the resources each consumed.
- o Provide a base for evaluating network performance changes.
- o Display the total number of terminals used for TSO within the reporting increment even if all are not listed on the report.
- o Isolate individual users of TSO terminals in a shared terminal pool.

Figure 3-13 illustrates a sample TSO Terminal Ranking Report.

INQUIRY ID:

TSOLXT - TSO Terminal Ranking by Response/Time
TSOLXU - TSO Terminal Ranking by Activity

```
DATA SOURCE (File/Timespan):

   TSOTSU - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time
parameters:

 TSOLXT - TSO Terminal Ranking by Response/Time
   o  range of CA MICS file cycles to be processed
   o  database ID to be processed
   o  ranking by number of total or short responses or
      connect time
   o  ranking order:  top or bottom "n" items
   o  number of rankings
   o  user IDs to be included
   o  user IDs to be excluded
   o  terminals to be included
   o  terminals to be excluded
   o  performance group numbers or workload manager service
      classes to be included
   o  performance group numbers or workload manager service
      classes to be excluded
   o  SYSID values to be included
   o  range of dates to be processed
   o  time range to be processed
   o  zone values
   o  report increment in minutes
   o  one response time objective


TSOLXU - TSO Terminal Ranking by Activity
   o  range of CA MICS file cycles to be processed
   o  database identifier
   o  activity ranking by CHARTOT, CHARTGET, CHARTPUT,
      TERMIO, TERMTGET, TERMTPUT
   o  ranking order:  top or bottom "n" items
   o  number of rankings
   o  user IDs to be included
   o  user IDs to be excluded
   o  terminal IDs to be included
   o  terminal IDs to be excluded
   o  performance group numbers or workload manager service
      classes to be included
   o  performance group numbers or workload manager service
      classes to be excluded
   o  SYSID values to be included
   o  date range to be processed
```

- time range to be processed
- zone values
- report increment in minutes
- one response time objective

```
                                        TOP 3 TERMINALS BY CONNECT TIME
                                              YOUR COMPANY NAME

INQUIRY:  TSOLXT                                                                                                  RUN DATE:  12JUN08
                                                    System = TSOP
                                                  For   FEBRUARY 1, 2008
----------------+----------+------+-------------------------------------------------------------------------------------------------------
                |          |      |<-------------- TOP LINE IS QUANTITY / BOTTOM LINE IS PCT OF TIME PERIOD TOTAL -------------->
                | TERMINAL | TYPE |  CPU   EXCP |     CHARACTERS     |    TERMIO    |  CONNECT |<------- RESPONSE AVERAGE ------->
     TIME       |  USERID  |ACCMET| TIME   COUNT|    TGET    TPUT    |  TGET   TPUT |   TIME   |  TOTAL |  SHORT | MEDIUM | NETDEL
----------------+----------+------+-------------+--------------------+--------------+----------+--------+--------+--------+-------
 20:00-21:00    |          |      |             |                    |              |          |        |        |        |
  11 TERMINALS  | ABC30014 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
  IN INTERVAL   |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |   10.3%  |    0.0%|    0.0%|    0.0%|      0
                | ABCX12   |      |             |                    |              |          |        |        |        |
                |          |      |             |                    |              |          |        |        |        |
                | ABC30154 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
                |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |   10.3%  |    0.0%|    0.0%|    0.0%|      0
                | ABCY21   |      |             |                    |              |          |        |        |        |
                |          |      |             |                    |              |          |        |        |        |
                | ABC30196 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
                |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |   10.3%  |    0.0%|    0.0%|    0.0%|      0
                | ABCY68   |      |             |                    |              |          |        |        |        |
----------------+----------+------+-------------+--------------------+--------------+----------+--------+--------+--------+-------
 21:00-22:00    |          |      |             |                    |              |          |        |        |        |
  13 TERMINALS  | ABC30014 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
  IN INTERVAL   |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |    9.7%  |    0.0%|    0.0%|    0.0%|      0
                | ABCX12   |      |             |                    |              |          |        |        |        |
                |          |      |             |                    |              |          |        |        |        |
                | ABC30154 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
                |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |    9.7%  |    0.0%|    0.0%|    0.0%|      0
                | ABCY21   |      |             |                    |              |          |        |        |        |
                |          |      |             |                    |              |          |        |        |        |
                | ABC30196 | 3270 |0:00:00     0|       0        0   |     0      0 | 1:00:00  | 0:00.00| 0:00.00| 0:00.00|0:00.00
                |          | VTAM |  0.0%  0.0% |    0.0%     0.0%   |  0.0%   0.0% |    9.7%  |    0.0%|    0.0%|    0.0%|      0
                | ABCY68   |      |             |                    |              |          |        |        |        |
----------------+----------+------+-------------+--------------------+--------------+----------+--------+--------+--------+-------

-------------------------------------------------------------------------------------------------------------------------------------
DATES=NONE,TIME=(20:00-23:59),INCREMENT=60
```

Figure 3-13. TSO Terminal Ranking

3.1.2.8 TSO Command Activity

The TSO Command Activity Report details the performance and resource consumption of specific TSO commands and programs. You use it to analyze the resources that the various TSO commands require and the programs they invoke. In addition, it lets you do the following:

- Identify potential problems with specific TSO commands.
- Quantify CLIST activity and resource consumption at the user level.
- Quantify command workload at the system level.
- Analyze command performance.

It provides information that you can use to define commands as short, medium, or long, and to establish the TSO Installation Performance Specification (IPS) factors that best service the commands.

INQUIRY ID:

TSOLX4 - TSO Command Activity Report

DATA SOURCE (File/Timespan):

TSOTSI/TSO_BI - DETAIL

Figure 3-14 illustrates a sample TSO Command Activity Report.

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

TSOLX4 - TSO Command Activity Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- terminals to be included
- terminals to be excluded
- user IDs to be included

- user IDs to be excluded
- option to remove all user IDs from the report
- report sorted by user/command, command/user, or none
- option to produce sub-total by user ID
- option to produce sub-total by command
- option to print all detail observations
- command names to be included
- command names to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service classes to be excluded
- two response time limit objectives in seconds
- select average response time or elapsed execution time

TSO Command Activity Report
YOUR COMPANY NAME

INQUIRY: TSOLX4 RUN DATE: 2JUN08

System = TSOP
SEQUENCE = COMMAND

UserID	Command Name	Cmd Count	Response T Avg. 5.00S Y 10.00S P	Storage Residency	TCB CPU Time SRB CPU Time	Excp Counts	TermIO TGET TPUT	Swapping Count	Swapping Avg Max	SRM Values Ended Trans Service Unit
ABCX04	CALL	227	11.60 93.8 L 99.0	6:00:50.7 0:02:48.3	0:27:33.4 0:02:48.3	365218 15970	14653 15970	4493	701 2244	17340 18136127
		227	11.60 93.8 99.0	6:00:50.7 0:02:48.3	0:27:33.4 0:02:48.3	365218 15970	14653 15970	4493	701 2244	17340 18136127

Data Level: 51 Option: ,DATES=01FEB08,TIME=(00:00-24:00),DISTRIBUTION=(5.00,10.00),ELAPSED

Figure 3-14. TSO Command Activity Report

3.1.2.9 TSO Program Activity

The TSO Program Activity Report provides detail and summary information on interactive applications and is designed to be run daily or weekly depending on the options selected. The information may be summarized in one of the following ways:

- Summarized by program to identify applications using the most resources.
- Summarized by userid to pinpoint user resource consumption.

You can use the report to do the following:

- Identify potential problem applications.
- Quantify application workload at the user level.
- Quantify application workload at the system level.
- Analyze interactive application program performance.

Figure 3-15 illustrates a sample TSO Program Activity Report.

INQUIRY ID:

TSOLX5 - TSO Program Activity Report

DATA SOURCE:

TSOTSI/TSO_BI - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

TSOLX5 - TSO Program Activity Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- option to remove all user IDs from the report
- report sorted by user/program, program/user, or none
- option to produce sub-total by user ID
- option to produce sub-total by program
- option to print all detail observations
- program names to be included
- program names to be excluded
- user IDs to be included
- user IDs to be excluded

- terminal IDs to be included
- terminal IDs to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service classes to be excluded
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- two response time limit objectives in seconds
- select average response time or elapsed execution time

TSO Program Activity Report
YOUR COMPANY NAME

INQUIRY: TSOLX5 RUN DATE: 3JUN08

System = TSOP

UserID	Program Name	Pgm Count	Response T Avg.	0.5S Y 1.0S P	Storage Residency	TCB CPU Time SRB CPU Time	TermIO Excp Counts	TermIO TGET TPUT	Swapping Count	Swapping Avg Max	SRM Values Ended Trans Service Unit
ABCX03	.		1.10	45.9 X	0:00:59.9	0:00:04.8	650	39	26	364	72
		1		67.6		0:00:00.4		47		1104	48221
ABCX04	.		1.40	42.9 X	0:01:32.3	0:00:06.4	2825	22	7	823	22
		2		61.9		0:00:00.7		33		1204	73514
ABCX08	.		1.62	37.5 X	0:00:56.4	0:00:02.4	93	25	7	158	30
		1		37.5		0:00:00.2		25		272	14575
ABCX10	.		1.48	48.2 X	0:07:13.5	0:00:38.6	8287	268	112	733	299
		10		59.1		0:00:03.5		271		1564	437746
ABCX25	.		0.93	60.4 X	0:09:14.9	0:00:56.9	8544	552	97	706	561
		4		80.5		0:00:05.1		597		1388	597520
ABCX26	.		0.86	47.1 X	0:00:42.6	0:00:02.7	586	19	24	522	31
		2		76.5		0:00:00.3		19		1260	29153
ABCX28	.		1.39	24.1 X	0:01:12.5	0:00:03.1	675	59	5	235	64
		9		38.9		0:00:00.6		75		368	24516
ABCX29	.		1.51	55.2 X	0:11:57.0	0:01:04.3	12368	424	166	724	509
		2		68.3		0:00:05.3		448		1020	724140
ABCX30	.		1.17	50.0 X	0:00:56.7	0:00:04.3	810	40	15	402	49
		5		50.0		0:00:00.5		42		1124	41935
ABCX31	.		1.62	35.0 X	0:03:35.2	0:00:15.3	1833	106	32	553	119
		7		40.0		0:00:01.2		107		1256	144016
ABCX41	.		1.27	55.6 X	0:03:13.5	0:00:15.6	3430	144	70	624	225
		2		64.7		0:00:01.6		146		952	174001

Data Level: 51 Option: USER,DATES=NONE,TIME=(00:00-24:00),DISTRIBUTION=(0.5,1.0)

Figure 3-15. TSO Program Activity Report

3.1.2.10 TSO Workload Response Report

The TSO Workload Response Report reports daily service and resource consumption figures as a function of time. The report includes average response time, response events counts, service units consumed, average swap-in delay, average swap-in time, average residency time, and the average network delay.

Figure 3-16 illustrates a sample TSO Workload Response Report.

INQUIRY ID:

TSOLXJ - TSO Workload Response Report

DATA SOURCE (File/Timespan):

TSOTSO - DETAIL (For online TSO reporting.)
TSO_BU - DETAIL (For batch TSO reporting.)

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

TSOLXJ - TSO Workload Response Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- SYSID values
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds

TSO WORKLOAD RESPONSE REPORT
YOUR COMPANY NAME

INQUIRY: TSOLXJ RUN DATE: 12DEC08

System = TSOP
For NOVEMBER 3, 2008

TIME PERIOD	AVERAGE TERMINAL RESPONSE TIME (SECS) TOTAL	SHORT	MEDIUM	LONG	RESPONSE EVENT COUNTS SHORT	MEDIUM	LONG	SERVICE UNITS SHORT AVG.	MEDIUM AVG.	LONG AVG.	AVG. SWAPIN DELAY	AVG. SWAPIN TIME	AVERAGE RESIDENCY TIME	AVG. NET. DELAY
10:00-10:15	1.17	0.36	1.98	6.97	874	144	103	265	1925	173648	0.01	0.14	1.54	0.09
10:15-10:30	1.71	0.38	2.28	11.76	1163	173	145	258	1887	160617	0.02	0.15	1.93	0.32
10:30-10:45	1.75	0.39	2.36	17.74	1065	126	86	257	2016	315552	0.02	0.15	3.18	0.43
10:45-11:00	2.45	0.36	2.19	24.16	953	111	93	229	1746	441086	0.02	0.15	2.19	0.08
11:00-11:15	1.89	0.42	2.25	15.07	1184	219	126	261	2000	414094	0.02	0.16	1.99	0.09
11:15-11:30	1.52	0.44	2.49	12.52	1458	184	127	244	1809	453783	0.02	0.15	1.80	0.29
11:30-11:45	1.51	0.38	2.44	16.00	1125	153	78	268	2015	743696	0.01	0.15	1.75	0.20
11:45-12:00	1.49	0.27	2.19	13.02	705	84	69	240	1937	683282	0.01	0.14	1.76	0.09
12:00-12:15	0.93	0.31	2.23	6.19	661	107	52	253	1892	801285	0.01	0.14	1.28	0.07
12:15-12:30	1.37	0.27	1.80	8.74	621	159	84	251	1910	513736	0.01	0.16	1.81	0.81
12:30-12:45	1.07	0.37	2.14	8.36	774	119	56	262	1914	804246	0.02	0.18	1.38	0.47
12:45-13:00	1.17	0.28	1.72	8.89	807	150	82	237	1852	615635	0.02	0.15	1.42	5.01
13:00-13:15	0.95	0.31	1.75	6.10	842	158	80	235	1893	674488	0.01	0.15	1.30	0.38
13:15-13:30	0.81	0.28	1.92	6.10	970	149	66	228	1791	764966	0.01	0.14	1.28	0.64
13:30-13:45	0.82	0.28	1.87	5.80	1019	172	74	232	2035	645515	0.01	0.14	1.07	0.20
13:45-14:00	0.88	0.35	2.19	6.78	1213	179	69	221	2058	622421	0.01	0.15	1.17	0.31
14:00-14:15	1.04	0.36	2.47	9.24	1569	240	87	218	1914	519845	0.02	0.15	1.33	0.52
14:15-14:30	0.88	0.33	2.49	9.21	1595	188	69	228	1876	642014	0.01	0.15	1.43	0.42
14:30-14:45	0.85	0.36	2.59	7.37	1427	169	63	224	1969	721679	0.02	0.15	1.18	0.81
14:45-15:00	0.98	0.34	2.00	7.18	1288	233	97	246	1845	453943	0.01	0.14	1.24	0.24
15:00-15:15	0.74	0.28	1.87	5.33	1059	163	66	240	1962	669319	0.01	0.14	1.03	0.42
15:15-15:30	0.79	0.26	1.82	6.41	935	154	59	219	1755	765906	0.01	0.15	1.15	0.19
15:30-15:45	0.86	0.33	1.95	7.60	882	144	46	235	1969	1004000	0.01	0.14	1.23	0.12
15:45-16:00	0.75	0.30	2.23	6.32	1215	139	60	221	1850	776472	0.01	0.17	1.12	0.69
16:00-16:15	1.15	0.43	2.25	8.83	997	151	71	230	1926	647376	0.01	0.15	1.42	0.61
16:15-16:30	0.91	0.29	2.21	9.53	1108	152	56	198	1696	785736	0.01	0.16	1.20	0.41
16:30-16:45	1.06	0.37	2.50	7.66	1107	159	80	245	1808	560620	0.01	0.16	1.17	0.42
SUMMARY	1.16	0.34	2.16	10.12	28616	4279	2144	328	1900	557745	0.01	0.15	1.49	0.44

DATES=NONE,TIME=(10:00-17:00),INCREMENT=15

Figure 3-16. TSO Workload Response Report

3.1.2.11 TSO Workload Paging Report

The TSO Workload Paging Report reports daily paging activity and statistics as a function of time. The report includes average response time, paging rates per second for VIO, Common, and LPA, as well as the page stealing rate and highest number of fixed frames.

Figure 3-17 illustrates a sample TSO Workload Paging Report.

```
INQUIRY ID:

   TSOLXK - TSO Workload Paging Report


DATA SOURCE (File/Timespan):

    TSOTSO - DETAIL (For online TSO reporting)
    TSO_BU - DETAIL (For batch TSO reporting)



RUNNING THE REPORT

Run this report under MICF, selecting the following run-time
parameters:

  TSOLXK - TSO Workload Paging Report

    o   database ID to be processed
    o   report batch or online data
    o   range of CA MICS file cycles to be processed
    o   user IDs to be included
    o   user IDs to be excluded
    o   SYSID values
    o   range of dates to be processed
    o   time range to be processed
    o   zone values
    o   report increment in minutes
    o   two response time limit objectives in seconds

--------------------------------------------------------------------------------
------------------------------------------------
```

TSO WORKLOAD PAGING REPORT
YOUR COMPANY NAME

INQUIRY: TSOLXK RUN DATE: 12DEC08

System = TSOP
For NOVEMBER 3, 2008

TIME PERIOD	AVERAGE TERMINAL RESPONSE TIME (SECS) TOTAL	SHORT	MEDIUM	LONG	PAGE RATES / SECOND INS	OUTS	VIO PAGES / SECOND INS	OUTS	SWAP PAGES / SECOND INS	OUTS	COMMON PAGE-IN RATE/SEC	PAGES STOLEN / SEC	LPA PAGE-IN RATE/SEC	HIGH FIXED FRAMES
10:00-10:15	1.17	0.36	1.98	6.97	1.2	0.4	0.0	0.0	4.7	5.6	0.1	0.4	0.1	41
10:15-10:30	1.71	0.38	2.28	11.76	1.1	0.5	0.0	0.0	4.0	4.7	0.1	0.6	0.1	41
10:30-10:45	1.75	0.39	2.36	17.74	0.7	0.3	0.0	0.0	2.5	3.0	0.0	0.4	0.0	41
10:45-11:00	2.45	0.36	2.19	24.16	0.7	0.2	0.0	0.0	2.4	2.9	0.0	0.3	0.0	40
11:00-11:15	1.89	0.42	2.25	15.07	0.6	0.2	0.0	0.0	1.8	2.2	0.0	0.3	0.0	41
11:15-11:30	1.52	0.44	2.49	12.52	0.4	0.2	0.0	0.0	1.1	1.3	0.0	0.3	0.0	39
11:30-11:45	1.51	0.38	2.44	16.00	0.3	0.1	0.0	0.0	0.8	1.0	0.0	0.1	0.0	51
11:45-12:00	1.49	0.27	2.19	13.02	0.2	0.1	0.0	0.0	0.7	0.9	0.0	0.1	0.0	39
12:00-12:15	0.93	0.31	2.23	6.19	0.1	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	38
12:15-12:30	1.37	0.27	1.80	8.74	0.1	0.0	0.0	0.0	0.4	0.5	0.0	0.0	0.0	39
12:30-12:45	1.07	0.37	2.14	8.36	0.2	0.1	0.0	0.0	0.7	0.8	0.0	0.1	0.0	39
12:45-13:00	1.17	0.28	1.72	8.89	0.2	0.0	0.0	0.0	0.6	0.7	0.0	0.1	0.0	37
13:00-13:15	0.95	0.31	1.75	6.10	0.2	0.1	0.0	0.0	0.7	0.8	0.0	0.1	0.0	37
13:15-13:30	0.81	0.28	1.92	6.10	0.1	0.0	0.0	0.0	0.5	0.6	0.0	0.1	0.0	37
13:30-13:45	0.82	0.28	1.87	5.80	0.1	0.0	0.0	0.0	0.6	0.7	0.0	0.0	0.0	41
13:45-14:00	0.88	0.35	2.19	6.78	0.1	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	38
14:00-14:15	1.04	0.36	2.47	9.24	0.1	0.1	0.0	0.0	0.5	0.6	0.0	0.1	0.0	39
14:15-14:30	0.88	0.33	2.49	9.21	0.1	0.1	0.0	0.0	0.3	0.4	0.0	0.1	0.0	39
14:30-14:45	0.85	0.36	2.59	7.37	0.2	0.1	0.0	0.0	0.5	0.6	0.0	0.1	0.0	49
14:45-15:00	0.98	0.34	2.00	7.18	0.1	0.1	0.0	0.0	0.3	0.4	0.0	0.1	0.0	49
15:00-15:15	0.74	0.28	1.87	5.33	0.1	0.0	0.0	0.0	0.2	0.3	0.0	0.1	0.0	37
15:15-15:30	0.79	0.26	1.82	6.41	0.1	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	37
15:30-15:45	0.86	0.33	1.95	7.60	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	37
15:45-16:00	0.75	0.30	2.23	6.32	0.1	0.0	0.0	0.0	0.4	0.5	0.0	0.0	0.0	37
16:00-16:15	1.15	0.43	2.25	8.83	0.1	0.0	0.0	0.0	0.4	0.4	0.0	0.1	0.0	37
16:15-16:30	0.91	0.29	2.21	9.53	0.1	0.0	0.0	0.0	0.3	0.4	0.0	0.1	0.0	39
16:30-16:45	1.06	0.37	2.50	7.66	0.1	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	38
SUMMARY	1.16	0.34	2.16	10.12	1.1	0.4	0.0	0.0	3.7	4.4	0.1	0.5	0.1	51

DATES=NONE,TIME=(10:00-17:00),INCREMENT=15

Figure 3-17. TSO Workload Paging Report

3.1.2.12 TSO Workload Swapping Report

The TSO Workload Swapping Report reports daily swapping activity and statistics as a function of time. The report includes response time averages, number of logical swaps, logical swap times (both average and maximum), number of physical swaps in and out, and the average and maximum working set size.

Figure 3-18 illustrates a sample TSO Workload Swapping Report.

INQUIRY ID:

TSOLXL - TSO Workload Swapping Report

DATA SOURCE (File/Timespan):

TSOTSO - DETAIL (For online TSO reporting)
TSO_BU - DETAIL (For batch TSO reporting)

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

TSOLXL - TSO Workload Swapping Report

- database ID to be processed
- report batch or online data
- range of CA MICS file cycles to be processed
- user IDs to be included
- user IDs to be excluded
- SYSID values
- range of dates to be processed
- time range to be processed
- zone values
- report increment in minutes
- two response time limit objectives in seconds

TSO WORKLOAD SWAPPING REPORT
YOUR COMPANY NAME

INQUIRY: TSOLXL RUN DATE: 12DEC08

System = TSOP
For NOVEMBER 3, 2008

TIME PERIOD	AVERAGE TERMINAL RESPONSE TIME (SECS) TOTAL	SHORT	MEDIUM	LONG	LOGICAL SWAPPING NUMBER SWAPINS	SWAPOUTS	SWAP TIME AVG.	LONGEST	PHYSICAL SWAPPING SWAPINS	SWAPOUTS	WORKING SET SIZE SWAPOUT AVG.	MAX.	SWAPIN AVG.	MAX.
10:00-10:15	1.17	0.36	1.98	6.97	838	1168	10.89	77.51	334	340	105	262	121	262
10:15-10:30	1.71	0.38	2.28	11.76	1170	1502	9.37	96.23	340	337	113	287	131	321
10:30-10:45	1.75	0.39	2.36	17.74	1013	1306	9.29	76.08	291	298	108	265	127	433
10:45-11:00	2.45	0.36	2.19	24.16	869	1184	9.65	85.20	312	314	108	332	127	405
11:00-11:15	1.89	0.42	2.25	15.07	1220	1588	9.21	60.53	385	382	111	322	128	393
11:15-11:30	1.52	0.44	2.49	12.52	1471	1818	8.66	58.40	359	362	105	239	121	399
11:30-11:45	1.51	0.38	2.44	16.00	1076	1365	9.46	88.64	286	291	109	239	128	246
11:45-12:00	1.49	0.27	2.19	13.02	661	864	13.07	176.58	202	202	103	220	129	342
12:00-12:15	0.93	0.31	2.23	6.19	618	830	11.15	182.45	211	214	103	320	124	391
12:15-12:30	1.37	0.27	1.80	8.74	621	835	11.51	122.89	221	223	115	336	135	561
12:30-12:45	1.07	0.37	2.14	8.36	730	967	10.25	112.43	239	235	117	230	138	231
12:45-13:00	1.17	0.28	1.72	8.89	821	1088	8.81	72.04	265	268	108	233	127	419
13:00-13:15	0.95	0.31	1.75	6.10	868	1106	10.27	113.08	237	238	104	250	125	295
13:15-13:30	0.81	0.28	1.92	6.10	934	1143	9.77	159.03	200	205	108	339	126	339
13:30-13:45	0.82	0.28	1.87	5.80	990	1285	10.06	98.61	287	286	106	355	127	363
13:45-14:00	0.88	0.35	2.19	6.78	1140	1485	9.27	59.78	341	341	104	248	120	262
14:00-14:15	1.04	0.36	2.47	9.24	1589	1931	8.21	68.40	336	341	106	246	120	251
14:15-14:30	0.88	0.33	2.49	9.21	1483	1757	8.20	67.49	278	275	104	267	122	307
14:30-14:45	0.85	0.36	2.59	7.37	1366	1681	8.97	120.28	313	317	103	216	122	366
14:45-15:00	0.98	0.34	2.00	7.18	1347	1642	9.09	93.65	293	290	106	283	125	323
15:00-15:15	0.74	0.28	1.87	5.33	1073	1326	9.32	82.93	259	267	109	266	131	300
15:15-15:30	0.79	0.26	1.82	6.41	917	1146	9.89	163.78	225	230	108	326	130	419
15:30-15:45	0.86	0.33	1.95	7.60	839	1115	10.97	98.38	280	275	113	324	133	340
15:45-16:00	0.75	0.30	2.23	6.32	1125	1408	9.08	70.63	287	291	111	295	130	295
16:00-16:15	1.15	0.43	2.25	8.83	940	1192	9.67	75.26	254	257	109	309	132	412
16:15-16:30	0.91	0.29	2.21	9.53	1067	1327	9.07	110.62	262	263	106	325	124	327
16:30-16:45	1.06	0.37	2.50	7.66	1104	1372	8386	86.96	271	267	100	284	120	323
SUMMARY	1.16	0.34	2.16	10.12	27890	35431	9.52	182.45	7568	7609	107	392	126	561

DATES=NONE,TIME=(10:00-17:00),INCREMENT=15

Figure 3-18. TSO Workload Swapping Report

3.1.3 TSO Audit Reports

The TSO audit reports are specialized reports that you can use on as-required basis to study a user's TSO activity in depth, or identify the users of TSO functions such as commands, programs, and program libraries.

The TSO audit reports provide a detailed and flexible tracking capability to aid those responsible for the administration and control of the TSO System. They offer varying levels of detail for the TSO user session and/or commands executed during the session. You may tailor the reports to display selected data elements captured by TSO/MON and to report additional statistics on the TSO session and executed commands and programs.

You can use these reports to:

- Obtain information concerning detailed resource consumption and user evaluation.
- Determine users of specific libraries, programs, and commands.
- Obtain detailed TSO command resource consumption information.
- Obtain an overview of system access by user logon and logoff.

You can use this report to perform the following audits:

- TSO User Session - Provides a trace of a TSO user's activity for each TSO/MON recording interval the user was logged on to TSO. This report uses TSO/MON recording interval information contained in the System record.
- TSO User Interactive - Provides detailed command resource measures and information contained in the Command records that the system generates during a TSO user's session.
- TSO Functional Session - Summarizes the TSO commands executed during each TSO/MON recording interval the audit covers. For each command, the report lists each user who used the command and the number of times it was issued. This report uses TSO/MON recording interval information contained in the System record.

RUNNING THE REPORT

All TSO audit reports run under MICF II and use multiple run-time parameters. You can tailor each of the audit reports to isolate portions of each TSO user's sessions or audit report data elements.

DIFFERENCES BETWEEN THE CA MICS TSO AUDIT REPORTS AND TSO/MON AUDIT REPORTS

While the CA MICS TSO Audit Reports replicate the TSO/MON audit reports as closely as possible, there are certain differences.

o Data Differences

The TSO_TSU file does not retain observations that contain no resource usage. For this reason, a user who is logged on, but does not use the enter key at least once during the interval will not have an observation on the file for that interval. Therefore, the User Interactive Trace Report no longer has average think time and number of think events.

o Report Parameters.

The paired INCLUDE and EXCLUDE parameter specifications in the CA MICS inquiries are NOT mutually exclusive as they are with TSO/MON. For instance, you can now specify a group of users to be included on the report and, at the same time, identify an individual user(s) to be excluded from the selected group. This capability is available for selection of the following:

- command names
- library names
- program names
- terminal IDs
- users IDs

Example - You might wish to include all users whose user IDs begin with ABC0 and, at the same time, exclude users ABC0300 and ABC0301. You do this by specifying:

```
                                Users to be included
                                       ABC0:
                                Users to be excluded
                                       ABC0300 ABC0301


The following sections describe these reports:

    1 - User Session Trace Report
    2 - User Interactive Trace Report
    3 - Functional Session Trace Report
```

3.1.3.1 TSO User Session Trace Report

You use the TSO User Session Trace Report when a TSO user complains of erratic response time problems and the TSO Activity, TSO Command Activity, and TSO User Ranking reports do not provide the information necessary to solve the problem. The TSO User Session Trace Report presents detailed performance information that you can use to resolve most complaints of this type.

The TSO User Session Report provides a clear picture of what a user did and what kind of service the user received during each CA TSO/MON PM recording interval. The report lists the TSO commands executed by the user in the sequence in which each unique TSO command was executed. This lets you determine a general sequence of events. The report shows response times classified as either short, medium, or long.

The report also provides a summary of the logon and logoff times for each TSO user being audited. This is a quick way to obtain the time periods during which the TSO users examined were actually logged on to TSO. In addition, the report provides terminal identification of the TSO terminal associated with each session so that you can determine the origin of a TSO session.

The report also provides all response distributions and presents a complete scenario of TSO resources consumed or generated by the user. Finally, the program that generates the User Session report calculates a set of ratios based on the data presented under "RESOURCES:".

Figure 3-19 illustrates a TSO User Session Trace Report.

```
INQUIRY ID:

   TSOLXM - User Session Trace

DATA SOURCE (File/Timespan):

   TSOTSU - DETAIL
   TSOTSC - DETAIL


RUNNING THE REPORT

Run this report under MICF, selecting the following runtime
parameters:
```

- database ID to be processed
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- user IDs to be included
- user IDs to be excluded
- terminals to be included
- terminals to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service classes to be excluded
- report format options

```
TSOLXM                                                CA MICS IS/MSS                                                PAGE     1
                                                    YOUR COMPANY NAME
                                                TSO AUDIT REPORT (SYSTEM TSOP)
                                                    USER SESSION TRACE

DATE SELECTION: NONE SPECIFIED                                                    CURRENT DATE/TIME: 12JUN08/17:29
OPTIONS: AUDIT=USER=(SESSION=(LOGONOFF COMMANDS RESPONSE RESOURCES RATIOS))       DATA LEVEL: 51
TIME=(10:00-12:00) USER=(ABC45)
*************************************************************************************************************************

ABC45   NO LOGON INDICATION - INTERVAL START: 01FEB08:09:59:59.54

ABC45   PROCESSING INTERVAL - START: 01FEB08:09:59:59.54     END: 01FEB08:10:04:59.57  VTAM  TERMINAL: ABC30001

          SPFPANELS: VIOFSCRN  2                                                                  TOTAL PANELS:       2

          COMMANDS:  DELETE    2     FIND      1     RFIND     6     SPFEDIT   1                  TOTAL COMMANDS:    10

          RESPONSE:                              D I S T R I B U T I O N  P E R C E N T A G E S  W I T H I N

                     CATEGORY        EVENTS  AVERAGE   0.25S   0.50S   1.00S   2.00S   5.00S  10.00S  30.00S
                     --------        ------  -------  ------  ------  ------  ------  ------  ------  ------
                     SHORT               23     0.30    65.2    87.0    91.3   100.0   100.0   100.0   100.0
                     MEDIUM               2     2.23     0.0     0.0    50.0    50.0   100.0   100.0   100.0
                     TOTAL               25     0.45    60.0    80.0    88.0    96.0   100.0   100.0   100.0

          RESOURCES: TCB CPU TIME                 0.84  ENDED SRM TRANSACTIONS          25  NON-TERMINAL I/O               169
                     SRB CPU TIME                 0.16  SERVICE UNITS                 7110  TERMINAL READS                  25
                     COMMAND RESIDENCY           10.80  PERFORMANCE GROUP                2  TERMINAL WRITES                 25
                     TERMINAL CHARS READ           147  TERMINAL CHARS WRITTEN       22131  TOTAL SWAPIN TIME              0.29
                     NUMBER SWAPIN EVENTS            4  TOTAL SWAPIN DELAY TIME       0.01  NUMBER SWAPIN DELAY EVENTS       4
                     TOTAL 2K BYTES SWAPPED        718  MAXIMUM 2K BYTES SWAPPED       198  NUMBER SWAPOUTS                  4
                     NUM. NETWORK DELAY EVENTS       0  AVERAGE NETWORK DELAY         0.00

          RATIOS:    % TCB CPU/ELAPSED             0.3  COMMANDS/SECOND               0.03  NON-TERM I-O/SECOND            0.56
                     % TOTAL CPU/ELAPSED           0.3  TRANSACTIONS/SECOND           0.08  NON-TERM I-O/TCB CPU SEC        200
                     % SRB CPU/TCB CPU            19.5  SERVICE UNITS/SECOND         23.70  TERM READS/SECOND              0.08
                     TERM CHARS READ/SECOND       0.49  AVG MSG LENGTH READ           5.88  TERM WRITES/SECOND             0.08
                     TERM CHARS WRITE/SECOND     73.76  AVG MSG LENGTH WRITTEN       885.2
```

Figure 3-19. TSO User Session Trace Report

3.1.3.2 TSO User Interactive Trace Report

TSO User Interactive Trace allows in-depth tracking of the commands used and their users. You can use the report to determine which commands particular users are invoking. It provides a detailed resource consumption and user evaluation capability that you can use to determine users of specific libraries, programs, and commands. The report also contains detailed TSO command resource consumption information, and an overview of system access by user logon and logoff.

You can tailor the report to show commands executed by specific TSO users or user groups (in particular, performance groups or workload manager service classes and certain terminals). You can limit command records that you select for the report by command name, program name, and data set (library) name.

This Audit Report is useful for documenting TSO sessions during which you suspect a TSO user was playing games, misusing resources, or using company computer resources for an outside business.

FORMAT:

Data is selected and displayed in predefined groupings of data elements called displays. Each data display is a section of the report which can be included in or excluded from the report. Displays to be included on the report are selected via the MICF run-time parameter for report format options.

The STARTSTOP data display reports the userid, command name, program name, library name, start and end date and time of command execution, and elapsed command execution time.

The RESPONSE data display lists the category, number of response events, the average response time, and distribution percentages for each response time (SHORT, MEDIUM, and LONG).

The RESOURCES data display reports the TCB CPU time, ended SRM transactions, non-terminal I/O, SRB CPU time, service units, terminal reads, command residency, performance group or workload manager service class, terminal writes, terminal characters read, terminal characters written,

terminal swapin time, number of swapin events, total swapin delay time, number of swapin delay events, total 2K bytes swapped, maximum 2K bytes swapped, number of swapouts, and number of SPF Dialog Manager panels.

Figure 3-20 is an example of a page from a TSO User Interactive Audit.

INQUIRY ID:

TSOLXN - TSO User Interactive Trace

DATA SOURCE (File/Timespan):

TSOTSI - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

- database ID to be processed
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- user IDs to be included
- user IDs to be excluded
- terminals to be included
- terminals to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service classes to be excluded
- command names to be included
- command names to be excluded
- program names to be included
- program names to be excluded
- library names to be included
- library names to be excluded
- report format options

```
                                                CA MICS IS/MSS
                                              YOUR COMPANY NAME
                                          TSO AUDIT REPORT (SYSTEM TSOP)
                                              USER INTERACTIVE TRACE

DATE SELECTION: 01FEB08, TIME SELECTION: 00:00-24:00                          CURRENT DATE/TIME: 23JUN08/13:25
OPTIONS: AUDIT=USER=(INTERACTIVE),PROGRAM RESOURCES RESPONSE STARTSTOP        DATA LEVEL: 51
 INCLUDE=USER=ABC68
*************************************************************************************************************************************

ABC68   COMMAND: CALL          PROGRAM: ABCSO210    LIBRARY: ACBPRD.TSO.LOAD
            START: 01FEB08:08:36:29.85          END: 01FEB08:08:49:16.23          ELAPSED TIME: 0:12:46.38


         RESPONSE:                              D I S T R I B U T I O N  P E R C E N T A G E S  W I T H I N

                    CATEGORY        EVENTS  AVERAGE   0.25S   0.50S   1.00S   2.00S   5.00S  10.00S  30.00S
                    --------        ------  -------  ------  ------  ------  ------  ------  ------  ------

                    SHORT              6    1.25     33.3    33.3    33.3    66.7   100.0   100.0   100.0
                    MEDIUM             2    2.03      0.0     0.0     0.0    50.0   100.0   100.0   100.0
                    TOTAL              8    1.45     25.0    25.0    25.0    62.5   100.0   100.0   100.0

         RESOURCES: TCB CPU TIME                 0.72  ENDED SRM TRANSACTIONS           9  NON-TERMINAL I/O                70
                    SRB CPU TIME                 0.09  SERVICE UNITS                 5163  TERMINAL READS                   9
                    COMMAND RESIDENCY           12.51  PERFORMANCE GROUP                2  TERMINAL WRITES                 10
                    TERMINAL CHARS READ          5988  TERMINAL CHARS WRITTEN         175  TOTAL SWAPIN TIME             0.05
                    NUMBER SWAPIN EVENTS            1  TOTAL SWAPIN DELAY TIME       0.00  NUMBER SWAPIN DELAY EVENTS      1
                    TOTAL 2K BYTES SWAPPED         92  MAXIMUM 2K BYTES SWAPPED        92  NUMBER SWAPOUTS                 1
                    SPF DIALOG MANAGER PANELS       0  AVERAGE NETWORK DELAY         0.00  NUM. NETWORK DELAY EVENTS       0
```

Figure 3-20. TSO User Interactive Trace Report

3.1.3.3 TSO Functional Session Trace

You use the Functional Session Trace Report to identify the TSO commands executed during each CA TSO/MON PM recording interval for the time period covered in the report. Because this report can also show the number of unique executions of each command by TSO user, you can use it to track unauthorized access to TSO commands and misuse of system resources (e.g., compiling programs in foreground rather than in batch). Further tailoring, using the Audit reporting control statement syntax, narrows the scope of the report to particular TSO commands, TSO users or user groups, performance groups or workload manager service classes, and TSO terminals. You can use this report to identify commands that you have not defined to the CA TSO/MON PM Commands Table.

Figure 3-21 shows an example of a TSO Functional Session Trace Report.

INQUIRY ID:

TSOLXO - TSO Functional Session Trace

DATA SOURCE (File/Timespan):

TSOTSC - DETAIL

RUNNING THE REPORT

Run this report under MICF, selecting the following run-time parameters:

- database ID to be processed
- range of CA MICS file cycles to be processed
- SYSID values to be included
- range of dates to be processed
- time range to be processed
- zone values
- user IDs to be included
- user IDs to be excluded
- terminals to be included
- terminals to be excluded
- command names to be included
- command names to be excluded
- performance group numbers or workload manager service classes to be included
- performance group numbers or workload manager service

classes to be excluded

- report format options

```
                                                CA MICS IS/MSS
                                              YOUR COMPANY NAME
                                        TSO AUDIT REPORT (SYSTEM TSOP)
                                            FUNCTIONAL SESSION TRACE

DATE SELECTION: 01FEB08, TIME SELECTION: 10:00-11:00                          CURRENT DATE/TIME: 23JUN08/18:25
OPTIONS: AUDIT=FUNCTIONAL=(SESSION)                                           DATA LEVEL: 51
 INCLUDE=USER=ACB06

*************************************************************************************************************************************

         PROCESSING INTERVAL - START: 01FEB08:09:59:59.54     END: 01FEB08:10:04:59.57

        ****  SPF DIALOG MANAGER PANELS  ****

          ABCE001  ACB06       3                                                    PANEL  TOTAL       3

          ABCE004  ACB06       3                                                    PANEL  TOTAL       3

          ABCE130  ACB06       4                                                    PANEL  TOTAL       4

          ABCQ100  ACB06       1                                                    PANEL  TOTAL       1

          ABCX000  ACB06      12                                                    PANEL  TOTAL      12

        ****  SPF DIALOG MANAGER PROGRAMS  ****

          ABCA     ACB06       6                                                    PROGRAM  TOTAL     6

        ****  TSO COMMANDS AND SUBCOMMANDS  ****

          SUBMIT   ACB06       3                                                    COMMAND  TOTAL     3
```

Figure 3-21. TSO Functional Session Trace Report

3.2 MICF Inquiries

Figure 3-22 lists the MICF inquiries that the TSO Analyzer provides.

MICF inquiry names follow the form cccptn, where:

```
 ccc   is the three-character product identifier.
   p   is the type of graphic. The value of this field is
       either C (color graphic), L (list), or P (printer).
   t   is the frequency with which the report may be
       executed.
   n   is an integer that differentiates this inquiry from
       others.
```

For example, the system would interpret an inquiry named TSOLD4 as:

```
                TSOLD4
                ---|||= the fourth list inquiry
                 | ||   being produced for the TSO
                 | ||   product at the DAYS time-span
                 | ||= may be run daily
                 | |= a list inquiry
                 |= a TSO product inquiry
```

Report Class	Report Name	Report Identifier		
		Color Graphics	List	Printer Graphics
General	Daily TSO User Ranking Reports		TSOLD1	
Exception	Daily Top Twenty TSO Resource Consumers		TSOLDA	
Workload	Daily TSO Workload Report	TSOCD1		TSOPD1
	Weekly TSO Workload Report	TSOCW1		TSOPW1
	Monthly TSO Workload Report	TSOCM1		TSOPM1

Report Class	Report Name	Report Identifier		
		Color Graphics	List	Printer Graphics
Service	Daily TSO Service Reports	TSOCD2		TSOPD2
	Weekly TSO Service Reports	TSOCW2		TSOPW2
	Monthly TSO Service Reports	TSOCM2		TSOPM2
	8am - 5pm TSO Service by Type	TSOCDT		
Availability	Daily TSO Availability Report	TSOCD3		TSOPD3
	Weekly TSO Availability Report	TSOCW3		TSOPW3
	Monthly TSO Availability Report	TSOCM3		TSOPM3
Performance	Daily TSO Resource Consumption Report	TSOCD4		TSOPD4
	Weekly TSO Resource Consumption Report	TSOCW4		TSOPW4
	Monthly TSO Resource Consumption Report	TSOCM4		TSOPM4
	Daily TSO Service Unit Analysis		TSOLDG	
	TSO Dynamic Resource Usage Report		TSOLXD	
	Monthly TSO Dynamic Resource Usage Report		TSOLMD	
Security	Daily TSO Command Identification		TSOLDF	

Figure 3-22. MICF Distributed Inquiries (Part 1 of 2)

Report Class	Report Name	Report Identifier		
		Color Graphics	List	Printer Graphics
TSOMGMT	TSO Profile Report		TSOLD2	
	TSO Profile Report by User/Term		TSOLD3	

	TSO Profile Report by User/Term/Perfgrp	TSOLD4	
	TSO Network Profile (Detail & Summary)	TSOLD5	
	TSO Network Profile (Detail)	TSOLD6	
	TSO Network Profile (Summary)	TSOLD7	
	TSO Workload Response Report	TSOLXJ	
	TSO Workload Paging Report	TSOLXK	
	TSO Workload Swapping Report	TSOLXL	
	TSO User Session Trace	TSOLXM	
	TSO User Interactive Trace	TSOLXN	
	TSO Functional Session Trace	TSOLXO	
	TSO User Ranking by Response/Time	TSOLXQ	
	TSO User Ranking by Resource/Activity	TSOLXR	
	TSO Terminal Ranking by Response/Time	TSOLXT	
	TSO Terminal Ranking by Activity	TSOLXU	
	TSO Activity Report	TSOLX1	
	TSO Activity Report by User/Term	TSOLX2	
	TSO Activity Report by User/Term/Perfgrp	TSOLX3	
	TSO Command Activity Report	TSOLX4	
	TSO Program Activity Report	TSOLX5	
	TSO Command Use Counts Report	TSOLX6	
	TSO Network Activity (Detail & Summary)	TSOLX7	
	TSO Network Activity (Detail)	TSOLX8	
	TSO Network Activity (Summary)	TSOLX9	

Figure 3-22. MICF Distributed Inquiries (Part 2 of 2)

To run the TSO MICF inquiries, use the CA MICS Workstation Facility's CA MICS Information Center Facility (MICF) menu option.

To see sample list reports, refer to Section 3.1 in this guide.

3.3 TSO Management Objective Reports

This section identifies and describes the TSO Management Objective Reports that are provided for the TSO Information Area. The reports are produced on a daily, weekly, and monthly basis and are described in that order within this section.

User-defined options are provided to enable you to specify data selection (time, zones, etc.), define the applicable objective values, and specify the scales of the graphic report representations. Each of the options are described in line with the reports to which they pertain.

The options available for producing the TSO Management Objective Reports are shown below:

Hourly Selection Range for Daily Reports:
The start and end hours of the day that are to be included in the Daily TSO Reports. We recommend that you set the hours to include the entire day (00 23).

Hourly Selection Range for Weekly Reports:
The start and end hours of the day that are to be included in the Weekly TSO Reports. We recommend that you set the hours to only include the prime-time hours (e.g., 08 16).

Total Response Objective:
The percentage of all TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for total TSO activity (e.g., 90% within 15 seconds).

Short Response Objective:
The percentage of short TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for short TSO activity (e.g., 96% within 4 seconds).

Medium Response Objective:
The percentage of medium TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for medium TSO activity (e.g., 94% within 6 seconds).

Hourly TSO Outage Limits:
The target number of uptime minutes per hour, generally set to 60, and the downtime objective per hour, which is generally set to 0 minutes.

Zone Selection for Monthly Reporting:
The zone or range of zones that are to be included in the Monthly TSO Reports. Normally all zones should be reported; therefore, the range should be 1 to 9. The TSO Reports could be limited to only the range of zones required.

Monthly Availability Hours:
The number of hours that TSO is targeted to be available in any given month for the specified zones.

Monthly IPL Limit:
The number of IPLs that TSO is targeted to experience in any given month for the specified zones.

Monthly TSO Service Unit Consumption:
The target and maximum number of service units consumed per zone within month by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

Monthly TSO Command Rate:
The target and maximum number of commands processed per zone within month by TSO. The target amount is used for a reference line on the graph and the maximum is used to set the maximum value on the graph's vertical axis.

The TSO report options, which are defined as SAS macro variables, are contained in the source member #TSOMOBJ in the MICS.USER.SOURCE library. The SAS source code for the TSO Management Objective Reports are contained in three members in MICS.SOURCE:

DYTSOMBO - Daily TSO Management Objective Reports
WKTSOMBO - Weekly TSO Management Objective Reports
MNTSOMBO - Monthly TSO Management Objective Reports

The descriptive material is explained in the following subsections:

1 - Daily TSO Management Objective Reports
2 - Weekly TSO Management Objective Reports
3 - Monthly TSO Management Objective Reports
4 - Setting TSO Management Objective Report Options

3.3.1 Daily TSO Management Objective Reports

The Daily TSO Management Objective Reports provide management a way to determine if their primary TSO processing objectives are being attained. The one-page charts illustrate the days activity by hour in reference to the established hourly objectives for: short, medium, and total response; command load; service unit consumption; and availability.

A hour of the day selection facility is provided so that these daily reports may reflect the entire 24 hours or a user-specified range.

Hourly Selection Range for Daily Reports:
The start and end hours of the day that are to be included in the Daily TSO Reports. We recommend that you set the hours to include the entire day (00 23).

```
&TSODLHR and &TSODHHR define the low and high hours of
     the day for selection of the TSO activity to be
     reported in the daily reports.

%LET TSODLHR=00;
%LET TSODHHR=23;
```

The following sections display and explain the Daily TSO Management Objective Reports:

1 - Report Format Descriptions
2 - Daily TSO Service Report - All Activity
3 - Daily TSO Service Report - Medium Activity
4 - Daily TSO Service Report - Short Activity
5 - Daily TSO Outage Report - Availability
6 - Daily TSO Resource Consumption Report - Service Units
7 - Daily TSO Throughput Report - Commands

3.3.1.1 Report Format Descriptions

The Daily Management Objective Reports are produced as a standard process in the CA MICS Daily Job Stream. Each of the reports is produced from the TSO System Activity File (DAYS.TSOTSO01), maintained in the data base's DAYS time-span. The SAS CHART procedure is used to produce the desired bar chart reports.

The report heading contains the installation name (e.g., XYZ Manufacturing, Inc.), the frequency identification (e.g., DAILY TSO MANAGEMENT OBJECTIVES), the objective being reported (e.g., TSO SERVICE OF 85% OF ALL ACTIVITY WITHIN 15 SECONDS), and the computing system (e.g., SYSID code) on which the TSO processing was measured.

The format of the bar chart illustrates the hour of the day along the horizontal axis and the measurement being reported (e.g. service units) along the vertical axis. The day being reported is identified below the hours of the day, just under the horizontal axis.

The vertical axis is used to chart the measure being reported, and it is with this axis that the management objective for this category is defined. The vertical axis is first established through the SAS CHART procedure AXIS option which simply identifies the highest value to be represented on the vertical axis. The management objective is then illustrated through the SAS CHART procedure REF option and formatted with a dashed line across the page to illustrate the management objective.

Consider the charting of the hourly objective for short service. The title describes the management objective as 95% within 5 seconds for short activity. The measure that is charted is the percentage of short events satisfied within 5 seconds for each hour of the day. Therefore, the vertical axis would be set up for a maximum value of 100 (for 100%), and the vertical reference line would be printed at the 95% level. This reference line then clearly depicts how the objective was satisfied or missed for each hour of the day.

A special note should be made at this time to point out that the location of the reference line on the vertical axis may be rounded for purposes of scaling the axis. Each vertical line may have a unit value of 2.5%, and therefore a reference line specification of 86% would not fall directly on a vertical axis coordinate. In this case, the 86% line would be shown as a line at 85%.

The member DYTSOMBO in the sharedprefix.MICS.SOURCE library contains the SAS statements for producing the chart reports. The member #TSOMOBJ contains the SAS macro variables used by DYTSOMBO. The #TSOMOBJ member contains the specifications for defining the objectives to be displayed and may be modified to reflect your installation's unique management objectives.

The remainder of this section explains and illustrates each of the standard Daily TSO Management Objective Reports.

3.3.1.2 Daily TSO Service Report - All Activity

The Daily TSO Service - All Activity Report quantifies the total TSO service (all activity including short, medium, and long events) provided on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the speed and consistency for all TSO activity is a percentage measure of the number of TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Total Response Objective:
The percentage of all TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for total TSO activity (e.g., 85% within 15 seconds).

&TSOPTR and &TSOSTR define the percentage target and second threshold (e.g., 85% within 15 seconds), respectively, for total TSO response time, used in daily, weekly, and monthly reports.

```
%LET TSOPTR=85;
%LET TSOSTR=15;
```

Figure 3-23 quantifies the service provided, with the horizontal axis representing the hours of the day and the vertical axis charting the percentage of total TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for total TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 85% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the total TSO service objective was missed for that hour.

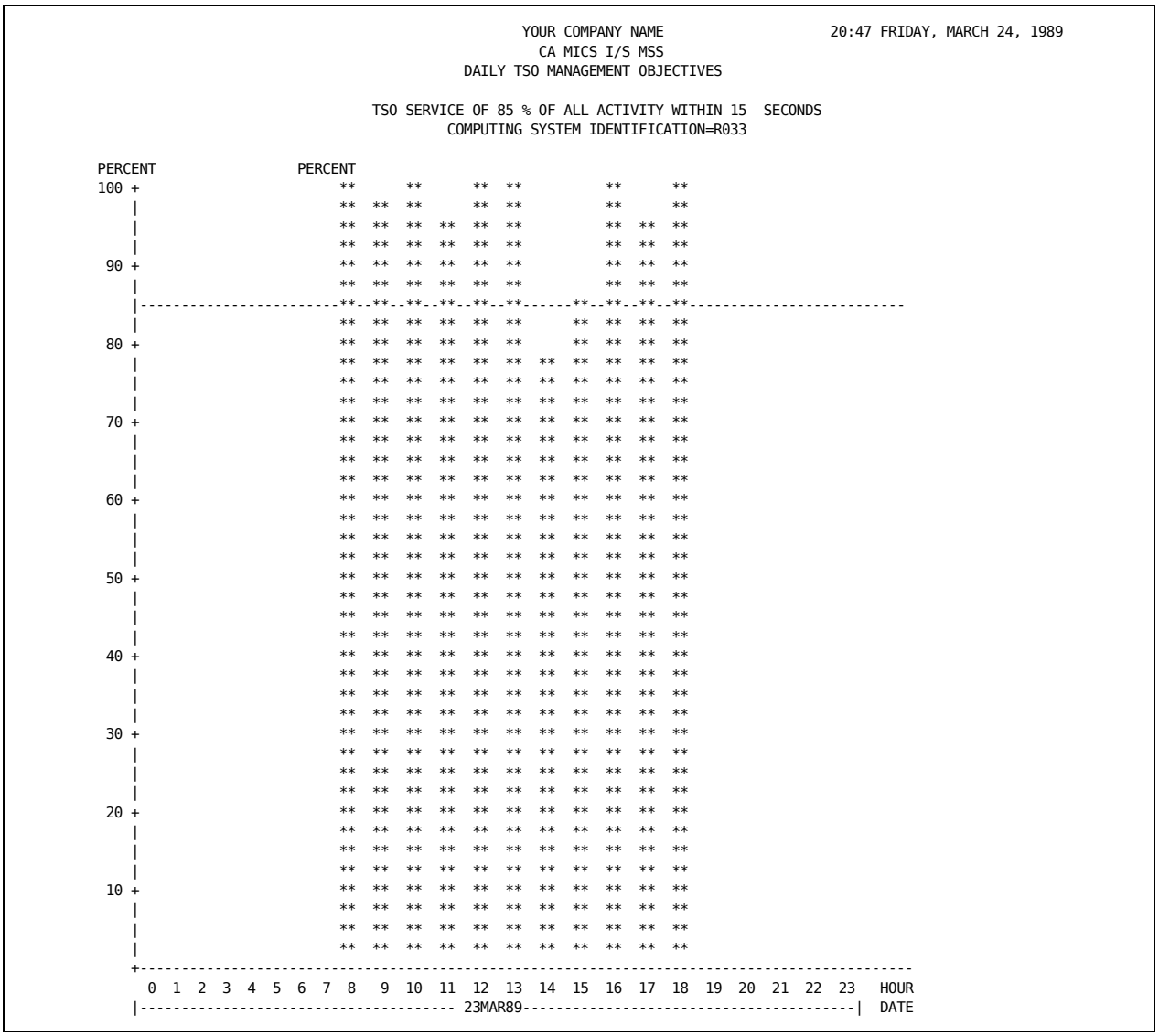


Figure 3-23. Daily TSO Service Report Format - All Activity

3.3.1.3 Daily TSO Service Report - Medium Activity

The Daily TSO Service - Medium Activity Report quantifies the TSO service for medium activity provided on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the speed and consistency for medium TSO activity is a percentage measure of the number of medium TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Medium Response Objective:
The percentage of medium TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for medium TSO activity (e.g., 90% within 15 seconds).

```
&TSOPMR and %TSOSMR define the percentage target and
     second threshold (e.g., 90% within 15 seconds),
     respectively, for medium TSO response time, used in
     daily, weekly, and monthly reports.

%LET TSOPMR=90;
%LET TSOSMR=15;
```

Figure 3-24 quantifies the service provided, with the horizontal axis representing the hours of the day and the vertical axis charting the percentage of medium TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for medium TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 90% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the medium TSO service objective was missed for that hour.

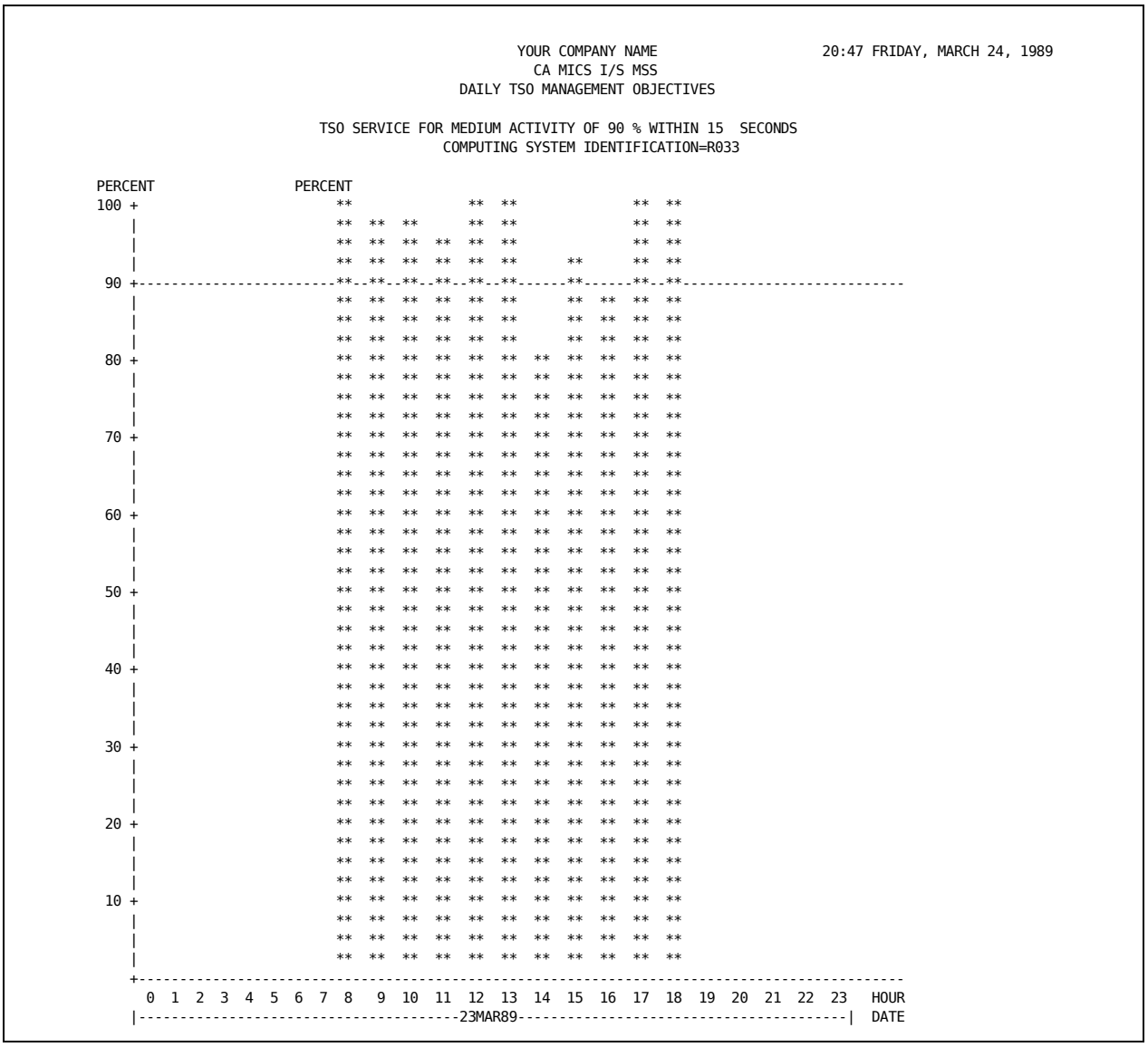


Figure 3-24. Daily TSO Service Report Format - Medium Activity

3.3.1.4 Daily TSO Service Report - Short Activity

The Daily TSO Service - Short Activity Report quantifies the TSO service for short activity provided on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the speed and consistency for short TSO activity is a percentage measure of the number of short TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Short Response Objective:
The percentage of short TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for short TSO activity (e.g., 95% within 5 seconds).

```
&TSOPSR and &TSOSSR define the percentage target and
     second threshold (e.g., 95% within 5 seconds),
     respectively, for short TSO response time, used in
     daily, weekly, and monthly reports.

%LET TSOPSR=95;
%LET TSOSSR=5;
```

Figure 3-25 quantifies the service provided with the horizontal axis representing the hours of the day and the vertical axis charting the percentage of short TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for short TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 95% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the short TSO service objective was missed for that hour.

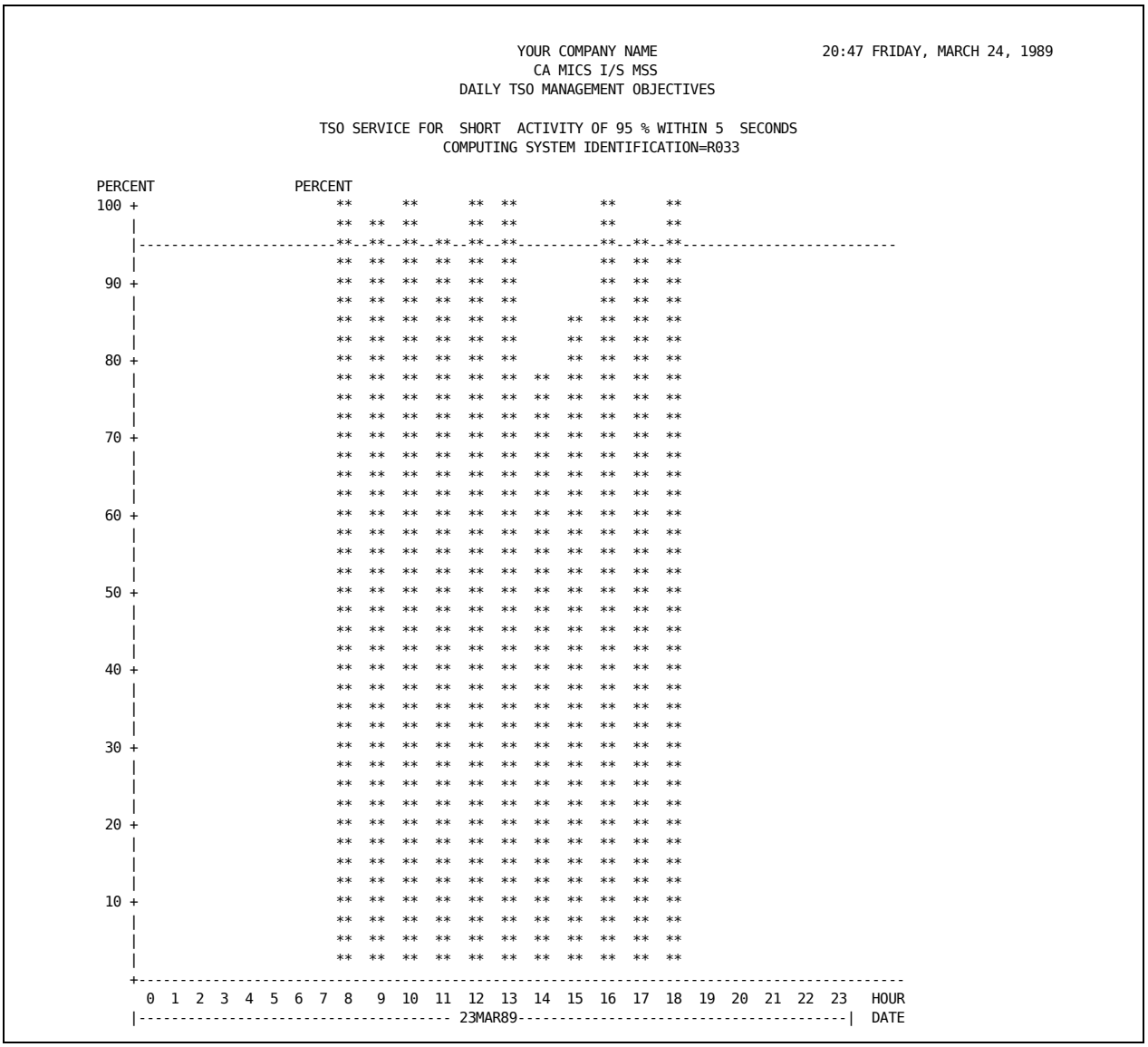


Figure 3-25. Daily TSO Service Report Format - Short Activity

3.3.1.5 Daily TSO Outage Report - Availability

The Daily TSO Outage - Availability Report quantifies the TSO outage incurred on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the availability of the TSO system is a measure of the number of minutes TSO incurred outage time within an hour of the day.

The following user options apply to this report:

Hourly TSO Outage Limits:
The target number of uptime minutes per hour, generally set to 60, and the downtime objective per hour, which is generally set to 0 minutes.

```
&TSOUT and &TSODT define the hourly uptime target and
     hourly downtime reference line, respectively, for
     daily and weekly reporting.

%LET TSOUT=60;
%LET TSODT=0;
```

Figure 3-26 quantifies the outage incurred, with the horizontal representing the hours of the day and the vertical charting the number of outage minutes incurred.

The management objective is to not incur any outage time, and therefore, any time a charted bar appears the TSO Outage objective was missed for that hour. The reference line is shown at the 0 minutes level on the vertical axis.

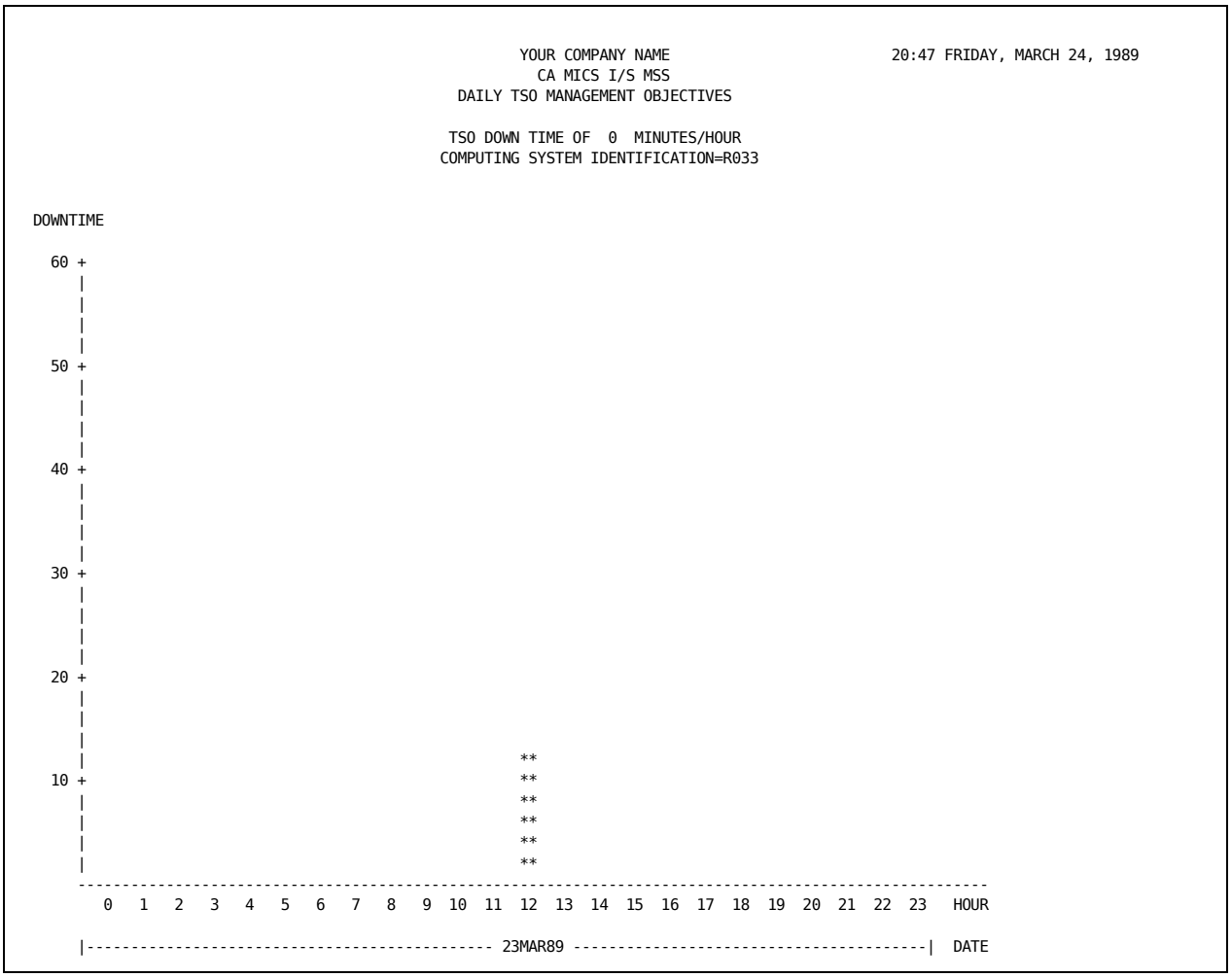


Figure 3-26. Daily TSO Outage Report Format - Availability

3.3.1.6 Daily TSO Resource Consumption Report

The Daily TSO Resource Consumption - Service Units Report quantifies the total TSO resource consumption in terms of service units consumed on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the rate of resource consumption for TSO is a measure of the number of service units consumed per hour.

The following user options apply to this report:

Daily TSO Service Unit Consumption:
The target and maximum number of service units consumed per hour by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

```
&TSOSAX and &TSOSREF define the vertical axis maximum
     scaling and reference line, respectively, for
     service unit consumption by hour in the daily and
     weekly reports.

%LET TSOSAX =8000000;
%LET TSOSREF=6000000;
```

Figure 3-27 quantifies the service unit consumption with the horizontal axis representing the hours of the day and the vertical axis charting the service units consumed.

The management objective for TSO resource consumption is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 6,000,000 service units consumed level of the vertical axis. Therefore, any hour for which the charted bar exceeds this reference line signals that the objective to contain resource consumption was missed for that hour.

The vertical axis is set with a maximum value of 8,000,000 to ensure uniform scaling from report to report. If the value is exceeded, the highest value encountered is used to set this vertical axis maximum value.

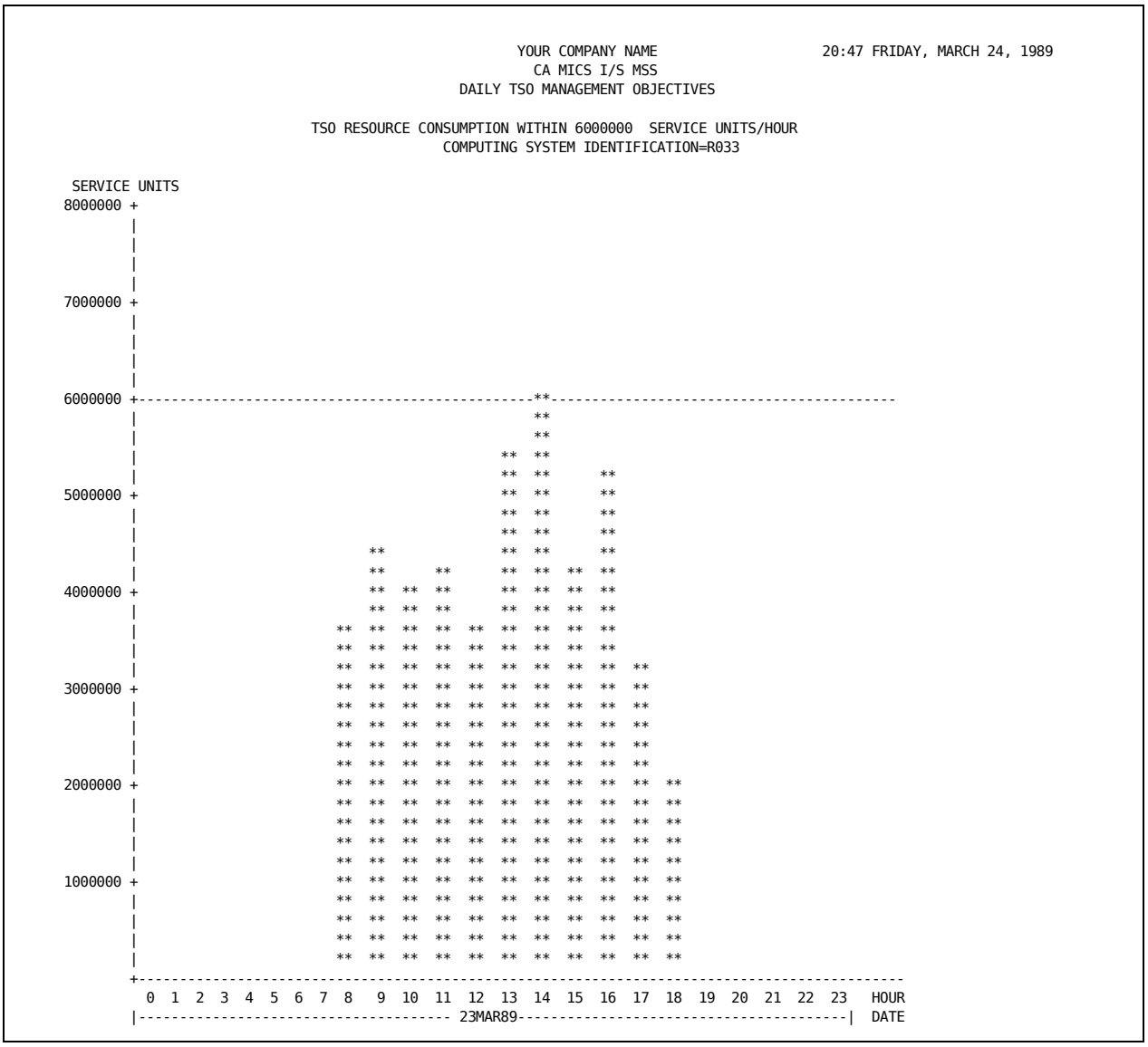


Figure 3-27. Daily TSO Resource Consumption Report Format - Service Units

3.3.1.7 Daily TSO Throughput Report - Commands

The Daily TSO Throughput - Commands Report quantifies the total TSO throughput in terms of commands processed on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the TSO throughput rate is a measure of the number of commands processed per hour.

The following user options apply to this report:

Daily TSO Command Rate:
The target and maximum number of commands processed per hour by TSO. The target amount is used for a reference line on the graph and the maximum is used to set the maximum value on the graph's vertical axis.

&TSOCAX and &TSOCREF define the vertical axis maximum scaling and reference line, respectively, for hourly command rate execution in the daily and weekly reports.

```
%LET TSOCAX = 8000;
%LET TSOCREF = 6000;
```

Figure 3-28 quantifies the commands processed with the horizontal axis representing the hours of the day and the vertical axis charting the commands processed.

The management objective for TSO throughput is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 6,000 commands processed level of the vertical axis. Therefore, any hour for which the charted bar exceeds this reference line signals that the objective to contain throughput was missed for that hour.

The vertical axis is set with a maximum value of 8,000 to ensure uniform scaling from report to report. If the value is exceeded, the highest value encountered is used to set this vertical axis maximum value.

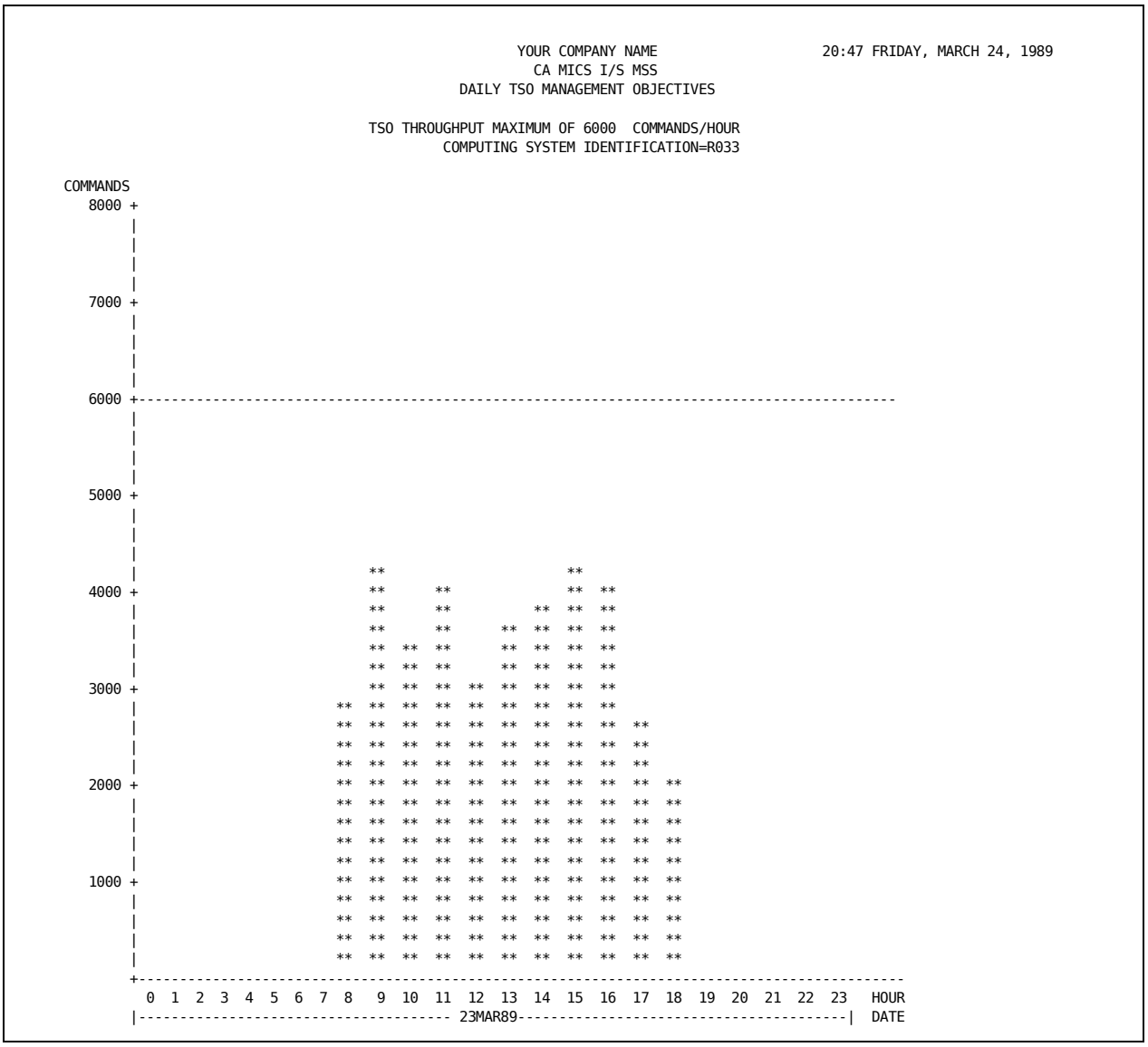


Figure 3-28. Daily TSO Throughput Report Format - Commands

3.3.2 Weekly TSO Management Objective Reports

The Weekly TSO Management Objective Reports provide management a way in which to determine if their primary TSO processing objectives are being met. The one-page charts illustrate the weeks activity by prime-time hour within day of the week in reference to the established hourly objectives for: short, medium, and total response; command load; service unit consumption; and availability.

An hour of the day selection facility is provided so that the weekly reports may reflect the entire 24 hours of each day or a user-specified range.

Hourly Selection Range for Weekly Reports:
The start and end hours of the day that are to be included in the Weekly TSO Reports. We recommend that you set the hours to include the prime time period of the day (08 18).

```
&TSOWLHR and &TSOWHHR define the low and high hours of
     the days for selection of the TSO activity to be
     reported in the weekly reports.

%LET TSOWLHR = 08;
%LET TSOWHHR = 18;
```

The following sections display and explain the weekly TSO Management Objective Reports:

1 - Report Format Descriptions
2 - Weekly TSO Service Report - All Activity
3 - Weekly TSO Service Report - Medium Activity
4 - Weekly TSO Service Report - Short Activity
5 - Weekly TSO Outage Report - Availability
6 - Weekly TSO Resource Consumption Report - Service Units
7 - Weekly TSO Throughput Report - Commands

3.3.2.1 Report Format Descriptions

The Weekly Management Objective Reports are produced as a standard process in the CA MICS Weekly Job Stream. Each of the reports is produced from the TSO System Activity Files for the last seven days (DAYS.TSOTSO01-DAYS.TSOTSO07), maintained in the data base's DAYS time-span. The SAS CHART procedure is used to produce the desired bar chart reports.

The report heading contains the installation name (e.g., XYZ Manufacturing, Inc.), the frequency identification (e.g., WEEKLY TSO MANAGEMENT OBJECTIVES), the objective being reported (e.g., TSO SERVICE OF 85% OF ALL ACTIVITY WITHIN 15 SECONDS), and the computing system (e.g., SYSID code) on which the TSO processing was measured for the week.

The format of the bar chart illustrates the hour of the day within a day of week grouping along the horizontal axis and the measurement being reported (e.g., service units) along the vertical axis. The day being reported is identified below the hours of the day, just under the horizontal axis.

The vertical axis is used to chart the measure being reported and it is with this axis that the management objective for this category is defined. The vertical axis is first established through the SAS CHART procedure AXIS option which simply identifies the highest value to be represented on the vertical axis. The management objective is then illustrated through the SAS CHART procedure REF option and formatted with a dashed line across the page to illustrate the management objective.

Consider the charting of the hourly objective for short service. The title describes the management objective as 95% within 5 seconds for short activity. The measure that is charted is the percentage of short events satisfied within 5 seconds for each hour of the day. Therefore, the vertical axis would be set up for a maximum value of 100 (for 100%) and the vertical reference line would be printed at the 95% level. This reference line then clearly depicts how the objective was satisfied or missed for each hour of the day.

The member WKTSOMBO in the sharedprefix.MICS.SOURCE library contains the SAS statements for producing the chart reports. The member #TSOMOBJ contains the SAS macro variables used by WKTSOMBO. The #TSOMOBJ member contains the specifications for defining the objectives to be displayed and may be modified to reflect your installation's unique management objectives.

The remainder of this section explains and illustrates each of the standard Weekly TSO Management Objective Reports.

3.3.2.2 Weekly TSO Service Report - All Activity

The Weekly TSO Service - All Activity Report quantifies the total TSO service (all activity including short, medium, and long events) provided on a prime-time hourly basis for the last seven days for each computing system.

The management objective to be tracked for evaluating the speed and consistency for all TSO activity is a percentage measure of the number of TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Total Response Objective:
The percentage of all TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for total TSO activity (e.g., 85% within 15 seconds).

```
    &TSOPTR and &TSOSTR define the percentage target and
         second threshold (e.g., 85% within 15 seconds),
         respectively, for total TSO response time, used in
         daily, weekly, and monthly reports.

         %LET TSOPTR = 85;
         %LET TSOSTR = 15;
```

Figure 3-29 quantifies the service provided with the horizontal axis representing the hours of the seven days and the vertical axis charting the percentage of total TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for total TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 85% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the total TSO service objective was missed for that hour in the week.

Note that when the system was down and/or no measurement data was available for an hour within a date, no bar appears.

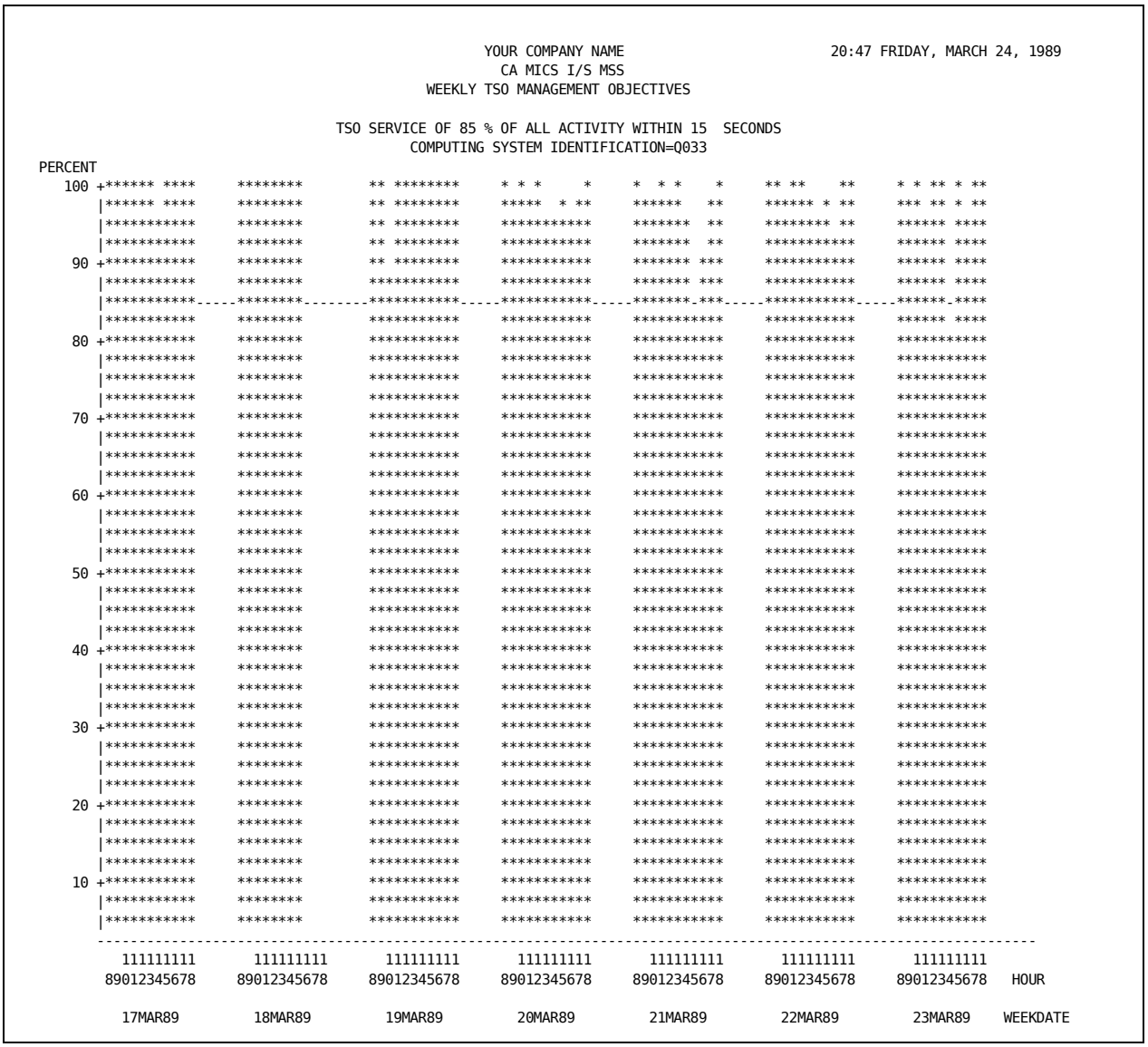


Figure 3-29. Weekly TSO Service Report Format - All Activity

3.3.2.3 Weekly TSO Service Report – Medium Activity

The Weekly TSO Service - Medium Activity Report quantifies the TSO service for medium activity provided on a prime-time hourly basis for the last seven days for each computing system.

The management objective to be tracked for evaluating the speed and consistency for medium TSO activity is a percentage measure of the number of medium TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Medium Response Objective:
The percentage of medium TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for medium TSO activity (e.g., 90% within 15 seconds).

```
    &TSOPMR and &TSOSMR define the percentage target and
         second threshold (e.g., 90% within 15 seconds),
         respectively, for medium TSO response time, used in
         daily, weekly, and monthly reports.

    %LET TSOPMR = 90;
    %LET TSOSMR = 15;
```

Figure 3-30 quantifies the service provided with the horizontal axis representing the hours of the seven days and the vertical axis charting the percentage of medium TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for medium TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 90% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the medium TSO service objective was missed.

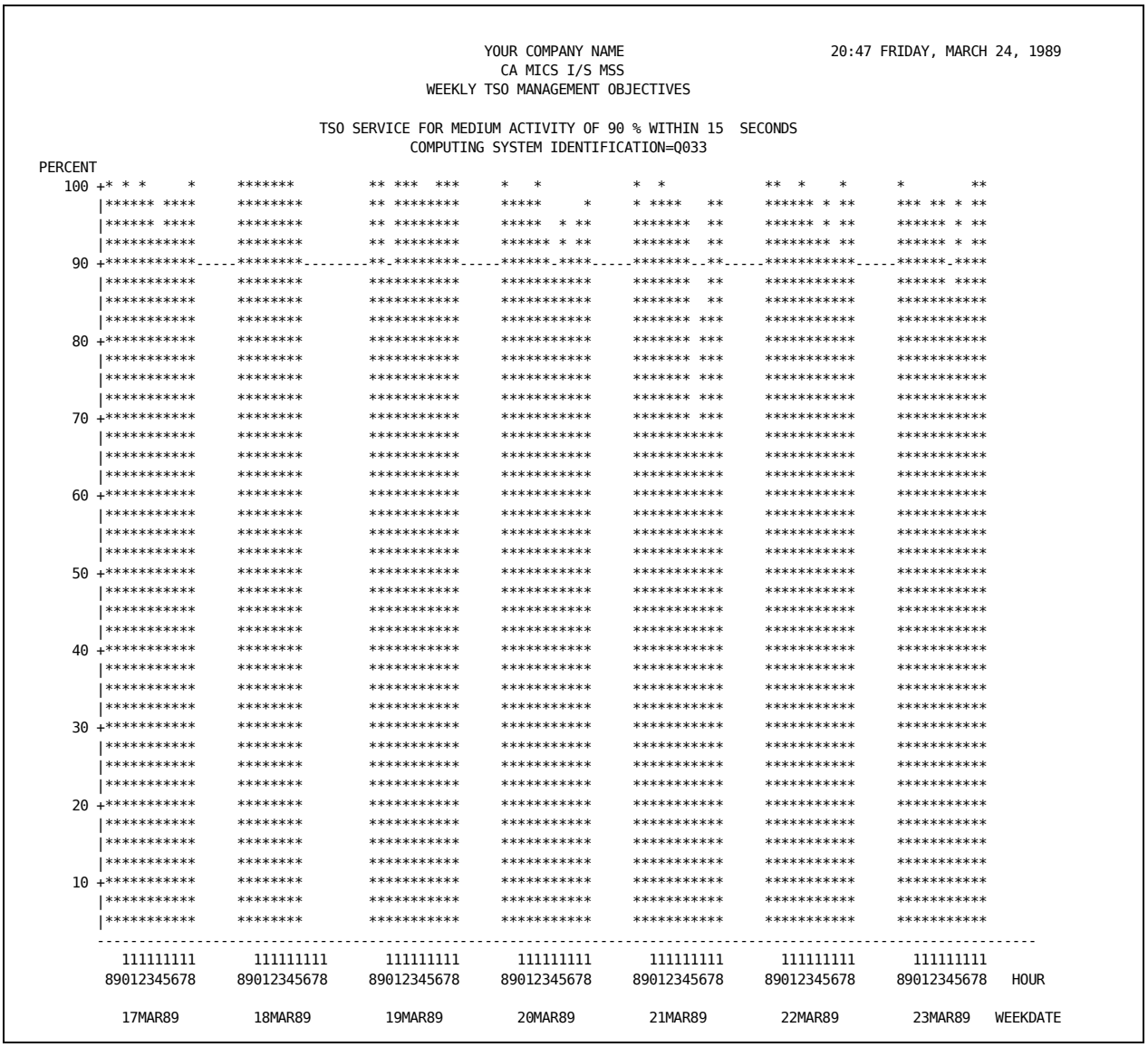


Figure 3-30. Weekly TSO Service Report Format - Medium Activity

3.3.2.4 Weekly TSO Service Report - Short Activity

The Weekly TSO Service - Short Activity Report quantifies the TSO service for short activity provided on a prime-time hourly basis for the last seven days for each computing system.

The management objective to be tracked for evaluating the speed and consistency for short TSO activity is a percentage measure of the number of short TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Short Response Objective:
The percentage of short TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for short TSO activity (e.g., 95% within 5 seconds).

```
    &TSOPSR and &TSOSSR define the percentage target and
         second threshold (e.g., 95% within 5 seconds),
         respectively, for short TSO response time, used in
         daily, weekly, and monthly reports.

    %LET TSOPSR = 95;
    %LET TSOSSR = 5;
```

Figure 3-31 quantifies the service provided with the horizontal axis representing the hours of the seven days and the vertical axis charting the percentage of short TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for short TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 95% level of the vertical axis. Therefore, any hour for which the charted bar falls below this reference line signals that the short TSO service objective was missed.

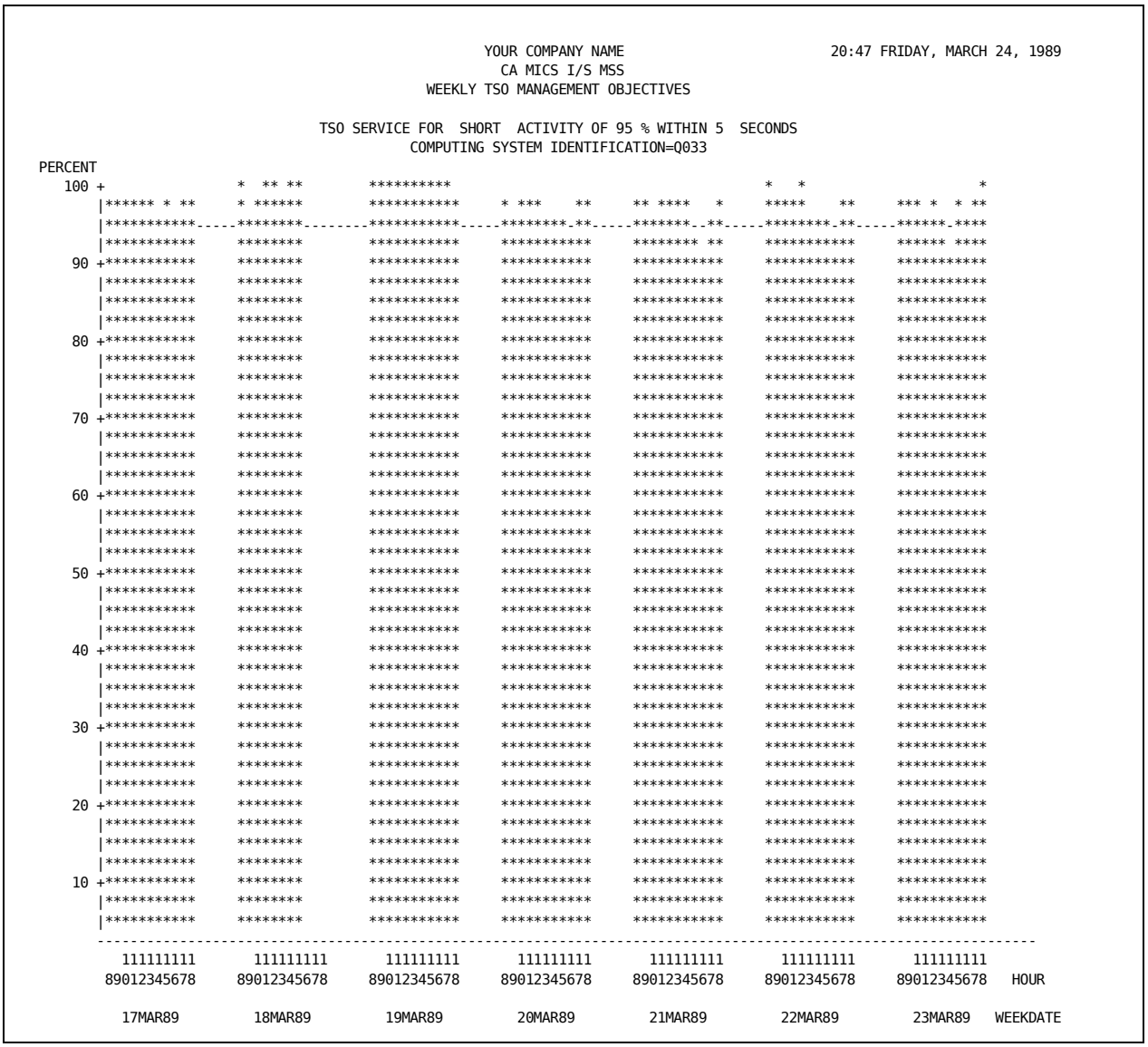


Figure 3-31. Weekly TSO Service Report Format - Short Activity

3.3.2.5 Weekly TSO Outage Report - Availability

The Weekly TSO Outage - Availability Report quantifies the TSO outage incurred on an hourly basis for the identified day and computing system.

The management objective to be tracked for evaluating the availability of the TSO system is a measure of the number of minutes TSO incurred outage time within an hour of the day.

The following user options apply to this report:

Hourly TSO Outage Limits:
The target number of uptime minutes per hour, generally set to 60, and the downtime objective per hour, which is generally set to 0 minutes.

```
&TSOUT and &TSODT define the hourly uptime target and
     hourly downtime reference line, respectively, for
     daily and weekly reporting.

%LET TSOUT = 60;
%LET TSODT = 0;
```

Figure 3-32 quantifies the outage incurred with the horizontal axis representing the hours of the seven days and the vertical axis charting the number of outage minutes incurred.

The management objective is to not incur any outage time; therefore, any time a charted bar appears, the TSO Outage objective was missed for that hour in the week. The reference line is shown at 0 on the vertical axis.

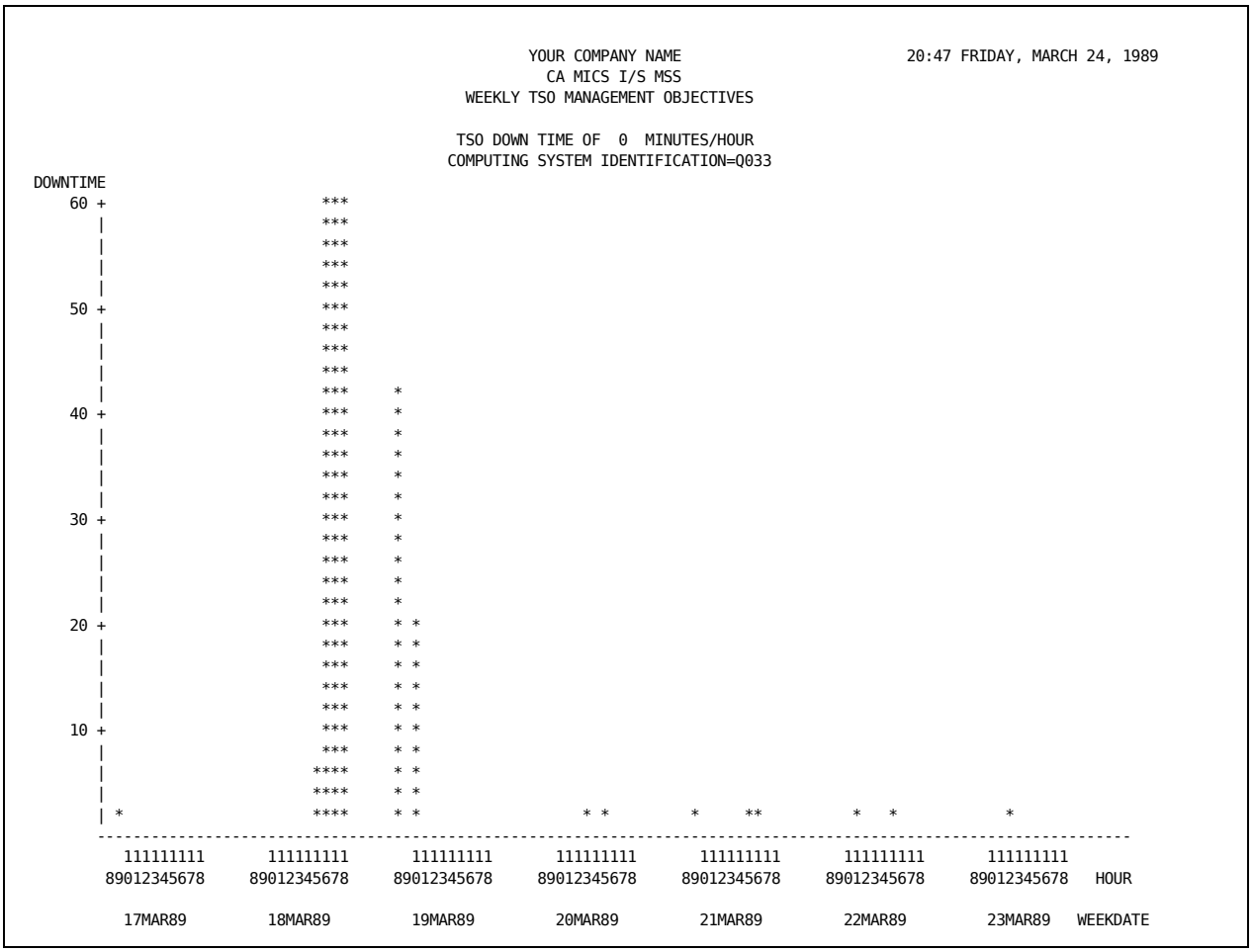


Figure 3-32. Weekly TSO Outage Report Format - Availability

3.3.2.6 Weekly TSO Resource Consumption Report

The Weekly TSO Resource Consumption - Service Units Report quantifies the total TSO resource consumption in terms of service units consumed on a prime-time hourly basis for the last seven days for each computing system.

The management objective to be tracked for evaluating the rate of resource consumption for TSO is a measure of the number of service units consumed per hour.

The following user options apply to this report:

Daily TSO Service Unit Consumption:
The target and maximum number of service units consumed per hour by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

```
&TSOSAX and &TSOSREF define the vertical axis maximum
     scaling and reference line, respectively, for
     service unit consumption by hour in the daily and
     weekly reports.

%LET TSOSAX = 8000000;
%LET TSOSREF = 6000000;
```

Figure 3-33 quantifies the service unit consumption with the horizontal axis representing the hours of the seven days and the vertical axis charting the service units consumed.

The management objective for TSO resource consumption is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 6,000,000 service units consumed level of the vertical axis. Therefore, any hour for which the charted bar exceeds this reference line signals that the objective to contain resource consumption was missed for that hour.

The maximum capacity for consuming service units is indicated by the top of the vertical axis which is set at a value of 8,000,000 service units per hour in the week.

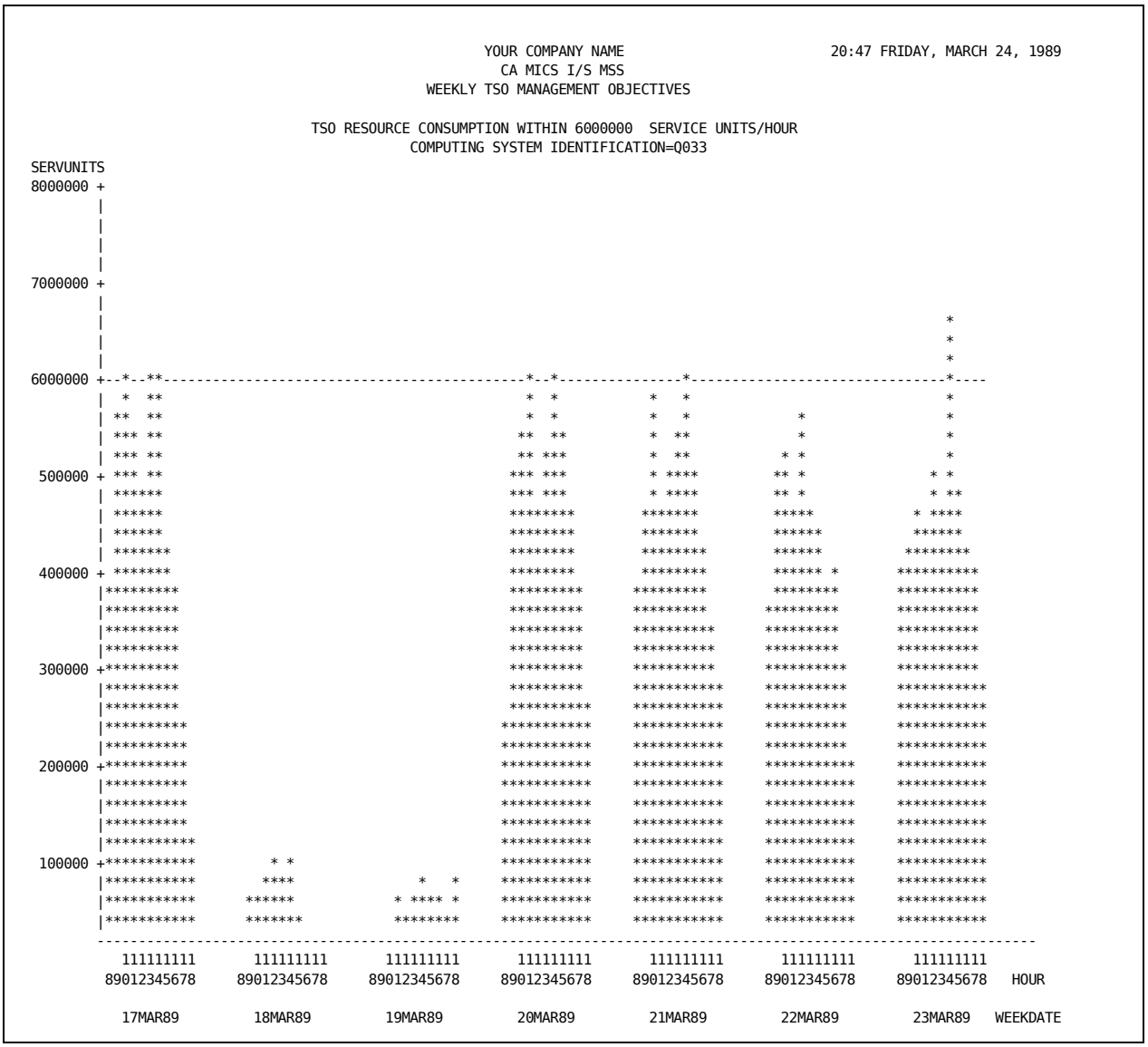


Figure 3-33. Weekly TSO Resource Consumption Report Format - Service Units

3.3.2.7 Weekly TSO Throughput Report - Commands

The Weekly TSO Throughput - Commands Report quantifies the total TSO throughput in terms of commands processed on a prime-time hourly basis for the last seven days for each computing system.

The management objective to be tracked for evaluating the TSO throughput rate is a measure of the number of commands processed per hour.

The following user options apply to this report:

Daily TSO Command Rate:
The target and maximum number of commands processed per hour by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

```
&TSOCAX and &TSOCREF define the vertical axis maximum
     scaling and reference line, respectively, for hourly
     command rate execution in the daily and weekly
     reports.

%LET TSOCAX = 8000;
%LET TSOCREF = 6000;
```

Figure 3-34 quantifies the commands processed with the horizontal axis representing the hours of the seven days and the vertical axis charting the commands processed.

The management objective for TSO throughput is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 6,000 commands processed level of the vertical axis. Therefore, any hour for which the charted bar exceeds this reference line signals that the objective to contain throughput was missed for that hour.

The maximum capacity for command processing is indicated by the top of the vertical axis, which is set at a value of 8,000 commands per hour.

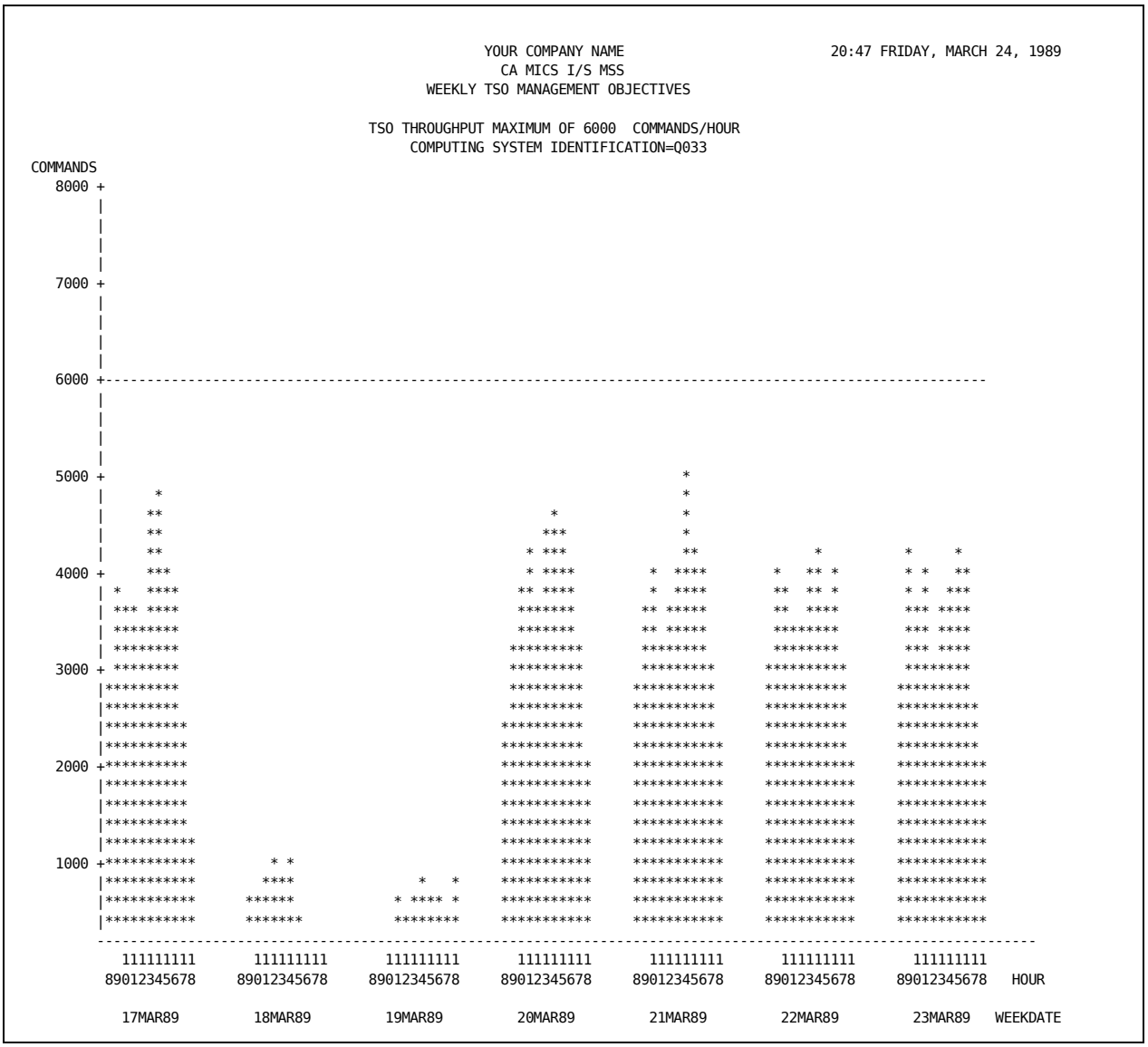


Figure 3-34. Weekly TSO Throughput Report Format - Commands

3.3.3 Monthly TSO Management Objective Reports

The Monthly TSO Management Objective Reports provide management a way in which to determine if their primary TSO processing objectives are being met. The one-page charts illustrate the activity by month and zone for up to twelve months. The charts report against the established hourly objectives for: short, medium, and total response; command load; service unit consumption; and availability.

A user option for zone selection is provided.

Zone Selection for Monthly Reporting:
The zone or range of zones that are to be included in the Monthly TSO Reports. Normally all zones should be reported; therefore, the range should be 1 to 9. The TSO Reports could be limited to only the range of zones required.

```
&TSOLOZN and &TSOHIZN define the low and high zones in
     the months input for selection of the TSO activity
     to be reported in the monthly reports.

%LET TSOLOZN = 1;
%LET TSOHIZN = 9;
```

The following sections display and explain the monthly TSO Management Objective Reports:

```
 1 - Report Format Description
 2 - Monthly TSO Service Report - All Activity
 3 - Monthly TSO Service Report - Medium Activity
 4 - Monthly TSO Service Report - Short Activity
 5 - Monthly TSO Available Hours Report
 6 - Monthly System IPL Report
 7 - Monthly TSO Resource Consumption Report - Service Units
 8 - Monthly TSO Throughput Report - Commands
```

3.3.3.1 Report Format Description

The Monthly TSO Management Objective Reports are produced as a standard process in the CA MICS Monthly Job Stream. Each of the reports is produced from the TSO System Activity Files for the previous twelve months (MONTHS.TSOTSO01-12) in the data base's MONTHS time-span. The SAS CHART procedure is used to produce the desired bar chart reports.

The report heading contains the installation name (e.g., XYZ Manufacturing, Inc.), the frequency identification (e.g., MONTHLY TSO MANAGEMENT OBJECTIVES), the objective being reported (e.g., TSO SERVICE OF 95% OF ALL ACTIVITY WITHIN 15 SECONDS), and the computing system (e.g., SYSID code) on which the TSO processing was measured for the month.

The charts illustrate time-zones within month along the horizontal axis and the measurement being reported (e.g., service units) along the vertical axis.

The vertical axis is used to chart the measure being reported and it is with this axis that the management objective for this category is defined. The vertical axis is first established through the SAS CHART procedure AXIS option which simply identifies the highest value to be represented on the vertical axis. The management objective is then illustrated through the SAS CHART procedure REF option and formatted with a dashed line across the page to illustrate the management objective.

Consider the charting of the objective for short service. The title describes the management objective as 95% within 5 seconds for short activity. The measure that is charted is the percentage of short events satisfied within 5 seconds for each zone of each month. Therefore, the vertical axis would be set up for a maximum value of 100 (for 100%) and the vertical reference line would be printed at the 95% level. This reference line then clearly depicts how the objective was satisfied or missed for each zone of each month.

The member MNTSOMBO in the sharedprefix.MICS.SOURCE library contains the SAS statements for producing the chart reports.

The user-defined options are provided through a SAS MACRO which is the member #TSOMOBJ stored in the sharedprefix.MICS.SOURCE library. The following are the definitions applicable to TSO monthly management objective reporting. The labels within the parentheses are the MACRO names used to define the options.

- Total TSO Service Definition (&TSOPTR and &TSOSTR)
- Short TSO Service Definition (&TSOPSR and &TSOSSR)
- Medium TSO Service Definition (&TSOPMR and &TSOSMR)
- Monthly Zone Availability Definition (&MUPHRS and &RUPHRS)
- Monthly Zone IPLs Definition (&MIPLS and &RIPLS)
- Monthly Zone Maximum and Target Service Units (&TSOMSAX and &TSOMSRF)
- Monthly Zone Maximum and Target Commands (&TSOMCAX and &TSOMCRF)

The remainder of this section explains and illustrates each of the standard Monthly TSO Management Objective Reports.

3.3.3.2 Monthly TSO Service Report - All Activity

The Monthly TSO Service - All Activity Report quantifies the total TSO service (all activity including short, medium, and long events) provided on a zone basis by month for each computing system.

The management objective to be tracked for evaluating the speed and consistency for all TSO activity is a percentage measure of the number of TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Total Response Objective:
The percentage of all TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for total TSO activity (e.g., 85% within 15 seconds).

```
    &TSOPTR and &TSOSTR define the percentage target and
         second threshold (e.g., 85% within 15 seconds),
         respectively, for total TSO response time, used in
         daily, weekly, and monthly reports.

         %LET &TSOPTR = 85;
         %LET &TSOSTR = 15;
```

Figure 3-35 quantifies the service provided with the horizontal axis representing zone within month and the vertical axis charting the percentage of total TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for total TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 85% level of the vertical axis. Therefore, any zone for which the charted bar falls below this reference line signals that the total TSO service objective was missed for that zone in the month.

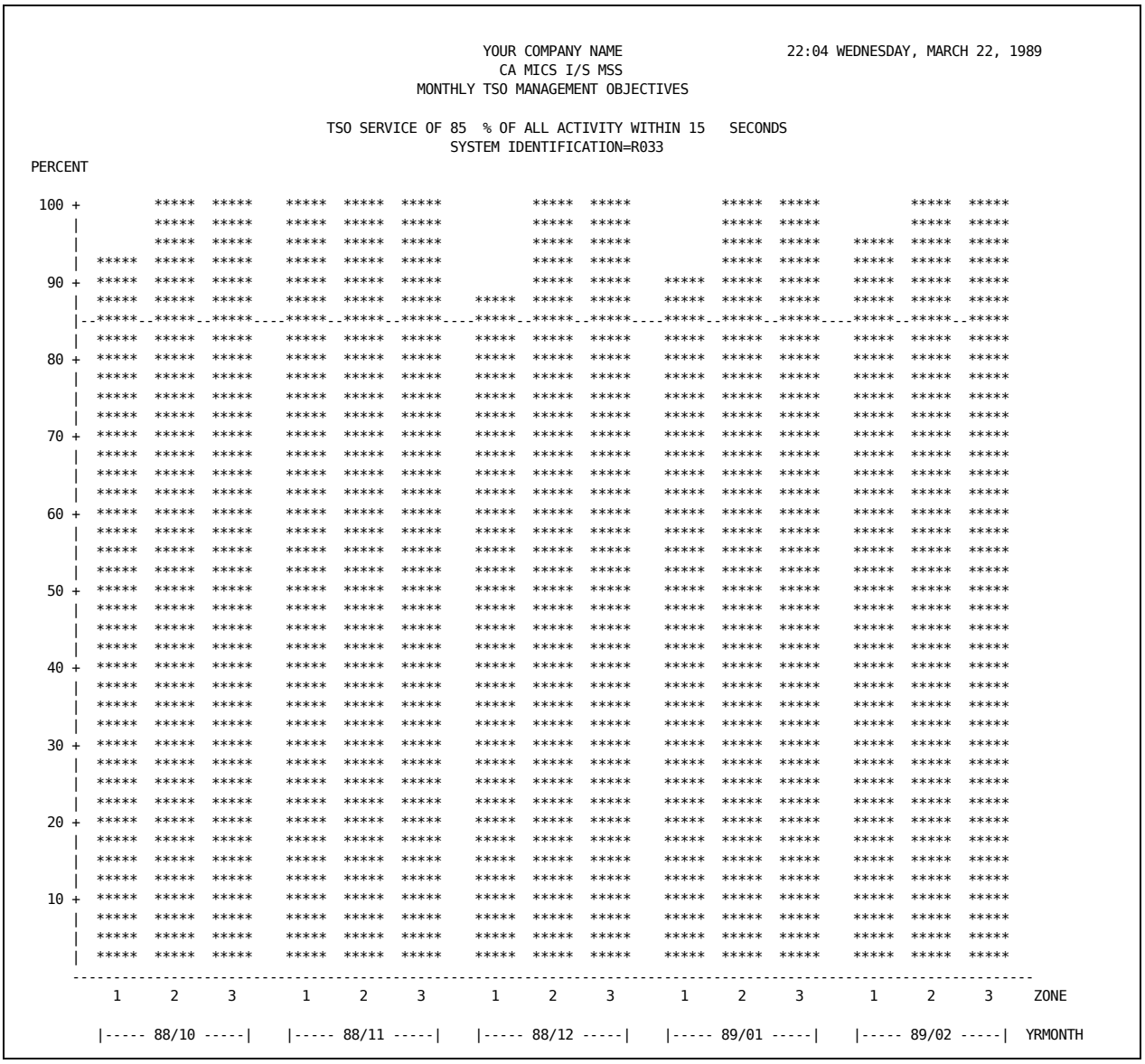


Figure 3-35. Monthly TSO Service Report Format - All Activity

3.3.3.3 Monthly TSO Service Report – Medium Activity

The Monthly TSO Service - Medium Activity Report quantifies the TSO service for medium activity provided on a zone basis by month for each computing system.

The management objective to be tracked for evaluating the speed and consistency for medium TSO activity is a percentage measure of the number of medium TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Medium Response Objective:
The percentage of medium TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for medium TSO activity (e.g., 90% within 15 seconds).

```
&TSOPMR and &TSOSMR define the percentage target and
     second threshold (e.g., 90% within 15 seconds),
     respectively, for medium TSO response time, used in
     daily, weekly, and monthly reports.

%LET &TSOPMR = 90;
%LET &TSOSMR = 15;
```

Figure 3-36 quantifies the service provided with the horizontal axis representing zone within month and the vertical axis charting the percentage of medium TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for medium TSO service is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 90% level of the vertical axis. Therefore, any zone for which the charted bar falls below this reference line signals that the medium TSO service objective was missed for that zone in the month.

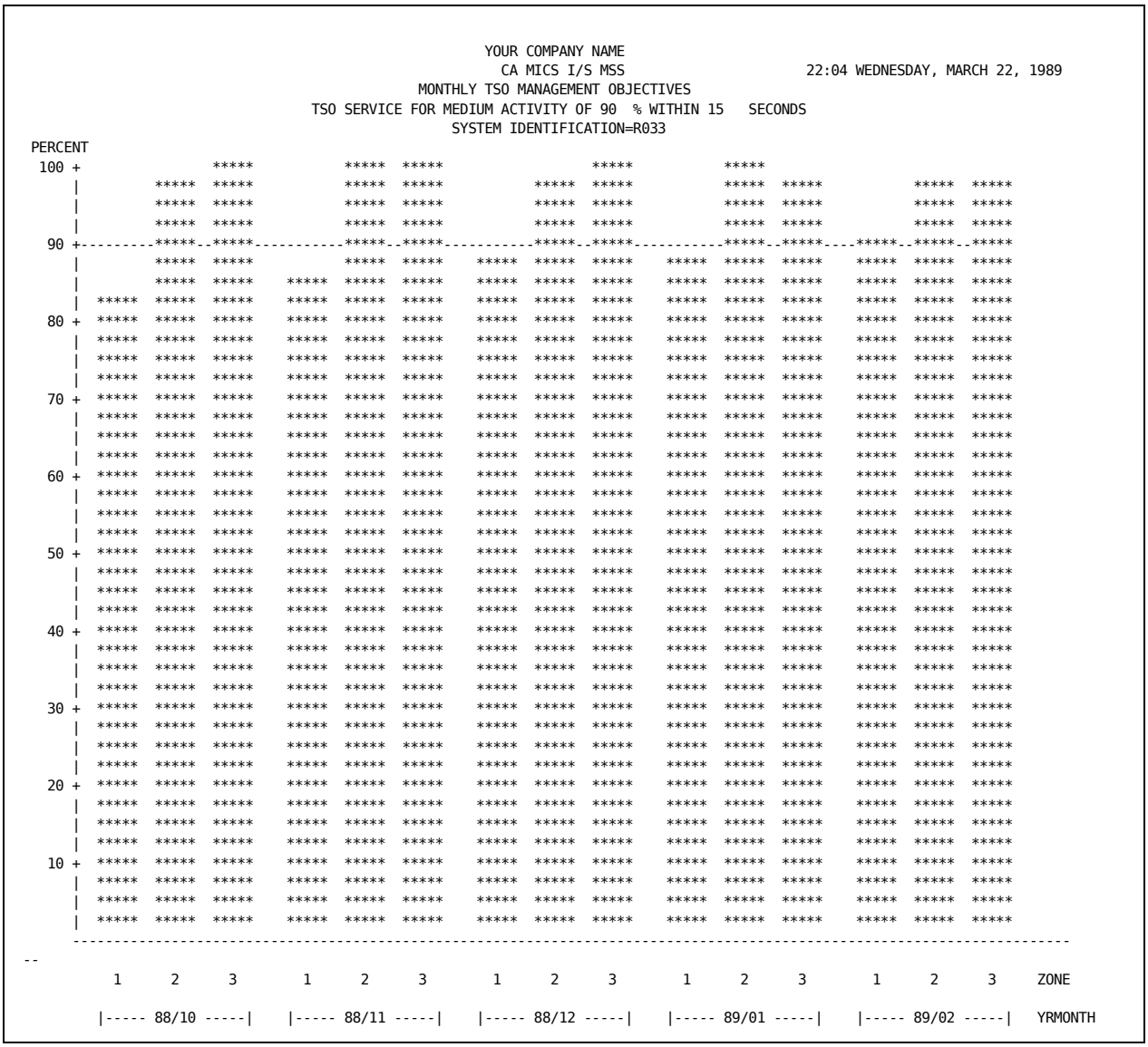


Figure 3-36. Monthly TSO Service Report Format - Medium Activity

3.3.3.4 Monthly TSO Service Report – Short Activity

The Monthly TSO Service - Short Activity Report quantifies the TSO service for short activity provided on a zone basis by month for each computing system.

The management objective to be tracked for evaluating the speed and consistency for short TSO activity is a percentage measure of the number of short TSO interactions that were satisfied within a specified number of seconds.

The following user options apply to this report:

Short Response Objective:
The percentage of short TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for short TSO activity (e.g., 95% within 5 seconds).

```
&TSOPSR and &TSOSSR define the percentage target and
     second threshold (e.g., 95% within 5 seconds),
     respectively, for short TSO response time, used in
     daily, weekly, and monthly reports.

%LET &TSOPSR = 95;
%LET &TSOSSR = 5;
```

Figure 3-37 quantifies the service provided with the horizontal axis representing zone within month and the vertical axis charting the percentage of short TSO interactions satisfied within the specified number of seconds, as identified in the title.

The management objective for short TSO service is shown by the dashed horizontal reference line printed across the level of the vertical axis. Any zone for which the charted bar falls below this reference line signals that the short TSO service objective was missed for that zone in the month.

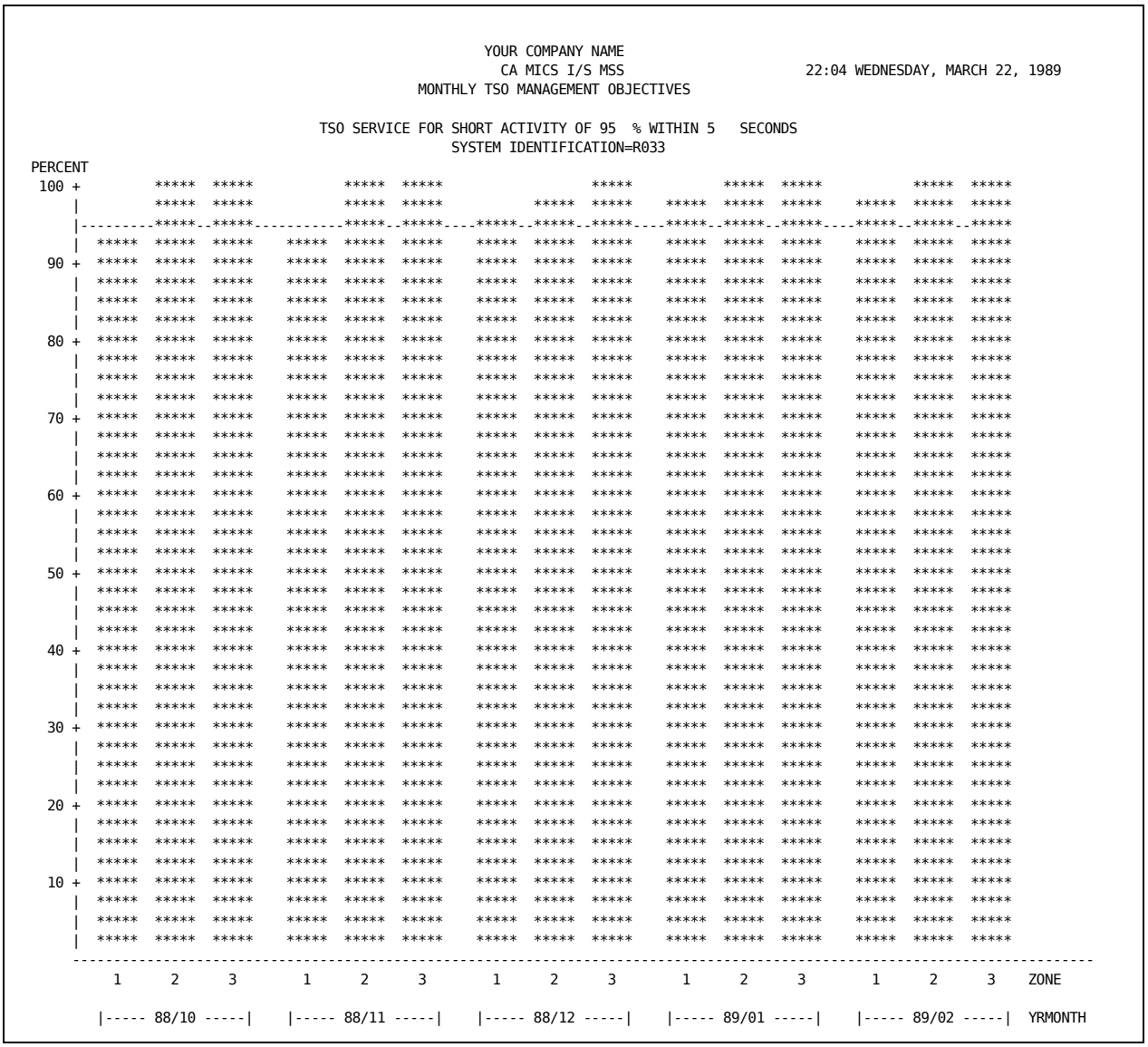


Figure 3-37. Monthly TSO Service Report Format - Short Activity

3.3.3.5 Monthly TSO Available Hours Report

The Monthly TSO Available Hours Report quantifies the TSO available hours on a zone basis by month and for each computing system.

The management objective to be tracked for evaluating the availability of the TSO system is a measure of the number of hours TSO was available for each zone by month.

The following user options apply to this report:

Monthly Availability Hours:
The number of hours that TSO is targeted to be available in any given month for the specified zones.

&MUPHRS and &RUPHRS define the vertical axis maximum scaling and reference line, respectively, for the number of hours TSO was available by zone in the monthly reports.

```
%LET MUPHRS = 400;
%LET RUPHRS = 200;
```

Figure 3-38 quantifies the available hours with the horizontal axis representing zone within month and the vertical axis charting the number of available TSO hours.

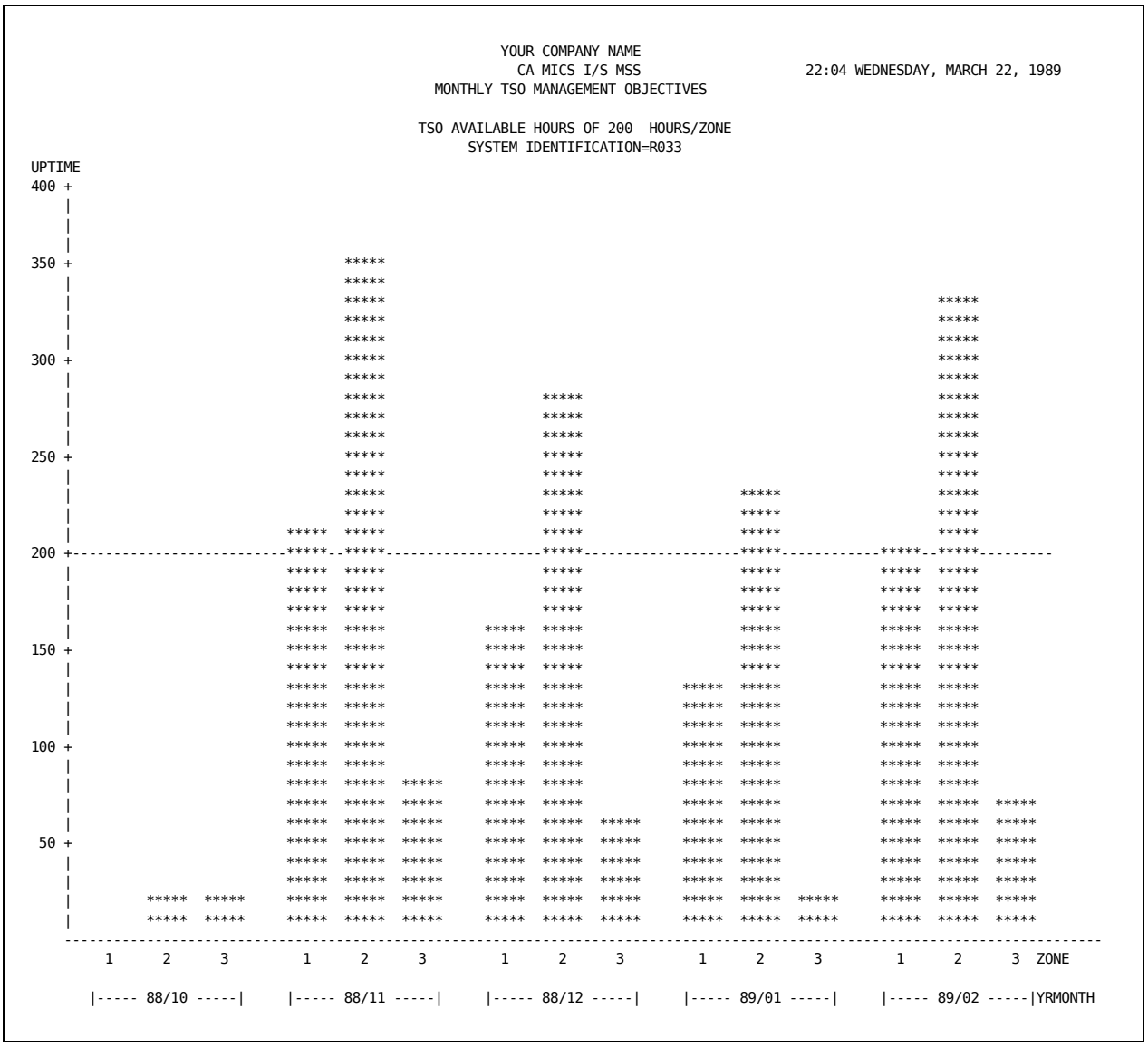


Figure 3-38. Monthly TSO Available Hours Report Format

3.3.3.6 Monthly System IPL Report

The Monthly System IPL Report quantifies the system IPLs incurred on a zone basis by month for each computing system.

The management objective to be tracked for evaluating the reliability of the TSO system is a measure of the number of IPLs which occurred by zone within month.

The following user options apply to this report:

Monthly IPL Limit:
The number of IPLs that TSO is targeted to experience in any given month for the specified zones.

```
&MIPLS and &RIPLS define the vertical axis maximum
     scaling and reference line, respectively, for the
     number of IPLs incurred by zone in the monthly
     reports.

%LET MIPLS = 18;
%LET RIPLS = 1;
```

Figure 3-39 quantifies the system IPLs incurred with the horizontal axis representing zone within month and the vertical axis charting the number of System IPLS incurred.

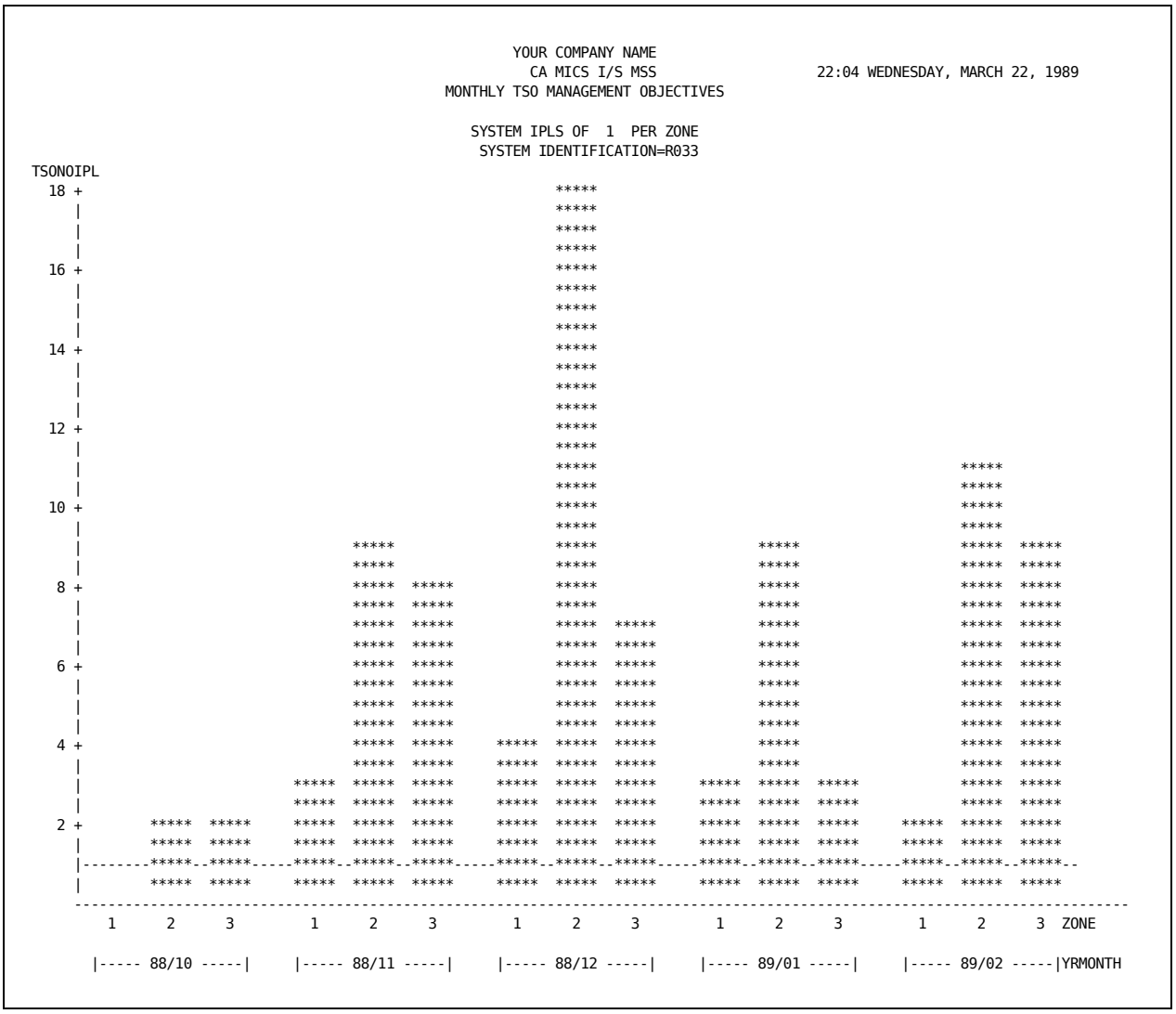


Figure 3-39. Monthly System IPL Report Format

3.3.3.7 Monthly TSO Resource Consumption Report

The Monthly TSO Resource Consumption - Service Units Report quantifies the total TSO resource consumption in terms of service units consumed on a zone basis for each month for each computing system.

The management objective to be tracked for evaluating the rate of resource consumption for TSO is a measure of the number of service units consumed per zone.

The following user options apply to this report:

Monthly TSO Service Unit Consumption:
The target and maximum number of service units consumed per zone within month by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

```
&TSOMSAX and &TSOMSRF define the vertical axis maximum
     scaling and reference line, respectively, for
     service unit consumption by zone in the monthly
     reports.

%LET &TSOMSAX = 1600;
%LET &TSOMSRF = 1200;
```

Figure 3-40 quantifies the service unit consumption with the horizontal axis representing the zone of the month and the vertical axis charting the service units consumed.

The management objective for TSO resource consumption is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 1200 million service units consumed level of the vertical axis. Therefore, any zone for which the charted bar exceeds this reference line signals that the objective to contain resource consumption was missed for that zone.

The maximum capacity for consuming service units is indicated by the top of the vertical axis which is set at a value of 1600 million service units per zone.

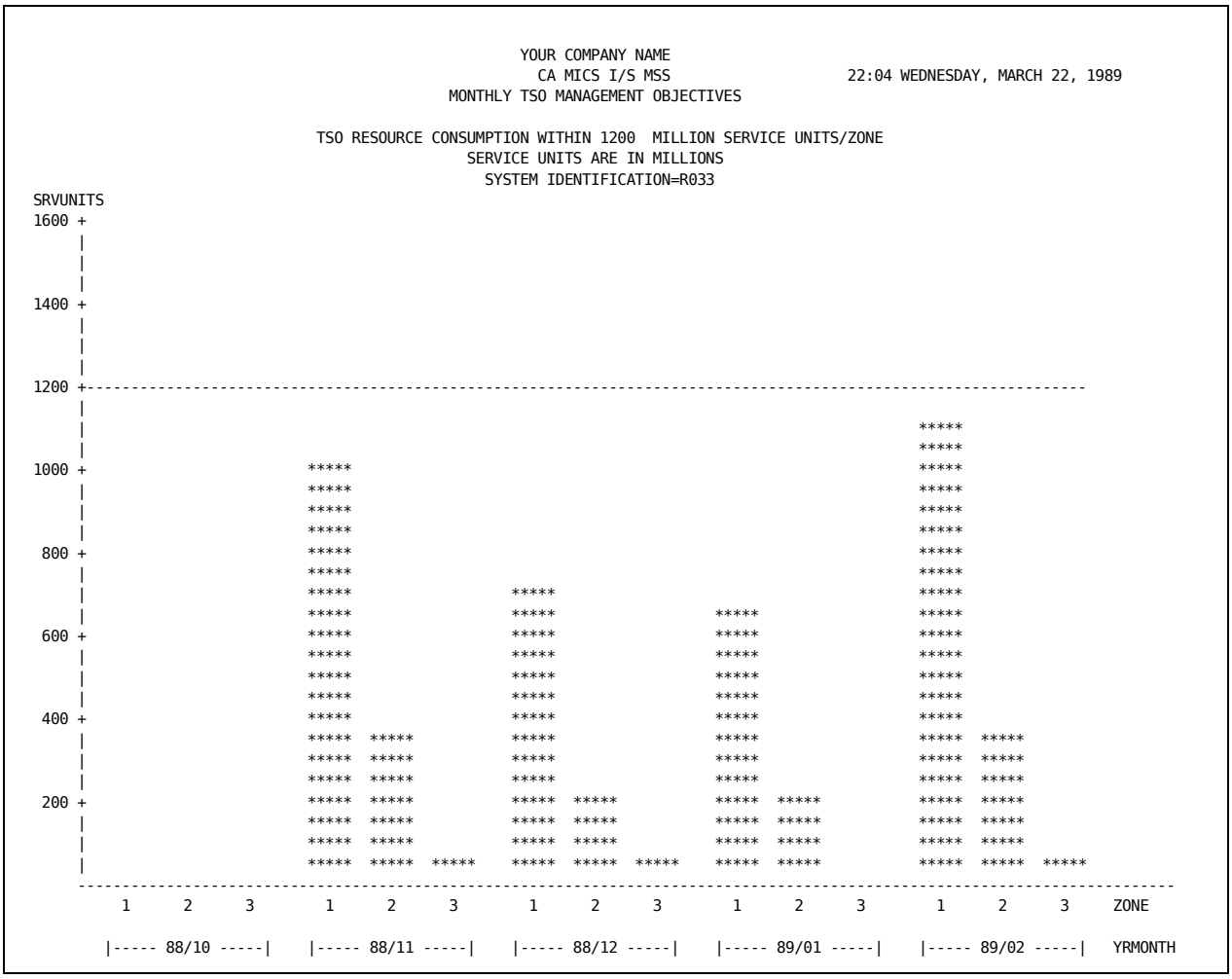


Figure 3-40. Monthly TSO Resource Consumption Report Format - Service Units

3.3.3.8 Monthly TSO Throughput Report - Commands

The Monthly TSO Throughput - Commands Report quantifies the total TSO throughput in terms of commands processed on a zone basis for each month for each computing system.

The management objective to be tracked for evaluating the TSO throughput rate is a measure of the number of commands processed per zone.

The following user options apply to this report:

Monthly TSO Command Rate:
The target and maximum number of commands processed per zone within month by TSO. The target amount is used for a reference line on the graph, and the maximum is used to set the maximum value on the graph's vertical axis.

```
    &TSOMCAX and &TSOMCRF define the vertical axis maximum
         scaling and reference line, respectively, for
         commands executed by zone in the monthly reports.

    %LET &TSOMCAX = 1600000;
    %LET &TSOMCRF = 1400000;
```

Figure 3-41 quantifies the commands processed with the horizontal axis representing zone within month and the vertical axis charting the commands processed.

The management objective for TSO throughput is shown by the dashed horizontal reference line printed across the chart. The reference line is shown at the 1,400,000 commands processed level of the vertical axis. Therefore, any zone for which the charted bar exceeds this reference line signals that the objective to contain throughput was missed for that zone.

The maximum capacity for command processing is indicated by the top of the vertical axis which is set at a value of 1,600,000 commands per zone.

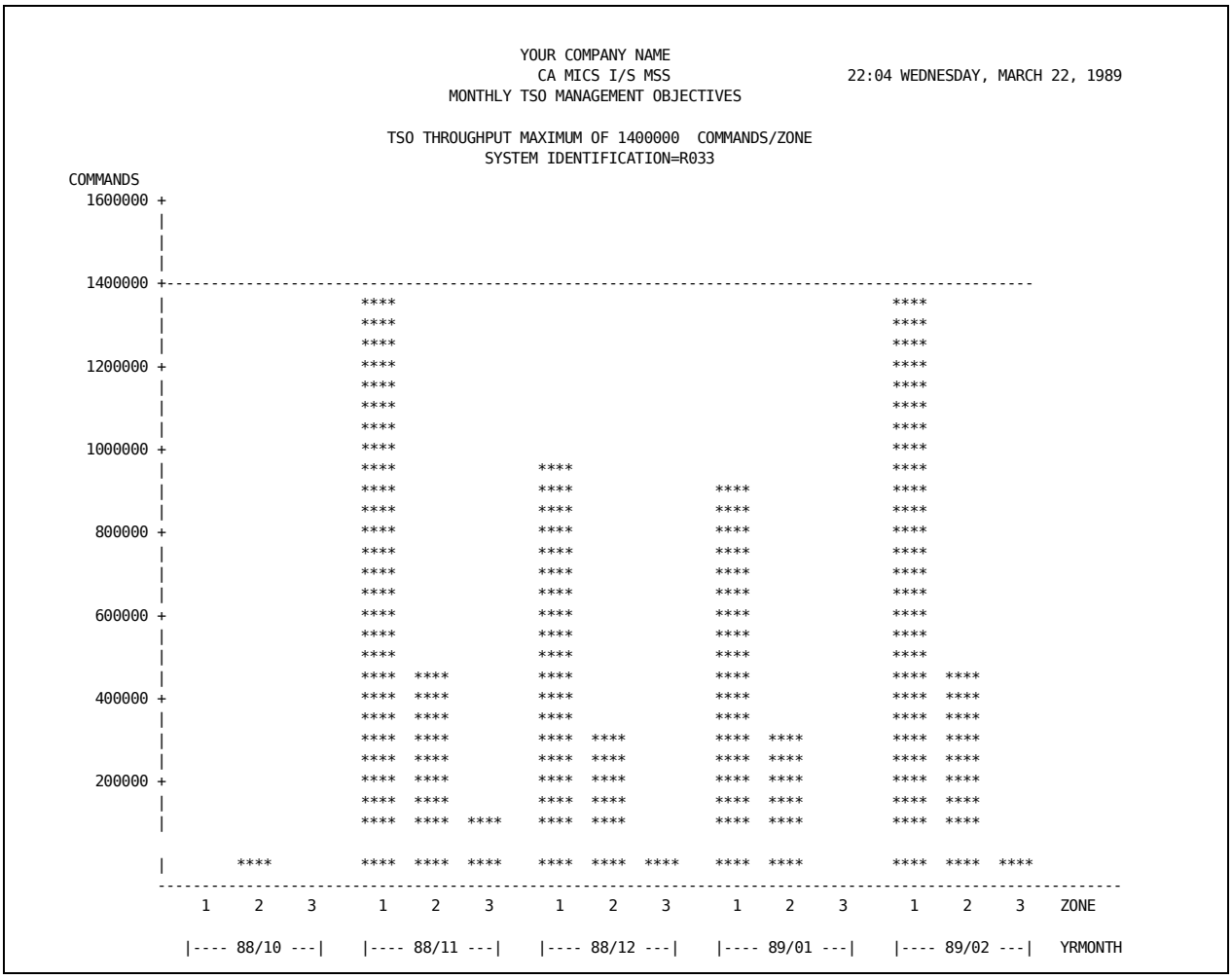


Figure 3-41. Monthly TSO Throughput Report Format - Commands

3.3.4 Setting TSO Management Objective Report Options

The TSO Management Objective Reports assume that a set of objectives related to the operation of TSO have been determined. Often this may not be the case. This section describes how the management objectives may be specified to the reporting process once they have been defined by management. First, however, a discussion of how the objectives may be established might prove useful.

Numbers which will be used as management objectives should not be defined without some analysis of the installation's historical TSO performance.

The CA MICS data base provides a useful information base for analyzing historical performance. The data base files that should be used in analyzing the TSO activity for purposes of establishing the TSO Report Options are listed according to the reports they apply to.

```
Daily   - DAYS.TSOTSO01
Weekly  - DAYS.TSOTSO01-10 (selects last week only)
Monthly - MONTHS.TSOTSO01-12
```

In each case the data source is the TSO System Activity (TSOTSO) File. We recommend that the following analysis steps be used to study past performance.

Statistical Analysis: The same data sources as mentioned above may be used to analyze in-depth the measures around which the management objectives are to be determined. Specifically, you can use the SAS procedures UNIVARIATE and FREQ to provide a reasonable statistical analysis of an individual measure, providing the analyst with mean, standard deviation, and percentile values. The percentile values may be the most applicable to the process of determining the management objectives target values.

In addition, check the perspective of TSO users as to what minimum level of service, availability, and throughput they require.

The integration of this information with data processing management's own priorities and requirements will establish the base for defining the management objectives for TSO.

The following sections describe specifically how an installation can specify the numerical values used in these

reports.

```
    1 - Report Options
    2 - Report Options MACRO Example
```

3.3.4.1 Report Options

SAS macro variables control the options for defining the TSO Management Objective Reports. To adjust the objectives for management objective reports, use the macros contained in either the sharedprefix or prefix MICS.SOURCE(#TSOMOBJ) member.

Changes made to macros at the complex level affect all units. To limit changes to a particular unit, add the macro to the unit level member following the %INCLUDE SOURCE(#TSOMOBJ) statement. The complex level member, as distributed, contains default objectives.

The macros provided with this product are in the form of SAS macro language symbolic variable assignments. The following macros are available.

Hourly Selection Range for Daily Reports:
The start and end hours of the day that are to be included in the Daily TSO Reports. We recommend that you set the hours to include the entire day (00 23).

&TSODLHR and &TSODHHR define the low and high hours of the day for selection of the TSO activity to be reported in the daily reports.

Hourly Selection Range for Weekly Reports:
The start and end hours of the day that are to be included in the Weekly TSO Reports. We recommend that you set the hours to include only the prime-time hours (e.g., 08 16).

&TSOWLHR and &TSOWHHR define the low and high hours of the days for selection of the TSO activity to be reported in the weekly reports.

Total Response Objective:
The percentage of all TSO responses that were satisfied within a specified number of seconds to reflect the installation's response objective for total TSO activity (e.g., 90% within 15 seconds).

&TSOPTR and &TSOSTR define the percentage target and second threshold (e.g., 90% within 4 seconds) for total TSO response time, used in daily, weekly, and monthly reports.

Short Response Objective:
The percentage of short TSO responses that were satisfied

```
within a specified number of seconds to reflect the
installation's response objective for short TSO activity
(e.g., 96% within 4 seconds).

    &TSOPSR and &TSOSSR define the percentage target and
         second threshold (e.g., 90% within 4 seconds) for
         short TSO response time, used in daily, weekly, and
         monthly reports.

Medium Response Objective:
The percentage of medium TSO responses that were satisfied
within a specified number of seconds to reflect the
installation's response objective for medium TSO activity
(e.g., 94% within 6 seconds).

    &TSOPMR and &TSOSMR define the percentage target and
         second threshold (e.g., 90% within 4 seconds) for
         medium TSO response time, used in daily, weekly, and
         monthly reports.

Daily TSO Service Unit Consumption:
The target and maximum number of service units consumed per
hour by TSO.  The target amount is used for a reference line
on the graph, and the maximum is used to set the maximum
value on the graph's vertical axis.

    &TSOSAX and &TSOSREF define the vertical axis maximum
         scaling and reference line for service unit
         consumption by hour in the daily and weekly reports.

Daily TSO Command Rate:
The target and maximum number of commands processed per hour
by TSO.  The target amount is used for a reference line on
the graph, and the maximum is used to set the maximum value
on the graph's vertical axis.

    &TSOCAX and &TSOCREF define the vertical axis maximum
         scaling and reference line for hourly command rate
         execution in the daily and weekly reports.

Hourly TSO Outage Limits:
The target number of uptime minutes per hour, generally set
to 60, and the downtime objective per hour, which is
generally set to 0 minutes.

    &TSOUT and &TSODT define the hourly uptime target and
         hourly downtime reference line for daily and weekly
         reporting.
```

```
Zone Selection for Monthly Reporting:
The zone or range of zones that are to be included in the
Monthly TSO Reports.  Normally all zones should be reported;
therefore, the range should be 1 to 9.  The TSO Reports could
be limited to only the range of zones required.

    &TSOLOZN and &TSOHIZN define the low and high zones in
         the months input for selection of the TSO activity
         to be reported in the monthly reports.

Monthly Availability Hours:
The number of hours that TSO is targeted to be available in
any given month for the specified zones.

    &MUPHRS and &RUPHRS define the vertical axis maximum
         scaling and reference line for the number hours TSO
         was available by zone in the monthly reports.

Monthly IPL Limit:
The number of IPLs that TSO is targeted to experience in any
given month for the specified zones.

    &MIPLS and &RIPLS define the vertical axis maximum
         scaling and reference line for the number of IPLs
         incurred by zone in the monthly reports.

Monthly TSO Service Unit Consumption:
The target and maximum number of service units consumed per
zone within month by TSO.  The target amount is used for a
reference line on the graph and the maximum is used to set
the maximum value on the graph's vertical axis.

    &TSOMSAX and &TSOMSRF define the vertical axis maximum
         scaling and reference line for service unit
         consumption by zone in the monthly reports.

Monthly TSO Command Rate:
The target and maximum number of commands processed per zone
within month by TSO.  The target amount is used for a
reference line on the graph and the maximum is used to set
the maximum value on the graph's vertical axis.

    &TSOMCAX and &TSOMCRF define the vertical axis maximum
         scaling and reference line for commands executed
         by zone in the monthly reports.
```

3.3.4.2 Report Options MACRO Example

Once the management objectives for TSO have been established they can easily be incorporated into the TSO Reports.

The specification of the management objectives to be used in the reporting process are defined in the #TSOMOBJ member of the sharedprefix.MICS.SOURCE library.

The #TSOMOBJ member is distributed with a set of default values. It is the responsibility of the CA MICS System Administrator to initially tailor the values and maintain them for subsequent installation changes and CA MICS system maintenance.

Figures 3-42 and 3-43 illustrate the macro variables for TSO Management Objective Reports.

The installation needs to define only the management objectives in the #TSOMOBJ member, and the reporting process will be tailored to your system's definitions.

```
*************************************************** ;
* THE FOLLOWING SECTION DEFINES THE OBJECTIVES,      * ;
* SELECTION FIELDS, AND CHARTING OPTIONS TO BE USED  * ;
* FOR DAILY, WEEKLY, AND MONTHLY TSO MANAGEMENT      * ;
* OBJECTIVE REPORTING.                               * ;
*************************************************** ;
* ;
* TOTAL RESPONSE SPECIFICATIONS ;
%LET   TSOPTR = percentage;
%LET   TSOSTR = seconds;
* MEDIUM RESPONSE SPECIFICATIONS ;
%LET  TSOPMR  = percentage;
%LET  TSOSMR  = seconds ;
* SHORT RESPONSE SPECIFICATIONS;
%LET  TSOPSR  = percentage ;
%LET  TSOSSR  = seconds ;
* AVAILABILITY SPECIFICATIONS;
%LET  TSOUT  =  uptime-mins ;
%LET  TSODT  =  downtime-mins  ;
* SERVICE UNITS CAPACITY SPECIFICATION;
%LET  TSOSAX  = maximum-service-units;
%LET  TSOSREF = target-service-units ;
* COMMAND THROUGHOUT SPECIFICATION;
%LET  TSOCAX  = maximum-commands ;
%LET  TSOCREF = target-commands  ;
* TIME SELECTION SPECIFICATION - DAILY;
```

```
%LET  TSODLHR = low-hour ;
%LET  TSODHHR = high-hour ;
* TIME SELECTION SPECIFICATION  - WEEKLY;
%LET  TSOWLHR = low-hour  ;
%LET  TSOWHHR = high-hour ;
* ZONE SELECTION SPECIFICATION - MONTHLY ;
%LET  TSOHIZN = low-zone ;
%LET  TSOLOZN = high-zone ;
* MONTHLY - SERVICE UNITS CAPACITY SPECIFICATION ;
* IN MILLIONS;
%LET  TSOMSAX = maximum-service-units;
%LET  TSOMSRF = target-service-units ;
* MONTHLY - COMMAND THROUGHOUT SPECIFICATION ;
%LET  TSOMCAX = maximum-commands ;
%LET  TSOMCRF = target-commands  ;
* MONTHLY - AVAILABILITY SPECIFICATIONS ;
%LET  MIPLS  =  maximum-IPLs   ;
%LET  RIPLS  =  target-IPLs    ;
%LET  MUPHRS =  maximum-uphours;
%LET  RUPHRS =  target-uphours ;
```

Figure 3-43 shows how the TSO options have been defined in #TSOMOBJ in the distributed version of the member.

```
*************************************************** ;
* THE FOLLOWING SECTION DEFINES THE OBJECTIVES,      * ;
* SELECTION FIELDS, AND CHARTING OPTIONS TO BE USED  * ;
* FOR DAILY, WEEKLY, AND MONTHLY TSO MANAGEMENT      * ;
* OBJECTIVE REPORTING.                               * ;
*************************************************** ;
* ;
* TOTAL RESPONSE SPECIFICATIONS ;
%LET  TSOPTR =  95 ;
%LET  TSOSTR =  15 ;
* MEDIUM RESPONSE SPECIFICATIONS ;
%LET  TSOPMR =  90 ;
%LET  TSOSMR =  15 ;
* SHORT RESPONSE SPECIFICATIONS ;
%LET  TSOPSR =  95 ;
%LET  TSOSSR =   5 ;
* AVAILABILITY SPECIFICATIONS ;
%LET  TSOUT  =  60 ;
%LET  TSODT  =   0 ;
* SERVICE UNITS CAPACITY SPECIFICATION ;
%LET  TSOSAX  = 12000000 ;
%LET  TSOSREF = 8000000  ;
* COMMAND THROUGHOUT SPECIFICATION ;
```

```
%LET  TSOCAX  = 12000 ;
%LET  TSOCREF = 8000  ;
* TIME SELECTION SPECIFICATION - DAILY ;
%LET  TSODLHR =  0  ;
%LET  TSODHHR = 23  ;
* TIME SELECTION SPECIFICATION - WEEKLY ;
%LET  TSOWLHR  = 8  ;
%LET  TSOWHHR = 17  ;
* ZONE SELECTION SPECIFICATION - MONTHLY ;
%LET  TSOHIZN  = 3  ;
%LET  TSOLOZN  = 1  ;
* MONTHLY - SERVICE UNITS CAPACITY SPECIFICATION ;
* IN MILLIONS;
%LET  TSOMSAX = 1500 ;
%LET  TSOMSRF = 1200 ;
* MONTHLY - COMMAND THROUGHOUT SPECIFICATION ;
%LET  TSOMCAX = 1500000 ;
%LET  TSOMCRF = 1400000 ;
* MONTHLY - AVAILABILITY SPECIFICATIONS ;
%LET  MIPLS  =  20  ;
%LET  RIPLS  =  2   ;
%LET  MUPHRS =  210 ;
%LET  RUPHRS =  200 ;
```

Chapter 4: EXCEPTIONS

The CA MICS TSO Analyzer supports the standard CA MICS exception process.

CA MICS exception processing enables the I/S organization to focus on problems impacting its effectiveness in terms of availability, service, workload, standards, security, and performance for the different areas of responsibility (e.g., TSO, IMS, VSE/POWER).

The standard exceptions for this product are shown in Figure 4-1. Each standard exception test is shipped with default values. However, to make effective use of the exception process, you must evaluate your needs and modify these sample values accordingly.

Number	Severity	Management Area	Exception Description
00001	Impacting	Standards	Interactive TSO Run Exceeded Elapsed Time Standard
00002	Warning	Standards	Interactive TSO Run Exceeded Resource Usage Limit
00003	Warning	Standards	Interactive TSO Compilation Exceeded Resource Limit
00004	Warning	Standards	Interactive TSO Compilation Service Objective Missed
00005	Warning	Standards	Game Played During TSO Prime-Time
00007	Warning	Security	Unauthorized Use of Program by TSO User
00050	Warning	Productivity	Excessive Use of TSO Command per Hour
00055	Warning	Productivity	Excessive Number of User LOGONS per Hour
00056	Warning	Standards	Unauthorized Use of TSO Commands
00057	Critical	Security	TSO Command Security Violation
00100	Critical	Availability	System IPL Detected
00101	Critical	Performance	Critical TSO TIOC Buffer Level Detected
00102	Warning	Performance	Warning TSO TIOC Buffer Level Detected
00103	Impacting	Performance	Interval TSO System Resource Overload
00150	Warning	Workload	Interval TSO User Resource Overload
00151	Warning	Workload	Excessive TSO User Interval Command Rate
00200	Impacting	Performance	Hourly TSO System Resource Overload
00201	Critical	Performance	Hourly TSO Capacity Limit Objective Exceeded
00202	Impacting	Performance	Prime-Time TSO System Resource Objective Missed
00203	Critical	Service	Hourly TSO Short Service Objective Missed
00204	Critical	Service	Hourly TSO Medium Service Objective Missed
00205	Warning	Service	Hourly TSO Long Service Objective Missed
00206	Critical	Service	Hourly TSO Total Service Objective Missed
00207	Critical	Availability	Hourly TSO Availability Objective Missed
00208	Critical	Availability	TCAM/VTAM Outage Detected
00209	Critical	Performance	Hourly TSO Throughput Limit Objective Exceeded
00250	Warning	Workload	Hourly TSO User Resource Overload
00251	Critical	Service	Prime-Time TSO User Total Service Objective Missed
00252	Critical	Service	Prime-Time TSO User Short Service Objective Missed
00253	Warning	Workload	Hourly TSO User Terminal I/O Excessively High
00305	Impacting	Performance	Supervisor Trace Table Too Small

```
            |  00306 |  Impacting | Performance    | Insufficient Catalog RPLs                      |
            |  00307 |  Warning   | Performance    | BLDL Not in Use                                |
            |  00308 |  Impacting | Performance    | GTF Active                                     |
            |  00309 |  Warning   | Performance    | OLTEP Active                                   |
            |  00310 |  Critical  | Availability   | Low Core Protection Not in Use                 |
            |  00311 |  Impacting | Availability   | COMMON Page Duplexing Not Active               |
            |  00312 |  Critical  | Availability   | Page/Swap I/O Error(s)                         |
            |  00313 |  Critical  | Performance    | AP/MP/Dyadic System Running in HD Mode         |
            |  00314 |  Critical  | Performance    | Machine Check(s) Occurred                      |
            |  00315 |  Warning   | Performance    | "Quiet Mode" Entered Due to Machine Checks     |
            |  00316 |  Critical  | Performance    | CPU Degraded by TLB/Cache Buffer Failure(s)    |
            |  00319 |  Critical  | Performance    | Recovery of I/O on Failed Processor in Progress
|

+--------------------+-----------------+-----------------------------------------------------
+
```

Figure 4-1. TSO Exception List

This section contains the following topics:

4.1 Exception Process Overview

The CA MICS exception process consists of the exceptions themselves, a set of standard reports, CA MICS Information Center Facility II (MICF II) inquiries, an exception test routine, and an exception value analysis routine. Each of these is described below.

EXCEPTIONS

An exception is the occurrence of an event which merits visibility and attention. It may be an occurrence that is a distinct problem (e.g., CICS abended at 2:00 pm), one that may be a problem and requires further research (e.g., a TSO user overloaded the system from 1:00 to 1:30 pm), or it may represent a standard, security, or audit violation (e.g., user XYZ is not authorized to use PDZAP and was detected using it seven times yesterday).

Because the volume of exception occurrences can be quite large, CA MICS provides means to categorize, aggregate, consolidate, and prioritize them to meet your needs. Each exception has

- An Exception Number for unique definition
- A Severity Level to signify degree of importance
- A Management Area to identify area of responsibility

STANDARD REPORTS

The standard exception reports provide a concise, integrated method for problem reporting. The following reports can be produced as part of the CA MICS DAILY job:

- Exception Management Overview Report
- Severity Level Exception Summary Report
- Management Area Exception Summary Report

You control which reports are produced via the REPORT EXCEPTIONS statement in prefix.MICS.PARMS(EXECDEF). Refer to Section 2.3.5 of the CA MICS Planning, Installation, Operation, and Maintenance (PIOM) Guide for more information.

Two additional standard reports can be produced as required

to provide the necessary background detail to effectively analyze reported exceptions. The two reports are

- Full Exception Detail Report
- Short Exception Detail Report

MICF II INQUIRIES

The catalog group EXCEPT that is shipped with CA MICS contains a number of standard MICF II inquiries that can be used to report exception conditions. In the following inquiry list, graphic reports whose value of 'x' is 'C', produce color graphic reports using SAS/GRAPH. If the value of 'x' is 'P', printer graphic reports are produced without using SAS/GRAPH.

- BASxM1 - Monthly Exception Summary Report
- BASxM2 - Monthly Mgmt. Area Exception Summary Report
- BASxM3 - Monthly Info. Area Exception Summary Report
- BASxM4 - Monthly Exception Management Overview Report
- BASxM5 - Monthly Info. Area Exception Overview Report
- BASxW1 - Weekly Exception Summary Report
- BASxW2 - Weekly Mgmt. Area Exception Summary Report
- BASxW3 - Weekly Info. Area Exception Summary Report

The following inquiries that produce printed reports are also available:

- BASLD2 - Daily Severity Level Exception Summary Report
- BASLD3 - Daily Management Area Exception Summary Report
- BASLD4 - Daily Short Exception Detail Report
- BASLD5 - Daily Full Exception Detail Report
- BASLD6 - Daily Exception Ranking Report
- BASLM6 - Monthly Exception Ranking Report

These standard inquiries have Execution-Time parameter selection that permits you to report on a subset of the exceptions. For example, inquiry BASLD5 allows selection on SYSID, Information Area, Management Area, Severity Level, and other criteria.

EXCEPTION TEST ROUTINE

Each component has an exception test routine that is invoked in the DAY200 step of the CA MICS DAILY job. You control which routines are invoked using the CREATE EXCEPTIONFILES

statement in prefix.MICS.PARMS(EXECDEF). Refer to the CA MICS Planning, Installation, Operation, and Maintenance (PIOM) Guide, Section 2.3.5, for more information on EXECDEF.

An exception test routine, written in the SAS language, defines the exception and tests to determine whether or not the exception condition is present in the data being processed. The distributed exception test routine for each component is contained in sharedprefix.MICS.SOURCE(DYcccEXC) where ccc is the component identifier. When the DAY200 step invokes the test routines, it does so by %INCLUDEing the DYcccEXC member from prefix.MICS.USER.SOURCE. As distributed, that member then %INCLUDEs the member from sharedprefix.MICS.SOURCE. See Section 4.2 of this guide, Setting Exception Values, for more information on DYcccEXC.

EXCEPTION VALUE ANALYSIS ROUTINE

Each component has an exception value analysis (EVA) routine that can be used to help determine values for the exception conditions. The EVA routine extracts information from the CA MICS data base. Descriptive statistics for the values of variables used in exception tests are printed in the Exception Value Analysis Report. The EVA routine for each component is stored in sharedprefix.MICS.SOURCE(cccEVA). The job control to execute the EVA process is contained in prefix.MICS.CNTL(cccEVA).

4.2 Setting Exception Values

Exception test routines contain exception tests which completely define the tests made to determine the exception condition. The exception tests also contain the definitions which define and classify the exception for reporting and analysis. A sample exception test is:

```
*
** 00151
** EXCESSIVE TSO USER INTERVAL COMMAND RATE
*;
  IF TSUTCOM > 500 THEN DO;
    EXCCODE ='00151';
    SEVERITY='W';
    MGMTAREA='WORKLOAD';
    EXCDESC1='EXCESSIVE TSO USER INTERVAL COMMAND RATE';
    EXCDESC2='COMMAND COUNT=' || PUT(TSUTCOM,8.);
    LINK HIT;
  END;
```

This exception test is processed for each observation that is in the latest cycle of the DETAIL TSO User Activity File (TSOTSU). The test is positive when the variable TSUTCOM has a value greater than 500, which indicates that a single command was issued by one user more than 500 times in a single TSO/MON recording interval. When the test is positive, the exception is categorized by providing the appropriate values for EXCCODE, SEVERITY, and MGMTAREA. EXCDESC1 provides a constant title for the exception. EXCDESC2 provides variable information for the conditions that caused the test to be positive. The LINK HIT statement invokes a routine that causes the exception condition to eventually be written to the Exception Activity File (ADMEXC) for later processing by the standard reports or MICF II inquiries.

Five hundred is the value that caused this exception to test positive. For most organizations, this value would cause either too many exceptions or too few exceptions to be reported, which defeats one of the purposes of exception processing--to report on "out of the ordinary" conditions that warrant attention. Therefore, each organization must determine and set its own unique exception values.

Furthermore, the values for some exception conditions should be determined uniquely for different environments within a single organization. For example, a system paging rate that would be excessive during the nightly batch processing may be

normal during the daytime hours which have heavy interactive usage. Also, different processors can support different paging rates. Numbers used as exception values should not be defined without some analysis of installation history, performance, and user requirements.

The exception value analysis routine uses the CA MICS data base to produce a report that provides a statistical analysis of the values of the variables used in the standard exception tests distributed with the products. Using the results of this analysis, along with your installation's internal political, security, or standards policies, industry publications and possibly your own analysis of data element behavior, you can determine the modifications that you should make to each exception test to provide meaningful exceptions in your environments.

You can also modify the exception test routine to add your own tests for additional exception conditions not detected by the standard tests delivered with the product.

4.3 Detailed Exception Descriptions

This section provides an in-depth description of each TSO Analyzer standard exception available in the exception report process. The exceptions are organized by number and appear sequentially starting with exception 00001.

The description format provides the title, number, and a statement on the purpose, rationale, and definition for each exception to give you some insight as to the meaning and use of the information. Lastly, SAS code is listed with a short explanation on modifying the exception threshold values.

00001: Interactive TSO Run Exceeded Elapsed Time Standard

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies long running interactive programs/
             commands.

RATIONALE    Identifying long interactive runs which can be
             submitted as batch jobs may result in improved
             productivity by freeing a terminal and allowing
             the user to do other work until the long run
             ends.

DEFINITION   This exception is detected when an interactive
             run exceeds the installation defined elapsed
             time limit.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS  situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00001
**  INTERACTIVE TSO RUN EXCEEDED ELAPSED TIME STANDARD
*;
IF TSIELPTM > elapsed-time
 THEN DO;
  EXCCODE='00001'; SEVERITY='I'; MGMTAREA='STANDARDS';
  EXCDESC1=
  'INTERACTIVE TSO RUN EXCEEDED ELAPSED TIME STANDARD';
  EXCDESC2='ELAPSED TIME(HH:MM:SS)= '
           || PUT(TSIELPTM,TIME.);
  LINK HIT;
END;

THRESHOLD     Modify the value used for elapsed time.
MODIFICATION

    elapsed-time  The amount of elapsed time is described as
                  hours, minutes, and seconds.  A threshold
                  of 3 minutes and 20 seconds would appear
                  as:
```

```
TSIELPTM > HMS(0,3,20)
```

00002: Interactive TSO Run Exceeded Resource Usage Limit

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies interactive runs that have exceeded
             installation defined resource consumption limits
             for the amount of CPU time, I/O, or service
             units consumed.

RATIONALE    Interactive runs that require excessive resource
             consumption may impose a potential TSO system
             response degradation.  It may indicate a program
             which should be considered for performance
             tuning.

DEFINITION   This exception is detected when an interactive
             run exceeds the installation defined limits for
             the amount of CPU time, I/O, or service units
             consumed.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00002
**  INTERACTIVE TSO RUN EXCEEDED RESOURCE USAGE LIMIT
*;
IF TSICPUTM > cpu-time
 OR TSIEXCPS > i/o
 OR TSISERVU > service-units
 THEN DO;
  EXCCODE='00002'; SEVERITY='W'; MGMTAREA='STANDARDS';
  EXCDESC1=
  'INTERACTIVE TSO RUN EXCEEDED RESOURCE USAGE LIMIT';
  EXCDESC2='CPU TIME(HH:MM:SS)= '
           || PUT(TSICPUTM,TIME.) ||
           ', EXCPS=' || PUT(TSIEXCPS,6.) ||
           ', SU=' || PUT(TSISERVU,7.);
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values used for CPU time, I/O, and service units, according to the following conventions:

cpu-time — The amount of CPU time is described as hours, minutes, and seconds. A threshold of 3 minutes and 20 seconds would appear as:

```
TSICPUTM > HMS(0,3,20)
```

i/o — The number of EXCPs is specified. A threshold of 1000 EXCPs would appear as:

```
TSIEXCPS > 1000
```

service-units — The number of service units is specified. A threshold of 35000 service units would appear as:

```
TSISERVU > 35000
```

00003: Interactive TSO Compilation Exceeded Resource Limit

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies interactive compilations that have
             exceeded installation defined resource
             consumption limits for the amount of CPU time,
             I/O, or service units consumed.

RATIONALE    Interactive compilations that require excessive
             resource consumption may pose one of two
             problems.  First, the high resource consumption
             required for an interactive foreground operation
             may impose a potential TSO system response
             degradation.  Second, a compilation that
             requires excessive resource consumption
             indicates a large source program which may
             violate structured or modular programming
             standards, but even more importantly, will
             require a longer time for execution, thus
             leaving the requesting programmer sitting
             unproductively at a locked terminal while
             waiting for completion.

DEFINITION   This exception is detected when an interactive
             compilation exceeds the installation defined
             limits for the amount of CPU time, I/O, or
             service units consumed.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00003
**  INTERACTIVE TSO COMPILATION EXCEEDED RESOURCE LIMIT
*;
IF TSICPUTM > cpu-time
 OR TSIEXCPS > i/o
 OR TSISERVU > service-units
 AND
 (   COMMAND='ASM' OR PROGRAM='ASM'
```

```
  OR COMMAND='COBOL' OR PROGRAM='COBOL'
  OR COMMAND='FORT' OR PROGRAM='FORT'
  OR COMMAND='PLI' OR PROGRAM='PLI'
  OR COMMAND='PLIC' OR PROGRAM='PLIC'
  OR COMMAND='GOFORT' OR PROGRAM='GOFORT'
  OR COMMAND='TESTCOB' OR PROGRAM='TESTCOB'
  OR COMMAND='TESTFORT' OR PROGRAM='TESTFORT'
 )
 THEN DO;
    EXCCODE='00003'; SEVERITY='W'; MGMTAREA='STANDARDS';
    EXCDESC1=
    'INTERACTIVE TSO COMPILATION EXCEEDED RESOURCE LIMIT';
    EXCDESC2='CPU TIME(HH:MM:SS)= '
             || PUT(TSICPUTM,TIME.) ||
             ', EXCPS=' || PUT(TSIEXCPS,6.) ||
             ', SU=' || PUT(TSISERVU,7.);
    LINK HIT;
END;

THRESHOLD      Modify the values used for CPU time, I/O, and
MODIFICATION   service units, as well as tailor the list of
               compilation commands or programs contained in
               the definition string according to the
               following conventions:

    cpu-time         The amount of CPU time is described as
                     hours, minutes, and seconds.  A
                     threshold of 3 minutes and 20 seconds
                     would appear as:

                         TSICPUTM > HMS(0,3,20)

    i/o              The number of EXCPs is specified.  A
                     threshold of 1000 EXCPs would appear as:

                         TSIEXCPS > 1000

    service-units    The number of service units is
                     specified.  A threshold of 35000 service
                     units would appear as:

                        TSISERVU > 35000

    program/command  The name of the command or program
                     compiler is specified as a one to eight
                     character alphanumeric field, and must
                     be enclosed in quotes as a standard SAS
                     character literal.  Additional
                     program/command names must be inserted
```

within the list and be connected to
the list with an OR. For the COBOL
compiler, the specification would be:

```
COMMAND='COBOL' OR PROGRAM='COBOL'
```

00004: Interactive TSO Compilation Service Objective Missed

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies interactive compilations that are
             within the installation defined service units
             consumption limit and have not received the
             installation service objective.

RATIONALE    Interactive compilations are productive for
             short programs.  Long compilations may cause
             system service degradation and long waits for
             the user at a locked keyboard.  An installation
             can define a service objective for short
             compiles and encourage users to run long
             compiles as batch jobs.  This exception could be
             multiply defined with objectives for various
             service unit consumption levels.

DEFINITION   This exception is detected when an interactive
             run exceeds the installation defined limits for
             service and consumes less than the defined
             service units.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00004
**  INTERACTIVE TSO COMPILATION SERVICE OBJECTIVE MISSED
*;
IF (TSIELPTM > elapsed-time
 AND TSISERVU < service-units)
 AND
 (   COMMAND='ASM' OR PROGRAM='ASM'
  OR COMMAND='COBOL' OR PROGRAM='COBOL'
  OR COMMAND='FORT' OR PROGRAM='FORT'
  OR COMMAND='PLI' OR PROGRAM='PLI'
  OR COMMAND='PLIC' OR PROGRAM='PLIC'
  OR COMMAND='GOFORT' OR PROGRAM='GOFORT'
  OR COMMAND='TESTCOB' OR PROGRAM='TESTCOB'
```

```
  OR COMMAND='TESTFORT' OR PROGRAM='TESTFORT'
 )
 THEN DO;
    EXCCODE='00004'; SEVERITY='W'; MGMTAREA='STANDARDS';
    EXCDESC1=
    'INTERACTIVE TSO COMPILATION SERVICE OBJECTIVE MISSED';
    EXCDESC2='ELAPSED TIME(HH:MM:SS)= '
             || PUT(TSIELPTM,TIME.);
    LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values used for elapsed time and service units, according to the following conventions:

elapsed-time — The amount of elapsed time is described as hours, minutes, and seconds. A threshold of 3 minutes and 20 seconds would appear as:

```
TSIELPTM > HMS(0,3,20)
```

service-units — The number of service units is specified. A threshold of 35000 service units would appear as:

```
TSISERVU < 35000
```

program/command — The name of the command or program compiler is specified as a one to eight character alphanumeric field, and must be enclosed in quotes as a standard SAS character literal. Additional program/command names must be inserted within the list and be connected to the list with an OR. For the COBOL compiler, the specification would be:

```
COMMAND='COBOL' OR 'PROGRAM='COBOL'
```

00005: Game Played During TSO Prime-Time

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies users playing STARTREK, HEARTS, or
             other specified games during TSO prime time.

RATIONALE    An installation can monitor users who are not
             using TSO productively during prime time, and
             can enforce restrictions to keep resources
             available for productive work.

DEFINITION   This exception is detected when a TSO user calls
             the STARTREK, HEARTS, or other specified games.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00005
**  GAME PLAYED DURING TSO PRIME-TIME
*;
IF  (PROGRAM='STARTREK'
 OR PROGRAM='HEARTS'
 OR PROGRAM='program-name'
 AND prime-time-hours
 AND prime-time-days
 THEN DO;
    EXCCODE='00005'; SEVERITY='W'; MGMTAREA='STANDARDS';
    EXCDESC1='GAME PLAYED DURING TSO PRIME-TIME';
    EXCDESC2='USE COUNT=' || PUT(TSINOEXS,3.);
    LINK HIT;
END;

THRESHOLD     Modify the list of games and specify the prime
MODIFICATION  time contained in the definition string
              according to the following conventions:

    program/command-name  The name of the command or program
                          is specified as a one to eight
                          character alphanumeric field, and
```

must be enclosed in quotes as a standard SAS character literal. Additional program/command names must be connected to the list with an OR. For the game named COFFEE, the specification would be:

```
OR COMMAND='COFFEE' OR PROGRAM='COFFEE'
```

prime-time-hours — The hour range to be included in the exception is specified. The general form of hour range specification is:

```
AND (hh1<=HOUR AND HOUR<=hh2)
```

The hour of the day must be within the hh1 through hh2 range. Prime time specified as 8 a.m. through 6:59 p.m. (18:59) would appear as:

```
AND ( 8 <=HOUR AND HOUR<= 18 )
```

prime-time-days — The days of the week to be included in the exception are specified by the first three characters of their names. They must be enclosed in quotes and separated with ORs. The general form of days specification is:

```
AND (DAYNAME='day' OR DAYNAME='day' OR DAYNAME='day'
OR DAYNAME='day' OR DAYNAME='day' OR DAYNAME='day')
```

Prime time specified as MONDAY through FRIDAY would appear as:

```
AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
OR DAYNAME='THU' OR DAYNAME='FRI' )
```

00007: Unauthorized Use of Program by TSO User

```
FILE              TSO Interactive Usage Activity
SAS FILE NAME     DETAIL.TSOTSI01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Security      (MGMTAREA='SECURITY')

PURPOSE      Identifies unauthorized users who have executed
             the SUPERZAP Program.

RATIONALE    SUPERZAP is an IBM Service Aid.  This program
             can be used to inspect/modify load modules, data
             in DASD data sets, or DASD Volume Table Of
             Contents (VTOCs).  Unauthorized users could make
             modifications to programs and data,
             circumventing normal security procedures.  This
             program could also be used to gain access to
             password protected data sets, through VTOC
             modification or penetration of the password data
             set.  Even when this program is used for
             legitimate purpose, there is the danger that the
             source program or audit trail will not be
             updated to reflect the change.

DEFINITION   This exception is detected when an unauthorized
             user calls the SUPERZAP program.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00007
**  UNAUTHORIZED USE OF PROGRAM BY TSO USER
*;
IF (
    PROGRAM='AMASPZAP'
 OR PROGRAM='IMASPZAP'
 OR PROGRAM='SUPERZAP'
 OR PROGRAM='program-name'
 )
 AND NOT(USER=:'user-id')
 THEN DO;
  EXCCODE='00007'; SEVERITY='W'; MGMTAREA='SECURITY';
  EXCDESC1='UNAUTHORIZED USE OF PROGRAM BY TSO USER';
```

```
  EXCDESC2='USE COUNT=' || PUT(TSINOEXS,3.);
  LINK HIT;
END;

THRESHOLD     Modify the list of SUPERZAP command and program
MODIFICATION  names contained in the definition string and
              specify the userids that will be excluded from
              causing exceptions, according to the following
              conventions:

    program/command-name  The name of the program/command is
                          specified as a one to eight
                          character alphanumeric field, and
                          must be enclosed in quotes as a
                          standard SAS character literal.
                          Additional program/command names
                          must be connected to the list with
                          an OR.  For the name ZAP, the
                          specification would be:

                             COMMAND='ZAP' OR 'PROGRAM='ZAP'

    user-id               The name of the userids to be used
                          for selection is specified as a one
                          to seven character alphanumeric
                          field, and must be enclosed in
                          quotes as a standard SAS character
                          literal.  Additional userids must
                          be included in parentheses and be
                          connected to the list with an
                          OR.  For all users whose ids do not
                          begin with SYS or ABC, the
                          specification would be:

                          AND NOT(USER=:'SYS' OR USER=:'ABC')

                          For all users whose ids do not
                          begin with SYS or user ABC006, the
                          specification would be:

                        AND NOT(USER=:'SYS' OR USER='ABC006')
```

00050: Excessive Use of TSO Command per Hour

```
FILE              TSO User Command Counts File
SAS FILE NAME     DETAIL.TSOTSC01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning              (SEVERITY='W')
MANAGEMENT AREA   Productivity  (MGMTAREA='PRODUCTIVITY')

PURPOSE      Identifies users who have exceeded the
             installation defined limits for the number of
             selected commands issued per hour.

RATIONALE    Five commands (SEND, STATUS, HELP SPF TUTORIAL,
             and TIME) can cause this exception.  The
             rationale for each command is given below.

               A) The TSO SEND command is used to broadcast
                  messages from one user to another, or from a
                  user to the operator.  This command should
                  not be issued excessively in a short period
                  of time under normal circumstances.
                  Excessive use may indicate unproductive users
                  or superfluous activity between several
                  time-sharing parties.

               B) The TSO STATUS command is used to determine
                  if a batch job has completed.  This command
                  should not be issued excessively in a short
                  period of time under normal circumstances.
                  Excessive use may indicate unproductive
                  users.  The NOTIFY option may be used to
                  signal a user when a job is completed.

               C) The TSO HELP command is used to find
                  information about TSO or specific TSO
                  commands.  This command should not be issued
                  excessively in a short period of time under
                  normal circumstances.  Excessive use may
                  indicate users who are unfamiliar with TSO.
                  These users may require training before they
                  can use TSO productively.

               D) The TSO SPF TUTORIAL command is used to find
                  information about SPF or specific SPF
                  commands.  This command should not be issued
                  excessively in a short period of time under
                  normal circumstances.  Excessive use may
                  indicate users who are unfamiliar with SPF.
```

```
                These users may require training before they
                can use SPF productively.

             E) The TSO TIME command is used to display the
                time, CPU time, and session time.  This
                command should not be issued excessively in a
                short period of time under normal
                circumstances.  Excessive use may indicate
                unproductive TSO users.

DEFINITION   This exception is detected when an individual
             userid's use of the specified commands per hour
             exceeds the installation specified maximum
             hourly limit.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00050
** EXCESSIVE USE OF TSO COMMAND PER HOUR
*;
IF  (COMMAND='SEND' AND TSCCOUNT > use-count )
 OR (COMMAND='STATUS' AND TSCCOUNT > use-count )
 OR (COMMAND='HELP' AND TSCCOUNT > use-count )
 OR (COMMAND='TUTORIAL' AND TSCCOUNT > use-count )
 OR (COMMAND='TIME' AND TSCCOUNT > use-count )
 OR (COMMAND='command-name' AND TSCCOUNT > use-count )
 THEN DO;
  MGMTAREA='PRODUCTIVITY'; EXCCODE='00050'; SEVERITY='W';
  EXCDESC1='EXCESSIVE USE OF TSO COMMAND PER HOUR';
  EXCDESC2='USE COUNT=' || PUT(TSCCOUNT,3.);
  LINK HIT;
END;

THRESHOLD     Modify the values used for the number of times
MODIFICATION  a command is executed and tailor the list of
              commands contained in the definition string
              according to the following conventions:

    use-count     The number of times a command is used per
                  hour.  A threshold of ten SEND commands per
                  hour would appear as:

                     (COMMAND='SEND' AND TSCCOUNT > 10 )
```

command-name The name of the command is specified as a one to eight character alphanumeric field, and must be enclosed in quotes as a standard SAS character literal. Additional command names must be inserted within the list and be connected to the list with an OR. For the COBOL compiler used six times, the specification would be:

```
OR (COMMAND='COBOL' AND TSCCOUNT > 6 )
```

00055: Excessive Number of User Logons per Hour

```
FILE              TSO User Command Counts File
SAS FILE NAME     DETAIL.TSOTSC01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Productivity  (MGMTAREA='PRODUCTIVITY')

PURPOSE      Identifies users who have exceeded the
             installation defined limit for the number of
             LOGON commands issued per hour.

RATIONALE    The TSO LOGON command is used to initiate a TSO
             session.  This command and LOGOFF, which
             terminates a TSO session, use a lot of
             resources.  Therefore, this command should not
             be issued excessively in a short period of time
             under normal circumstances.  Excessive use may
             indicate unproductive TSO users who are not
             planning their TSO sessions.

DEFINITION   This exception is detected when an individual
             userid's logons per hour exceeds the
             installation specified maximum hourly limit.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00055
** EXCESSIVE NUMBER OF USER LOGONS PER HOUR
*;
IF COMMAND='LOGON'
 AND TSCCOUNT > logon-count
 THEN DO;
  EXCCODE='00055'; SEVERITY='W'; MGMTAREA='PRODUCTIVITY';
  EXCDESC1='EXCESSIVE NUMBER OF USER LOGONS PER HOUR';
  EXCDESC2='LOGONS=' || PUT(TSCCOUNT,3.);
  LINK HIT;
END;

THRESHOLD     Modify the values used for the number of times
MODIFICATION  a command is executed, according to the
              following conventions:
```

logon-count	The number of user logons per hour. A threshold of two logons per hour would appear as: TSCCOUNT > 2

00056: Unauthorized Use of TSO Commands

```
FILE              TSO User Command Counts File
SAS FILE NAME     DETAIL.TSOTSC01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Standards     (MGMTAREA='STANDARDS')

PURPOSE      Identifies unauthorized users who have executed
             restricted commands.

RATIONALE    Three commands (OPER, LOOK, and RMFMON) can
             cause this exception.  The rationale for each
             command is given below.

    o TSO OPER command is used to allow authorized users to
      enter operator commands.  The OPER command checks the
      installation's User Attribute Data Set (UADS) to
      determine if a user is authorized to enter operator
      commands.  Unauthorized users are prevented from
      entering operator commands.  The use of this command by
      unauthorized users may indicate users who are probing
      the system to determine the limits of their access.
      The UADS entry for the unauthorized user should be
      verified to ensure that it has not been tampered with.

    o TSO LOOK command, a product of Applied Data Research,
      Princeton, New Jersey, is used to display CPU
      utilization, I/O activity, paging activity, Auxiliary
      Storage Manager (ASM) information, and System Resource
      Manager (SRM) information.  In addition, jobs can be
      canceled, address spaces terminated, jobs set
      nonswappable, dispatching priorities changed, and
      memory modified.  The use of this command is limited to
      authorized users of OPER commands.  In addition, other
      restrictions can be imposed during LOOK installation.
      Unauthorized users are prevented from entering LOOK
      commands.  The use of this command by unauthorized
      users may indicate users who are probing the system to
      determine the limits of their access.  The UADS entry
      for the unauthorized user should be verified to ensure
      that it has not been tampered with.

    o TSO RMFMON command, a part of the Resource Measurement
      Facility (RMF), IBM Program Product, is used to display
      system performance information, including System
      Resource Manager (SRM) information, paging activity,
      address space state information, and resource
```

```
      consumption information.  Authorized users of this
      command are specified during RMFMON installation.
      Unauthorized users are prevented from entering RMFMON
      commands.  Because of the technical nature of the
      information provided, the use of this command by
      unauthorized users should be followed up to determine
      the reason for their attempting access.

      RMF provides a user authorization exit routine
      (ERBTSOCK) which can be used to limit use of RMFMON
      (reference (SC28-0922)).

DEFINITION   This exception is detected when an unauthorized
             user executes a restricted command.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00056
** UNAUTHORIZED USE OF TSO COMMANDS
*;
IF  (COMMAND='OPER' AND NOT(ID=:'user-id'))
 OR (COMMAND='LOOK' AND NOT(ID=:'user-id'))
 OR (COMMAND='RMFMON' AND NOT(ID=:'user-id'))
 THEN DO;
  EXCCODE='00056'; SEVERITY='W'; MGMTAREA='STANDARDS';
  EXCDESC1='UNAUTHORIZED USE OF TSO COMMAND';
  EXCDESC2='USE COUNT=' || PUT(TSCCOUNT,3.);
  LINK HIT;
END;

THRESHOLD     Modify the list of authorized users according
MODIFICATION  to the following conventions:

    user-id   The name of the userids to be used for
              selection is specified as a one to eight
              character alphanumeric field, and must be
              enclosed in quotes as a standard SAS character
              literal.  Additional userids must be included
              in the parentheses and be connected to the list
              with an OR.  For all users whose userids do not
              begin with SYS or ABC, the specification would
              be:

                 AND NOT(USER=:'SYS' OR USER=:'ABC')
```

For all users whose userids do not begin with
SYS or user ABC006, the specification would be:

```
AND NOT(USER=:'SYS' OR USER='ABC006')
```

00057: TSO Command Security Violation

```
FILE              TSO User Command Counts File
SAS FILE NAME     DETAIL.TSOTSC01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Security      (MGMTAREA='SECURITY')

PURPOSE      Identifies unauthorized users who have executed
             the ACCOUNT command.

RATIONALE    The TSO ACCOUNT command is used to add, change,
             delete, and list entries in the installation's
             User Attribute Data Set (UADS).  The ACCOUNT
             command checks UADS to determine if a user is
             authorized to enter accounting commands.
             Unauthorized users are prevented from entering
             accounting commands.  The use of this command by
             unauthorized users may indicate users who are
             probing the system to determine the limits of
             their access.  The UADS entry for the
             unauthorized user should be verified to ensure
             that it has not been tampered with.
             Unauthorized users could use this command to
             find/change passwords, create/delete userids,
             and give unauthorized access to restricted
             facilities to their own or other userids.

DEFINITION   This exception is detected when an unauthorized
             user executes the TSO ACCOUNT command.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00057
** TSO COMMAND SECURITY VIOLATION
*;
IF  (COMMAND='ACCOUNT' AND NOT(ID=:'user-id'))
 THEN DO;
  EXCCODE='00057'; SEVERITY='C'; MGMTAREA='SECURITY';
  EXCDESC1='TSO COMMAND SECURITY VIOLATION';
  EXCDESC2='USE COUNT=' || PUT(TSCCOUNT,3.);
  LINK HIT;
END;
```

```
THRESHOLD      Modify the list of authorized ACCOUNT users
MODIFICATION   according to the following conventions:

    user-id    The name of the userids to be used for
               selection is specified as a one to eight
               character alphanumeric field, and must be
               enclosed in quotes as a standard SAS character
               literal.  Additional userids must be included
               in the parentheses and be connected to the
               list with an OR.  For all users whose ids do
               not begin with SYS or ABC, the specification
               would be:

                  AND NOT(USER=:'SYS' OR USER=:'ABC')

               For all users whose ids do not begin with SYS
               or user ABC006, the specification would be:

                  AND NOT(USER=:'SYS' OR USER='ABC006')
```

00100: System IPL Detected

```
FILE              TSO System Activity File
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Identifies system IPLs.

RATIONALE    Unplanned IPLs result in reruns and cause
             frustration for TSO users.  Determining the
             reason for all IPLs may improve procedures and
             eliminate some unnecessary outages.

DEFINITION   This exception is detected when an IPL occurs.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00100
** SYSTEM IPL DETECTED
*;
IF TSONOIPL > 0
 THEN DO;
  EXCCODE='00100'; SEVERITY='C'; MGMTAREA='AVAILABILITY';
  EXCDESC1='SYSTEM IPL DETECTED';
  LINK HIT;
END;

THRESHOLD     You may want to restrict this exception to
MODIFICATION  prime time.  In this case, you can add the
              following code before the THEN of the IF
              statement:

    prime time   The hour range and days of the week to be
                 included in the exception are specified.
                 The hour of the day must be within the hh1
                 through hh2 range.  Prime time specified as
                 8 a.m.  through 6:59 p.m.  (18:59) would
                 appear as:

                    AND ( 8 <=HOUR AND HOUR<= 18 )
```

The days of the week are represented by the first three characters of their names. They must be enclosed in quotes and separated with ORs. Prime time specified as MONDAY through FRIDAY would appear as:

```
AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
    OR DAYNAME='THU' OR DAYNAME='FRI' )
```

00101: Critical TSO TIOC Buffer Level Detected

```
FILE              TSO System Activity File
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies intervals during which all TSO
             terminals were locked out for input because of a
             buffer shortage.

RATIONALE    When the number of Terminal Input / Output
             Coordinator (TIOC) buffers falls below the
             Reserve Buffer (RESVBUF) value specified in
             SYS1.PARMLIB(IKJPRM00), all terminals are locked
             for input.  This is done to ensure a reserve of
             free buffers for output.  No external warning is
             given for this condition except that TSO users
             may experience long response times.  This
             condition may also be indicated by a higher than
             normal number of OWAIT swaps.  For a discussion
             of the use and meaning of the TIOC parameters,
             see OS/VS2 MVS SYSTEM PROGRAMMING LIBRARY:
             INSTALLATION AND TUNING GUIDE, GC28-0681, Part 3
             System Initialization, Member Name:  IKJPRM00.

DEFINITION   This exception is detected when the number of
             TIOC buffers falls within the range that causes
             terminal input lockup.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00101
** CRITICAL TSO TIOC BUFFER LEVEL DETECTED
*;
IF TSOUPTM > 0
 AND (0<=TSOMTIOC AND TSOMTIOC<= tioc-buffers)
 THEN DO;
    EXCCODE='00101'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
    EXCDESC1='CRITICAL TSO TIOC BUFFER LEVEL DETECTED';
    EXCDESC2='MINIMUM TIOC BUFFERS=' || PUT(TSOMTIOC,4.);
    LINK HIT;
```

```
END;

THRESHOLD     Modify the value for the number of TIOC
MODIFICATION  buffers, which is critical, according to the
              following conventions:

    tioc-buffer   The number of buffers or less which will
                  cause performance degradation.  A threshold
                  of 50, which would be the RESVBUF value,
                  would appear as:

                     (0<=TSOMTIOC AND TSOMTIOC<= 50)

                  NOTE:  The TIOC buffer number for this
                  exception should be coordinated with
                  exception number 00102, which is the
                  warning level exception.
```

00102: Warning TSO TIOC Buffer Level Detected

```
FILE              TSO System Activity File
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies intervals during which TSO approached
             a buffer shortage.

RATIONALE    When the number of Terminal Input / Output
             Coordinator (TIOC) buffers falls below the
             Reserve Buffer (RESVBUF) value specified in
             SYS1.PARMLIB(IKJPRM00), all terminals are locked
             for input.  This is done to ensure a reserve of
             free buffers for output.  No external warning is
             given for this condition except that TSO users
             may experience long response times.  For a
             discussion of the meaning and use of the TIOC
             parameters, see OS/VS2 MVS SYSTEM PROGRAMMING
             LIBRARY:  INSTALLATION AND TUNING GUIDE, GC28-
             0681, Part 3:  System Initialization, Member
             Name:  IKJPRM00.

DEFINITION   This exception is detected when the number of
             TIOC buffers falls within the range that
             approaches the critical limit when terminal
             input lockup will occur.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00102
** WARNING TSO TIOC BUFFER LEVEL DETECTED
*;
IF TSOUPTM > 0
 AND (tioc-buffers1 <=TSOMTIOC AND TSOMTIOC<= tioc-buffers2)
 THEN DO;
  EXCCODE='00102'; SEVERITY='W'; MGMTAREA='PERFORMANCE';
  EXCDESC1='WARNING TSO TIOC BUFFER LEVEL DETECTED';
  EXCDESC2='MINIMUM TIOC BUFFERS=' || PUT(TSOMTIOC,4.);
  LINK HIT;
END;
```

```
THRESHOLD     Modify the value for the TIOC buffer range that
MODIFICATION  approaches the critical RESVBUF value,
              according to the following conventions:

    tioc-buffers  The number of buffers or less which will
                  cause performance degradation.  A RESVBUF
                  of 50 with a warning range of 51 through
                  100 would appear as:

                     ( 51 <=TSOMTIOC AND TSOMTIOC<= 100)

                  NOTE:  The TIOC buffer range for this
                  exception should be coordinated with
                  exception number 00101, which is the
                  critical level exception.
```

00103: Interval TSO System Resource Overload

```
FILE              TSO System Activity File
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies the intervals when the TSO workload
             is so large that service may be impacted.

RATIONALE    Poor performance results when the TSO workload
             exceeds the configuration limit.  It is possible
             for one or a few TSO users to cause degraded
             response for all users by consuming large
             amounts of CPU time or by doing large numbers of
             I/Os.  At times, this may result from a program
             or CLIST that is in an infinite loop.

             It may be necessary to:

               A) Review the heaviest users' work for
                  efficiency improvements.

               B) Have some users run at a lower priority.

               C) Submit some of the TSO work to batch.

DEFINITION   This exception is detected when the interval TSO
             CPU time, I/O, or service units exceed the
             installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00103
** INTERVAL TSO SYSTEM RESOURCE OVERLOAD
*;
IF TSOCPUTM > cpu-time
 OR TSOEXCPS > i/o
 OR TSOSERVU > service-units
 THEN DO;
  EXCCODE='00103'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='INTERVAL TSO SYSTEM RESOURCE OVERLOAD';
```

```
  EXCDESC2='CPU TIME(HH:MM:SS)= '
           || PUT(TSOCPUTM,TIME.) ||
           ', EXCPS=' || PUT(TSOEXCPS,6.) ||
           ', SU=' || PUT(TSOSERVU,7.);
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values used for CPU time, I/O, and service units, according to the following conventions:

cpu-time — The amount of CPU time is described as hours, minutes, and seconds. A threshold of 2 minutes and 30 seconds would appear as:

```
TSOCPUTM > HMS(0,2,30)
```

i/o — The number of EXCPs is specified. A threshold of 15000 EXCPs would appear as:

```
TSOEXCPS > 15000
```

service-units: The number of service units is specified. A threshold of 1000000 service units would appear as:

```
TSOSERVU > 1000000
```

00150: Interval TSO User Resource Overload

```
FILE              TSO User Activity File
SAS FILE NAME     DETAIL.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Workload      (MGMTAREA='WORKLOAD')

PURPOSE      Identifies users whose interval workload is
             large enough to impact the service to other
             users.

RATIONALE    It is possible for a TSO user to cause degraded
             response for others by consuming large amounts
             of CPU time or by doing a large number of I/Os.
             At times, this may result from a program or
             CLIST that is in an infinite loop.

             If a user's workload is impacting others, it may
             be necessary to:

               A) Review the heaviest users' work for
                  efficiency improvements.

               B) Have some users run at a lower priority.

               C) Submit some of the TSO work to batch.

               D) Alter the IPS values for objectives,
                  domains, or time slice groups in order to
                  achieve the installation response and
                  service objectives.

DEFINITION   This exception is detected when an individual
             user's CPU time, I/O, or service units exceed
             the installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00150
**  INTERVAL TSO USER RESOURCE OVERLOAD
*;
IF TSUCPUTM > cpu-time
```

```
 OR TSUEXCPS > i/o
 OR TSUSERVU > service-units
 THEN DO;
   EXCCODE='00150'; SEVERITY='W'; MGMTAREA='WORKLOAD';
   EXCDESC1='INTERVAL TSO USER RESOURCE OVERLOAD';
   EXCDESC2='CPU TIME(HH:MM:SS)= '
           || PUT(TSUCPUTM,TIME.) ||
           ', EXCPS=' || PUT(TSUEXCPS,6.) ||
           ', SU=' || PUT(TSUSERVU,7.);
   LINK HIT;
END;
```

THRESHOLD MODIFICATION

Modify the values used for CPU time, I/O, and service units according to the following conventions:

cpu-time

The amount of CPU time is described as hours, minutes, and seconds. A threshold of 1 minute and 10 seconds would appear as:

```
TSUCPUTM > HMS(0,1,10)
```

i/o

The number EXCPs is specified. A threshold of 1000 EXCPs would appear as:

```
TSUEXCPS > 1000
```

service-units

The number of service units is specified. A threshold of 38000 service units would appear as:

```
TSUSERVU > 38000
```

00151: Excessive TSO User Interval Command Rate

```
FILE              TSO User Activity File
SAS FILE NAME     DETAIL.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Workload      (MGMTAREA='WORKLOAD')

PURPOSE      Identifies users whose interval command
             execution rate could indicate a looping CLIST.

RATIONALE    It is possible for a TSO user to loop within a
             CLIST without doing productive work.  When this
             happens, the user may believe there is a
             response problem.  Other users may find a
             response degradation because of the workload
             imposed by the looping CLIST.

DEFINITION   This exception is detected when an individual
             user's command execution rate exceeds the
             installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00151
**  EXCESSIVE TSO USER INTERVAL COMMAND RATE
*;
IF TSUTCOM > command-count
 THEN DO;
  EXCCODE='00151'; SEVERITY='W'; MGMTAREA='WORKLOAD';
  EXCDESC1='EXCESSIVE TSO USER INTERVAL COMMAND RATE';
  EXCDESC2='COMMAND COUNT=' || PUT(TSUTCOM,8.);
  LINK HIT;
END;

THRESHOLD     Modify the command count value, according to
MODIFICATION  the following conventions:

    command-count  The number of commands executed by a user
                   within one interval is specified.  A
                   threshold of 30 commands would appear as:

                      TSUTCOM > 30
```

00200: Hourly TSO System Resource Overload

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting            (SEVERITY='I')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies the hours when the TSO workload is so
             large that service may be impacted.

RATIONALE    Poor performance results when the TSO workload
             exceeds the configuration limit.  It is possible
             for one or a few TSO users to cause degraded
             response for all users by consuming large
             amounts of CPU time or by doing large numbers of
             I/Os.  At times, this may result from a program
             or CLIST which is in an infinite loop.

             It may be necessary to:

              A) Review the heaviest users' work for
                 efficiency improvements.

              B) Have some users run at a lower priority.

              C) Submit some of the TSO work to batch.

              D) Alter the IPS values for objectives,
                 domains, or time slice groups in order to
                 achieve the installation's response and
                 service objectives.

              E) If the installation wishes to provide some
                 overall distribution of service between
                 major subsystems (e.g., batch, TSO, CICS,
                 IMS, etc.), and MVS/SE is installed, time
                 slice groups may be used to achieve this.

DEFINITION   This exception is detected when the hourly TSO
             CPU time, I/O, or service units exceed the
             installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:
```

```
************************************************************;
*
**  00200
**  HOURLY TSO SYSTEM RESOURCE OVERLOAD
*;
IF TSOCPUTM > cpu-time
 OR TSOSERVU > service-units
 OR TSOEXCPS > excps
 THEN DO;
  EXCCODE='00200'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='HOURLY TSO SYSTEM RESOURCE OVERLOAD';
  EXCDESC2='CPU TIME(HH:MM:SS)= '
           || PUT(TSOCPUTM,TIME.) ||
           ', EXCPS=' || PUT(TSOEXCPS,7.) ||
           ', SUS=' || PUT(TSOSERVU,8.);
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values used for CPU time, service units, of I/O according to the following conventions:

cpu-time — The amount of CPU time is described as hours, minutes, and seconds. A threshold of 3 minutes and 20 seconds would appear as:

```
TSOCPUTM > HMS(0,3,20)
```

excps — The number of EXCPs (I/O) is specified. A threshold of 150000 EXCPs would appear as:

```
TSOSERVU > 150000
```

service-units — The number of service units is specified. A threshold of 9000000 service units would appear as:

```
TSOSERVU > 9000000
```

00201: Hourly TSO Capacity Limit Objective Exceeded

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies the hours when the installation
             defined capacity limit is exceeded.

RATIONALE    Poor performance results when the TSO capacity,
             measured in service units, exceeds the
             configuration limit.  This can be caused by
             growth in the number of TSO users.  In this
             case, a configuration upgrade or TSO restriction
             will be required to meet service objectives.  It
             is also possible that a looping user or a few
             users who are putting an exceptional load on the
             TSO system could cause this problem.

             If installation management's objective is to
             restrict TSO resource consumption to the defined
             capacity limit, the detection of this exception
             may indicate the need to revise the IPS in order
             to do one or more of the following:

               A) Lower the service objectives for TSO work.

               B) Limit the number of concurrent TSO users by
                  domain controls.

               C) Provide lower dispatching priorities for
                  TSO.

               D) Use time slice groups (MVS/SE only) to
                  control the total service provided to TSO
                  relative to other work categories.

DEFINITION   This exception is detected when the hourly
             service unit consumption exceeds the
             installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:
```

```
************************************************************;
*
**  00201
**  HOURLY TSO CAPACITY LIMIT OBJECTIVE EXCEEDED
*;
IF TSOSERVU > service-units
  THEN DO;
  EXCCODE='00201'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='HOURLY TSO CAPACITY LIMIT OBJECTIVE EXCEEDED';
  EXCDESC2='UPTIME(HH:MM:SS)= '
           || PUT(TSOUPTM,TIME.) ||
           ', AVG USERS=' || PUT(TSOAVUSR,3.) ||
           ', SUS=' || PUT(TSOSERVU,8.);
  LINK HIT;
END;

THRESHOLD     Modify the value used for service units,
MODIFICATION  according to the following conventions:


    service-units   The number of service units is specified.
                    A threshold of 12000000 service units
                    would appear as:

                       TSOSERVU > 12000000
```

00202: Prime-Time TSO System Resource Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies the prime-time TSO hours when less
             than the installation defined service units were
             consumed.

RATIONALE    An installation can set a resource consumption
             for prime time.  If for any reason this level of
             usage is not delivered, the cause should be
             identified.  Some of the causes may be:  shared
             DASD reserves, long ENQUEUE on critical
             resources, lost interrupts on I/O devices, CPU
             stopped by operator, etc.

             You can further research this problem by
             scanning the MVS Performance Group and Period
             (SCPPGA and SCPPPA) files in the data base to
             determine if the TSO objective was missed
             because other higher priority work prevented TSO
             from using system resources.

             If installation management's objective is to
             increase TSO resource availability, the IPS may
             need revision to do one or more of the
             following:

               A) Raise the service objectives for TSO work.

               B) Raise the number of concurrent TSO users by
                  domain controls.

               C) Provide higher dispatching priorities for
                  TSO.

               D) Use time slice groups (MVS/SE only) to
                  improve the total service provided to TSO
                  relative to other work categories.

DEFINITION   This exception is detected when all users
             service units consumed falls below the
             installation objective.
```

```
EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00202
**  PRIME-TIME TSO SYSTEM RESOURCE OBJECTIVE MISSED
*;
IF TSOUPTM > uptime
 AND TSOSERVU < service-units
 AND (hh1<=HOUR AND HOUR<=hh2)
 AND (  DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
     OR DAYNAME='THU' OR DAYNAME='FRI' )
 THEN DO;
  EXCCODE='00202'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='PRIME-TIME TSO SYSTEM RESOURCE OBJECTIVE MISSED';
  EXCDESC2='UPTIME(HH:MM:SS)= '
           || PUT(TSOUPTM,TIME.) ||
           ', AVG USERS=' || PUT(TSOAVUSR,3.) ||
           ', SUS=' || PUT(TSOSERVU,7.);
  LINK HIT;
END;

THRESHOLD     Modify the value of uptime, service units, and
MODIFICATION  prime time, according to the following
              conventions:

    uptime         The minimum amount of time during the hour
                   that TSO was available is specified.  This
                   check is made so that exceptions are not
                   produced when TSO was not available.  A
                   threshold of 57 minutes of uptime would
                   appear as:

                      TSOUPTM > HMS(0,50,00)

    service-units  The number of service units is specified.
                   A threshold of 3000000 service units would
                   appear as:

                      TSOSERVU < 3000000

    prime time     The hour range and days of the week to be
                   included in the exception are specified.
                   The hour of the day must be within the hh1
                   through hh2 range.  Prime time specified
                   as 8 a.m. through 6:59 p.m. (18:59) would
```

appear as:

```
   AND ( 8 <=HOUR AND HOUR<= 18 )
```

The days of the week are represented by the first three characters of their names. They must be enclosed in quotes and separated with ORs. Prime time specified as MONDAY through FRIDAY would appear as:

```
AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
OR DAYNAME='THU' OR DAYNAME='FRI' )
```

00203: Hourly TSO Short Service Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours when TSO users' response
             time did not meet the installation defined short
             response service objective.

RATIONALE    An installation can set a service objective for
             all users as a percent of all short responses
             which will be completed within a certain time.
             Setting the service objective this way
             recognizes the importance of consistency of
             response, which is not reflected in an average.

DEFINITION   This exception is detected when average user
             short response for an hour falls below the
             installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS  situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00203
**  HOURLY TSO SHORT SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=SPCT;
IF (PERCENT + .5) < OBJECT
 AND TSOSRESC > EVENTS
 THEN DO;
  EXCCODE='00203'; SEVERITY='C'; MGMTAREA='SERVICE';
  EXCDESC1='HOURLY TSO SHORT SERVICE OBJECTIVE MISSED';
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '%  WAS ' ||
       PUT (PERCENT,3.) || '%   WITHIN ' || PUT (SECONDS,3.)
       || ' SECONDS';
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values of seconds and percent to define the installation service objective (the percent of responses within a certain number of seconds), according to the following conventions:

seconds — The number of seconds in the service objective is specified. An objective of five seconds would appear as:

```
SECONDS = 5
```

percent — The target percentage that is associated with the seconds given above (e.g., 90% within 5 seconds) would appear as:

```
OBJECT = 90
```

number-of-responses — The minimum number of short response events for which this exception is to be considered would appear as:

```
EVENTS = 20
```

00204: Hourly TSO Medium Service Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours when TSO users' response
             time did not meet the installation defined
             nontrivial response service objective.

RATIONALE    An installation can set a service objective for
             all users as a percent of all nontrivial
             responses which will be completed within a
             certain time.  Setting the service objective
             this way recognizes the importance of
             consistency of response, which is not reflected
             in an average.

DEFINITION   This exception is detected when average user
             nontrivial response for an hour falls below the
             installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00204
**  HOURLY TSO MEDIUM SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=MPCT;
IF (PERCENT + .5) < OBJECT
 AND TSOMRESC > EVENTS
 THEN DO;
  EXCCODE='00204'; SEVERITY='C'; MGMTAREA='SERVICE';
  EXCDESC1='HOURLY TSO MEDIUM SERVICE OBJECTIVE MISSED';
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '%  WAS ' ||
       PUT (PERCENT,3.) || '%   WITHIN ' || PUT (SECONDS,3.)
       || ' SECONDS';
  LINK HIT;
```

```
END;

THRESHOLD     Modify the values of seconds and percent to
MODIFICATION  define the installation service objective (the
              percent of responses within a certain number of
              seconds), according to the following
              conventions:

    seconds     The number of seconds in the service
                objective is specified.  An objective of five
                seconds would appear as:

                   SECONDS = 5

    percent     The target percentage that is associated with
                the seconds given above (e.g., 90% within
                five seconds) would appear as:

                   OBJECT = 90

    number-of-responses  The minimum number of medium
                         response events for which this
                         exception is to be considered would
                         appear as:

                            EVENTS = 20
```

00205: Hourly TSO Long Service Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours when TSO users' response
             time did not meet the installation defined long
             response service objective.

RATIONALE    An installation can set a service objective for
             all users as a percent of all long responses
             which will be completed within a certain time.
             Setting the service objective this way
             recognizes the importance of consistency of
             response, which is not reflected in an average.

DEFINITION   This exception is detected when average user
             long response for an hour falls below the
             installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00205
**  HOURLY TSO LONG SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=LPCT;
IF (PERCENT + .5) < OBJECT
 AND TSOLRESC > EVENTS
 THEN DO;
  EXCCODE='00205'; SEVERITY='W'; MGMTAREA='SERVICE';
  EXCDESC1='HOURLY TSO LONG SERVICE OBJECTIVE MISSED';
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '%  WAS ' ||
       PUT (PERCENT,3.) || '%   WITHIN ' || PUT (SECONDS,3.)
       || ' SECONDS';
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values of seconds and percent to define the installation service objective (the percent of responses within a certain number of seconds), according to the following conventions:

seconds — The number of seconds in the service objective is specified. An objective of five seconds would appear as:

```
SECONDS = 5
```

percent — The target percentage that is associated with the seconds given above (e.g., 90% within five seconds) would appear as:

```
OBJECT = 90
```

number-of-responses — The minimum number of long response events for which this exception is to be considered would appear as:

```
EVENTS = 20
```

00206: Hourly TSO Total Service Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY         Critical      (SEVERITY='C')
MANAGEMENT AREA  Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours when TSO users' response
             time did not meet the installation defined total
             response service objective.

RATIONALE    An installation can set a service objective for
             users as a percent of all responses which will
             be completed within a certain time.  Setting the
             service objective this way recognizes the
             importance of consistency of response, which is
             not reflected in an average.

DEFINITION   This exception is detected when average user
             response for an hour falls below the
             installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00206
**  HOURLY TSO TOTAL SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=TPCT;
IF (PERCENT + .5) < OBJECT
 AND TSOTRESC > EVENTS
 THEN DO;
  EXCCODE='00206'; SEVERITY='C'; MGMTAREA='SERVICE';
  EXCDESC1='HOURLY TSO TOTAL SERVICE OBJECTIVE MISSED';
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '%  WAS ' ||
       PUT (PERCENT,3.) || '%   WITHIN ' || PUT (SECONDS,3.)
       || ' SECONDS';
  LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values of seconds and percent to define the installation service objective (the percent of responses within a certain number of seconds), according to the following conventions:

seconds — The number of seconds in the service objective is specified. An objective of five seconds would appear as:

```
SECONDS = 5
```

percent — The target percentage that is associated with the seconds given above (e.g., 90% within five seconds) would appear as:

```
OBJECT = 90
```

number-of-responses — The minimum number of total response events for which this exception is to be considered would appear as:

```
EVENTS = 20
```

00207: Hourly TSO Availability Objective Missed

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Identifies the hours during which TSO was not
             available.

RATIONALE    An installation can monitor the times when TSO
             was not available to ensure that users are
             receiving adequate availability.

DEFINITION   This exception is detected when the total TSO
             available time is less than one hour.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00207
**  HOURLY TSO AVAILABILITY OBJECTIVE MISSED
*;
IF TSOUPTM < uptime
 THEN DO;
  EXCCODE='00207'; SEVERITY='C'; MGMTAREA='AVAILABILITY';
  EXCDESC1='HOURLY TSO AVAILABILITY OBJECTIVE MISSED';
  EXCDESC2='AVAILABILITY (HH:MM:SS)=' || PUT(TSOUPTM,TIME.);
  LINK HIT;
END;

THRESHOLD     Modify the value of uptime, according to the
MODIFICATION  following conventions:

    uptime    The minimum amount of time during the hour that
              TSO was available is specified.  A threshold of
              57 minutes of uptime would appear as:

                 TSOUPTM < HMS(0,57,00)
```

00208: TCAM/VTAM Outage Detected

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Identifies TCAM/VTAM outages.

RATIONALE    TCAM/VTAM outages cause an interruption in TSO
             availability.  These outages may be the result
             of a system IPL, or planned or unplanned
             stopping of TCAM/VTAM.

DEFINITION   This exception is detected when the TCAM/VTAM
             outage time is nonzero.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00208
**  TCAM/VTAM OUTAGE DETECTED
*;
IF TSOTVDTM > 0
 THEN DO;
  EXCCODE='00208'; SEVERITY='C'; MGMTAREA='AVAILABILITY';
  EXCDESC1='TCAM/VTAM OUTAGE DETECTED';
  EXCDESC2='OUTAGE (HH:MM:SS)=' || PUT(TSOTVDTM,TIME.);
  LINK HIT;
END;


THRESHOLD    None required.
MODIFICATION
```

00209: Hourly TSO Throughput Limit Objective Exceeded

```
FILE              TSO System Activity File
SAS FILE NAME     DAYS.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Identifies the hours during which the TSO
             command throughput exceeded the installation
             defined limit.

RATIONALE    An installation may set a limit based on the CPU
             power and configuration.  This limit represents
             the maximum hourly throughput which can be
             maintained while the installation still meets
             its service objectives.

DEFINITION   This exception is detected when the hourly TSO
             command count exceeds the installation defined
             value.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00209
**  HOURLY TSO THROUGHPUT LIMIT OBJECTIVE EXCEEDED
*;
IF TSOTCOM > command-count
 THEN DO;
  EXCCODE='00209'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='TSO THROUGHPUT LIMIT OBJECTIVE EXCEEDED';
  EXCDESC2='COMMAND COUNT=' || PUT(TSOTCOM,8.);
  LINK HIT;
END;


THRESHOLD           Modify the value used for command count,
MODIFICATION        according to the following conventions:

    command-count   The total number of commands executed
                    within one hour is specified.  A
                    threshold of 12000 commands would appear
                    as:
```

```
TSOTCOM > 12000
```

00250: Hourly TSO User Resource Overload

```
FILE              TSO User Activity File
SAS FILE NAME     DAYS.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Workload      (MGMTAREA='WORKLOAD')

PURPOSE      Identifies users whose hourly workload is large
             enough to impact the service to other users.

RATIONALE    It is possible for a TSO user to cause degraded
             response for others by consuming large amounts
             of CPU time or by doing large numbers of I/Os.
             At times, this results from a program or CLIST
             which is in an infinite loop.  If this user's
             workload is impacting others, it may be
             necessary to:

               A) Review the heaviest user's work for
                  efficiency improvements.

               B) Have some users run at a lower priority.

               C) Submit some of the TSO work to batch.

               D) Alter the IPS values for objectives,
                  domains, or time slice groups, in order to
                  achieve the installations response and
                  service objectives.

DEFINITION   This exception is detected when an individual
             user's CPU time, I/O, or service units exceed
             the installation defined limits.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00250
**  HOURLY TSO USER RESOURCE OVERLOAD
*;
IF TSUCPUTM > cpu-time
 OR TSUEXCPS > i/o
 OR TSUSERVU > service-units
```

```
 THEN DO;
  EXCCODE='00250'; SEVERITY='W'; MGMTAREA='WORKLOAD';
  EXCDESC1='HOURLY TSO USER RESOURCE OVERLOAD';
  EXCDESC2='CPU TIME(HH:MM:SS)= '
           || PUT(TSUCPUTM,TIME.) ||
           ', EXCPS=' || PUT(TSUEXCPS,6.) ||
           ', SU=' || PUT(TSUSERVU,7.);
  LINK HIT;
END;
```

THRESHOLD MODIFICATION

Modify the values used for CPU time, I/O, and service units, according to the following conventions:

cpu-time

The amount of CPU time is described as hours, minutes, and seconds. A threshold of 3 minutes and 20 seconds would appear as:

```
TSUCPUTM > HMS(0,3,20)
```

i/o

The number of nonterminal I/O operations is specified. A threshold of 1000 EXCPs would appear as:

```
TSUEXCPS > 1000
```

service-units

The number of service units is specified. A threshold of 35000 service units would appear as:

```
TSUSERVU > 35000
```

00251: Prime-Time TSO User Total Service Objective Missed

```
FILE              TSO User Activity File
SAS FILE NAME     DAYS.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours during prime time when
             users' response time did not meet the
             installation defined total response service
             objective.

RATIONALE    An installation can set a service objective for
             users as a percent of all responses which will
             be completed within a certain time.  Setting the
             service objective this way recognizes the
             importance of consistency of response, which is
             not reflected in an average.

DEFINITION   This exception is detected when an individual
             user's response for an hour falls below the
             installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00251
**  PRIME-TIME TSO USER TOTAL SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=TPCT;
IF (PERCENT + .5) < OBJECT
 AND TSUTRESC > EVENTS
 AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
      OR DAYNAME='THU' OR DAYNAME='FRI')
     AND (HOUR >= 08 AND HOUR <= 17)
 THEN DO;
  EXCCODE='00251'; SEVERITY='C'; MGMTAREA='SERVICE';
  EXCDESC1=
  'PRIME-TIME TSO USER TOTAL SERVICE OBJECTIVE MISSED';
```

```
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '% WAS ' ||
       PUT (PERCENT,3.) || '% WITHIN ' ||   PUT (SECONDS,3.)
       || ' SECONDS';
  LINK HIT;
END;
```

THRESHOLD MODIFICATION

Modify the values of seconds and percent to define the installation service objective (the percent of responses within a certain number of seconds), according to the following conventions:

seconds

The number of seconds in the service objective is specified. An objective of five seconds would appear as:

```
SECONDS = 5
```

percent

The target percentage that is associated with the seconds given above (e.g., 90% within five seconds) would appear as:

```
OBJECT = 90
```

number-of-responses

The minimum number of total response events for which this exception is to be considered would appear as:

```
EVENTS = 1000
```

prime time

The hour range and days of the week to be included in the exception are specified. The hour of the day must be within the hh1 through hh2 range. Prime time specified as 8 a.m. through 6:59 p.m. (18:59) would appear as:

```
AND ( 8 <=HOUR AND HOUR<= 18 )
```

The days of the week are represented by the first three characters of their names. They must be enclosed in quotes and separated with ORs. Prime time specified as MONDAY through FRIDAY would appear as:

```
AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
OR DAYNAME='THU' OR DAYNAME='FRI' )
```

00252: Prime-Time TSO User Short Service Objective Missed

```
FILE              TSO User Activity File
SAS FILE NAME     DAYS.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Service       (MGMTAREA='SERVICE')

PURPOSE      Identifies the hours during prime time when a
             user's response time did not meet the
             installation defined short response service
             objective.

RATIONALE    An installation can set a service objective for
             users as a percent of all short responses which
             will be completed within a certain time.
             Setting the service objective this way
             recognizes the importance of consistency of
             response, which is not reflected in an average.

DEFINITION   This exception is detected when an individual
             user's short response for an hour falls below
             the installation objective.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00252
**  PRIME-TIME TSO USER SHORT SERVICE OBJECTIVE MISSED
*;
SECONDS=seconds;
OBJECT=percent;
EVENTS=number-of-responses;
_PCTRESP
PERCENT=SPCT;
IF (PERCENT + .5) < OBJECT
 AND TSUSRESC > EVENTS
 AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
      OR DAYNAME='THU' OR DAYNAME='FRI')
     AND (HOUR >= 08 AND HOUR <= 17)
 THEN DO;
   EXCCODE='00252'; SEVERITY='C'; MGMTAREA='SERVICE';
   EXCDESC1=
   'PRIME-TIME USER SHORT SERVICE OBJECTIVE MISSED';
```

```
  EXCDESC2='OBJECTIVE ' || PUT(OBJECT,3.) || '% WAS ' ||
       PUT (PERCENT,3.) || '% WITHIN ' ||   PUT (SECONDS,3.)
       || ' SECONDS';
   LINK HIT;
END;
```

THRESHOLD MODIFICATION — Modify the values of seconds and percent to define the installation service objective (the percent of responses within a certain number of seconds), according to the following conventions:

seconds — The number of seconds in the service objective is specified. An objective of five seconds would appear as:

```
SECONDS = 5
```

percent — The target percentage that is associated with the seconds given above (e.g., 90% within five seconds) would appear as:

```
OBJECT = 90
```

number-of-responses — The minimum number of short response events for which this exception is to be considered would appear as:

```
EVENTS = 1000
```

prime time — The hour range and days of the week to be included in the exception are specified. The hour of the day must be within the hh1 through hh2 range. Prime time specified as 8 a.m. through 6:59 p.m. (18:59) would appear as:

```
AND ( 8 <=HOUR AND HOUR<= 18 )
```

The days of the week are represented by the first three characters of their names. They must be enclosed in quotes and separated with ORs. Prime time specified as MONDAY through FRIDAY would appear as:

```
AND (DAYNAME='MON' OR DAYNAME='TUE' OR DAYNAME='WED'
     OR DAYNAME='THU' OR DAYNAME='FRI' )
```

00253: Hourly TSO User Terminal I/O Excessively High

```
FILE              TSO User Activity File
SAS FILE NAME     DAYS.TSOTSU01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Workload      (MGMTAREA='WORKLOAD')

PURPOSE      Identifies users with unusually high terminal
             I/O activity.

RATIONALE    High terminal I/O activity can result in
             degraded response for users sharing a multi-
             point line.  In particular, 3270 users have been
             known to FLASH through large files by causing a
             continuous CLEAR or ENTER.  Under some
             conditions, this can lock out other users on the
             same line.

DEFINITION   This exception is detected when an individual
             user's terminal I/O for an hour exceeds the
             installation defined limit.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
**  00253
**  HOURLY TSO USER TERMINAL I/O EXCESSIVELY HIGH
*;
TERMIO=TSUTGETS + TSUTPUTS;
IF TERMIO > termio
 THEN DO;
  EXCCODE='00253'; SEVERITY='W'; MGMTAREA='WORKLOAD';
  EXCDESC1='HOURLY TSO USER TERMINAL I/O EXCESSIVELY HIGH';
  EXCDESC2='TPUTS=' || PUT(TSUTPUTS,8.) ||
           ', TGETS=' || PUT(TSUTGETS,8.);
  LINK HIT;
END;

THRESHOLD     Modify the value used for terminal I/O,
MODIFICATION  according to the following conventions:

    termio    The number of I/O operations (TGETS+TPUTS) is
              specified.  A threshold of 1000 EXCPs would
```

appear as:

```
TERMIO > 1000
```

00305: Supervisor Trace Table Too Small

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting    (SEVERITY='I')
MANAGEMENT AREA   Performance  (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates that the supervisor trace is not
             serving its purpose.

RATIONALE    Keeping a "trace table" within the MVS nucleus
             with entries that record supervisor events is
             very useful for system problem-shooting.  MVS
             system dumps can be difficult or impossible to
             analyze without the information available in the
             trace table.  Also, since so many different
             events are traced, a table smaller than a
             certain size can result in seeing only events
             which happened after the events of interest
             (e.g., RTM processing).

DEFINITION   Code is provided to note this exception when the
             following data element is found with a nonzero
             value:

            TSOXSTRX - Intvls When Supervisor Trace Too Small

             See Appendix B for more information on this
             data element.


EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00305
** SUPERVISOR TRACE TABLE TOO SMALL
*;
IF TSOXSTRX > 0
 THEN DO;
  EXCCODE='00305'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='SUPERVISOR TRACE TABLE TOO SMALL';
   EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
```

```
END;

THRESHOLD      Most likely, you will want to modify this
MODIFICATION   exception to only signal an exception for the
               opposite of how you usually run your systems.
               For example, if it is installation policy to
               run with trace on, you will want to generate an
               exception if trace is off.

               You may want to generate this kind of exception
               selectively based on SYSID.  However, for all
               your systems, you will probably want to keep
               the exception approximately the size of the
               trace table.
```

00306: Insufficient Catalog RPLs

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Warns of possible catalog access bottleneck.

RATIONALE    A VSAM Request Parameter List (RPL) must be
             allocated from a fixed-size pool for each
             catalog request concurrently processed.  Most
             MVS systems degrade when fewer than 5 of these
             control blocks are allocated.

DEFINITION   This exception is detected when the data element
             TSOXRPLX (Intvls When Catalog RPLs Less Than 5)
             is found with a nonzero value.  See Appendix B
             for more information on this data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00306
** INSUFFICIENT CATALOG RPLS
*;
IF TSOXRPLX > 0
 THEN DO;
  EXCCODE='00306'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='INSUFFICIENT CATALOG RPLS';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
MODIFICATION
```

00307: BLDL Not in Use

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Warns of possible performance degradation due to
             high activity on LNKLSTxx directories.

RATIONALE    The MVS fixed or pageable BLDL facilities are an
             important means of reducing I/O to the
             directories of what is usually a long list of
             LNKLSTnn data sets.

DEFINITION   Code is provided to note this exception when any
             of the following data elements are found with a
             nonzero value:

             TSOXBLDN - Intvls When BLDL Not in Use
             TSOXBLDX - Intvls When BLDL Not in Collating Seq

             See Appendix B for more information on this
             data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00307
** BLDL NOT IN USE
*;
IF TSOXBLDN > 0
    OR TSOXBLDX > 0
 THEN DO;
  EXCCODE='00307'; SEVERITY='W'; MGMTAREA='PERFORMANCE';
  EXCDESC1='BLDL NOT IN USE';
   EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD     If you are running "dynamic BLDL," you may want
MODIFICATION  to disable this exception because some
              implementations of it give the appearance of an
```

incorrectly ordered BLDL table.

00308: GTF Active

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Warns that GTF recording is in process.

RATIONALE    Depending on the options with which it is
             started, IBM's Generalized Trace Facility
             Service Aid can impose a large overhead on the
             system.  Typically, GTF is used as a last resort
             in solving a critical system problem.  Such
             problems often occur when the load on the system
             is the highest and the extra CPU load is least
             bearable.  GTF being active can explain many
             performance degradations.

DEFINITION   This exception is noted when the data element
             TSOXGTFY (Intvls When GTF in Use) is found with
             a nonzero value.  Consult the CA MICS Data
             Dictionary for more information about this data
             element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00308
** GTF ACTIVE
*;
IF TSOXGTFY > 0
 THEN DO;
  EXCCODE='00308'; SEVERITY='I'; MGMTAREA='PERFORMANCE';
  EXCDESC1='GTF ACTIVE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
MODIFICATION
```

00309: OLTEP Active

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Warns that OLTEP is in use.

RATIONALE    OLTEP can cause some system degradation.  More
             importantly, OLTEP is used during periods of
             hardware difficulties (at least if you see this
             exception generated on prime shift when no new
             I/O device installation would be going on).

DEFINITION   This exception is noted when the data element
             TSOXOLTY (Intvls When OLTEP in Use) is found
             with a nonzero value.  Consult the CA MICS Data
             Dictionary for more information about this data
             element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00309
** OLTEP ACTIVE
*;
IF TSOXOLTY > 0
 THEN DO;
  EXCCODE='00309'; SEVERITY='W'; MGMTAREA='PERFORMANCE';
  EXCDESC1='OLTEP ACTIVE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD     None required.  If a certain nonprime period is
MODIFICATION  devoted to hardware maintenance at your site,
              you might not want to generate an exception for
              OLTEP use during that period.
```

00310: Low Core Protection Not In Use

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTS001
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Indicates possible MVS reliability exposure.

RATIONALE    In SE-1, a new low core protection mechanism was
             introduced to supplement storage key protection.
             By setting bit 3 of control register 0, MVS can
             disallow stores under CPU program control which
             use a LOGICAL address less than 512 (decimal).
             CA MICS will never note this exception for
             pre-SE systems.

             MVS does turn this protection off and then on
             again when certain low core fields must be
             changed, but TSO/MON should never see it.  It
             should be done very quickly while the CPU is
             disabled for interrupts.

             However, this protection is not airtight.  The
             I/O Supervisor (IOS) does NOT turn it off and on
             when it goes to set the Channel Address Word
             (CAW) in preparation for issuing SIO/SIOF.
             Rather, the system segment/page tables are set
             to map addresses FFF000-FFFFFF to real addresses
             000000-000FFF (which are in turn converted to
             "absolute" addresses by PREFIXing).

DEFINITION   This exception is noted when the data element
             TSOXLCPN (Intvls When Low Core Protection Not in
             Use) is found with a nonzero value and the
             parameters specified for this system in
             prefix.MICS.PARMS(SYSID) indicate the MVS level
             as SE1 or above.  Consult the CA MICS Data
             Dictionary for more information about the
             TSOXLCPN data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

_SYSID;      * BRING IN PARMS(SYSID) DEFINITIONS;
```

```
************************************************************;
*
** 00310
** LOW CORE PROTECTION NOT IN USE
*;
IF TSOXLCPN > 0 AND SCP ^ = 'MVS'
 THEN DO;
  EXCCODE='00310'; SEVERITY='C'; MGMTAREA='AVAILABILITY';
  EXCDESC1='LOW CORE PROTECTION NOT IN USE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD     None required.  It is important that
MODIFICATION  prefix.MICS.PARMS(SYSID) be kept up-to-date
              with respect to the operating system level of
              all of your systems.
```

00311: COMMON Page Duplexing Not Active

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Impacting     (SEVERITY='I')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Indicates that the reliability enhancer is not
             in use.

RATIONALE    The facility of double-logging pages that
             change in the COMMON area is intended to save an
             unscheduled IPL if the primary COMMON paging
             data set becomes unusable.  This is done at some
             cost.

             The performance analyst should note whether or
             not COMMON is being duplexed to verify that the
             trade-off between reliability and performance
             that has been agreed to is in fact the one
             that has been implemented.

DEFINITION   This exception is noted when the data element
             TSOXCPDY (Intvls When COMMON Page Duplexing in
             Use) is found with a zero value.  See Appendix B
             for more information on this data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00311
** COMMON PAGE DUPLEXING NOT ACTIVE
*;
IF TSOXCPDY = 0
 THEN DO;
  EXCCODE='00311'; SEVERITY='I'; MGMTAREA='AVAILABILITY';
  EXCDESC1='COMMON PAGE DUPLEXING NOT ACTIVE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;
```

THRESHOLD	None required. If your installation does not
MODIFICATION	find duplexing valuable, you may want to disable this exception.

00312: Page/Swap I/O Error(s)

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Availability  (MGMTAREA='AVAILABILITY')

PURPOSE      Indicates hardware problems in the page/swap
             subsystem.

RATIONALE    The integrity of data moving to and from MVS's
             paging and swapping data sets is of vital
             concern from both a performance and a
             reliability point of view.  Whether or not
             either are actually impacted and by how much
             depend on the nature, frequency, and location
             of the errors.  (For example, a permanent I/O
             error on a page write is not fatal--ASM marks
             the slot as "bad" and tries another.  On the
             other hand, a failure to read a page needed for
             the IMS control region's private area would be
             fatal to online data base processing).

DEFINITION   This exception is noted when the data element
             TSOXPAGY (Intvls When I/O Errors on Paging Ops)
             is found with a nonzero value.  See Appendix B
             for more information on this data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00312
** PAGE/SWAP I/O ERROR(S)
*;
IF TSOXPAGY > 0
 THEN DO;
  EXCCODE='00312'; SEVERITY='C'; MGMTAREA='AVAILABILITY';
  EXCDESC1='PAGE/SWAP I/O ERROR(S)';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
```

```
MODIFICATION
```

00313: AP/MP/Dyadic System Running in HD Mode

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates unusual machine operating mode.

RATIONALE    A multiprocessor may be run as either one system
             with two CPUs or two systems with one CPU each
             ("half-duplex" mode), but sites usually pay the
             extra cost of an MP because they intend to run
             it as a multiprocessor.  This exception assumes
             that if an MP is running with only one CPU, it
             is because the other is down.  (This is always
             true of attached processors and dyadic
             processors which do not support partitioning).

DEFINITION   This exception is noted when the data element
             TSOXCPUH (Intvls When CPU in HD Mode) is found
             with a nonzero value.  Consult the CA MICS Data
             Dictionary for more information about this data
             element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00313
** AP/MP/DYADIC SYSTEM RUNNING IN HD MODE
*;
IF TSOXCPUH > 0
 THEN DO;
  EXCCODE='00313'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='AP/MP/DYADIC SYSTEM RUNNING IN HD MODE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD     None required.  You should disable this
MODIFICATION  exception for any MP that is normally run as
              two UPs.
```

00314: Machine Check(s) Occurred

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates that machine failures have occurred.

RATIONALE    The health of the system hardware is an obvious
             concern from a reliability/availability
             perspective.

DEFINITION   This exception is noted when any of the
             following data elements are found with a nonzero
             value:

             TSOXSRMY - Intvls When Sys Recovery Machine
                        Checks
             TSOXIPMY - Intvls When Instruction Process
                        Machine Checks
             TSOXSMCY - Intvls When System Machine Checks
             TSOXIPRY - Intvls When Bad PSW or Reg Machine
                        Check
             TSOXTODY - Intvls When TOD Clock Machine Checks
             TSOXCTMY - Intvls When CPU Timer Machine Checks
             TSOXCCMY - Intvls When Clock Comparator Mach
                        Checks

             See Appendix B for more information on this
             data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00314
** MACHINE CHECK(S) OCCURRED
*;
IF SUM(OF TSOXSRMY TSOXIPMY TSOXSMCY TSOXIPRY
          TSOXTODY TSOXCTMY TSOXCCMY) > 0
 THEN DO;
  EXCCODE='00314'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='MACHINE CHECK(S) OCCURRED';
```

```
  IF TSOXSRMY > 0 THEN
       EXCDESC2=' SYSTEM RECOVERY CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXIPMY > 0 THEN
       EXCDESC2=' INSTRUCTION-PROCESSING CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXSMCY > 0 THEN
       EXCDESC2=' SYSTEM CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXIPRY > 0 THEN
       EXCDESC2=' INVALID REG OR PSW CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXTODY > 0 THEN
       EXCDESC2=' TOD CLOCK CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXCTMY > 0 THEN
       EXCDESC2=' CPU TIMER CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXCCMY > 0 THEN
       EXCDESC2=' CLOCK COMPARATOR CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD     None required.
MODIFICATION
```

00315: "Quiet Mode" Entered Due to Machine Checks

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Warning       (SEVERITY='W')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates that numerous recoverable machine
             failures have occurred.

RATIONALE    "Soft" machine checks may require recovery
             processing which degrades the effective speed of
             the machine.

             Modern computing hardware has a significant
             ability to recover from internal hardware
             problems without any effect on the logical
             operation of the system (but possibly with some
             performance degradation).  For example, the
             system can usually recover from a single-bit
             error in any location of main memory.
             Furthermore, if the hardware cannot recover from
             the error, it is possible that the software can
             (for example by ABENDing just the task which
             took the hit).

             Even though the system has recovered from an
             error, the hardware signals to MVS that an error
             occurred so that a record of it can be made for
             tracking and analysis purposes.  The signal is
             called a "soft" machine check.

             "Soft" machine checks are named this because
             they do not prevent the machine from processing
             correctly.  MVS can mask them to prevent the
             logging of gross amounts of redundant data.  MVS
             does this when it receives a certain number of
             machine checks of a given type.  When a subclass
             of soft machine failure is masked, MVS is said
             to be in "quiet mode" for that class of failure.
             While in quiet mode, no console messages or
             LOGREC records will be written for that kind of
             machine error.  When MVS goes into "quiet mode,"
             it issues a message to that effect to the master
             console.

             An MVS Operator command can be issued to take
```

```
             the system out of a quiet mode after the failing
             component has been repaired.

DEFINITION   This exception is noted when any of the
             following data elements are found with a nonzero
             value:

             TSOXSMQY - Intvls When Sys Recover Check Msgs
                        Quiet

             See Appendix B for more information on this
             data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00315
** 'QUIET MODE' ENTERED DUE TO MACHINE CHECK
*;
IF TSOXSMQY > 0
 THEN DO;
  EXCCODE='00315'; SEVERITY='W'; MGMTAREA='PERFORMANCE';
  EXCDESC1='QUIET MODE ENTERED DUE TO MACHINE CHECK';
       EXCDESC2=' SYSTEM RECOVERY CHECK'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
MODIFICATION
```

00316: CPU Degraded by TLB/Cache Buffer Failure(s)

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates probable severe degradation of CPU
             speed.

RATIONALE    Large processor performance depends on a very
             high percentage of memory fetches being
             satisfied from the CPU's ultra-high-speed
             "cache" buffer and an even higher percentage of
             virtual-to-real address translations being
             accomplished from the CPU's Translation Look-
             Aside Buffer (TLB).

             The LOGICAL operation of the system can continue
             without either or both of the cache and the TLB,
             but performance impact would become worse.  For
             this reason, the hardware informs MVS of any
             impact on the TLB or cache via a "degradation"
             "soft" machine check.

             Note that it is possible to lose only part of
             the TLB or cache.  The hardware is segmented on
             most models so it may degrade rather than either
             working perfectly or not at all.

DEFINITION   This exception is noted when the data element
             TSOXTLBX (Intvls When TLB or Cache Machine Chks)
             is found with a nonzero value.  See Appendix B
             for more information on this data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
             LOCATION and are described below:

************************************************************;
*
** 00316
** CPU DEGRADED BY TLB/CACHE BUFFER FAILURE
*;
IF TSOXTLBX > 0
 THEN DO;
```

```
  EXCCODE='00316'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='CPU DEGRADED BY TLB/CACHE BUFFER FAILURE';
  EXCDESC2=' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
MODIFICATION
```

00319: Recovery of I/O on Failed Processor In Progress

```
FILE              TSO System Activity
SAS FILE NAME     DETAIL.TSOTSO01
SOURCE LOCATION   sharedprefix.MICS.SOURCE(DYTSOEXC)

SEVERITY          Critical      (SEVERITY='C')
MANAGEMENT AREA   Performance   (MGMTAREA='PERFORMANCE')

PURPOSE      Indicates that multiprocessor is running in
             degraded mode.

RATIONALE    The 168-MP, 3033-MP, and the 3081 all support
             (optional on 168-MP) some scheme for continuing
             to do I/O to devices normally only accessible
             from a CPU that has failed.  Such devices are
             deemed to be "asymmetrically attached" because
             they lack paths (channels) from both sides of
             the MP/dyadic processors.  Any device may be
             asymmetrically attached.  Certain old-style TP
             devices (e.g., BSC lines going through 3705-EP)
             must be.

             In 168-MP, the recovery scheme is called "CRH"
             for Channel Recovery Hardware, a less
             sophisticated method of issuing DIAGNOSE
             instructions to connect and disconnect channel 6
             of the healthy processor to a given channel of
             the dead one and then issue SIOs and/or "poll"
             for I/O interrupts.  In newer processors, a more
             architecturally complex solution called "channel
             set switching" has been implemented.  In either
             case, the loss of a processor and its I/O is a
             serious matter that can manifest itself in a
             number of ways, such as TP line time outs.

DEFINITION   This exception is noted when either of the
             following data elements contains a nonzero
             value:

             TSOXCRHY - Intvls When Chan Reconfig Hard Active
             TSOXCSSY - Intvls When Chan Set Switching Active

             See Appendix B for more information on this
             data element.

EXCEPTION    The SAS statements identifying the exception
STATEMENTS   situation and describing the condition are
             stored in the source member named in SOURCE
```

LOCATION and are described below:

```
************************************************************;
*
** 00319
** RECOVERY OF I/O ON FAILED PROCESSOR IN PROGRESS
*;
IF SUM (OF TSOXCRHY TSOXCSSY) > 0
 THEN DO;
  EXCCODE='00319'; SEVERITY='C'; MGMTAREA='PERFORMANCE';
  EXCDESC1='RECOVERY OF I/O ON FAILED PROCESSOR IN PROGRESS';
  IF TSOXCRHY > 0 THEN
       EXCDESC2='CHANL RECONFIG HARDWARE IS ACTIVE'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  IF TSOXCSSY > 0 THEN
       EXCDESC2='CHANNEL SET SWITCHING IS ACTIVE'
            || ' ENDTS=' || PUT(ENDTS,DATETIME19.2);
  LINK HIT;
END;

THRESHOLD    None required.
MODIFICATION
```

Chapter 5: FILES

This chapter identifies each file in the TSO Information Area and defines its level of summarization and data sequencing as the files appear in the applicable time-span levels.

The files maintained in the TSO Information Area are:

- TSO Batch Command Information File (TSO_BI)
- TSO Batch Data Set Name File (TSO_BD)
- TSO Batch User Activity File (TSO_BU)
- TSO Batch User Command Counts File (TSO_BC)
- TSO Data Set Name File (TSOTSA)
- TSO Dynamic Resource Usage File (TSODRU)
- TSO System Activity File (TSOTSO)
- TSO Terminal Activity File (TSO_TA)
- TSO User Activity File (TSOTSU)
- TSO User Command Counts File (TSOTSC)
- TSO User Interactive Usage File (TSOTSI)
- TSO Workload Manager File (TSOTSW)

The table below identifies the individual data base files and categorizes them by the information area to which they belong. For each file in an information area, the following information is provided:

XDWMYT - This entry defines the time-spans in which the file is supported. A nonblank indicates that the file is supported. A '.' indicates that the file is not supported. The time-spans indicated by "XDWMYT" are as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA

```
 File - The SAS name used to access this file.

 File Name  - The descriptive label for the file.

 NOTE:  The time-spans in which a file is supported are
        defined by each installation when CA MICS is
        installed.  Therefore, this table has been generated
        as part of the installation process to accurately
        reflect the CA MICS system at your installation.
```

TSO Information Area	Date Generated: Tue, May 12, 2009

XDWMYT	File	File Name
.....	TSO_BC	TSO BATCH USER COMMAND COUNTS FILE
.....	TSO_BD	TSO BATCH DATA SET NAME FILE
.....	TSO_BI	TSO BATCH COMMAND INFORMATION FILE
.....	TSO_BU	TSO BATCH USER ACTIVITY FILE
.....	TSODRU	TSO DYNAMIC RESOURCE USAGE FILE
X....	TSOTSA	TSO DATA SET NAME FILE
X..M..	TSOTSC	TSO USER COMMAND COUNTS FILE
X..M..	TSOTSI	TSO USER INTERACTIVE USAGE FILE
XDWMY.	TSOTSO	TSO SYSTEM ACTIVITY FILE
XD.MY.	TSOTSU	TSO USER ACTIVITY FILE
XDWMY.	TSOTSW	TSO WORKLOAD MANAGER DEFINITION FILE
.....	TSO_TA	TSO TERMINAL ACTIVITY FILE

Figure 5-1. TSO Files' Active Time-Spans

This section contains the following topics:

5.1 Data Element Naming Conventions

The data elements in the CA MICS Data Base files follow naming conventions that depend on whether they are standard or common data elements. Standard data elements use the first three characters of their name to identify the file in which they are defined. The exception to this rule is that elements in a parallel file use the file identification of the parent file. An example of this would be the Terminal Activity File (TSO_TA) which uses the TSU prefix. The following chart lists the three-character prefix with which the standard data element names begin and the file in which they are contained.

File Name	File	Prefix
TSO Batch Command Information File	TSO_BI	TSI
TSO Batch Data Set Name File	TSO_BD	TSA
TSO Batch User Activity File	TSO_BU	TSU
TSO Batch User Command Counts File	TSO_BC	TSC
TSO Data Set Name File	TSOTSA	TSA
TSO Dynamic Resource Usage File	TSODRU	DRU
TSO System Activity File	TSOTSO	TSO
TSO Terminal Activity File	TSO_TA	TSU
TSO User Activity File	TSOTSU	TSU
TSO User Command Counts File	TSOTSC	TSC
TSO User Interactive Usage File	TSOTSI	TSI
TSO Workload Manager File	TSOTSW	TSW

Common data elements do not use a data element prefix. They have a common definition across data base information areas or across files within an information area. You will find common data elements listed in the "Sequence/Summary Data Elements" and "Common Data Elements" sections of the Data Elements List that accompany the DETAIL file descriptions in this chapter.

5.2 TSO Information Area Files

This section describes each file built by the CA MICS TSO Analyzer. Data elements are described in Appendix B, Data Dictionary.

This section describes the following files:

1 - TSO System Activity File (TSOTSO)
2 - TSO User Activity File (TSOTSU)
3 - TSO User Command Counts File (TSOTSC)
4 - TSO User Interactive Usage File (TSOTSI)
5 - TSO Terminal Activity File (TSO_TA)
6 - TSO Data Set Name File (TSOTSA)
7 - TSO Batch User Command Counts File (TSO_BC)
8 - TSO Batch Data Set Name File (TSO_BD)
9 - TSO Batch Command Information File (TSO_BI)
10 - TSO Batch User Activity File (TSO_BU)
11 - TSO Dynamic Resource Usage File (TSODRU)
12 - TSO Workload Manager File (TSOTSW)

5.2.1 TSO System Activity File (TSOTSO)

The TSO System Activity File contains data that quantifies the total TSO system service (response), load, and availability for defined intervals of time. Resource consumption, service (total, short, medium, and long response), availability, and performance measures are provided. This file is derived from the TSO/MON System Record, SCB and UCB segments.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.1.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity				
DETAIL	SYSID ENDTS	YEAR	MONTH	DAY	HOUR
DAYS	SYSID	YEAR	MONTH	DAY	HOUR
WEEKS	SYSID	YEAR	WEEK	ZONE	HOUR
MONTHS	SYSID	YEAR	MONTH	ZONE	
YEARS	SYSID	YEAR	ZONE		
TABLES	N/A				

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-2. TSOTSO Time-Span Granularity Chart

5.2.1.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

XD....E	DAY	- Day of Month
XDW...E	HOUR	- Hour of Day
XD.M..E	MONTH	- Month of Year
XDWMY.E	SYSID	- System Identifier
XDW...E	WEEK	- Week of Year
XDWMY.E	YEAR	- Year of Century

```
 XDWMY.E  ZONE     - Time Zone

Common Data Elements

 XDWMY.E  CPUMODEL - CPU Model Identification
 XD....E  DAYNAME  - Name of Day of Week
 XDWMY.E  DURATION - Recording Interval Time
 XDWMY.E  ENDTS    - End Time Stamp
 XDWMY.E  INTERVLS - Number of Recording Intervals
 XDWMY.E  MICSVER  - CA MICS Version Number
 XDWMY.E  ORGSYSID - Originating System Identification
 XDWMY.E  STARTTS  - Start Time Stamp
 XDWMY.E  TSMERESP - Excessive Response Time Threshold
 XDWMY.E  TSMNODST - Number Of Distribution Values
 XDWMY.E  TSMONVER - TSO/MON Version Number
 XDWMY.E  TSMRVAL1 - Response Distribution Limits 1
 XDWMY.E  TSMRVAL2 - Response Distribution Limits 2
 XDWMY.E  TSMRVAL3 - Response Distribution Limits 3
 XDWMY.E  TSMRVAL4 - Response Distribution Limits 4
 XDWMY.E  TSMRVAL5 - Response Distribution Limits 5
 XDWMY.E  TSMRVAL6 - Response Distribution Limits 6
 XDWMY.E  TSMRVAL7 - Response Distribution Limits 7
 XDWMY.E  TSMRVAL8 - Response Distribution Limits 8

Retained Data Elements

 X.....   TSOAMUTM - Time Spent At Max Users
 X.....   TSOIFLAG - IPS Flag Field
 X.....   TSOIPF1  - Performance Group Flag For PGN 1
 X.....   TSOIPF10 - Performance Group Flag For PGN 10
 X.....   TSOIPF2  - Performance Group Flag For PGN 2
 X.....   TSOIPF3  - Performance Group Flag For PGN 3
 X.....   TSOIPF4  - Performance Group Flag For PGN 4
 X.....   TSOIPF5  - Performance Group Flag For PGN 5
 X.....   TSOIPF6  - Performance Group Flag For PGN 6
 X.....   TSOIPF7  - Performance Group Flag For PGN 7
 X.....   TSOIPF8  - Performance Group Flag For PGN 8
 X.....   TSOIPF9  - Performance Group Flag For PGN 9
 X.....   TSOIPG1  - Performance Group Nbr For PGN 1
 X.....   TSOIPG10 - Performance Group Nbr For PGN 10
 X.....   TSOIPG2  - Performance Group Nbr For PGN 2
 X.....   TSOIPG3  - Performance Group Nbr For PGN 3
 X.....   TSOIPG4  - Performance Group Nbr For PGN 4
 X.....   TSOIPG5  - Performance Group Nbr For PGN 5
 X.....   TSOIPG6  - Performance Group Nbr For PGN 6
 X.....   TSOIPG7  - Performance Group Nbr For PGN 7
 X.....   TSOIPG8  - Performance Group Nbr For PGN 8
 X.....   TSOIPG9  - Performance Group Nbr For PGN 9
 X.....   TSOIPSS  - IPS Suffix When SU Algorithm In Use
```

```
 XDWMY.E  TSOISCOE - IOC Service Definition Coefficient
 X.....   TSOISM1  - Medium Service Threshold For PGN 1
 X.....   TSOISM10 - Medium Service Threshold For PGN 10
 X.....   TSOISM2  - Medium Service Threshold For PGN 2
 X.....   TSOISM3  - Medium Service Threshold For PGN 3
 X.....   TSOISM4  - Medium Service Threshold For PGN 4
 X.....   TSOISM5  - Medium Service Threshold For PGN 5
 X.....   TSOISM6  - Medium Service Threshold For PGN 6
 X.....   TSOISM7  - Medium Service Threshold For PGN 7
 X.....   TSOISM8  - Medium Service Threshold For PGN 8
 X.....   TSOISM9  - Medium Service Threshold For PGN 9
 X.....   TSOISS1  - Short Service Threshold For PGN 1
 X.....   TSOISS10 - Short Service Threshold For PGN 10
 X.....   TSOISS2  - Short Service Threshold For PGN 2
 X.....   TSOISS3  - Short Service Threshold For PGN 3
 X.....   TSOISS4  - Short Service Threshold For PGN 4
 X.....   TSOISS5  - Short Service Threshold For PGN 5
 X.....   TSOISS6  - Short Service Threshold For PGN 6
 X.....   TSOISS7  - Short Service Threshold For PGN 7
 X.....   TSOISS8  - Short Service Threshold For PGN 8
 X.....   TSOISS9  - Short Service Threshold For PGN 9
 XDWMY.E  TSOMSCOE - MSO Service Definition Coefficient
 X.....   TSOSOPTS - TSO/MON Options Flag1
 X.....   TSOSOPT2 - TSO/MON Options Flag2
 XDWMY.E  TSOSSCOE - SRB Service Definition Coefficient
 XDWMY.E  TSOTSCOE - TCB Service Definition Coefficient

Accumulated Data Elements

 XDWMY.   TSOCLIST - TSO CLIST Count
 XDWMY.E  TSOCONTM - Terminal Connect Time
 XDWMY.   TSOCOST  - Processing Charges
 XDWMY.   TSOCPUNI - Instructions Executed
 XDWMY.E  TSOCPUTM - CPU Time Consumed
 XDWMY.E  TSODEVTM - Interval Device Connect Time
 XDWMY.   TSOERESC - Excessive Response Event Count
 XDWMY.   TSOERSTM - Excessive Response Time Total
 XDWMY.E  TSOEXCPS - I/O (EXCPs) Generated
 XDWMY.   TSOGETCH - TGET Character Traffic
 XDWMY.   TSOLCOM  - Long Commands Processed
 XDWMY.E  TSOLDST1 - Count Long Responses Within Limit 1
 XDWMY.E  TSOLDST2 - Count Long Responses Within Limit 2
 XDWMY.E  TSOLDST3 - Count Long Responses Within Limit 3
 XDWMY.E  TSOLDST4 - Count Long Responses Within Limit 4
 XDWMY.E  TSOLDST5 - Count Long Responses Within Limit 5
 XDWMY.E  TSOLDST6 - Count Long Responses Within Limit 6
 XDWMY.E  TSOLDST7 - Count Long Responses Within Limit 7
 XDWMY.E  TSOLDST8 - Count Long Responses Within Limit 8
 XDWMY.E  TSOLGDUR - Logon Duration
```

```
XDWMY.E  TSOLRESC - Long Response Event Count
XDWMY.E  TSOLRSTM - Long Response Time Total
XDWMY.   TSOMCOM  - Medium Commands Processed
XDWMY.E  TSOMDST1 - Count Medium Responses Within Limit 1
XDWMY.E  TSOMDST2 - Count Medium Responses Within Limit 2
XDWMY.E  TSOMDST3 - Count Medium Responses Within Limit 3
XDWMY.E  TSOMDST4 - Count Medium Responses Within Limit 4
XDWMY.E  TSOMDST5 - Count Medium Responses Within Limit 5
XDWMY.E  TSOMDST6 - Count Medium Responses Within Limit 6
XDWMY.E  TSOMDST7 - Count Medium Responses Within Limit 7
XDWMY.E  TSOMDST8 - Count Medium Responses Within Limit 8
XDWMY.E  TSOMRESC - Medium Response Event Count
XDWMY.E  TSOMRSTM - Medium Response Time Total
XDWMY.   TSOMTHCT - Over Max Think Count
XDWMY.   TSOMTHTM - Over Max Think Time Total
XDWMY.E  TSONOIPL - Number of IPLs
XDWMY.E  TSONOLOG - User Logons
XDWMY.E  TSOPANLC - SPF DM Panel Count
XDWMY.   TSOPETTM - Pseudo Elapsed Time
XDWMY.E  TSOPGCMI - Common Page-Ins
XDWMY.E  TSOPGHSI - Hiperspace Page-Ins
XDWMY.E  TSOPGHSO - Hiperspace Page-Outs
XDWMY.E  TSOPGIN  - Page-In Count
XDWMY.E  TSOPGLPA - LPA Page-Ins
XDWMY.E  TSOPGOUT - Page-Out Count
XDWMY.E  TSOPGSTL - Page Steals
XDWMY.E  TSOPGSWI - Swap Page-Ins
XDWMY.E  TSOPGSWO - Swap Page-Outs
XDWMY.E  TSOPGVI  - VIO Page-Ins
XDWMY.E  TSOPGVO  - VIO Page-Outs
XDWMY.   TSOPUTCH - TPUT Character Traffic
XDWMY.E  TSORESTM - Transaction Residency Time
XDWMY.   TSOSCOM  - Short Commands Processed
XDWMY.E  TSOSDST1 - Count Short Responses Within Limit 1
XDWMY.E  TSOSDST2 - Count Short Responses Within Limit 2
XDWMY.E  TSOSDST3 - Count Short Responses Within Limit 3
XDWMY.E  TSOSDST4 - Count Short Responses Within Limit 4
XDWMY.E  TSOSDST5 - Count Short Responses Within Limit 5
XDWMY.E  TSOSDST6 - Count Short Responses Within Limit 6
XDWMY.E  TSOSDST7 - Count Short Responses Within Limit 7
XDWMY.E  TSOSDST8 - Count Short Responses Within Limit 8
XDWMY.E  TSOSERCU - CPU Service Units
XDWMY.E  TSOSERIU - IOC Service Units
XDWMY.E  TSOSERLE - Long Event Service Units
XDWMY.E  TSOSERME - Medium Event Service Units
XDWMY.E  TSOSERMU - MSO Service Units
XDWMY.E  TSOSERSE - Short Event Service Units
XDWMY.E  TSOSERSU - SRB Service Units
XDWMY.E  TSOSERVU - Service Units
```

```
XDWMY.E  TSOSICNT - Swap-In Time Event Count
XDWMY.E  TSOSIDTM - Swap-In Delay Time
XDWMY.   TSOSINTM - Swap-In Time
XDWMY.E  TSOSNDCT - Sampled Network Delay Event Count
XDWMY.E  TSOSNDTM - Sample Network Delay Time Total
XDWMY.E  TSOSRBTM - SRB CPU Time
XDWMY.E  TSOSRESC - Short Response Event Count
XDWMY.E  TSOSRSTM - Short Response Time Total
XDWMY.   TSOSRU   - System Resource Units
XDWMY.E  TSOSWAPS - Physical Swap-Out Count
XDWMY.E  TSOSWPLI - Logical Swap-In Count
XDWMY.E  TSOSWPLO - Logical Swap-Out Count
XDWMY.E  TSOSWPPI - Physical Swap-In Count
XDWMY.E  TSOSWPSI - Total Swapped-In Bytes (1K Blocks)
XDWMY.E  TSOSWPSZ - Total Swapped-Out Bytes (1K Blocks)
XDWMY.E  TSOSWPTM - Total Logical Swap Time
XDWMY.E  TSOTCBTM - TCB CPU Time
XDWMY.E  TSOTCOM  - Total Commands Processed
XDWMY.E  TSOTDST1 - Count Total Responses Within Limit 1
XDWMY.E  TSOTDST2 - Count Total Responses Within Limit 2
XDWMY.E  TSOTDST3 - Count Total Responses Within Limit 3
XDWMY.E  TSOTDST4 - Count Total Responses Within Limit 4
XDWMY.E  TSOTDST5 - Count Total Responses Within Limit 5
XDWMY.E  TSOTDST6 - Count Total Responses Within Limit 6
XDWMY.E  TSOTDST7 - Count Total Responses Within Limit 7
XDWMY.E  TSOTDST8 - Count Total Responses Within Limit 8
XDWMY.E  TSOTGETS - TGETs Issued
XDWMY.E  TSOTHCNT - Think Event Count
XDWMY.E  TSOTHKTM - Think Time Total
XDWMY.E  TSOTPUTS - TPUTs Issued
XDWMY.E  TSOTRANS - SRM Ended Transactions
XDWMY.E  TSOTRESC - Total Response Event Count
XDWMY.E  TSOTRSTM - Total Response Time All Functions
XDWMY.   TSOTVDTM - TCAM/VTAM Downtime
XDWMY.E  TSOUPTM  - TSO Availability Time
XDWMY.E  TSOUSRCT - Total Count of Active Users
XDWMY.E  TSOXBLDN - Intvls When BLDL Not In Use
XDWMY.   TSOXBLDO - Intvls When nonstandard BLDL In use
XDWMY.   TSOXBLDX - Intvls When BLDL Not In Collating Seq
XDWMY.   TSOXCCMY - Intvls When Clock Comparator Mach Check
XDWMY.E  TSOXCPDY - Intvls When Common Page Duplexing In Us
XDWMY.   TSOXCPUH - Intvls When CPU In HD Mode
XDWMY.   TSOXCRHY - Intvls When Chan Recovery Hard Active
XDWMY.   TSOXCSSY - Intvls When Chan Set Switching Active
XDWMY.   TSOXCTMY - Intvls When CPU Timer Machine Checks
XDWMY.E  TSOXGTFY - Intvls When GTF In Use
XDWMY.   TSOXIPMY - Intvls When Instruction Process Checks
XDWMY.   TSOXIPRY - Intvls When Bad PSW Or Reg Machine Check
XDWMY.   TSOXLCPN - Intvls When Low Core Protect Not In Use
```

```
 XDWMY.E  TSOXOLTY - Intvls When OLTEP In Use
 XDWMY.E  TSOXPAGY - Intvls When I/O Errors On Paging Ops
 XDWMY.E  TSOXRPLX - Intvls When Catalog RPLs Less Than 5
 XDWMY.   TSOXSMCY - Intvls When System Machine Checks
 XDWMY.   TSOXSMQY - Intvls When Sys Recover Check Msgs Quiet
 XDWMY.   TSOXSRMY - Intvls When Sys Recovery Machine Checks
 XDWMY.E  TSOXSTRX - Intvls When Supervisor Trace Too Small
 XDWMY.   TSOXTLBX - Intvls When TLB Or Cache Machine Chks
 XDWMY.   TSOXTODY - Intvls When TOD Clock Machine Checks

Minimum Data Elements

 XDWMY.E  TSOMTIOC - Min TIOC Buffers

Maximum Data Elements

 XDWMY.   TSOMPCPU - Max CPU Usage
 XDWMY.   TSOMXETM - Max Excessive Response Time
 XDWMY.E  TSOMXFRM - Max Fixed Frames
 XDWMY.   TSOMXKTM - Max User Think Time
 XDWMY.   TSOMXLTM - Max Long Response Time
 XDWMY.   TSOMXMTM - Max Medium Response Time
 XDWMY.   TSOMXSTM - Max Short Response Time
 XDWMY.E  TSOMXSWI - Max Swapped-In Bytes (1K Blocks)
 XDWMY.   TSOMXTTM - Max Response Time All Functions
 XD....   TSOMXUIC - Max Unreferenced Interval Count
 XDWMY.E  TSOMXUSR - Max Concurrent User Load
 XDWMY.E  TSOMXWTM - Max Logical Swap Time
 XDWMY.E  TSOSWPHI - Max Swapped-Out Bytes (1K Blocks)

Derived Data Elements

 ...MY.E  TSOAVCTM - Avg TSO Session Time
 XDWMY.   TSOAVETM - Avg Excessive Response Time
 XDWMY.E  TSOAVKTM - Avg User Think Time
 XDWMY.E  TSOAVLTM - Avg Long Response Time
 XDWMY.E  TSOAVMTM - Avg Medium Response Time
 XDWMY.E  TSOAVSTM - Avg Short Response Time
 XDWMY.E  TSOAVTTM - Avg Response Time All Functions
 XDWMY.E  TSOAVUSR - Avg Concurrent User Load
 XDWMY.E  TSOPCCPU - Pct CPU Usage
 XDWMY.E  TSOPCLR1 - Cumm Pct Long Resp Within Limit 1
 XDWMY.E  TSOPCLR2 - Cumm Pct Long Resp Within Limit 2
 XDWMY.E  TSOPCLR3 - Cumm Pct Long Resp Within Limit 3
 XDWMY.E  TSOPCLR4 - Cumm Pct Long Resp Within Limit 4
 XDWMY.E  TSOPCLR5 - Cumm Pct Long Resp Within Limit 5
 XDWMY.E  TSOPCLR6 - Cumm Pct Long Resp Within Limit 6
 XDWMY.E  TSOPCLR7 - Cumm Pct Long Resp Within Limit 7
 XDWMY.E  TSOPCMR1 - Cumm Pct Medium Resp Within Limit 1
```

```
XDWMY.E  TSOPCMR2 - Cumm Pct Medium Resp Within Limit 2
XDWMY.E  TSOPCMR3 - Cumm Pct Medium Resp Within Limit 3
XDWMY.E  TSOPCMR4 - Cumm Pct Medium Resp Within Limit 4
XDWMY.E  TSOPCMR5 - Cumm Pct Medium Resp Within Limit 5
XDWMY.E  TSOPCMR6 - Cumm Pct Medium Resp Within Limit 6
XDWMY.E  TSOPCMR7 - Cumm Pct Medium Resp Within Limit 7
XDWMY.E  TSOPCSR1 - Cumm Pct Short Resp Within Limit 1
XDWMY.E  TSOPCSR2 - Cumm Pct Short Resp Within Limit 2
XDWMY.E  TSOPCSR3 - Cumm Pct Short Resp Within Limit 3
XDWMY.E  TSOPCSR4 - Cumm Pct Short Resp Within Limit 4
XDWMY.E  TSOPCSR5 - Cumm Pct Short Resp Within Limit 5
XDWMY.E  TSOPCSR6 - Cumm Pct Short Resp Within Limit 6
XDWMY.E  TSOPCSR7 - Cumm Pct Short Resp Within Limit 7
XDWMY.E  TSOPCTR1 - Cumm Pct All Resp Within Limit 1
XDWMY.E  TSOPCTR2 - Cumm Pct All Resp Within Limit 2
XDWMY.E  TSOPCTR3 - Cumm Pct All Resp Within Limit 3
XDWMY.E  TSOPCTR4 - Cumm Pct All Resp Within Limit 4
XDWMY.E  TSOPCTR5 - Cumm Pct All Resp Within Limit 5
XDWMY.E  TSOPCTR6 - Cumm Pct All Resp Within Limit 6
XDWMY.E  TSOPCTR7 - Cumm Pct All Resp Within Limit 7
```

5.2.1.3 Usage Considerations

This section identifies any special considerations or techniques related to using the TSOTSO file. Additionally, retrieval examples are provided to help you use this file.

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

Special Considerations/Techniques

1. The following data elements only have meaning when using the TSOTSOnn file in the DETAIL time-span. They lose significance once summarization has been performed. These data elements should only be referenced when using the TSOTSOnn file in the DETAIL time-span.

   TSOSOPTS - TSO/MON Options Flag1
   TSOSOPT2 - TSO/MON Options Flag2
   TSOIPSS - IPS Suffix When SU Algorithm in Use
   TSOIFLAG - IPS Flag Field
   TSOIPG1 : TSOIPG10 - Performance Group Numbers
   TSOISS1 : TSOISS10 - Short Service Thresholds
   TSOISM1 : TSOISM10 - Medium Service Thresholds
   TSOIPF1 : TSOIPF10 - Performance Group Flags

2. The following data elements are allowed for in this record but are reserved at this time.

   TSOPETTM - Pseudo Elapsed Time
   TSOSRU - System Resource Units
   TSOCOST - Processing Charges

3. The following data elements are user-defined option dependent, and should be used within the frame of reference of the option's definition.

   CA MICS PARMS SYSID
       CPUMODEL - CPU Model Identification
       TSOCPUNI - Instructions Executed

```
    TSO/MON Options
        TSMRVAL1:TSMRVAL8 - Response Distribution Limits
        TSMERESP - Excessive Response Time Threshold

4.  The ENDTS and STARTTS, when appearing in the
    DAYS, WEEKS, MONTHS, or YEARS time-spans, bound the
    span of time over which the data has been summarized.
    STARTTS is the lowest date and time, and ENDTS is the
    highest date and time for the data summarized.  The
    data elements STARTTS and ENDTS have different
    meanings when used in the DETAIL time-span versus
    their role in the DAYS, WEEKS, MONTHS, and YEARS
    time-spans.  Their purpose in the DETAIL time-span is
    described below:

      o  STARTTS represents TSO/MON recording interval
         start time.
      o  ENDTS represents TSO/MON recording interval end
         time.

Retrieval Examples

1.  Print yesterday's average short response by hour:

    DATA;
    SET &PTSOD..TSOTSO01;
    PROC PRINT; VAR SYSID HOUR TSOAVSTM;

2.  Print the average total response time for zone 1 for
    the last six months:

    DATA;
    SET &PTSOM..TSOTSO01 &PTSOM..TSOTSO02
        &PTSOM..TSOTSO03 &PTSOM..TSOTSO04
        &PTSOM..TSOTSO05 &PTSOM..TSOTSO06;
    IF ZONE='1';
    PROC PRINT; VAR SYSID YEAR MONTH TSOAVTTM;

3.  Retrieve the detail minimum TIOC buffer count and
    display for each TSO/MON recording interval for the
    hours of 8-10 a.m.  yesterday:

    DATA;
    SET &PTSOX..TSOTSO01;
    IF HOUR=8 OR HOUR=9;
    PROC PRINT; VAR SYSID ENDTS TSOMTIOC;
```

5.2.2 TSO User Activity File (TSOTSU)

The TSO User Activity File contains data that quantifies the total activity of a TSO userid's TSO system service (response), load, and access for defined intervals of time. Resource consumption, service (total, short, medium, and long response), terminal access, and performance measures are provided. This file is derived from the TSO/MON System Record, UCB segments.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.2.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity				
DETAIL	SYSID	USER	YEAR	MONTH	DAY
	HOUR	ENDTS			
DAYS	SYSID	USER	YEAR	MONTH	DAY
	HOUR				
WEEKS	N/A				
MONTHS	SYSID	USER	YEAR	MONTH	ZONE
YEARS	SYSID	USER	YEAR	ZONE	
TABLES	N/A				

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-3. TSOTSU Time-Span Granularity Chart

5.2.2.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

XD....E	DAY	- Day of Month
XD.M..E	MONTH	- Month of Year
XD.MY.E	SYSID	- System Identifier
XD.MY.E	USER	- User Identification

```
 XD....E  WEEK     - Week of Year
 XD.MY.E  YEAR     - Year of Century
 XD.MY.E  ZONE     - Time Zone

Common Data Elements

 XD.MY.E  ASID     - Address Space Identification
 XD....E  DAYNAME  - Name of Day of Week
 X.....E  DEVCLASS - Device Class
 X.....E  DEVTYPE  - Device Type
 XD.MY.E  ENDTS    - End Time Stamp
 XD....E  HOUR     - Hour of Day
 XD.MY.E  INTERVLS - Number of Recording Intervals
 XD....E  JESJOBNO - JES Job Number
 X.....E  LINETYPE - VTAM/TCAM Line Type Identification
 XD....E  LOGPROC  - Logon Procedure Name
 XD.MY.E  LOGTS    - Logon Time-stamp
 XD.MY.E  MICSVER  - CA MICS Version Number
 XD.MY.E  PERFGRP  - Performance Group Number
 XD.MY.E  STARTTS  - Start Time Stamp
 X.....E  TERMID   - TSO Terminal ID
 XD.MY.E  TSMERESP - Excessive Response Time Threshold
 XD.MY.E  TSMNODST - Number Of Distribution Values
 XD.MY.E  TSMONVER - TSO/MON Version Number
 XD.MY.E  TSMRVAL1 - Response Distribution Limits 1
 XD.MY.E  TSMRVAL2 - Response Distribution Limits 2
 XD.MY.E  TSMRVAL3 - Response Distribution Limits 3
 XD.MY.E  TSMRVAL4 - Response Distribution Limits 4
 XD.MY.E  TSMRVAL5 - Response Distribution Limits 5
 XD.MY.E  TSMRVAL6 - Response Distribution Limits 6
 XD.MY.E  TSMRVAL7 - Response Distribution Limits 7
 XD.MY.E  TSMRVAL8 - Response Distribution Limits 8
 XD.MY.E  WLMCLASS - Service Class Name
 XD.MY.E  WLMGMCT  - Intvls when in WLM Goal Mode
 XD.MY.E  WLMMDXCT - Intvls where changed to Goal Mode
 X.....E  WLMMODE  - Workload Manager Mode

Retained Data Elements

 X.....   TSUSOPTS - Response Option Flags

Accumulated Data Elements

 XD.MY.   TSUCLIST - TSO CLIST Count
 XD.MY.E  TSUCONTM - Terminal Connect Time
 XD.MY.E  TSUCOST  - Processing Charges
 XD.MY.E  TSUCPUNI - Instructions Executed
 XD.MY.E  TSUCPUTM - CPU Time Consumed
 XD.MY.E  TSUDEVTM - Interval Device Connect Time
```

```
XD.MY.   TSUERESC - Excessive Response Event Count
XD.MY.   TSUERSTM - Excessive Response Time Total
XD.MY.E  TSUEXCPS - I/O (EXCPs) Generated
XD.MY.E  TSUGETCH - TGET Character Traffic
XD.MY.E  TSUITKTM - Interval Think Time
XD.MY.E  TSULCOM  - Long Commands Processed
XD.MY.E  TSULDST1 - Count Long Responses Within Limit 1
XD.MY.E  TSULDST2 - Count Long Responses Within Limit 2
XD.MY.E  TSULDST3 - Count Long Responses Within Limit 3
XD.MY.E  TSULDST4 - Count Long Responses Within Limit 4
XD.MY.E  TSULDST5 - Count Long Responses Within Limit 5
XD.MY.E  TSULDST6 - Count Long Responses Within Limit 6
XD.MY.E  TSULDST7 - Count Long Responses Within Limit 7
XD.MY.E  TSULDST8 - Count Long Responses Within Limit 8
XD.MY.E  TSULGDUR - Logon Duration
XD.MY.E  TSULRESC - Long Response Event Count
XD.MY.E  TSULRSTM - Long Response Time Total
XD.MY.E  TSUMCOM  - Medium Commands Processed
XD.MY.E  TSUMDST1 - Count Medium Responses Within Limit 1
XD.MY.E  TSUMDST2 - Count Medium Responses Within Limit 2
XD.MY.E  TSUMDST3 - Count Medium Responses Within Limit 3
XD.MY.E  TSUMDST4 - Count Medium Responses Within Limit 4
XD.MY.E  TSUMDST5 - Count Medium Responses Within Limit 5
XD.MY.E  TSUMDST6 - Count Medium Responses Within Limit 6
XD.MY.E  TSUMDST7 - Count Medium Responses Within Limit 7
XD.MY.E  TSUMDST8 - Count Medium Responses Within Limit 8
XD.MY.E  TSUMRESC - Medium Response Event Count
XD.MY.E  TSUMRSTM - Medium Response Time Total
XD.MY.   TSUMTHCT - Over Max Think Count
XD.MY.   TSUMTHTM - Over Max Think Time Total
XD.MY.E  TSUNOLOG - User Logons
XD.MY.   TSUPANLC - SPF DM Panel Count
XD.MY.   TSUPETTM - Pseudo Elapsed Time
XD.MY.E  TSUPGCMI - Common Page-Ins
XD.MY.E  TSUPGHSI - Hiperspace Page-Ins
XD.MY.E  TSUPGHSO - Hiperspace Page-Outs
XD.MY.E  TSUPGIN  - Page-In Count
XD.MY.E  TSUPGLPA - LPA Page-Ins
XD.MY.E  TSUPGOUT - Page-Out Count
XD.MY.E  TSUPGSTL - Page Steals
XD.MY.E  TSUPGSWI - Swap Page-Ins
XD.MY.E  TSUPGSWO - Swap Page-Outs
XD.MY.E  TSUPGVI  - VIO Page-Ins
XD.MY.E  TSUPGVO  - VIO Page-Outs
XD.MY.E  TSUPUTCH - TPUT Character Traffic
XD.MY.E  TSURESTM - Transaction Residency Time
XD.MY.E  TSUSCOM  - Short Commands Processed
XD.MY.   TSUSCTBK - Responses Dropped Due To S/M Ctl Intvl
XD.MY.E  TSUSDST1 - Count Short Responses Within Limit 1
```

```
XD.MY.E  TSUSDST2 - Count Short Responses Within Limit 2
XD.MY.E  TSUSDST3 - Count Short Responses Within Limit 3
XD.MY.E  TSUSDST4 - Count Short Responses Within Limit 4
XD.MY.E  TSUSDST5 - Count Short Responses Within Limit 5
XD.MY.E  TSUSDST6 - Count Short Responses Within Limit 6
XD.MY.E  TSUSDST7 - Count Short Responses Within Limit 7
XD.MY.E  TSUSDST8 - Count Short Responses Within Limit 8
XD.MY.E  TSUSERCU - CPU Service Units
XD.MY.E  TSUSERIU - IOC Service Units
XD.MY.E  TSUSERLE - Long Event Service Units
XD.MY.E  TSUSERME - Medium Event Service Units
XD.MY.E  TSUSERMU - MSO Service Units
XD.MY.E  TSUSERSE - Short Event Service Units
XD.MY.E  TSUSERSU - SRB Service Units
XD.MY.E  TSUSERVU - Service Units
XD.MY.E  TSUSICNT - Swap-in Count
XD.MY.E  TSUSIDCT - Swap-in Delay Count
XD.MY.E  TSUSIDTM - Swap-in Delay Time
XD.MY.E  TSUSINTM - Swap-in Time
XD.MY.E  TSUSNDCT - Sampled Network Delay Event Count
XD.MY.E  TSUSNDTM - Sample Network Delay Time Total
XD.MY.E  TSUSRBTM - SRB CPU Time
XD.MY.E  TSUSRESC - Short Response Event Count
XD.MY.E  TSUSRSTM - Short Response Time Total
XD.MY.   TSUSRU   - System Resource Units
XD.MY.E  TSUSWAPS - Physical Swap-Out Count
XD.MY.E  TSUSWPLI - Logical Swap-In Count
XD.MY.E  TSUSWPLO - Logical Swap-Out Count
XD.MY.E  TSUSWPPI - Physical Swap-In Count
XD.MY.E  TSUSWPSI - Total Swapped-In Bytes (1K Blocks)
XD.MY.E  TSUSWPSZ - Total Swapped-Out Bytes (1K Blocks)
XD.MY.E  TSUSWPTM - Total Logical Swap Time
XD.MY.E  TSUTCBTM - TCB CPU Time
XD.MY.E  TSUTCOM  - Total Commands Processed
XD.MY.E  TSUTDST1 - Count Total Responses Within Limit 1
XD.MY.E  TSUTDST2 - Count Total Responses Within Limit 2
XD.MY.E  TSUTDST3 - Count Total Responses Within Limit 3
XD.MY.E  TSUTDST4 - Count Total Responses Within Limit 4
XD.MY.E  TSUTDST5 - Count Total Responses Within Limit 5
XD.MY.E  TSUTDST6 - Count Total Responses Within Limit 6
XD.MY.E  TSUTDST7 - Count Total Responses Within Limit 7
XD.MY.E  TSUTDST8 - Count Total Responses Within Limit 8
XD.MY.E  TSUTGETS - TGETs Issued
XD.MY.   TSUTHCNT - Think Event Count
XD.MY.E  TSUTHKTM - Think Time Total
XD.MY.E  TSUTPUTS - TPUTS Issued
XD.MY.E  TSUTRANS - SRM Ended Transactions
XD.MY.E  TSUTRESC - Total Response Event Count
XD.MY.E  TSUTRSTM - Total Response Time All Functions
```

```
Minimum Data Elements

 XD.MY.   TSUSSHCT - Shortest Session Manager Ctl Intvl

Maximum Data Elements

 XD.MY.   TSUMXETM - Max Excessive Response Time
 XD.MY.E  TSUMXFRM - Max Fixed Frames
 XD.MY.   TSUMXKTM - Max User Think Time
 XD.MY.   TSUMXLTM - Max Long Response Time
 XD.MY.   TSUMXMTM - Max Medium Response Time
 XD.MY.   TSUMXSTM - Max Short Response Time
 XD.MY.E  TSUMXSWI - Max Swapped-In Bytes (1K Blocks)
 XD.MY.   TSUMXTTM - Max Response Time All Functions
 XD....   TSUMXUIC - Max Unreferenced Interval Count
 XD.MY.E  TSUMXWTM - Max Logical Swap Time
 XD.MY.E  TSUSWPHI - Max Swapped-Out Bytes (1K Blocks)

Derived Data Elements

 ...MY.E  TSUAVCTM - Avg TSO Session Length
 XD.MY.   TSUAVETM - Avg Excessive Response Time
 XD.MY.   TSUAVKTM - Avg User Think Time
 XD.MY.E  TSUAVLTM - Avg Long Response Time
 XD.MY.E  TSUAVMTM - Avg Medium Response Time
 XD.MY.E  TSUAVSTM - Avg Short Response Time
 XD.MY.E  TSUAVTTM - Avg Response Time All Functions
 XD.MY.E  TSUPCLR1 - Cumm Pct Long Resp Within Limit 1
 XD.MY.E  TSUPCLR2 - Cumm Pct Long Resp Within Limit 2
 XD.MY.E  TSUPCLR3 - Cumm Pct Long Resp Within Limit 3
 XD.MY.E  TSUPCLR4 - Cumm Pct Long Resp Within Limit 4
 XD.MY.E  TSUPCLR5 - Cumm Pct Long Resp Within Limit 5
 XD.MY.E  TSUPCLR6 - Cumm Pct Long Resp Within Limit 6
 XD.MY.E  TSUPCLR7 - Cumm Pct Long Resp Within Limit 7
 XD.MY.E  TSUPCMR1 - Cumm Pct Medium Resp Within Limit 1
 XD.MY.E  TSUPCMR2 - Cumm Pct Medium Resp Within Limit 2
 XD.MY.E  TSUPCMR3 - Cumm Pct Medium Resp Within Limit 3
 XD.MY.E  TSUPCMR4 - Cumm Pct Medium Resp Within Limit 4
 XD.MY.E  TSUPCMR5 - Cumm Pct Medium Resp Within Limit 5
 XD.MY.E  TSUPCMR6 - Cumm Pct Medium Resp Within Limit 6
 XD.MY.E  TSUPCMR7 - Cumm Pct Medium Resp Within Limit 7
 XD.MY.E  TSUPCSR1 - Cumm Pct Short Resp Within Limit 1
 XD.MY.E  TSUPCSR2 - Cumm Pct Short Resp Within Limit 2
 XD.MY.E  TSUPCSR3 - Cumm Pct Short Resp Within Limit 3
 XD.MY.E  TSUPCSR4 - Cumm Pct Short Resp Within Limit 4
 XD.MY.E  TSUPCSR5 - Cumm Pct Short Resp Within Limit 5
 XD.MY.E  TSUPCSR6 - Cumm Pct Short Resp Within Limit 6
 XD.MY.E  TSUPCSR7 - Cumm Pct Short Resp Within Limit 7
```

```
XD.MY.E  TSUPCTR1 - Cumm Pct Total Resp Within Limit 1
XD.MY.E  TSUPCTR2 - Cumm Pct Total Resp Within Limit 2
XD.MY.E  TSUPCTR3 - Cumm Pct Total Resp Within Limit 3
XD.MY.E  TSUPCTR4 - Cumm Pct Total Resp Within Limit 4
XD.MY.E  TSUPCTR5 - Cumm Pct Total Resp Within Limit 5
XD.MY.E  TSUPCTR6 - Cumm Pct Total Resp Within Limit 6
XD.MY.E  TSUPCTR7 - Cumm Pct Total Resp Within Limit 7
```

5.2.2.3 Usage Considerations

```
This section identifies any special considerations or
techniques related to using the TSOTSU file.  Additionally,
retrieval examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

Before using the TSO batch files for accounting or capacity
planning, carefully consider these impacts:

o Data duplication can occur because resource utilization
  information for batch TSO jobs appears in both the CA MICS
  TSO Analyzer batch files and the Batch Information Area
  files of the CA MICS MVS Batch and Operations Analyzer.

  Please contact CA MICS Product Support before using the TSO
  batch files for these purposes.

o Accounting Considerations

  If both the TSO batch files and the MVS Batch and
  Operations Analyzer files are used for accounting, the
  redundant resource utilization data will result in
  duplicate accounting charges unless you account for
  different resource items from each information area.

  For example, if you account for command count from the TSO
  batch files and CPU time from the MVS Batch and Operations
  Analyzer files, you will not incur duplicate charges.

  If you charge for the same resource item (such as CPU time)
  in both information areas, you end up with duplicate
  charges to the same user.

o Capacity Planning Considerations

  If both the TSO Analyzer's batch files and the MVS Batch
  and Operations Analyzer's Batch Information Area files are
  used for capacity planning purposes, the duplication of
  resource data can skew workload utilization information.

  Consequently, do not use the TSO Analyzer's batch files for
  capacity planning purposes.

  Please note that this recommendation applies only to the
  batch files of the CA MICS TSO Analyzer and not to the
  online-oriented files.
```

1. To populate account code data elements (TSOACTn),
   a. code the TSOACCT and TSOACRT parameters as described in sections 7.2.1 and 7.2.2 of this guide.
   b. change the COMP statement in TSOGENIN as described in section 7.2.3 of this guide.

2. The following data elements only have meaning when using the TSOTSUnn file in the DETAIL time-span. They lose significance once summarization has been performed. These data elements should only be referenced when using the TSOTSUnn file in the DETAIL time-span.

   PERFGRP - Performance Group Number
   ASID - Address Space Identification
   LOGTS - LOGON Time-stamp
   TSUSOPTS - Response Option Flags

3. The data element TSUCOST (Processing Charges) obtains its value from code you write in the user exit _USRSTSU.

4. The following data elements are user-defined or option-dependent. They should be used within the frame of reference of the option's definition.

   sharedprefix.MICS.PARMS(SYSID)
       CPUMODEL - CPU Model Identification
       TSUCPUNI - Instructions Executed
   TSO/MON Options
       TSMRVAL1:TSMRVAL8 - Response Distribution Limits
       TSMERESP - Excessive Response Time Threshold

5. To activate the VTAM/TCAM data elements, change the NAME statements in TSOGENIN from:

   ```
   NAME DEVTYPE      99  N N N N N .
   NAME TERMID       99  N N N N N .
   NAME LINETYPE     99  N N N N N .
   ```

   to:

   ```
   NAME DEVTYPE      99  0 N N N N .
   NAME TERMID       99  0 N N N N .
   NAME LINETYPE     99  0 N N N N .
   ```

6. STARTTS and ENDTS in the DAYS, MONTHS, or YEARS time-spans bound the span of time over which the data has

```
    been summarized.  STARTTS is the lowest date and time,
    and ENDTS is the highest date and time, for the data
    summarized.

    In the DETAIL time-span, STARTTS represents TSO/MON
    recording interval start time and ENDTS represents
    TSO/MON recording interval end time.

Retrieval Examples
------------------


In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
dependent, so you should find out what the identifiers are at
your installation.

1.  Print yesterday's average short response by hour for
    user CPM0001:

    DATA;
    SET &PTSOD..TSOTSU01;
    IF USER='CPM0001';
    PROC PRINT; VAR SYSID HOUR TSOAVSTM;

2.  Print the average total response time by zone for the
    departments CPM, REG, and OIL, over the last six
    months:

    DATA;
    SET &PTSOM..TSOTSU01 &PTSOM..TSOTSU02
        &PTSOM..TSOTSU03 &PTSOM..TSOTSU04
        &PTSOM..TSOTSU05 &PTSOM..TSOTSU06;
    IF USER=:'CPM' OR USER=:'REG' OR USER=:'OIL';
    USER=SUBSTR(USER,1,3);
    LENGTH KEYID $7.;
    KEYID=PUT(YEAR,2.) '/' PUT(MONTH,2.) '-'
          ZONE;
    PROC FREQ; TABLES KEYID*USER / WEIGHT TSUAVTTM;

3.  Total the service units used by department REG for
    last month by system (SYSID):

    %LET BY = SYSID YEAR MONTH;
```

```
%LET BREAK = MONTH;
DATA FILE1;
SET &PTSOM..TSOTSU01;
IF USER=:'REG';
DATA FILE1;
SET FILE1;
%TSUSUM;
PROC PRINT; VAR SYSID YEAR MONTH USER TSUSERVU;
```

4. Total the service units used by department REG for last month on all systems:

```
%LET BY = YEAR MONTH;
%LET BREAK = MONTH;
DATA FILE1;
SET &PTSOM..TSOTSU01;
IF USER=:'REG';
PROC SORT DATA=FILE1; BY &BY;
DATA FILE1;
SET FILE1;
%TSUSUM;
PROC PRINT; VAR YEAR MONTH USER TSUSERVU;
```

5.2.3 TSO User Command Counts File (TSOTSC)

The TSO User Command Counts File contains data that quantifies an individual TSO userid's command usage by identifying the commands used and their frequency of use for defined intervals of time. This file is derived from the TSO/MON System Record, UCB and CCB segments.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.3.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each time-span. "N/A" indicates that the file is not supported in a time-span.

NOTE: The time-spans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity				
DETAIL	SYSID	USER	COMTYPE	COMPRIM	COMMAND
	YEAR	MONTH	DAY	HOUR	ENDTS
DAYS	N/A				
WEEKS	N/A				
MONTHS	SYSID	USER	COMTYPE	COMPRIM	COMMAND
	YEAR	MONTH			
YEARS	N/A				
TABLES	N/A				

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-4. TSOTSC Time-span Granularity Chart

5.2.3.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

X..M..E	COMMAND	- Command Name
X..M..E	COMPRIM	- Primary Command Category
X..M..E	COMTYPE	- Command Type
X.....E	DAY	- Day of Month
X.....E	HOUR	- Hour of Day

```
 X..M..E  MONTH    - Month of Year
 X..M..E  SYSID    - System Identifier
 X..M..E  USER     - User Identification
 X.....E  WEEK     - Week of Year
 X..M..E  YEAR     - Year of Century
 X.....E  ZONE     - Time Zone

Common Data Elements

 X..M..E  CLUSTER  - Workload Classification Number
 X..M..E  COMABB   - Command Abbreviation
 X.....E  DAYNAME  - Name of Day of Week
 X..M..E  ENDTS    - End Time Stamp
 X..M..E  INTERVLS - Number of Recording Intervals
 X..M..E  MICSVER  - CA MICS Version Number
 X..M..E  STARTTS  - Start Time Stamp
 X..M..E  TSMONVER - TSO/MON Version Number
 X..M..E  TSOAPU   - TSO Application Unit ID

Accumulated Data Elements

 X..M..E  TSCCOST  - Processing Charges
 X..M..E  TSCCOUNT - Times Used
```

5.2.3.3 Usage Considerations

```
This section identifies any special considerations or
techniques related to using the TSOTSC file.  Additionally,
retrieval examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

1.  To populate account code data elements (TSOACTn),
    a. code the TSOACCT and TSOACRT parameters as described
       in sections 7.2.1 and 7.2.2 of this guide.
    b. change the COMP statement in TSOGENIN as described in
       section 7.2.3 of this guide.

2.  The data element TSCCOST (Processing Charges) obtains its
    value from code you write in the user exit _USRSTSC.

3.  STARTTS and ENDTS in the MONTHS time-span bounds the span
    of time over which the data has been summarized.  STARTTS
    is the lowest date and time, and ENDTS is the highest
    date and time, for the data summarized.

    In the DETAIL time-span, STARTTS represents TSO/MON
    recording interval start time and ENDTS represents
    TSO/MON recording interval end time.

4.  The data element COMPRIM identifies the type of the
    command (primary, TSO EDIT subcommand, etc.) based on
    the order in which the TSO/MON Commands Table has been
    defined.

5.  The data element COMMAND contains a value of '*UNKNOWN'
    if the command's abbreviation, COMABB, did not have a
    corresponding match in the TSO/MON Commands Table.

Retrieval Examples
------------------


In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
dependent, so you should find out what the identifiers are at
your installation.
```

1. Print the users who used the TSO EDIT command yesterday:

```
DATA;
SET &PTSOX..TSOTSC01;
IF COMMAND='EDIT';
PROC PRINT; VAR SYSID USER ENDTS TSCCOUNT;
```

2. Display what commands user COM001 used for the last two months and group them by command type (e.g., SPF, TSO, primary, etc.):

```
DATA FILE1;
SET &PTSOM..TSOTSC01 &PTSOM..TSOTSC02;
IF USER='COM001';
PROC SORT DATA=FILE1; BY COMPRIM COMMAND;
PROC FREQ; TABLES COMMAND; BY COMPRIM;
```

3. Total the number of commands which are being executed and are not defined in the TSO/MON Commands Table:

```
DATA FILE1;
SET &PTSOM..TSOTSC01 END=EOF;
IF COMMAND='*UNKNOWN';
COUNTX+TSCCOUNT;
IF EOF THEN PUT COUNTX=;
```

5.2.4 TSO User Interactive Usage File (TSOTSI)

The TSO User Interactive Usage File contains data that quantifies an individual TSO userid's service (response), load, and usage for interactive commands (e.g., CALL STARTREK) that, by installation definition, cause a TSO/MON Command Record to be recorded when the commands are executed. This file is derived from the TSO/MON Command Record.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.4.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	SYSID USER COMMAND PROGRAM TSISEQNO ENDTS
DAYS	N/A
WEEKS	N/A
MONTHS	SYSID USER COMMAND PROGRAM YEAR MONTH
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-5. TSOTSI Time-Span Granularity Chart

5.2.4.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

X..M..E	COMMAND	- Command Name
X.....E	DAY	- Day of Month
X.....E	HOUR	- Hour of Day
X..M..E	MONTH	- Month of Year
X..M..E	PROGRAM	- Program Name

```
 X..M..E  SYSID    - System Identifier
 X.....E  TSISEQNO - Command Record Sequence Number
 X..M..E  USER     - User Identification
 X.....E  WEEK     - Week of Year
 X..M..E  YEAR     - Year of Century
 X.....E  ZONE     - Time Zone

Common Data Elements

 X..M..E  ASID     - Address Space Identification
 X..M..E  CLUSTER  - Workload Classification Number
 X..M..E  COMABB   - Command Abbreviation
 X..M..E  COMPRIM  - Primary Command Category
 X..M..E  COMTYPE  - Command Type
 X.....E  DAYNAME  - Name of Day of Week
 X.....E  DEVCLASS - Device Class
 X.....E  DEVTYPE  - Device Type
 X..M..E  ENDTS    - End Time Stamp
 X.....E  JESJOBNO - JES Job Number
 X.....E  LINETYPE - VTAM/TCAM Line Type Identification
 X.....E  LOGPROC  - Logon Procedure Name
 X..M..E  LOGTS    - Logon Time-stamp
 X..M..E  MICSVER  - CA MICS Version Number
 X..M..E  PERFGRP  - Performance Group Number
 X..M..E  STARTTS  - Start Time Stamp
 X.....E  TERMID   - TSO Terminal ID
 X..M..E  TSMERESP - Excessive Response Time Threshold
 X..M..E  TSMNODST - Number Of Distribution Values
 X..M..E  TSMONVER - TSO/MON Version Number
 X..M..E  TSMRVAL1 - Response Distribution Limits 1
 X..M..E  TSMRVAL2 - Response Distribution Limits 2
 X..M..E  TSMRVAL3 - Response Distribution Limits 3
 X..M..E  TSMRVAL4 - Response Distribution Limits 4
 X..M..E  TSMRVAL5 - Response Distribution Limits 5
 X..M..E  TSMRVAL6 - Response Distribution Limits 6
 X..M..E  TSMRVAL7 - Response Distribution Limits 7
 X..M..E  TSMRVAL8 - Response Distribution Limits 8
 X..M..E  TSOAPU   - TSO Application Unit ID
 X..M..E  WLMCLASS - Service Class Name
 X..M..E  WLMGMCT  - Intvls when in WLM Goal Mode
 X..M..E  WLMMDXCT - Intvls where changed to Goal Mode
 X.....E  WLMMODE  - Workload Manager Mode

Retained Data Elements

 X.....   TSIBUF   - Command Buffer Area
 X.....   TSIBUFL  - Command Buffer Area Content Length
 X.....   TSIPTYPE - SPF Function Type
 X.....   TSIRCTYP - Command Activity Record Type
```

```
 X.....   TSISOPTS - Response Options

Accumulated Data Elements

 X..M..E  TSICOST  - Processing Charges
 X..M..   TSICPUNI - Instructions Executed
 X..M..E  TSICPUTM - CPU Time Consumed
 X..M..E  TSIDEVTM - Interval Device Connect Time
 X..M..E  TSIELPTM - Execution Elapsed Time
 X..M..   TSIERESC - Excessive Response Event Count
 X..M..   TSIERSTM - Excessive Response Time Total
 X..M..E  TSIEXCPS - I/O (EXCPs) Generated
 X..M..E  TSIGETCH - TGET Character Traffic
 X..M..E  TSILDST1 - Count Long Responses Within Limit 1
 X..M..E  TSILDST2 - Count Long Responses Within Limit 2
 X..M..E  TSILDST3 - Count Long Responses Within Limit 3
 X..M..E  TSILDST4 - Count Long Responses Within Limit 4
 X..M..E  TSILDST5 - Count Long Responses Within Limit 5
 X..M..E  TSILDST6 - Count Long Responses Within Limit 6
 X..M..E  TSILDST7 - Count Long Responses Within Limit 7
 X..M..E  TSILDST8 - Count Long Responses Within Limit 8
 X..M..E  TSILRESC - Long Response Event Count
 X..M..E  TSILRSTM - Long Response Time Total
 X..M..E  TSIMDST1 - Count Medium Responses Within Limit 1
 X..M..E  TSIMDST2 - Count Medium Responses Within Limit 2
 X..M..E  TSIMDST3 - Count Medium Responses Within Limit 3
 X..M..E  TSIMDST4 - Count Medium Responses Within Limit 4
 X..M..E  TSIMDST5 - Count Medium Responses Within Limit 5
 X..M..E  TSIMDST6 - Count Medium Responses Within Limit 6
 X..M..E  TSIMDST7 - Count Medium Responses Within Limit 7
 X..M..E  TSIMDST8 - Count Medium Responses Within Limit 8
 X..M..E  TSIMRESC - Medium Response Event Count
 X..M..E  TSIMRSTM - Medium Response Time Total
 X..M..E  TSINOEXS - Number Executions
 X..M..E  TSIPANLC - SPF DM Panel Count
 X..M..   TSIPETTM - Pseudo Elapsed Time
 X..M..E  TSIPGCMI - Common Page-Ins
 X..M..E  TSIPGHSI - Hiperspace Page-Ins
 X..M..E  TSIPGHSO - Hiperspace Page-Outs
 X..M..E  TSIPGIN  - Page-In Count
 X..M..E  TSIPGLPA - LPA Page-Ins
 X..M..E  TSIPGOUT - Page-Out Count
 X..M..E  TSIPGSTL - Page Steals
 X..M..E  TSIPGSWI - Swap Page-Ins
 X..M..E  TSIPGSWO - Swap Page-Outs
 X..M..E  TSIPGVI  - VIO Page-Ins
 X..M..E  TSIPGVO  - VIO Page-Outs
 X..M..E  TSIPUTCH - TPUT Character Traffic
 X..M..E  TSIRESTM - Transaction Residency Time
```

```
X..M..E  TSISDST1 - Count Short Responses Within Limit 1
X..M..E  TSISDST2 - Count Short Responses Within Limit 2
X..M..E  TSISDST3 - Count Short Responses Within Limit 3
X..M..E  TSISDST4 - Count Short Responses Within Limit 4
X..M..E  TSISDST5 - Count Short Responses Within Limit 5
X..M..E  TSISDST6 - Count Short Responses Within Limit 6
X..M..E  TSISDST7 - Count Short Responses Within Limit 7
X..M..E  TSISDST8 - Count Short Responses Within Limit 8
X..M..E  TSISERCU - CPU Service Units
X..M..E  TSISERIU - IOC Service Units
X..M..E  TSISERLE - Long Event Service Units
X..M..E  TSISERME - Medium Event Service Units
X..M..E  TSISERMU - MSO Service Units
X..M..E  TSISERSE - Short Event Service Units
X..M..E  TSISERSU - SRB Service Units
X..M..E  TSISERVU - Service Units
X.....E  TSISICNT - Swap-In Time Event Count
X..M..E  TSISIDCT - Swap-in Delay Count
X.....E  TSISIDTM - Swap-In Delay Time Total
X.....E  TSISINTM - Swap-In Time Total
X..M..E  TSISNDCT - Sampled Network Delay Event Count
X..M..E  TSISNDTM - Sample Network Delay Time Total
X..M..E  TSISRBTM - SRB CPU Time
X..M..E  TSISRESC - Short Response Event Count
X..M..E  TSISRSTM - Short Response Time Total
X..M..   TSISRU   - System Resource Units
X..M..E  TSISWAPS - Physical Swap-Out Count
X..M..E  TSISWPLI - Logical Swap-In Count
X..M..E  TSISWPLO - Logical Swap-Out Count
X..M..E  TSISWPPI - Physical Swap-In Count
X..M..E  TSISWPSI - Total Swapped-In Bytes (1K Blocks)
X..M..E  TSISWPSZ - Total Swapped-Out Bytes (1K Blocks)
X..M..E  TSITCBTM - TCB CPU Time
X..M..E  TSITDST1 - Count Total Responses Within Limit 1
X..M..E  TSITDST2 - Count Total Responses Within Limit 2
X..M..E  TSITDST3 - Count Total Responses Within Limit 3
X..M..E  TSITDST4 - Count Total Responses Within Limit 4
X..M..E  TSITDST5 - Count Total Responses Within Limit 5
X..M..E  TSITDST6 - Count Total Responses Within Limit 6
X..M..E  TSITDST7 - Count Total Responses Within Limit 7
X..M..E  TSITDST8 - Count Total Responses Within Limit 8
X..M..E  TSITGETS - TGETs Issued
X..M..E  TSITPUTS - TPUTs Issued
X..M..E  TSITRANS - SRM Ended Transactions
X..M..E  TSITRESC - Total Response Event Count
X..M..E  TSITRSTM - Total Response Time Total

Maximum Data Elements
```

```
 X..M..   TSIMXELP - Max Elapsed Time
 X..M..   TSIMXETM - Max Excessive Response Time
 X..M..E  TSIMXFRM - Max Fixed Frames
 X..M..   TSIMXLTM - Max Long Response Time
 X..M..   TSIMXMTM - Max Medium Response Time
 X..M..   TSIMXSTM - Max Short Response Time
 X..M..E  TSIMXSWI - Max Swapped-In Bytes (1K Blocks)
 X..M..   TSIMXTTM - Max Response Time All Functions
 X.....   TSIMXUIC - Max Unreferenced Interval Count
 X..M..E  TSISWPHI - Max Swapped-Out Bytes (1K Blocks)
 X.....E  TSIXDOM  - Cross Domain Environment During Command

Derived Data Elements

 X..M..   TSIAVELP - Avg Elapsed Time
 X..M..   TSIAVETM - Avg Excessive Response Time
 X..M..E  TSIAVLTM - Avg Long Response Time
 X..M..E  TSIAVMTM - Avg Medium Response Time
 X..M..E  TSIAVSTM - Avg Short Response Time
 X..M..E  TSIAVTTM - Avg Total Response Time
 X..M..E  TSIPCLR1 - Cumm Pct Long Resp Within Limit 1
 X..M..E  TSIPCLR2 - Cumm Pct Long Resp Within Limit 2
 X..M..E  TSIPCLR3 - Cumm Pct Long Resp Within Limit 3
 X..M..E  TSIPCLR4 - Cumm Pct Long Resp Within Limit 4
 X..M..E  TSIPCLR5 - Cumm Pct Long Resp Within Limit 5
 X..M..E  TSIPCLR6 - Cumm Pct Long Resp Within Limit 6
 X..M..E  TSIPCLR7 - Cumm Pct Long Resp Within Limit 7
 X..M..E  TSIPCMR1 - Cumm Pct Medium Resp Within Limit 1
 X..M..E  TSIPCMR2 - Cumm Pct Medium Resp Within Limit 2
 X..M..E  TSIPCMR3 - Cumm Pct Medium Resp Within Limit 3
 X..M..E  TSIPCMR4 - Cumm Pct Medium Resp Within Limit 4
 X..M..E  TSIPCMR5 - Cumm Pct Medium Resp Within Limit 5
 X..M..E  TSIPCMR6 - Cumm Pct Medium Resp Within Limit 6
 X..M..E  TSIPCMR7 - Cumm Pct Medium Resp Within Limit 7
 X..M..E  TSIPCSR1 - Cumm Pct Short Resp Within Limit 1
 X..M..E  TSIPCSR2 - Cumm Pct Short Resp Within Limit 2
 X..M..E  TSIPCSR3 - Cumm Pct Short Resp Within Limit 3
 X..M..E  TSIPCSR4 - Cumm Pct Short Resp Within Limit 4
 X..M..E  TSIPCSR5 - Cumm Pct Short Resp Within Limit 5
 X..M..E  TSIPCSR6 - Cumm Pct Short Resp Within Limit 6
 X..M..E  TSIPCSR7 - Cumm Pct Short Resp Within Limit 7
 X..M..E  TSIPCTR1 - Cumm Pct Total Resp Within Limit 1
 X..M..E  TSIPCTR2 - Cumm Pct Total Resp Within Limit 2
 X..M..E  TSIPCTR3 - Cumm Pct Total Resp Within Limit 3
 X..M..E  TSIPCTR4 - Cumm Pct Total Resp Within Limit 4
 X..M..E  TSIPCTR5 - Cumm Pct Total Resp Within Limit 5
 X..M..E  TSIPCTR6 - Cumm Pct Total Resp Within Limit 6
 X..M..E  TSIPCTR7 - Cumm Pct Total Resp Within Limit 7
```

5.2.4.3 Usage Considerations

```
This section identifies special considerations or techniques
related to using the TSOTSI file.  Additionally, retrieval
examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

1.  To populate account code data elements (TSOACTn),
    a. code the TSOACCT and TSOACRT parameters as described
       in sections 7.2.1 and 7.2.2 of this guide.
    b. change the COMP statement in TSOGENIN as described in
       section 7.2.3 of this guide.

2.  The following data elements only have meaning when
    using the TSOTSInn file in the DETAIL time-span.
    They lose significance once summarization has been
    performed.  These data elements should only be
    referenced when using the TSOTSInn file in the DETAIL
    time-span.

    ASID     - Address Space Identification
    LOGTS    - LOGON Time-Stamp
    PERFGRP  - Performance Group Number
    TSISOPTS - Response Options

3.  The following data elements obtain their values from code
    you write in the user exit _USRSTSI:

    CLUSTER  - Workload Classification Number
    TSICOST  - Processing Charges
```

4. The following data elements are user-defined or option dependent. They should be used within the frame of reference of the option's definition.

   TSO/MON Options
   - TSMRVAL1:TSMRVAL8 - Response Distribution Limits
   - TSIBUF - Command Buffer Area *
   - TSIBUFL - Command Buffer Area Content Length *
   - TSIRCTYP - Command Activity Record Type *
   - TSMERESP - Excessive Response Time Threshold

   * TSO/MON Commands Table command recording option dependent.

5. To activate the VTAM/TCAM data elements, change the NAME statements in TSOGENIN from:

```
NAME DEVTYPE      99  N N N N N .
NAME TERMID       99  N N N N N .
NAME LINETYPE     99  N N N N N .
```

   to:

```
NAME DEVTYPE      99  0 N N N N .
NAME TERMID       99  0 N N N N .
NAME LINETYPE     99  0 N N N N .
```

6. STARTTS and ENDTS in the MONTHS time-span bounds the span of time over which the data has been summarized. STARTTS is the lowest date and time, and ENDTS is the highest date and time, for the data summarized.

   In the DETAIL time-span, STARTTS represents TSO/MON recording interval start time and ENDTS represents TSO/MON recording interval end time.

7. The data element COMPRIM identifies the type of the command (primary, TSO EDIT subcommand, etc.) based on the order in which the TSO/MON Commands Table has been defined.

8. The data element COMMAND contains a value of '*UNKNOWN' if the command's abbreviation, COMABB, did not have a corresponding match in the TSO/MON Commands Table.

```
Retrieval Examples
------------------


In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
dependent, so you should find out what the identifiers are at
your installation.

1.  Print the users who executed STARTREK yesterday:

    DATA;
    SET &PTSOX..TSOTSI01;
    IF PROGRAM='STARTREK';
    PROC PRINT; VAR SYSID USER STARTTS ENDTS TSISERVU;

2.  Display what programs user COM001 used for the last
    two months:

    DATA FILE1;
    SET &PTSOM..TSOTSI01 &PTSOM..TSOTSI02;
    IF USER='COM001';
    PROC SORT DATA=FILE1; BY PROGRAM;
    PROC FREQ; TABLES PROGRAM;
```

5.2.5 TSO Terminal Activity File (TSO_TA)

The TSO Terminal Activity File (TSO_TA) contains data that quantifies the VTAM/TCAM terminal service (response), load, and access for defined intervals of time.

The TSO_TA file is effective for analyzing hardware utilization and the placement of new terminals in the network.

The TSO_TA file is derived from the TSOTSU file's DETAIL time-span. By default, the TSO_TA file is delivered inactive.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.5.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

At the DETAIL level you would reference the TSOTSU file which contains the finest granular view of the data possible.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-6. TSO_TA Time-Span Granularity Chart

5.2.5.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

.....E	DAY	- Day of Month
.....E	HOUR	- Hour of Day
.....E	LINETYPE	- VTAM/TCAM Line Type Identification
.....E	MONTH	- Month of Year
.....E	SYSID	- System Identifier
.....E	TERMID	- TSO Terminal ID

```
 ......E  WEEK     - Week of Year
 ......E  YEAR     - Year of Century
 ......E  ZONE     - Time Zone

Common Data Elements

 ......E  DAYNAME  - Name of Day of Week
 ......E  DEVCLASS - Device Class
 ......E  DEVTYPE  - Device Type
 ......E  ENDTS    - End Time Stamp
 ......E  INTERVLS - Number of Recording Intervals
 ......E  MICSVER  - CA MICS Version Number
 ......E  STARTTS  - Start Time Stamp
 ......E  TSMERESP - Excessive Response Time Threshold
 ......E  TSMNODST - Number Of Distribution Values
 ......E  TSMONVER - TSO/MON Version Number
 ......E  TSMRVAL1 - Response Distribution Limits 1
 ......E  TSMRVAL2 - Response Distribution Limits 2
 ......E  TSMRVAL3 - Response Distribution Limits 3
 ......E  TSMRVAL4 - Response Distribution Limits 4
 ......E  TSMRVAL5 - Response Distribution Limits 5
 ......E  TSMRVAL6 - Response Distribution Limits 6
 ......E  TSMRVAL7 - Response Distribution Limits 7
 ......E  TSMRVAL8 - Response Distribution Limits 8

Retained Data Elements

 ......   TSUSOPTS - Response Option Flags

Accumulated Data Elements

 ......   TSUCLIST - TSO CLIST Count
 ......E  TSUCONTM - Terminal Connect Time
 ......E  TSUCOST  - Processing Charges
 ......E  TSUCPUNI - Instructions Executed
 ......E  TSUCPUTM - CPU Time Consumed
 ......E  TSUDEVTM - Interval Device Connect Time
 ......   TSUERESC - Excessive Response Event Count
 ......   TSUERSTM - Excessive Response Time Total
 ......E  TSUEXCPS - I/O (EXCPs) Generated
 ......E  TSUGETCH - TGET Character Traffic
 ......E  TSUITKTM - Think Time Interval
 ......   TSULCOM  - Long Commands Processed
 ......   TSULDST1 - Count Long Responses Within Limit 1
 ......   TSULDST2 - Count Long Responses Within Limit 2
 ......   TSULDST3 - Count Long Responses Within Limit 3
 ......   TSULDST4 - Count Long Responses Within Limit 4
 ......   TSULDST5 - Count Long Responses Within Limit 5
 ......   TSULDST6 - Count Long Responses Within Limit 6
```

```
......   TSULDST7 - Count Long Responses Within Limit 7
......   TSULDST8 - Count Long Responses Within Limit 8
......E  TSULGDUR - Logon Duration
......   TSULRESC - Long Response Event Count
......   TSULRSTM - Long Response Time Total
......   TSUMCOM  - Medium Commands Processed
......   TSUMDST1 - Count Medium Responses Within Limit 1
......   TSUMDST2 - Count Medium Responses Within Limit 2
......   TSUMDST3 - Count Medium Responses Within Limit 3
......   TSUMDST4 - Count Medium Responses Within Limit 4
......   TSUMDST5 - Count Medium Responses Within Limit 5
......   TSUMDST6 - Count Medium Responses Within Limit 6
......   TSUMDST7 - Count Medium Responses Within Limit 7
......   TSUMDST8 - Count Medium Responses Within Limit 8
......E  TSUMRESC - Medium Response Event Count
......E  TSUMRSTM - Medium Response Time Total
......   TSUMTHCT - Over Max Think Count
......   TSUMTHTM - Over Max Think Time Total
......E  TSUNOLOG - User Logons
......   TSUPANLC - SPF DM Panel Count
......   TSUPETTM - Pseudo Elapsed Time
......E  TSUPGCMI - Common Page-Ins
......E  TSUPGHSI - Hiperspace Page-Ins
......E  TSUPGHSO - Hiperspace Page-Outs
......E  TSUPGIN  - Page-In Count
......E  TSUPGLPA - LPA Page-Ins
......E  TSUPGOUT - Page-Out Count
......E  TSUPGSTL - Page Steals
......E  TSUPGSWI - Swap Page-Ins
......E  TSUPGSWO - Swap Page-Outs
......E  TSUPGVI  - VIO Page-Ins
......E  TSUPGVO  - VIO Page-Outs
......E  TSUPUTCH - TPUT Character Traffic
......E  TSURESTM - Transaction Residency Time
......   TSUSCOM  - Short Commands Processed
......   TSUSCTBK - Responses Dropped Due To S/M Ctl Intvl
......E  TSUSDST1 - Count Short Responses Within Limit 1
......E  TSUSDST2 - Count Short Responses Within Limit 2
......E  TSUSDST3 - Count Short Responses Within Limit 3
......E  TSUSDST4 - Count Short Responses Within Limit 4
......E  TSUSDST5 - Count Short Responses Within Limit 5
......E  TSUSDST6 - Count Short Responses Within Limit 6
......E  TSUSDST7 - Count Short Responses Within Limit 7
......E  TSUSDST8 - Count Short Responses Within Limit 8
......E  TSUSERCU - CPU Service Units
......E  TSUSERIU - IOC Service Units
......E  TSUSERLE - Long Event Service Units
......E  TSUSERME - Medium Event Service Units
......E  TSUSERMU - MSO Service Units
```

```
 ......E  TSUSERSE - Short Event Service Units
 ......E  TSUSERSU - SRB Service Units
 ......E  TSUSERVU - Service Units
 ......E  TSUSICNT - Swap-in Count
 ......E  TSUSIDCT - Swap-in Delay Count
 ......E  TSUSIDTM - Swap-in Delay Time
 ......E  TSUSINTM - Swap-in Time
 ......E  TSUSNDCT - Sampled Network Delay Event Count
 ......E  TSUSNDTM - Sample Network Delay Time Total
 ......E  TSUSRBTM - SRB CPU Time
 ......E  TSUSRESC - Short Response Event Count
 ......E  TSUSRSTM - Short Response Time Total
 ......   TSUSRU   - System Resource Units
 ......E  TSUSWAPS - Physical Swap-Out Count
 ......E  TSUSWPLI - Logical Swap-In Count
 ......E  TSUSWPLO - Logical Swap-Out Count
 ......E  TSUSWPPI - Physical Swap-In Count
 ......E  TSUSWPSI - Total Swapped-In Bytes (1K Blocks)
 ......E  TSUSWPSZ - Total Swapped-Out Bytes (1K Blocks)
 ......E  TSUSWPTM - Total Logical Swap Time
 ......E  TSUTCBTM - TCB CPU Time
 ......E  TSUTCOM  - Total Commands Processed
 ......   TSUTDST1 - Count Total Responses Within Limit 1
 ......   TSUTDST2 - Count Total Responses Within Limit 2
 ......   TSUTDST3 - Count Total Responses Within Limit 3
 ......   TSUTDST4 - Count Total Responses Within Limit 4
 ......   TSUTDST5 - Count Total Responses Within Limit 5
 ......   TSUTDST6 - Count Total Responses Within Limit 6
 ......   TSUTDST7 - Count Total Responses Within Limit 7
 ......   TSUTDST8 - Count Total Responses Within Limit 8
 ......E  TSUTGETS - TGETs Issued
 ......   TSUTHCNT - Think Event Count
 ......E  TSUTHKTM - Think Time Total
 ......E  TSUTPUTS - TPUTS Issued
 ......   TSUTRANS - SRM Ended Transactions
 ......E  TSUTRESC - Total Response Event Count
 ......E  TSUTRSTM - Total Response Time All Functions

Minimum Data Elements

 ......E  TSUMNGTR - Min Input Character Traffic Rate
 ......E  TSUMNPTR - Min Output Character Traffic Rate
 ......   TSUSSHCT - Shortest Session Manager Ctl Intvl

Maximum Data Elements

 ......   TSUMXETM - Max Excessive Response Time
 ......E  TSUMXFRM - Max Fixed Frames
 ......E  TSUMXGTR - Max Input Character Traffic Rate
```

```
......   TSUMXKTM - Max User Think Time
......   TSUMXLTM - Max Long Response Time
......   TSUMXMTM - Max Medium Response Time
......E  TSUMXPTR - Max Output Character Traffic Rate
......   TSUMXSTM - Max Short Response Time
......E  TSUMXSWI - Max Swapped-In Bytes (1K Blocks)
......   TSUMXTTM - Max Response Time All Functions
......   TSUMXUIC - Max Unreferenced Interval Count
......E  TSUMXWTM - Max Logical Swap Time
......E  TSUSWPHI - Max Swapped-Out Bytes (1K Blocks)

Derived Data Elements

......E  TSUAVCTM - Avg TSO Session Length
......   TSUAVETM - Avg Excessive Response Time
......   TSUAVKTM - Avg User Think Time
......   TSUAVLTM - Avg Long Response Time
......   TSUAVMTM - Avg Medium Response Time
......E  TSUAVSTM - Avg Short Response Time
......   TSUAVTTM - Avg Response Time All Functions
......   TSUPCLR1 - Cumm Pct Long Resp Within Limit 1
......   TSUPCLR2 - Cumm Pct Long Resp Within Limit 2
......   TSUPCLR3 - Cumm Pct Long Resp Within Limit 3
......   TSUPCLR4 - Cumm Pct Long Resp Within Limit 4
......   TSUPCLR5 - Cumm Pct Long Resp Within Limit 5
......   TSUPCLR6 - Cumm Pct Long Resp Within Limit 6
......   TSUPCLR7 - Cumm Pct Long Resp Within Limit 7
......   TSUPCMR1 - Cumm Pct Medium Resp Within Limit 1
......   TSUPCMR2 - Cumm Pct Medium Resp Within Limit 2
......   TSUPCMR3 - Cumm Pct Medium Resp Within Limit 3
......   TSUPCMR4 - Cumm Pct Medium Resp Within Limit 4
......   TSUPCMR5 - Cumm Pct Medium Resp Within Limit 5
......   TSUPCMR6 - Cumm Pct Medium Resp Within Limit 6
......   TSUPCMR7 - Cumm Pct Medium Resp Within Limit 7
......E  TSUPCSR1 - Cumm Pct Short Resp Within Limit 1
......E  TSUPCSR2 - Cumm Pct Short Resp Within Limit 2
......E  TSUPCSR3 - Cumm Pct Short Resp Within Limit 3
......E  TSUPCSR4 - Cumm Pct Short Resp Within Limit 4
......E  TSUPCSR5 - Cumm Pct Short Resp Within Limit 5
......E  TSUPCSR6 - Cumm Pct Short Resp Within Limit 6
......E  TSUPCSR7 - Cumm Pct Short Resp Within Limit 7
......E  TSUPCTAC - Pct Terminal Active
......   TSUPCTR1 - Cumm Pct Total Resp Within Limit 1
......   TSUPCTR2 - Cumm Pct Total Resp Within Limit 2
......   TSUPCTR3 - Cumm Pct Total Resp Within Limit 3
......   TSUPCTR4 - Cumm Pct Total Resp Within Limit 4
......   TSUPCTR5 - Cumm Pct Total Resp Within Limit 5
......   TSUPCTR6 - Cumm Pct Total Resp Within Limit 6
......   TSUPCTR7 - Cumm Pct Total Resp Within Limit 7
```

```
......E  TSUTACTM - Terminal Active Time
......E  TSUTGRAT - Input Character Traffic Rate
......E  TSUTPRAT - Output Character Traffic Rate
```

5.2.5.3 Usage Considerations

```
This section identifies any special considerations or
techniques related to using the TSO_TA file.  Additionally,
retrieval examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

1.  The TSO_TA file is derived from the TSOTSU file, so it
    has many of the same data element names, labels, and
    formats.

2.  To activate the TSO_TA file, refer to data base file
    tailoring discussion in Chapter 6 of the CA MICS System
    Modification Guide.

3.  The following data elements are user-defined or
    option-dependent.  They should be used within the frame
    of reference of the option's definition.

    sharedprefix.MICS.PARMS(SYSID)
        CPUMODEL - CPU Model Identification

    TSO/MON Options
        TSMRVAL1:TSMRVAL8 - Response Distribution Limits
        TSMERESP - Excessive Response Time Threshold

4.  STARTTS and ENDTS in the DAYS, MONTHS, or YEARS
    time-spans bound the span of time over which the data has
    been summarized.  STARTTS is the lowest date and time,
    and ENDTS is the highest date and time, for the data
    summarized.

    In the DETAIL time-span, STARTTS represents TSO/MON
    recording interval start time and ENDTS represents
    TSO/MON recording interval end time.

Retrieval Examples
------------------


In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
```

dependent, so you should find out what the identifiers are at your installation.

1. Print yesterday's average TSO session time by hour for terminal PULU001:

```
DATA;
SET &PTSOD..TSO_TA01;
IF TERMID='PULU001';
PROC PRINT; VAR SYSID HOUR TSUAVCTM;
```

2. Print the average TSO session time by zone for the terminal id's beginning with CP, RE, and OI, over the last six months:

```
DATA;
SET &PTSOM..TSO_TA01 &PTSOM..TSO_TA02
    &PTSOM..TSO_TA03 &PTSOM..TSO_TA04
    &PTSOM..TSO_TA05 &PTSOM..TSO_TA06;
IF TERMID=:'CP' OR TERMID=:'RE' OR TERMID=:'OI';
TERMID=SUBSTR(TERMID,1,2);
LENGTH KEYID $7.;
KEYID=PUT(YEAR,2.) '/' PUT(MONTH,2.) '-'
      ZONE;
PROC FREQ; TABLES KEYID*TERMID / WEIGHT TSUAVCTM;
```

5.2.6 TSO Data Set Name File (TSOTSA)

The TSO Data Set Name File provides an audit trail of data sets and members of partitioned data sets that are accessed under ISPF. This file is derived from the TSO/MON Command Record.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.6.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity				
DETAIL	SYSID	DSNAME	TSADSEQ	MEMBER	TSAMSEQ
	YEAR	MONTH	DAY	HOUR	ENDTS
DAYS	N/A				
WEEKS	N/A				
MONTHS	N/A				
YEARS	N/A				
TABLES	N/A				

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-7. TSOTSA Time-Span Granularity Chart

5.2.6.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

X.....E	DAY	- Day of Month
X.....E	DSNAME	- Data Set Name
X.....E	HOUR	- Hour of Day
X.....E	MEMBER	- PDS Member Name
X.....E	MONTH	- Month of Year

```
 X.....E  SYSID    - System Identifier
 X.....E  TSADSEQ  - Data Set Sequence Number
 X.....E  TSAMSEQ  - Member Sequence Number
 X.....E  WEEK     - Week of Year
 X.....E  YEAR     - Year of Century
 X.....E  ZONE     - Time Zone

Common Data Elements

 X.....E  COMMAND  - Command Name
 X.....E  ENDTS    - End Time Stamp
 X.....E  STARTTS  - Start Time Stamp
 X.....   TSMONVER - TSO/MON Version Number
 X.....E  USER     - User Identification
 X.....   VOLSER   - Volume Serial Number

Retained Data Elements

 X.....   TSADFUNC - Primary Function Code
 X.....   TSAMFUNC - Subfunction Code
```

5.2.6.3 Usage Considerations

This section identifies any special considerations or techniques related to using the TSOTSA file. Additionally, a retrieval example is provided to help you use this file.

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

Special Considerations/Techniques

1. This file is similar to the TSOTSI file in that observations are generated upon execution of TSO commands.

2. The TSOTSA file is relevant in the DETAIL time-span only.

3. You must have coded DSNAMES=nnn option in the TSO/MON options member. If not, the data will not be collected by TSO/MON and the TSOTSA cycles will be empty.

Retrieval Example

1. Identify the TSO USERID(s) that deleted member SMFDUMP from SYS2.PROCLIB.

```
DATA;
SET &PTSOX..TSOTSA01;
IF DSNAME='SYS2.PROCLIB' AND MEMBER='SMFDUMP' AND
   TSAMFUNC='D';
PROC PRINT;VAR ENDTS USER;
```

5.2.7 TSO Batch User Command Counts File (TSO_BC)

The TSO Batch User Command Counts File (TSO_BC) contains data that quantifies command usage by batch TSO jobs for defined intervals of time.

You can use the TSO_BC file to audit the use of TSO batch command facilities by a userid (JOBNAME) or group of userids (JOBNAMEs). You can also review the use of any command or subcommand by a userid (JOBNAME) to analyze standards, performance, or security considerations.

The TSO_BC file is derived from the TSO/MON System Record (200), UCB, UCBE, and UCCB segments.

By default, the TSO_BC file is delivered inactive.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.7.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each time-span. "N/A" indicates that the file is not supported in a time-span.

NOTE: The time-spans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-8. TSO_BC Time-span Granularity Chart

5.2.7.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

.....E	COMMAND	- Command Name
.....E	COMPRIM	- Primary Command Category
.....E	COMTYPE	- Command Type
.....E	DAY	- Day of Month
.....E	HOUR	- Hour of Day
.....E	MONTH	- Month of Year

```
 ......E  SYSID    - System Identifier
 ......E  USER     - User Identification
 ......E  WEEK     - Week of Year
 ......E  YEAR     - Year of Century
 ......E  ZONE     - Time Zone

Common Data Elements

 ......E  CLUSTER  - Workload Classification Number
 ......E  COMABB   - Command Abbreviation
 ......E  DAYNAME  - Name of Day of Week
 ......E  ENDTS    - End Time Stamp
 ......E  INTERVLS - Number of Recording Intervals
 ......E  MICSVER  - CA MICS Version Number
 ......E  STARTTS  - Start Time Stamp
 ......E  TSMONVER - TSO/MON Version Number
 ......E  TSOAPU   - TSO Application Unit ID

Accumulated Data Elements

 ......E  TSCCOST  - Processing Charges
 ......E  TSCCOUNT - Times Used
```

5.2.7.3 Usage Considerations

```
This section identifies special considerations or techniques
related to using the TSO_BC file.  Additionally, retrieval
examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

Before using the TSO batch files for accounting or capacity
planning, carefully consider these impacts:

o Data duplication can occur because resource utilization
  information for batch TSO jobs appears in both the CA MICS
  TSO Analyzer batch files and the Batch Information Area
  files of the CA MICS MVS Batch and Operations Analyzer.

  Please contact CA MICS Product Support before using the TSO
  batch files for these purposes.

o Accounting Considerations

  If both the TSO batch files and the MVS Batch and
  Operations Analyzer files are used for accounting, the
  redundant resource utilization data will result in
  duplicate accounting charges unless you account for
  different resource items from each information area.

  For example, if you account for command count from the TSO
  batch files and CPU time from the MVS Batch and Operations
  Analyzer files, you will not incur duplicate charges.

  If you charge for the same resource item (such as CPU time)
  in both information areas, you end up with duplicate
  charges to the same user.

o Capacity Planning Considerations

  If both the TSO Analyzer's batch files and the MVS Batch
  and Operations Analyzer's Batch Information Area files are
  used for capacity planning purposes, the duplication of
  resource data can skew workload utilization information.

  Consequently, do not use the TSO Analyzer's batch files for
  capacity planning purposes.

  Please note that this recommendation applies only to the
  batch files of the CA MICS TSO Analyzer and not to the
  online-oriented files.
```

1. To activate the TSO_BC file, refer to data base file tailoring discussion in Chapter 6 of the CA MICS System Modification Guide.

2. The data element TSCCOST (Processing Charges) obtains its value from code you write in the user exit _USRSTSC.

3. To populate account code data elements (TSOACTn),
   a. code the TSOACCT and TSOACRT parameters as described in sections 7.2.1 and 7.2.2 of this guide.
   b. change the COMP statement in TSOGENIN as described in section 7.2.3 of this guide.

4. STARTTS and ENDTS in the MONTHS time-span bounds the span of time over which the data has been summarized. STARTTS is the lowest date and time, and ENDTS is the highest date and time, for the data summarized.

   In the DETAIL time-span, STARTTS represents TSO/MON recording interval start time and ENDTS represents TSO/MON recording interval end time.

5. The data element COMPRIM identifies the type of the command (primary, TSO EDIT subcommand, etc.) based on the order in which the TSO/MON commands table has been defined.

6. The data element COMMAND contains a value of '*UNKNOWN' if the command's abbreviation, COMABB, does not have a corresponding match in the TSO/MON Commands Table.

Retrieval Examples

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

1. Print the users who used the TSO EDIT command yesterday:

```
DATA;
SET &TSOX..TSO_BC01;
IF COMMAND='EDIT';
PROC PRINT; VAR SYSID USER ENDTS TSCCOUNT;
RUN;
```

2. Display what commands user COM001 used for the last two months and group them by command type (e.g., SPF, TSO, primary, etc.):

```
DATA FILE1;
SET &TSOM..TSO_BC01 &TSOM..TSO_BC02;
IF USER='COM001';
PROC SORT DATA=FILE1; BY COMPRIM COMMAND;
PROC FREQ; TABLES COMMAND; BY COMPRIM;
RUN;
```

3. Total the number of commands which are being executed and are not defined in the TSO/MON Commands Table:

```
DATA FILE1;
SET &TSOM..TSO_BC01 END=EOF;
IF COMMAND='*UNKNOWN'THEN COUNTX+TSCCOUNT;
IF EOF THEN PUT COUNTX=;
RUN;
```

5.2.8 TSO Batch Data Set Name File (TSO_BD)

The TSO Batch Data Set Name File (TSO_BD) enables you to audit data sets and members of partitioned data sets that are accessed in batch TSO steps.

The TSO_BD file logs data set access activity by SYSID, YEAR, MONTH, WEEK, DAY, HOUR, and ENDTS. The USERID (JOBNAME), primary function and subfunction, data set name, and member name are also kept in this file.

Because the TSO_BD file is derived from the TSO/MON Command Record (199) at Releases 5.2 and higher, the TSO_BD file is delivered inactive by default.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.8.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-9. TSO_BD Time-Span Granularity Chart

5.2.8.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

.....E	DAY	- Day of Month
.....E	DSNAME	- Data Set Name
.....E	HOUR	- Hour of Day
.....E	MEMBER	- PDS Member Name
.....E	MONTH	- Month of Year
.....E	SYSID	- System Identifier

```
 ......E  TSADSEQ  - Data Set Sequence Number
 ......E  TSAMSEQ  - Member Sequence Number
 ......E  WEEK     - Week of Year
 ......E  YEAR     - Year of Century
 ......E  ZONE     - Time Zone

Common Data Elements

 ......E  COMMAND  - Command Name
 ......E  ENDTS    - End Time Stamp
 ......E  STARTTS  - Start Time Stamp
 ......   TSMONVER - TSO/MON Version Number
 ......E  USER     - User Identification
 ......   VOLSER   - Volume Serial Number

Retained Data Elements

 ......   TSADFUNC - Primary Function Code
 ......   TSAMFUNC - Subfunction Code
```

5.2.8.3 Usage Considerations

```
This section identifies any special considerations or
techniques related to using the TSO_BD file.  Additionally, a
retrieval example is provided to help you use this file.

Special Considerations/Techniques
---------------------------------

Before using the TSO batch files for accounting or capacity
planning, carefully consider these impacts:

o Data duplication can occur because resource utilization
  information for batch TSO jobs appears in both the CA MICS
  TSO Analyzer batch files and the Batch Information Area
  files of the CA MICS MVS Batch and Operations Analyzer.

  Please contact CA MICS Product Support before using the TSO
  batch files for these purposes.

o Accounting Considerations

  If both the TSO batch files and the MVS Batch and
  Operations Analyzer files are used for accounting, the
  redundant resource utilization data will result in
  duplicate accounting charges unless you account for
  different resource items from each information area.

  For example, if you account for command count from the TSO
  batch files and CPU time from the MVS Batch and Operations
  Analyzer files, you will not incur duplicate charges.

  If you charge for the same resource item (such as CPU time)
  in both information areas, you end up with duplicate
  charges to the same user.

o Capacity Planning Considerations

  If both the TSO Analyzer's batch files and the MVS Batch
  and Operations Analyzer's Batch Information Area files are
  used for capacity planning purposes, the duplication of
  resource data can skew workload utilization information.

  Consequently, do not use the TSO Analyzer's batch files for
  capacity planning purposes.

  Please note that this recommendation applies only to the
  batch files of the CA MICS TSO Analyzer and not to the
  online-oriented files.
```

1. This file is similar to the TSOTSI and TSOTSA files in that observations are generated only upon execution of TSO commands.

2. The TSO_BD file is relevant in the DETAIL time-span only.

3. To activate the TSO_BD file, refer to data base file tailoring discussion in Chapter 6 of the CA MICS System Modification Guide.

Retrieval Example

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

1. Identify the batch TSO job(s) that deleted member DUMP from SYS2.PROCLIB.

```
DATA;
SET &TSOX..TSO_BD01;
IF DSNAME='SYS2.PROCLIB' AND MEMBER='DUMP' AND
   TSAMFUNC='D';
PROC PRINT;VAR ENDTS USER;
RUN;
```

5.2.9 TSO Batch Command Information File (TSO_BI)

The TSO Batch Command Information File (TSO_BI) quantifies the resource consumption and use of installation-defined commands and programs executed under batch TSO.

You can use the TSO_BI file to report batch command facilities use for an individual user or a group of users.

The TSO_BI file is derived from the TSO/MON Command Record (199) and is, by default, inactive when shipped.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.9.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-10. TSO_BI Time-Span Granularity Chart

5.2.9.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

.....E	COMMAND	- Command Name
.....E	DAY	- Day of Month
.....E	HOUR	- Hour of Day
.....E	MONTH	- Month of Year
.....E	PROGRAM	- Program Name
.....E	SYSID	- System Identifier

```
  ......E  TSISEQNO - Command Record Sequence Number
  ......E  USER     - User Identification
  ......E  WEEK     - Week of Year
  ......E  YEAR     - Year of Century
  ......E  ZONE     - Time Zone

Common Data Elements

  ......E  ASID     - Address Space Identification
  ......E  CLUSTER  - Workload Classification Number
  ......E  COMABB   - Command Abbreviation
  ......E  COMPRIM  - Primary Command Category
  ......E  COMTYPE  - Command Type
  ......E  DAYNAME  - Name of Day of Week
  ......E  DEVCLASS - Device Class
  ......E  DEVTYPE  - Device Type
  ......E  ENDTS    - End Time Stamp
  ......E  JESJOBNO - JES Job Number
  ......E  LINETYPE - VTAM/TCAM Line Type Identification
  ......E  LOGPROC  - Logon Procedure Name
  ......E  LOGTS    - Logon Time-stamp
  ......E  MICSVER  - CA MICS Version Number
  ......E  PERFGRP  - Performance Group Number
  ......E  STARTTS  - Start Time Stamp
  ......E  TERMID   - TSO Terminal ID
  ......E  TSMERESP - Excessive Response Time Threshold
  ......E  TSMNODST - Number Of Distribution Values
  ......E  TSMONVER - TSO/MON Version Number
  ......E  TSMRVAL1 - Response Distribution Limits 1
  ......E  TSMRVAL2 - Response Distribution Limits 2
  ......E  TSMRVAL3 - Response Distribution Limits 3
  ......E  TSMRVAL4 - Response Distribution Limits 4
  ......E  TSMRVAL5 - Response Distribution Limits 5
  ......E  TSMRVAL6 - Response Distribution Limits 6
  ......E  TSMRVAL7 - Response Distribution Limits 7
  ......E  TSMRVAL8 - Response Distribution Limits 8
  ......E  TSOAPU   - TSO Application Unit ID
  ......E  WLMCLASS - Service Class Name
  ......E  WLMGMCT  - Intvls when in WLM Goal Mode
  ......E  WLMMDXCT - Intvls where changed to Goal Mode
  ......E  WLMMODE  - Workload Manager Mode

Retained Data Elements

  ......   TSIBUF   - Command Buffer Area
  ......   TSIBUFL  - Command Buffer Area Content Length
  ......   TSIPTYPE - SPF Function Type
  ......   TSIRCTYP - Command Activity Record Type
  ......   TSISOPTS - Response Options
```

```
Accumulated Data Elements

 ......E  TSICOST  - Processing Charges
 ......   TSICPUNI - Instructions Executed
 ......E  TSICPUTM - CPU Time Consumed
 ......E  TSIDEVTM - Interval Device Connect Time
 ......E  TSIELPTM - Execution Elapsed Time
 ......   TSIERESC - Excessive Response Event Count
 ......   TSIERSTM - Excessive Response Time Total
 ......E  TSIEXCPS - I/O (EXCPs) Generated
 ......E  TSIGETCH - TGET Character Traffic
 ......E  TSILDST1 - Count Long Responses Within Limit 1
 ......E  TSILDST2 - Count Long Responses Within Limit 2
 ......E  TSILDST3 - Count Long Responses Within Limit 3
 ......E  TSILDST4 - Count Long Responses Within Limit 4
 ......E  TSILDST5 - Count Long Responses Within Limit 5
 ......E  TSILDST6 - Count Long Responses Within Limit 6
 ......E  TSILDST7 - Count Long Responses Within Limit 7
 ......E  TSILDST8 - Count Long Responses Within Limit 8
 ......E  TSILRESC - Long Response Event Count
 ......E  TSILRSTM - Long Response Time Total
 ......E  TSIMDST1 - Count Medium Responses Within Limit 1
 ......E  TSIMDST2 - Count Medium Responses Within Limit 2
 ......E  TSIMDST3 - Count Medium Responses Within Limit 3
 ......E  TSIMDST4 - Count Medium Responses Within Limit 4
 ......E  TSIMDST5 - Count Medium Responses Within Limit 5
 ......E  TSIMDST6 - Count Medium Responses Within Limit 6
 ......E  TSIMDST7 - Count Medium Responses Within Limit 7
 ......E  TSIMDST8 - Count Medium Responses Within Limit 8
 ......E  TSIMRESC - Medium Response Event Count
 ......E  TSIMRSTM - Medium Response Time Total
 ......E  TSINOEXS - Number Executions
 ......E  TSIPANLC - SPF DM Panel Count
 ......   TSIPETTM - Pseudo Elapsed Time
 ......E  TSIPGCMI - Common Page-Ins
 ......E  TSIPGHSI - Hiperspace Page-Ins
 ......E  TSIPGHSO - Hiperspace Page-Outs
 ......E  TSIPGIN  - Page-In Count
 ......E  TSIPGLPA - LPA Page-Ins
 ......E  TSIPGOUT - Page-Out Count
 ......E  TSIPGSTL - Page Steals
 ......E  TSIPGSWI - Swap Page-Ins
 ......E  TSIPGSWO - Swap Page-Outs
 ......E  TSIPGVI  - VIO Page-Ins
 ......E  TSIPGVO  - VIO Page-Outs
 ......E  TSIPUTCH - TPUT Character Traffic
 ......E  TSIRESTM - Transaction Residency Time
 ......E  TSISDST1 - Count Short Responses Within Limit 1
```

```
......E  TSISDST2 - Count Short Responses Within Limit 2
......E  TSISDST3 - Count Short Responses Within Limit 3
......E  TSISDST4 - Count Short Responses Within Limit 4
......E  TSISDST5 - Count Short Responses Within Limit 5
......E  TSISDST6 - Count Short Responses Within Limit 6
......E  TSISDST7 - Count Short Responses Within Limit 7
......E  TSISDST8 - Count Short Responses Within Limit 8
......E  TSISERCU - CPU Service Units
......E  TSISERIU - IOC Service Units
......E  TSISERLE - Long Event Service Units
......E  TSISERME - Medium Event Service Units
......E  TSISERMU - MSO Service Units
......E  TSISERSE - Short Event Service Units
......E  TSISERSU - SRB Service Units
......E  TSISERVU - Service Units
......E  TSISICNT - Swap-In Time Event Count
......E  TSISIDCT - Swap-in Delay Count
......E  TSISIDTM - Swap-In Delay Time Total
......E  TSISINTM - Swap-In Time Total
......E  TSISNDCT - Sampled Network Delay Event Count
......E  TSISNDTM - Sample Network Delay Time Total
......E  TSISRBTM - SRB CPU Time
......E  TSISRESC - Short Response Event Count
......E  TSISRSTM - Short Response Time Total
......   TSISRU   - System Resource Units
......E  TSISWAPS - Physical Swap-Out Count
......E  TSISWPLI - Logical Swap-In Count
......E  TSISWPLO - Logical Swap-Out Count
......E  TSISWPPI - Physical Swap-In Count
......E  TSISWPSI - Total Swapped-In Bytes (1K Blocks)
......E  TSISWPSZ - Total Swapped-Out Bytes (1K Blocks)
......E  TSITCBTM - TCB CPU Time
......E  TSITDST1 - Count Total Responses Within Limit 1
......E  TSITDST2 - Count Total Responses Within Limit 2
......E  TSITDST3 - Count Total Responses Within Limit 3
......E  TSITDST4 - Count Total Responses Within Limit 4
......E  TSITDST5 - Count Total Responses Within Limit 5
......E  TSITDST6 - Count Total Responses Within Limit 6
......E  TSITDST7 - Count Total Responses Within Limit 7
......E  TSITDST8 - Count Total Responses Within Limit 8
......E  TSITGETS - TGETs Issued
......E  TSITPUTS - TPUTs Issued
......E  TSITRANS - SRM Ended Transactions
......E  TSITRESC - Total Response Event Count
......E  TSITRSTM - Total Response Time Total

Maximum Data Elements

......   TSIMXELP - Max Elapsed Time
```

```
......   TSIMXETM - Max Excessive Response Time
......E  TSIMXFRM - Max Fixed Frames
......   TSIMXLTM - Max Long Response Time
......   TSIMXMTM - Max Medium Response Time
......   TSIMXSTM - Max Short Response Time
......E  TSIMXSWI - Max Swapped-In Bytes (1K Blocks)
......   TSIMXTTM - Max Response Time All Functions
......   TSIMXUIC - Max Unreferenced Interval Count
......E  TSISWPHI - Max Swapped-Out Bytes (1K Blocks)
......E  TSIXDOM  - Cross Domain Environment During Command

Derived Data Elements

......   TSIAVELP - Avg Elapsed Time
......   TSIAVETM - Avg Excessive Response Time
......E  TSIAVLTM - Avg Long Response Time
......E  TSIAVMTM - Avg Medium Response Time
......E  TSIAVSTM - Avg Short Response Time
......E  TSIAVTTM - Avg Total Response Time
......E  TSIPCLR1 - Cumm Pct Long Resp Within Limit 1
......E  TSIPCLR2 - Cumm Pct Long Resp Within Limit 2
......E  TSIPCLR3 - Cumm Pct Long Resp Within Limit 3
......E  TSIPCLR4 - Cumm Pct Long Resp Within Limit 4
......E  TSIPCLR5 - Cumm Pct Long Resp Within Limit 5
......E  TSIPCLR6 - Cumm Pct Long Resp Within Limit 6
......E  TSIPCLR7 - Cumm Pct Long Resp Within Limit 7
......E  TSIPCMR1 - Cumm Pct Medium Resp Within Limit 1
......E  TSIPCMR2 - Cumm Pct Medium Resp Within Limit 2
......E  TSIPCMR3 - Cumm Pct Medium Resp Within Limit 3
......E  TSIPCMR4 - Cumm Pct Medium Resp Within Limit 4
......E  TSIPCMR5 - Cumm Pct Medium Resp Within Limit 5
......E  TSIPCMR6 - Cumm Pct Medium Resp Within Limit 6
......E  TSIPCMR7 - Cumm Pct Medium Resp Within Limit 7
......E  TSIPCSR1 - Cumm Pct Short Resp Within Limit 1
......E  TSIPCSR2 - Cumm Pct Short Resp Within Limit 2
......E  TSIPCSR3 - Cumm Pct Short Resp Within Limit 3
......E  TSIPCSR4 - Cumm Pct Short Resp Within Limit 4
......E  TSIPCSR5 - Cumm Pct Short Resp Within Limit 5
......E  TSIPCSR6 - Cumm Pct Short Resp Within Limit 6
......E  TSIPCSR7 - Cumm Pct Short Resp Within Limit 7
......E  TSIPCTR1 - Cumm Pct Total Resp Within Limit 1
......E  TSIPCTR2 - Cumm Pct Total Resp Within Limit 2
......E  TSIPCTR3 - Cumm Pct Total Resp Within Limit 3
......E  TSIPCTR4 - Cumm Pct Total Resp Within Limit 4
......E  TSIPCTR5 - Cumm Pct Total Resp Within Limit 5
......E  TSIPCTR6 - Cumm Pct Total Resp Within Limit 6
......E  TSIPCTR7 - Cumm Pct Total Resp Within Limit 7
```

5.2.9.3 Usage Considerations

```
This section identifies special considerations or techniques
related to using the TSO_BI file.  Additionally, retrieval
examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------


Before using the TSO batch files for accounting or capacity
planning, carefully consider these impacts:

o Data duplication can occur because resource utilization
  information for batch TSO jobs appears in both the CA MICS
  TSO Analyzer batch files and the Batch Information Area
  files of the CA MICS MVS Batch and Operations Analyzer.

  Please contact CA MICS Product Support before using the TSO
  batch files for these purposes.

o Accounting Considerations

  If both the TSO batch files and the MVS Batch and
  Operations Analyzer files are used for accounting, the
  redundant resource utilization data will result in
  duplicate accounting charges unless you account for
  different resource items from each information area.

  For example, if you account for command count from the TSO
  batch files and CPU time from the MVS Batch and Operations
  Analyzer files, you will not incur duplicate charges.

  If you charge for the same resource item (such as CPU time)
  in both information areas, you end up with duplicate
  charges to the same user.

o Capacity Planning Considerations

  If both the TSO Analyzer's batch files and the MVS Batch
  and Operations Analyzer's Batch Information Area files are
  used for capacity planning purposes, the duplication of
  resource data can skew workload utilization information.

  Consequently, do not use the TSO Analyzer's batch files for
  capacity planning purposes.

  Please note that this recommendation applies only to the
  batch files of the CA MICS TSO Analyzer and not to the
```

online-oriented files.

1. To activate the TSO_BI file, refer to data base file tailoring discussion in Chapter 6 of the CA MICS System Modification Guide.

2. To populate account code data elements (TSOACTn),
   a. code the TSOACCT and TSOACRT parameters as described in sections 7.2.1 and 7.2.2 of this guide.
   b. change the COMP statement in TSOGENIN as described in section 7.2.3 of this guide.

3. The following data elements only have meaning when using the TSO_BInn file in the DETAIL time-span. They lose significance once summarization has been performed. These data elements should only be referenced when using the TSO_BInn file in the DETAIL time-span.

   ASID - Address Space Identification
   LOGTS - LOGON Time-Stamp
   PERFGRP - Performance Group Number
   TSISOPTS - Response Options

4. The following data elements obtain their values from code you write in the user exit _USRSTSI:

   CLUSTER - Workload Classification Number
   TSICOST - Processing Charges

5. The following data elements are user-defined or option-dependent. They should be used within the frame of reference of the option's definition.

   TSO/MON Options
   TSMRVAL1:TSMRVAL8 - Response Distribution Limits
   TSIBUF - Command Buffer Area *
   TSIBUFL - Command Buffer Area Content Length *
   TSIRCTYP - Command Activity Record Type *
   TSMERESP - Excessive Response Time Threshold

   * TSO/MON Commands Table command recording option dependent.

6. STARTTS and ENDTS in the MONTHS time-span bounds the span of time over which the data has been summarized. STARTTS is the lowest date and time, and ENDTS is the highest date and time, for the data summarized.

   In the DETAIL time-span, STARTTS represents TSO/MON

recording interval start time and ENDTS represents TSO/MON recording interval end time.

7. The data element COMPRIM identifies the type of the command (primary, TSO EDIT subcommand, etc.) based on the order in which the TSO/MON Commands Table has been defined.

8. The data element COMMAND contains a value of '*UNKNOWN' if the command's abbreviation, COMABB, did not have a corresponding match in the TSO/MON Commands Table.

Retrieval Examples

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

1. Print the users who executed TABLESRC in batch TSO yesterday:

```
DATA;
SET &TSOX..TSO_BI01;
IF PROGRAM='TABLESRC';
PROC PRINT; VAR SYSID USER STARTTS ENDTS TSISERVU;
RUN;
```

2. Display what programs user COM001 used for the last two months in batch TSO processing:

```
DATA FILE1;
SET &TSOM..TSO_BI01 &TSOM..TSO_BI02;
IF USER='COM001';
PROC SORT DATA=FILE1; BY PROGRAM;
PROC FREQ; TABLES PROGRAM;
RUN;
```

5.2.10 TSO Batch User Activity File (TSO_BU)

The TSO Batch User Activity File (TSO_BU) quantifies a user's total batch activity for defined intervals of time. Resource consumption and performance measures are provided.

You can use the TSO_BU file to analyze batch TSO usage trends, productivity, and the use of batch TSO resources at the userid (JOBNAME) level.

The TSO_BU file is derived from the TSO/MON System Record (200), UCB and UCBE segments, and is delivered inactive by default.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.10.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-11. TSO_BU Time-Span Granularity Chart

5.2.10.2 Data Elements List

The table below identifies data elements contained in this
file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element
is supported. The timespans are indicated by
the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with
the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are
defined by each installation when CA MICS is installed.
Therefore, this table has been generated as part of the
installation process to accurately reflect the CA MICS
system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E"
under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

......E	DAY	- Day of Month
......E	MONTH	- Month of Year
......E	SYSID	- System Identifier
......E	USER	- User Identification
......E	WEEK	- Week of Year

```
 ......E  YEAR     - Year of Century
 ......E  ZONE     - Time Zone

Common Data Elements

 ......E  ASID     - Address Space Identification
 ......E  DAYNAME  - Name of Day of Week
 ......E  DEVCLASS - Device Class
 ......E  DEVTYPE  - Device Type
 ......E  ENDTS    - End Time Stamp
 ......E  HOUR     - Hour of Day
 ......E  INTERVLS - Number of Recording Intervals
 ......E  JESJOBNO - JES Job Number
 ......E  LINETYPE - VTAM/TCAM Line Type Identification
 ......E  LOGPROC  - Logon Procedure Name
 ......E  LOGTS    - Logon Time-stamp
 ......E  MICSVER  - CA MICS Version Number
 ......E  PERFGRP  - Performance Group Number
 ......E  STARTTS  - Start Time Stamp
 ......E  TERMID   - TSO Terminal ID
 ......E  TSMERESP - Excessive Response Time Threshold
 ......E  TSMNODST - Number Of Distribution Values
 ......E  TSMONVER - TSO/MON Version Number
 ......E  TSMRVAL1 - Response Distribution Limits 1
 ......E  TSMRVAL2 - Response Distribution Limits 2
 ......E  TSMRVAL3 - Response Distribution Limits 3
 ......E  TSMRVAL4 - Response Distribution Limits 4
 ......E  TSMRVAL5 - Response Distribution Limits 5
 ......E  TSMRVAL6 - Response Distribution Limits 6
 ......E  TSMRVAL7 - Response Distribution Limits 7
 ......E  TSMRVAL8 - Response Distribution Limits 8
 ......E  WLMCLASS - Service Class Name
 ......E  WLMGMCT  - Intvls when in WLM Goal Mode
 ......E  WLMMDXCT - Intvls where changed to Goal Mode
 ......E  WLMMODE  - Workload Manager Mode

Retained Data Elements

 ......   TSUSOPTS - Response Option Flags

Accumulated Data Elements

 ......   TSUCLIST - TSO CLIST Count
 ......E  TSUCONTM - Terminal Connect Time
 ......E  TSUCOST  - Processing Charges
 ......E  TSUCPUNI - Instructions Executed
 ......E  TSUCPUTM - CPU Time Consumed
 ......E  TSUDEVTM - Interval Device Connect Time
 ......   TSUERESC - Excessive Response Event Count
```

```
......   TSUERSTM - Excessive Response Time Total
......E  TSUEXCPS - I/O (EXCPs) Generated
......E  TSUGETCH - TGET Character Traffic
......E  TSUITKTM - Interval Think Time
......E  TSULCOM  - Long Commands Processed
......E  TSULDST1 - Count Long Responses Within Limit 1
......E  TSULDST2 - Count Long Responses Within Limit 2
......E  TSULDST3 - Count Long Responses Within Limit 3
......E  TSULDST4 - Count Long Responses Within Limit 4
......E  TSULDST5 - Count Long Responses Within Limit 5
......E  TSULDST6 - Count Long Responses Within Limit 6
......E  TSULDST7 - Count Long Responses Within Limit 7
......E  TSULDST8 - Count Long Responses Within Limit 8
......E  TSULGDUR - Logon Duration
......E  TSULRESC - Long Response Event Count
......E  TSULRSTM - Long Response Time Total
......E  TSUMCOM  - Medium Commands Processed
......E  TSUMDST1 - Count Medium Responses Within Limit 1
......E  TSUMDST2 - Count Medium Responses Within Limit 2
......E  TSUMDST3 - Count Medium Responses Within Limit 3
......E  TSUMDST4 - Count Medium Responses Within Limit 4
......E  TSUMDST5 - Count Medium Responses Within Limit 5
......E  TSUMDST6 - Count Medium Responses Within Limit 6
......E  TSUMDST7 - Count Medium Responses Within Limit 7
......E  TSUMDST8 - Count Medium Responses Within Limit 8
......E  TSUMRESC - Medium Response Event Count
......E  TSUMRSTM - Medium Response Time Total
......   TSUMTHCT - Over Max Think Count
......   TSUMTHTM - Over Max Think Time Total
......E  TSUNOLOG - User Logons
......   TSUPANLC - SPF DM Panel Count
......   TSUPETTM - Pseudo Elapsed Time
......E  TSUPGCMI - Common Page-Ins
......E  TSUPGHSI - Hiperspace Page-Ins
......E  TSUPGHSO - Hiperspace Page-Outs
......E  TSUPGIN  - Page-In Count
......E  TSUPGLPA - LPA Page-Ins
......E  TSUPGOUT - Page-Out Count
......E  TSUPGSTL - Page Steals
......E  TSUPGSWI - Swap Page-Ins
......E  TSUPGSWO - Swap Page-Outs
......E  TSUPGVI  - VIO Page-Ins
......E  TSUPGVO  - VIO Page-Outs
......E  TSUPUTCH - TPUT Character Traffic
......E  TSURESTM - Transaction Residency Time
......E  TSUSCOM  - Short Commands Processed
......   TSUSCTBK - Responses Dropped Due To S/M Ctl Intvl
......E  TSUSDST1 - Count Short Responses Within Limit 1
......E  TSUSDST2 - Count Short Responses Within Limit 2
```

```
......E  TSUSDST3 - Count Short Responses Within Limit 3
......E  TSUSDST4 - Count Short Responses Within Limit 4
......E  TSUSDST5 - Count Short Responses Within Limit 5
......E  TSUSDST6 - Count Short Responses Within Limit 6
......E  TSUSDST7 - Count Short Responses Within Limit 7
......E  TSUSDST8 - Count Short Responses Within Limit 8
......E  TSUSERCU - CPU Service Units
......E  TSUSERIU - IOC Service Units
......E  TSUSERLE - Long Event Service Units
......E  TSUSERME - Medium Event Service Units
......E  TSUSERMU - MSO Service Units
......E  TSUSERSE - Short Event Service Units
......E  TSUSERSU - SRB Service Units
......E  TSUSERVU - Service Units
......E  TSUSICNT - Swap-in Count
......E  TSUSIDCT - Swap-in Delay Count
......E  TSUSIDTM - Swap-in Delay Time
......E  TSUSINTM - Swap-in Time
......E  TSUSNDCT - Sampled Network Delay Event Count
......E  TSUSNDTM - Sample Network Delay Time Total
......E  TSUSRBTM - SRB CPU Time
......E  TSUSRESC - Short Response Event Count
......E  TSUSRSTM - Short Response Time Total
......   TSUSRU   - System Resource Units
......E  TSUSWAPS - Physical Swap-Out Count
......E  TSUSWPLI - Logical Swap-In Count
......E  TSUSWPLO - Logical Swap-Out Count
......E  TSUSWPPI - Physical Swap-In Count
......E  TSUSWPSI - Total Swapped-In Bytes (1K Blocks)
......E  TSUSWPSZ - Total Swapped-Out Bytes (1K Blocks)
......E  TSUSWPTM - Total Logical Swap Time
......E  TSUTCBTM - TCB CPU Time
......E  TSUTCOM  - Total Commands Processed
......E  TSUTDST1 - Count Total Responses Within Limit 1
......E  TSUTDST2 - Count Total Responses Within Limit 2
......E  TSUTDST3 - Count Total Responses Within Limit 3
......E  TSUTDST4 - Count Total Responses Within Limit 4
......E  TSUTDST5 - Count Total Responses Within Limit 5
......E  TSUTDST6 - Count Total Responses Within Limit 6
......E  TSUTDST7 - Count Total Responses Within Limit 7
......E  TSUTDST8 - Count Total Responses Within Limit 8
......E  TSUTGETS - TGETs Issued
......   TSUTHCNT - Think Event Count
......E  TSUTHKTM - Think Time Total
......E  TSUTPUTS - TPUTS Issued
......E  TSUTRANS - SRM Ended Transactions
......E  TSUTRESC - Total Response Event Count
......E  TSUTRSTM - Total Response Time All Functions
```

```
Minimum Data Elements

 ......   TSUSSHCT - Shortest Session Manager Ctl Intvl

Maximum Data Elements

 ......   TSUMXETM - Max Excessive Response Time
 ......E  TSUMXFRM - Max Fixed Frames
 ......   TSUMXKTM - Max User Think Time
 ......   TSUMXLTM - Max Long Response Time
 ......   TSUMXMTM - Max Medium Response Time
 ......   TSUMXSTM - Max Short Response Time
 ......E  TSUMXSWI - Max Swapped-In Bytes (1K Blocks)
 ......   TSUMXTTM - Max Response Time All Functions
 ......   TSUMXUIC - Max Unreferenced Interval Count
 ......E  TSUMXWTM - Max Logical Swap Time
 ......E  TSUSWPHI - Max Swapped-Out Bytes (1K Blocks)

Derived Data Elements

 ......E  TSUAVCTM - Avg TSO Session Length
 ......   TSUAVETM - Avg Excessive Response Time
 ......   TSUAVKTM - Avg User Think Time
 ......E  TSUAVLTM - Avg Long Response Time
 ......E  TSUAVMTM - Avg Medium Response Time
 ......E  TSUAVSTM - Avg Short Response Time
 ......E  TSUAVTTM - Avg Response Time All Functions
 ......E  TSUPCLR1 - Cumm Pct Long Resp Within Limit 1
 ......E  TSUPCLR2 - Cumm Pct Long Resp Within Limit 2
 ......E  TSUPCLR3 - Cumm Pct Long Resp Within Limit 3
 ......E  TSUPCLR4 - Cumm Pct Long Resp Within Limit 4
 ......E  TSUPCLR5 - Cumm Pct Long Resp Within Limit 5
 ......E  TSUPCLR6 - Cumm Pct Long Resp Within Limit 6
 ......E  TSUPCLR7 - Cumm Pct Long Resp Within Limit 7
 ......E  TSUPCMR1 - Cumm Pct Medium Resp Within Limit 1
 ......E  TSUPCMR2 - Cumm Pct Medium Resp Within Limit 2
 ......E  TSUPCMR3 - Cumm Pct Medium Resp Within Limit 3
 ......E  TSUPCMR4 - Cumm Pct Medium Resp Within Limit 4
 ......E  TSUPCMR5 - Cumm Pct Medium Resp Within Limit 5
 ......E  TSUPCMR6 - Cumm Pct Medium Resp Within Limit 6
 ......E  TSUPCMR7 - Cumm Pct Medium Resp Within Limit 7
 ......E  TSUPCSR1 - Cumm Pct Short Resp Within Limit 1
 ......E  TSUPCSR2 - Cumm Pct Short Resp Within Limit 2
 ......E  TSUPCSR3 - Cumm Pct Short Resp Within Limit 3
 ......E  TSUPCSR4 - Cumm Pct Short Resp Within Limit 4
 ......E  TSUPCSR5 - Cumm Pct Short Resp Within Limit 5
 ......E  TSUPCSR6 - Cumm Pct Short Resp Within Limit 6
 ......E  TSUPCSR7 - Cumm Pct Short Resp Within Limit 7
 ......E  TSUPCTR1 - Cumm Pct Total Resp Within Limit 1
```

```
......E  TSUPCTR2 - Cumm Pct Total Resp Within Limit 2
......E  TSUPCTR3 - Cumm Pct Total Resp Within Limit 3
......E  TSUPCTR4 - Cumm Pct Total Resp Within Limit 4
......E  TSUPCTR5 - Cumm Pct Total Resp Within Limit 5
......E  TSUPCTR6 - Cumm Pct Total Resp Within Limit 6
......E  TSUPCTR7 - Cumm Pct Total Resp Within Limit 7
```

5.2.10.3 Usage Considerations

```
This section identifies any special considerations or
techniques related to using the TSO_BU file.  Additionally,
retrieval examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

Before using the TSO batch files for accounting or capacity
planning, carefully consider these impacts:

o Data duplication can occur because resource utilization
  information for batch TSO jobs appears in both the CA MICS
  TSO Analyzer batch files and the Batch Information Area
  files of the CA MICS MVS Batch and Operations Analyzer.

  Please contact CA MICS Product Support before using the TSO
  batch files for these purposes.

o Accounting Considerations

  If both the TSO batch files and the MVS Batch and
  Operations Analyzer files are used for accounting, the
  redundant resource utilization data will result in
  duplicate accounting charges unless you account for
  different resource items from each information area.

  For example, if you account for command count from the TSO
  batch files and CPU time from the MVS Batch and Operations
  Analyzer files, you will not incur duplicate charges.

  If you charge for the same resource item (such as CPU time)
  in both information areas, you end up with duplicate
  charges to the same user.

o Capacity Planning Considerations

  If both the TSO Analyzer's batch files and the MVS Batch
  and Operations Analyzer's Batch Information Area files are
  used for capacity planning purposes, the duplication of
  resource data can skew workload utilization information.

  Consequently, do not use the TSO Analyzer's batch files for
  capacity planning purposes.

  Please note that this recommendation applies only to the
  batch files of the CA MICS TSO Analyzer and not to the
  online-oriented files.
```

1. To activate the TSO_BU file, refer to data base file tailoring discussion in Chapter 6 of the CA MICS System Modification Guide.

2. To populate account code data elements (TSOACTn),
   a. code the TSOACCT and TSOACRT parameters as described in sections 7.2.1 and 7.2.2 of this guide.
   b. change the COMP statement in TSOGENIN as described in section 7.2.3 of this guide.

3. The following data elements only have meaning when using the TSO_BUnn file in the DETAIL time-span. They lose significance once summarization has been performed. These data elements should only be referenced when using the TSO_BUnn file in the DETAIL time-span.

   PERFGRP - Performance Group Number
   ASID - Address Space Identification
   LOGPROC - Logon Procedure Name
   LOGTS - LOGON Time-stamp
   TSUSOPTS - Response Option Flags

4. The data element TSUCOST (Processing Charges) obtains its value from code you write in the user exit _USRSTSU.

5. The following data elements are user-defined or option dependent, and they should be used within the frame of reference of the option's definition.

   CA MICS PARMS SYSID
       CPUMODEL - CPU Model Identification
       TSUCPUNI - Instructions Executed

   TSO/MON Options
       TSMRVAL1-TSMRVAL8 - Response Distribution Limits
       TSMERESP - Excessive Response Time Threshold

6. STARTTS and ENDTS in the DAYS, MONTHS, or YEARS time-spans bound the span of time over which the data has been summarized. STARTTS is the lowest date and time, and ENDTS is the highest date and time, for the data summarized.

   In the DETAIL time-span, STARTTS represents TSO/MON recording interval start time and ENDTS represents TSO/MON recording interval end time.

```
Retrieval Examples
------------------


In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
dependent, so you should find out what the identifiers are at
your installation.

1.  Total the service units used by department REG for
    last month by system (SYSID):

    %LET BY = SYSID YEAR MONTH;
    %LET BREAK = MONTH;
    DATA FILE1;
    SET &TSOM..TSO_BU01;
    IF USER=:'REG';
    DATA FILE1;
    SET FILE1;
    %_BUSUM;
    PROC PRINT; VAR SYSID YEAR MONTH USER TSUSERVU;
    RUN;

2.  Total the service units used by department REG for
    last month on all systems:

    %LET BY = YEAR MONTH;
    %LET BREAK = MONTH;
    DATA FILE1;
    SET &TSOM..TSO_BU01;
    IF USER=:'REG';
    PROC SORT DATA=FILE1; BY &BY;
    DATA FILE1;
    SET FILE1;
    %_BUSUM;
    PROC PRINT; VAR YEAR MONTH USER TSUSERVU;
    RUN;
```

5.2.11 TSO Dynamic Resource Usage File (TSODRU)

The TSO Dynamic Resource Usage File (TSODRU) contains data that quantifies total service (response), load, and usage for all interactive commands (for example, ALLOCATE, CALL, CHANGE) if TSO/MON is instructed to record dynamic resource usage when any command is executed. By default, the TSODRU file is delivered inactive.

You can use the TSODRU file to report the use of interactive facilities and programs such as compilers, program products, games, and service aids (like IMASPZAP).

The TSODRU file is derived from the TSO/MON System Record (200), DRU segment.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.11.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity
DETAIL	N/A
DAYS	N/A
WEEKS	N/A
MONTHS	N/A
YEARS	N/A
TABLES	N/A

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the DERIVED option.

Figure 5-12. TSODRU Time-Span Granularity Chart

5.2.11.2 Data Elements List

```
The table below identifies data elements contained in this
file.  The entries for each data element are:

TIMESPAN:  Defines the timespans in which the data element
           is supported.  The timespans are indicated by
           the letters &amp;quot;XDWMYT&amp;quot; as follows:

                 X - DETAIL
                 D - DAYS
                 W - WEEKS
                 M - MONTHS
                 Y - YEARS
                 T - TABLES AREA
                 . - File is not supported

 The timespan field also indicates Essential Elements with
 the letter E, if applicable.

 DATA ELEMENT:  The data element name.

 DATA ELEMENT DESCRIPTION:  The data element's long name.

 The timespans in which a data element is supported are
 defined by each installation when CA MICS is installed.
 Therefore, this table has been generated as part of the
 installation process to accurately reflect the CA MICS
 system at your installation.



GENERATION DATE: Tue, May 12, 2009

Note:  Essential data elements are identified by an "E"
       under the Timespan asterisk (*) column.

  Time-    Data      Data Element
  Span *  Element    Description (LABEL)
 -------  --------   ----------------------------------------


Sequence/Summary Data Elements

 ......E  COMMAND  - Command Name
 ......E  COMPRIM  - Primary Command Category
 ......E  DAY      - Day of Month
 ......E  HOUR     - Hour of Day
 ......E  MONTH    - Month of Year
```

```
 ......E  SYSID    - System Identifier
 ......E  WEEK     - Week of Year
 ......E  YEAR     - Year of Century
 ......E  ZONE     - Time Zone

Common Data Elements

 ......E  DAYNAME  - Name of Day of Week
 ......E  ENDTS    - End Time Stamp
 ......E  INTERVLS - Number of Recording Intervals
 ......E  MICSVER  - CA MICS Version Number
 ......E  STARTTS  - Start Time Stamp
 ......E  TSMONVER - TSO/MON Version Number

Accumulated Data Elements

 ......E  DRUCOUNT - Times Used
 ......E  DRUCPUTM - CPU Time Consumed
 ......E  DRUEXCPS - I/O (EXCPs) Generated
 ......E  DRUSERVU - Service Units
 ......E  DRUSRBTM - SRB CPU Time
 ......E  DRUTCBTM - TCB CPU Time
 ......E  DRUTGETS - TGETS Issued
 ......E  DRUTPUTS - TPUTS Issued
 ......E  DRUTRANS - SRM Ended Transactions
 ......E  DRUTRESC - Total Response Event Count
 ......E  DRUTRSTM - Total Response Time All Functions
```

5.2.11.3 Usage Considerations

```
This section identifies special considerations or techniques
related to using the TSODRU file.  Additionally, retrieval
examples are provided to help you use this file.

Special Considerations/Techniques
---------------------------------

1.  To activate the TSODRU file, refer to data base file
    tailoring discussion in Chapter 6 of the CA MICS System
    Modification Guide.

2.  STARTTS and ENDTS in the MONTHS time-span bounds the span
    of time over which the data has been summarized.  STARTTS
    is the lowest date and time, and ENDTS is the highest
    date and time, for the data summarized.

    In the DETAIL time-span, STARTTS represents TSO/MON
    recording interval start time and ENDTS represents
    TSO/MON recording interval end time.

3.  The data element COMPRIM identifies the type of the
    command (primary, TSO EDIT subcommand, etc.) based on
    the order in which the TSO/MON Commands Table has been
    defined.

4.  The data element COMMAND contains a value of '*UNKNOWN'
    if the command's abbreviation, COMABB, did not have a
    corresponding match in the TSO/MON Commands Table.

Retrieval Examples
------------------

In the examples, a SAS macro variable is used to specify the
DDname part of the CA MICS file name. These macro variables
are a standard part of CA MICS and are available for all
files. The macro variable name has the form &diiit, where d
is the database identifier, iii is the information area
name, and t is the timespan.  For the examples, a database
identifier of P is used.  The identifier is installation
dependent, so you should find out what the identifiers are at
your installation.


1.  How many resources were consumed for ALLOCATEs
    yesterday by HOUR:

    LET BY = SYSID COMMAND HOUR;
```

```
LET BREAK = HOUR;
DATA FILE1;
SET &PTSOX..TSODRU01;
IF COMMAND='ALLOCATE';
DATA FILE2;
SET FILE1;
%DRUSUM;
PROC PRINT; VAR SYSID COMMAND DRUCOUNT DRUSRBTM
  DRUTCBTM DRUCPUTM DRUTRSTM DRUEXCPS DRUSERVU
  DRUTGETS DRUTPUTS;
```

2. Print the average service units used for each command executed last month by system (SYSID):

```
DATA;
SET &PTSOM..TSODRU01;
AVGSU=DRUSERVU/DRUCOUNT;
PROC PRINT;
  VAR SYSID COMMAND MONTH DRUCOUNT DRUSERVU AVGSU;
```

5.2.12 TSO Workload Manager File (TSOTSW)

The TSO Workload Manager File (TSOTSW) contains data that quantifies MVS/ESA SP 5.1 Workload Manager information when the Workload Manager is operating in goal mode. By default, the TSOTSW file is delivered inactive.

You can use the TSOTSW file to report on the workload manager policy in effect during the measurement interval.

This file is derived from the TSO/MON System Record, WSCB segment.

The following sections describe the file's organization, list the data elements maintained, and provide usage hints.

1 - File Organization
2 - Data Elements List
3 - Usage Considerations

5.2.12.1 File Organization

The table below identifies data elements by which the file is sequenced and summarized in each timespan. N/A indicates that the file is not supported in a timespan. At the DETAIL level, data is sequenced but not summarized.

NOTE: The timespans in which a file is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

Timespan	Level of Data Granularity				
DETAIL	SYSID	YEAR	MONTH	DAY	HOUR
	ENDTS	WLMPOLCY	WLMCLASS	WLMCLSPD	
DAYS	SYSID	YEAR	MONTH	DAY	HOUR
	WLMPOLCY	WLMCLASS	WLMCLSPD		
WEEKS	SYSID	YEAR	WEEK	ZONE	HOUR
	WLMPOLCY	WLMCLASS	WLMCLSPD		
MONTHS	SYSID	YEAR	MONTH	ZONE	WLMPOLCY
	WLMCLASS	WLMCLSPD			
YEARS	SYSID	YEAR	ZONE	WLMPOLCY	WLMCLASS
	WLMCLSPD				
TABLES	N/A				

Generation Date: Tue, May 12, 2009

NOTE: This file was generated with ESSENTIAL=ALL option in effect. All data elements defined in the file are generated.
NOTE: This file was generated with DERIVED=DEFault option in effect. Whether data elements are kept on the file on auxiliary storage or not is controlled by the complex definition of the

DERIVED option.

Figure 5-13. TSOTSW Time-Span Granularity Chart

5.2.12.2 Data Elements List

The table below identifies data elements contained in this file. The entries for each data element are:

TIMESPAN: Defines the timespans in which the data element is supported. The timespans are indicated by the letters "XDWMYT" as follows:

X - DETAIL
D - DAYS
W - WEEKS
M - MONTHS
Y - YEARS
T - TABLES AREA
. - File is not supported

The timespan field also indicates Essential Elements with the letter E, if applicable.

DATA ELEMENT: The data element name.

DATA ELEMENT DESCRIPTION: The data element's long name.

The timespans in which a data element is supported are defined by each installation when CA MICS is installed. Therefore, this table has been generated as part of the installation process to accurately reflect the CA MICS system at your installation.

GENERATION DATE: Tue, May 12, 2009

Note: Essential data elements are identified by an "E" under the Timespan asterisk (*) column.

Time-Span *	Data Element	Data Element Description (LABEL)

Sequence/Summary Data Elements

XD....E	DAY	- Day of Month
XDW...E	HOUR	- Hour of Day
XD.M..E	MONTH	- Month of Year
XDWMY.E	SYSID	- System Identifier
XDW...E	WEEK	- Week of Year
XDWMY.E	WLMCLASS	- Service Class Name

```
 XDWMY.E  WLMCLSPD - Service/Report Class Period
 XDWMY.E  WLMPOLCY - Service Policy Name
 XDWMY.E  YEAR     - Year of Century
 XDWMY.E  ZONE     - Time Zone

Common Data Elements

 XDWMY.E  CPUMODEL - CPU Model Identification
 XD....E  DAYNAME  - Name of Day of Week
 XDWMY.E  DURATION - Recording Interval Time
 XDWMY.E  ENDTS    - End Time Stamp
 XDWMY.E  INTERVLS - Number of Recording Intervals
 XDWMY.E  ORGSYSID - Originating System Identification
 XDWMY.E  STARTTS  - Start Time Stamp
 XDWMY.E  TSMONVER - TSO/MON Version Number
 XDWMY.E  WLMGOLPC - Service Goal - Resp Time Percentile
 XDWMY.E  WLMGOLRI - Service Goal - Relative Importance
 XDWMY.E  WLMGOLRT - Service Goal - Response Time
 XDWMY.E  WLMGOLTP - Service Goal Type
 XDWMY.E  WLMGOLVE - Service Goal - Velocity

Retained Data Elements

 XDWMY.E  TSWPERDS - Number of Service Class Periods
 XDWMY.E  TSWTHRSH - Service Class Period SU Threshold
```

5.2.12.3 Usage Considerations

This section identifies special considerations or techniques related to using the TSOTSW file. Additionally, retrieval examples are provided to help you use this file.

Special Considerations and Techniques

1. To activate the TSOTSW file, refer to data base file tailoring discussion in Chapter 6 of the CA MICS System Modification Guide.

2. STARTTS and ENDTS in the MONTHS time-span bounds the span of time over which the data has been summarized. STARTTS is the lowest date and time, and ENDTS is the highest date and time, for the data summarized.

   In the DETAIL time-span, STARTTS represents TSO/MON recording interval start time and ENDTS represents TSO/MON recording interval end time.

Retrieval Example

In the examples, a SAS macro variable is used to specify the DDname part of the CA MICS file name. These macro variables are a standard part of CA MICS and are available for all files. The macro variable name has the form &diiit, where d is the database identifier, iii is the information area name, and t is the timespan. For the examples, a database identifier of P is used. The identifier is installation dependent, so you should find out what the identifiers are at your installation.

1. List the Workload Manager Response Time Percentile values for the CLASS1 Service Class.

```
%LET BY = WLMPOLCY WLMCLASS YEAR MONTH DAY;
DATA FILE1;
SET &TSOD..TSOTSW01;
IF WLMCLASS=:'CLASS1';
PROC SORT DATA=FILE1; BY &BY;
PROC PRINT;
VAR YEAR MONTH DAY HOUR WLMPOLCY WLMCLASS TSWGOLPC;
BY &BY;
RUN;
```

Chapter 6: DATA SOURCES

The CA MICS TSO Analyzer uses CA TSO/MON Command Records' and System Records' measurement data to produce files in the TSO Information Area of the CA MICS data base. Consult with your organization's TSO/MON System Administrator to ensure that these records are available from your TSO/MON system.

Details about records used by this CA MICS product are discussed later in this chapter. For additional information about data sources, refer to the TSO/MON documentation.

This section contains the following topics:

6.1 Data Collector Considerations

Before installing the CA MICS TSO Analyzer, the CA MICS System Administrator must address the data collection considerations that TSO/MON requires. These include space considerations, record type identification, and the availability of TSO/MON data sets.

- The TSO/MON Command Records provide the data for the TSO User Interactive Usage File (TSOTSI) and the TSO Data Set Name File (TSOTSA). Thus, whenever TSO/MON detail command recording is changed to substantially increase the number of TSO/MON command records generated, the System Administrator must assess the space impact on these files.

- The SMF record type numbers used for the TSO/MON System and Command Records must be identical to those specified on the INPUTSOURCE statement in sharedprefix.MICS.GENLIB(TSOGENIN).

- Prior to TSO/MON Version 6, the daily execution of the data base update step reads the TSO/MON Command Table parameters from the source library specified in the TSMPARMS DD card of prefix.MICS.PARMS(JCLDEF), parses it, and translates the two character command abbreviations found in the input records back to the full command and subcommand name. The TSO Analyzer uses standard TSO/MON routines to open and search the TSO/MON Command Table, which must be available during execution of the daily step. These routines are specified on the TSMLINK DD card.

  At TSO/MON Version 6 and higher, the daily execution of the data base update step reads the full command name directly from the TSO/MON System and Command records, so parsing and translating command abbreviations from the TSO/MON Command Table is unnecessary.

6.2 Record Descriptions

The TSO/MON records shown in Figure 6-1 are used by the CA MICS TSO Analyzer. The figure shows when each record is written and what each record contains.

Two types of records are generated by TSO/MON: System Records and Command Records. A brief description of these records follows. You can find more detailed information in the TSO/MON Technical Reference Guide.

Record name	Written	Record contents
System (200)	For every TSO/MON recording interval	TSO System Resource Usage User Resource Usage TSO Performance Information TSO Dynamic Resource Usage WLM Goal Mode Usage
Command (199)	At the end of each interactive command execution or checkpoint interval	Performance and Resource Usage Information for Selected Commands

Figure 6-1. TSO/MON Record Descriptions

TSO/MON System Record (Type 200)

This record describes system and user activity over the installation-defined processing interval (a time period). Because this record could become very large with many concurrent users, it is split into multiple physical records when it exceeds a set maximum length. To obtain system level statistics, the user level information in each physical record is aggregated and then combined with similar data from any other system records that describe the same interval.

The System Record is a variable length physical record comprised of logical sections. The System Record always contains both TSO system status and user activity information. The exact size of a physical record depends on the number of users logged on to TSO during the interval.

The System Record consists of:

- One System Control Block (SCB) section that contains system level information. Half-word offsets in the SCB point to the EXCB, PGB (not running the WLM in goal mode), or WSCB (running the WLM in goal mode), and the first UCB. The offset value of the EXCB and the PGB or WSCB is zero in the second and subsequent System Records describing the same time period. The offset value for the first UCB is zero when no user activity occurs in the interval. There is an SCB section in every System Record describing the same time period.

- One Exception Control Block (EXCB) section that contains system exception information. There is only one EXCB for each processing interval, and it is in the first physical record. There is no EXCB in the second and subsequent System Records describing the same time period.

- For TSO/MON releases not running the WLM in goal mode, one Performance Group Block (PGB) section that contains the performance groups and service values used during the processing interval. This block is variable length and contains one to ten entries. There is at most one PGB for each processing interval, and it is in the first physical record. There is no PGB in the second and subsequent System Records describing the same time period. The PGB is appended to the System Record only if the Service Unit response type option was selected.

- For TSO/MON releases running the WLM in goal mode, one Workload Manager Service Class Block (WSCB) section that describes the workload manager policy used during the measurement interval. It contains the policy name, the number of service classes in the policy, and, for each service class, information about performance periods.

- One User Control Block (UCB) section for each user logged on during the interval. Each UCB has a half-word offset field which points to the next UCB and a half-word offset field which points to the User Control Block Extension (UCBE) for the current UCB. The value of the 'next ucb' pointer is zero in the last UCB section in a record. A flag byte within the UCB identifies the source of the information as batch TSO or online TSO.

- For TSO/MON releases prior to Version 6, one Command Control Block (CCB) section for each unique command issued by the user during the interval. The UCB contains the

number of unique commands issued in the interval. CCBs are appended to UCBs only for TSO users who issued commands during the interval.

- One User Control Block Extension (UCBE) section for each user logged on during the interval. Each UCBE has a half-word offset field which points to the first Full Command Block (FCB). The value of this offset is zero when there is no FCB section.

- One Full Command Block (FCB) section for each unique command, each user dialog program, each user dialog panel, and the name of each CLIST invoked by the user during the processing interval. The UCBE contains a count of the number of FCB sections. FCBs are appended to the UCBEs only if the Full Command Name option was specified in the TSO/MON Options Table.

- One Accounting Segment (ACT) is appended to each UCBE after any FCBs if ACCOUNTING=YES is specified in the TSO/MON Options Table. Each accounting segment is variable in length and is an exact duplicate of the accounting information available in the SMF type 35, or type 30 records.

- One Dynamic Resource Usage Block (DRU) section for each command executed within the interval. The SCB contains a half-word offset field which points to the first DRU and a half-word count field which contains the number of DRU segments present in the System Record. The DRU segments are contained in 1 or more System Records following the last UCB containing System Record. The DRU segment is optional and will be present only if TSO/MON is instructed to record all command usage.

Each separate physical record consists of one SCB (see description) and zero or more UCB/CCB/UCBE/FCB/ACT and DRU logical sections. There can be many physical records per interval. For a given processing interval, the EXCB and PGB or WSCB segments are present only in the first physical record.

The record generation date/time stamps of these physical records are identical. The length-of-processing-interval field (TSMSINTV) of the SCB is zero in all physical records but the first. From the standard SMF header (starting at the system indicator field) down through the zero TSMSINTV field, the second and subsequent physical records for the same processing interval are identical. The next field in the SCB

is named TSMSSEGN. It increments by one for each physical record, starting at one.

TSO/MON Command Record (Type 199)

When the Command Record Generation option is specified in the TSO/MON Options Table, a command record is written to SMF each time a TSO user issues a command or subcommand that the installation has selected for recording. An installation selects commands for which recording is desired by specifying DETAIL=COMMAND or PROGRAM in the TSO/MON Commands Table entry for the individual commands. Coding DETAIL=COMMAND in the Commands Table entry indicates that a command record with no program information is to be generated. Coding DETAIL=PROGRAM indicates that a program name is to be provided in the command record. If the Data Set Name Recording option is also specified in the TSO/MON Options Table, then coding DETAIL=PROGRAM in the Commands Table entry indicates that a command record containing program name and data set name is to be generated.

Command Records contain resource usage measurements, response and swap statistics, and TSO terminal characteristics for each invocation of the selected commands. A flag byte in the record indicates whether the record was generated as a result of a command executing under batch TSO or online TSO.

If the checkpoint option is specified in the TSO/MON Options Table, a checkpointed command record is written for long-running TSO commands each time the checkpoint number of processing intervals is exceeded.

The DSname and member blocks are present only if a positive integer value was specified for the DSNAME=nnn option in the TSO/MON Options Table and DETAIL=PROGRAM was specified for this particular command in the TSO/MON Commands Table (see above). The length of this additional information varies and could theoretically reach 32760 bytes in length (including the standard portion of the Command Record).

The information below is repeated for as many data sets as are accessed in the invocation of the command. For example, if the command is CALL, then only one data set name and one member name will be appended to the Command Record if the data set name information is available in the command buffer. If the command is SPFEDIT (PDF Option 2), the data set names and member names are appended to the end of the Command

Record as they are accessed during execution of the SPFEDIT Command. PDF Functions 1 (BROWSE), 2 (SPFEDIT), and 3.x (UTILITIES) are supported by the SPF Interface for data set name capture.

The accounting segment is present only if ACCOUNTING=YES has been specified in the TSO/MON Options Table.

6.3 CA MICS and CA SMF Director Interface

CA SMF Director is an SMF management product with special features that can be used to optimize CA MICS processing. CA SMF Director can significantly reduce operational overhead by creating content specific files while simultaneously creating an SMF historical archive during the SMF dump process.

CA MICS DAILY and incremental update operational jobs can be modified to take advantage of this product, provided your site is licensed for and has CA SMF Director installed in your environment.

CA SMF Director provides functions that extract SMF data at dump time or from previously archived SMF files. These functions eliminate the need for any external utilities used for preprocessing of the SMF dump tape for data extraction prior to execution of the DAILY job. In addition, the DAYSMF step of the CA MICS DAILY job may no longer be required. For details on how to eliminate the DAYSMF step, see section 5.10, Removing the DAYSMF Step from the DAILY Job of the PIOM guide.

CA SMF Director SPLIT and EXTRACT statement operands provide a way for you to create content specific files to meet your requirements. The main functions of the operands include the ability to:

- Select system identifiers
- Select or exclude SMF record types and subtypes
- Use conditional statements for granularity
- Define time boundaries for SMF data

To use the SPLIT function of CA SMF Director for CA MICS components, one or more SPLIT statements must be coded. The split is performed at SMF dump time and the files can then be used as input to products in one or more units. The same results can be accomplished by using the EXTRACT function of CA SMF Director, which retrieves data from the previously created history files. For more information on the SPLIT and EXTRACT functions, see the CA SMF Director User Guide at http://ca.com/support.

A complete set of SMF record types and subtypes, for each CA MICS component that inputs SMF data, can be found in sharedprefix.MICS.PARMS(cccSMFD), where ccc is the three-character product identifier. Each PARMS member lists the available SMF record types and subtypes for that component in a format suitable for use in CA SMF Director SPLIT and EXTRACT statements. These members are provided as examples only; the CA SMF Director JCL should not reference sharedprefix.MICS.PARMS(cccSMFD).

Chapter 7: DEFINING PARAMETERS

This chapter describes how to define the parameters that are required for installing the CA MICS TSO Analyzer. The CA MICS System Administrator should use this chapter as a detailed reference in conjunction with the CA MICS Planning, Installation, Operation, and Maintenance (PIOM) Guide.

Defining CA MICS parameters requires you to gain the necessary understanding of your installation and its needs, and translate that understanding into CA MICS parameters.

In particular, this chapter requests that you:

- Arrive at a number of policy decisions.
- Fill out several worksheets.
- Translate the worksheet entries into the corresponding CA MICS parameter library member entries.

These activities represent the major portion of the product installation process.

This chapter focuses on considerations that are unique to the TSO Analyzer. Chapters 2 and 3 of the CA MICS PIOM Guide document the mechanics of the CA MICS installation process and include checklists that describe each installation step.

If you have a question at any time during your review of the material presented here, please contact the CA MICS Product Support Group.

This section contains the following topics:

7.1 Environmental Considerations

Before coding product parameters, you need to know about the TSO environment(s) at your installation. Before you specify parameters for the product:

- Examine existing user groups, account codes, and job control information used by the TSO system. This information helps you code appropriate values for account codes.
- Review the default options for the parameters to determine their applicability to your site.
- Review reporting requirements to determine whether or not you need to code MICF II inquiries to satisfy the needs of the TSO group.
- Review current CA MICS parameter specifications:
  - Review data base unit specifications to determine which unit or units should include TSO/MON data.
  - Review the SYSID parameter to determine whether it correlates to the TSO data. Your site's SYSID definition is located in the prefix.MICS.PARMS data set associated with each data base unit.
  - Review the CA MICS ZONE parameter to ensure that it reflects the variations in TSO data. This parameter is located in the prefix.MICS.PARMS data set associated with each data base unit.
  - Examine existing accounting standards for other CA MICS components, if applicable, to ensure that the CA MICS Accounting and Chargeback Product aggregates information consistently.

7.2 Complex Level Parameters

Complex level parameters describe the TSO Analyzer to the CA MICS system. These parameters are described in the following subsections:

1 - Account Code Specification (TSOACCT)
2 - Account Code Exit Routine (TSOACRT)
3 - Analyzer Definition Statements (TSOGENIN)

7.2.1 Account Code Specification (TSOACCT)

Account code data elements, a part of the file's sort and summarization key, have names of the form TSOACTx, where x is 1 through 9. If you activate the account code support, the TSO Analyzer uses these TSOACTx elements to associate monitor data with the responsible individual or group.

The following TSO Analyzer files support account codes:

- TSO User Activity File (TSOTSU)
- TSO User Command Counts File (TSOTSC)
- TSO User Interactive Usage File (TSOTSI)
- TSO Batch User Activity File (TSO_BU)
- TSO Batch User Command Counts File (TSO_BC)
- TSO Batch Command Information File (TSO_BI)

The account code parameter, sharedprefix.MICS.PARMS(TSOACCT), defines how many account code fields are maintained in the TSO Analyzer's files. (CA MICS supports from one through nine account codes.) In addition to defining the number of fields, the TSOACCT parameter defines the length of each field and its contents.

The parameters specified in the TSOACCT member of the sharedprefix.MICS.PARMS data set define the account field structure. To assign values to the account fields, you need to code an account code exit routine, TSOACRT, described in Section 7.2.2.

Once you have defined the account codes and their derivation, you need to activate them by setting an option in the sharedprefix.MICS.GENLIB(TSOGENIN) member. Section 7.2.3 describes how to activate the account codes.

PREPARATION

Each installation has its own method for associating commands and users with the projects or departments within the organization. Before defining the account codes, you should investigate your installation's accounting standards, in order to:

- Identify the coding system (e.g., your cost center coding system for identifying the division, department, project and employee).

- Identify how the codes are specified. For example,

the division may be determined by part of the user ID.

- Identify if and how the codes are verified to ensure that they correspond to a valid definition. We recommend that you validate all account codes and assign unidentified or invalid account codes to a special installation overhead account code (see the documentation of the TSOACRT exit). This approach provides two benefits: it will filter out invalid codes from inclusion in the data base and, therefore, will require less DASD space for storing the data in the TSO Information Area files; and you can easily see how much of this unidentifiable activity is taking place.

Consider the following in determining the number of account fields required to meet your installation's reporting and analysis needs:

- Account fields are part of the file keys for the files that support them. As such, at least one record is generated for each combination of values. (More than one record may be generated because other fields also make up the file keys.) A greater number of account fields means that the data base will be larger than if fewer account fields are defined, but reporting and analysis can be performed in greater detail.

- If you anticipate needing to expand the account code structure in the future, establish an extra account code now to eliminate the need to retrofit the data base later to add the new account code.

DEFINING THE TSO ACCOUNT CODE PARAMETER

Once prepared, code the contents of the worksheet in the data set sharedprefix.MICS.PARMS(TSOACCT). Observe the following conventions when coding:

- Blank statements are permitted. Comments are coded by beginning the statement with an asterisk (*).

- Account levels must be specified in ascending order, starting with 1. You can specify up to nine account levels, with no gaps between the numbers.

- The statements are free-form but positional.

```
SAMPLE TSOACCT MEMBER

The sample TSOACCT member is distributed to contain:

* SAMPLE ACCOUNT CODE SPECIFICATION
     1 10 'DIVISION'
     2 10 'USER'

This sample uses only two account codes:  one for division,
the other for user.  Each account code is ten bytes long.


SPECIFYING THE TIME-SPAN MASK OPTION

The time-span mask option is used to deactivate the account
code in specified time-spans.  Specifying a time-span mask
requires coding the account code statement using the time-
span mask parameter T(......), as follows:

          level  T(......)  length  'descriptive title'

This example shows the placement and syntax of the time-span
mask on the account code statement.  Each "." position in the
T position represents a time-span, in the order:  DETAIL,
DAYS, WEEKS, MONTHS, YEARS, and TABLES.  For each time-span,
a Y indicates that the account level should be active and an
N indicates that the account level should be inactive.

This parameter is optional.  If it is not coded, the assumed
value is T(YYYYYY).

The following rules apply if you code this parameter:

    o  DETAIL must always be Y.  Account codes may not be
       deactivated in this time-span.

    o  If DAYS is N, then WEEKS, MONTHS, and YEARS must also
       be N.  If the account code level is inactive in the
       DAYS time-span, it cannot be active in higher
       time-spans.

    o  If MONTHS is N, then YEARS must be N.  If the account
       code level is inactive in the MONTHS time-span, it
       cannot be active in the YEARS time-span.

COLLECTING DATA TO SPECIFY ACCOUNT CODES
```

Use the worksheet in Figure 7-1 to organize the information
needed to code TSOACCT.

```
+-------------------------------------------------------------------------+
| INSTALLATION PREPARATION WORKSHEET:  TSO Account Code Specification     |
| PARMS Library Member is TSOACCT                                         |
| Reference:  Section 7.2.1 - CA MICS TSO Analyzer Guide                  |
+-------------------------------------------------------------------------+
|                                                                         |
|  ACCOUNT  TIME SPAN  FIELD                                              |
| CODE LEVEL  MASK     LENGTH  DESCRIPTION                                |
|   (1-9)                                                                 |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|     _     T(______)   __    '_____________________________________'    |
|                                                                         |
|                                                                         |
|                                                                         |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+
| ....5...10...15...20...25...30...35...40...45...50...55...60...65...70.. |
+-------------------------------------------------------------------------+
```

Figure 7-1. TSO Account Code Specification Worksheet

where the fields are:

ACCOUNT CODE LEVEL — the level of importance of the element. Level 1 is the most important field, and level 9 is the least important.

TIME-SPAN MASK	account code levels can be deactivated in the DAYS, WEEKS, MONTHS, and YEARS time-spans. For example, the DETAIL time-span may have account code levels 1, 2, and 3, while the MONTHS time-span has only level 1. Setting account code levels by time-span is accomplished by specifying this additional parameter on the account code statements, as described below.
FIELD LENGTH	the length of the specified element. Valid lengths range from 1 to 30.
DESCRIPTION	the title that describes the account code level. Valid descriptions range from 1 to 40 characters.

7.2.2 Account Code Exit Routine (TSOACRT)

An account code exit routine tells CA MICS how to assign values to the fields defined by the account code specification. The routine is invoked to build the elements TSOACTn, where n is the account code level. For example, if TSOACCT defines three account code levels, TSOACRT builds the elements TSOACT1, TSOACT2, and TSOACT3.

The routine sets the values of all TSOACTn variables in the following files:

- TSO User Activity File (TSOTSU)
- TSO User Command Counts File (TSOTSC)
- TSO User Interactive Usage File (TSOTSI)
- TSO Batch User Activity File (TSO_BU)
- TSO Batch User Command Counts File (TSO_BC)
- TSO Batch Command Information File (TSO_BI)

Code the account code exit routine in SAS and verify that it is correct. A sample TSOACRT member is provided in sharedprefix.MICS.PARMS(TSOACRT). Refer to Section 2.3.1.5, Notes on Coding CA MICS Parameters, in the CA MICS Planning, Installation, Operation, and Maintenance Guide for coding help. Figure 7-2 provides a worksheet for coding your routine.

PREPARATION

The CA MICS TSO Analyzer provides a sample account code exit routine and certain program aids to help you verify the accuracy of any modifications you make to the routine. You can use each of the elements in the TSOTSI and TSOTSC files for deriving account code information for commands. For each user, all the elements in the TSOTSU file are available. The TMPBATCH element can be used to determine the source of the information being processed. A value of zero indicates online TSO information while a value of one indicates batch TSO information. TMPBATCH is available at execution time, but is not retained in the data base files.

Exits to the account code derivation routine are provided at the point just prior to the creation of records in these files. If the assignment of account codes depends on the specific invocation of the routine, the variable SMFRTYPE, which identifies the SMF record type, can be tested. SMFRTYPE will have a value equal to that contained in variable K199 if the routine has been invoked for TSOTSI and

TSO_DBI records, and equal to variable K200 if the routine has been invoked for TSOTSU, TSOTSC, TSO_DBU, and TSO_DBC records.

The data element that is most often used to determine the account code value is USER (User ID). In addition, you can use five variables, ACTFLD1 through ACTFLD5, which contain the first five levels of the MVS accounting information.

NOTE: The ACTFLD1 through ACTFLD5 variables are not stored in the data base and are only present when the input data source is TSO/MON Release 5.0 or higher.

EXAMPLES

Example 1:

The following example assumes that an installation has defined two account code levels in sharedprefix.MICS.PARMS member TSOACCT and that they are derived as follows:

TSOACT1 - is the first three characters of the user ID.

TSOACT2 - is the second four characters of the user ID.

An overhead category is defined for each account code level. The TSOACCT member for the account definition would be:

```
1 3 'DIVISION'
2 4 'USER'
```

The SAS code defined for the user account code exit would be as follows:

```
/*-----------------------------------------------------------*/
/*                                                           */
/* SAMPLE TSO ACCOUNT CODE DERIVATION EXIT                   */
/*                                                           */
/*  DIVISION IS BUILT FROM POSITIONS 1-3 OF USER ID.         */
/*                                                           */
/*  USER IS BUILT FROM POSITIONS 4-7 OF USER ID.             */
/*                                                           */
/*                                                           */
/*  NOTE: ANY DATA ELEMENT IN THE DATA SET ALLOCATION FILE */
/*        CAN BE USED IN DERIVING THE ACCOUNT CODES.         */
/*        ADDITIONALLY, THE FOLLOWING VARIABLES ARE          */
/*        AVAILABLE WHEN THE INPUT DATA SOURCE IS            */
/*        TSO/MON RELEASE 5.0 OR HIGHER:                     */
```

```
/*                                                          */
/*        ACTFLD1-ACTFLD5 ARE VARIABLES THAT CONTAIN THE    */
/*        FIRST FIVE LEVELS OF MVS ACCOUNTING INFORMATION,  */
/*        RESPECTIVELY.                                     */
/*                                                          */
/*----------------------------------------------------------*/
     IF LENGTH(USER) LT 3 THEN TSOACT1 = '***';
     ELSE TSOACT1 = SUBSTR(USER,1,3);
     IF LENGTH(USER) LT 7 THEN TSOACT2 = '****';
     ELSE TSOACT2 = SUBSTR(USER,4,4);
```

Example 2:

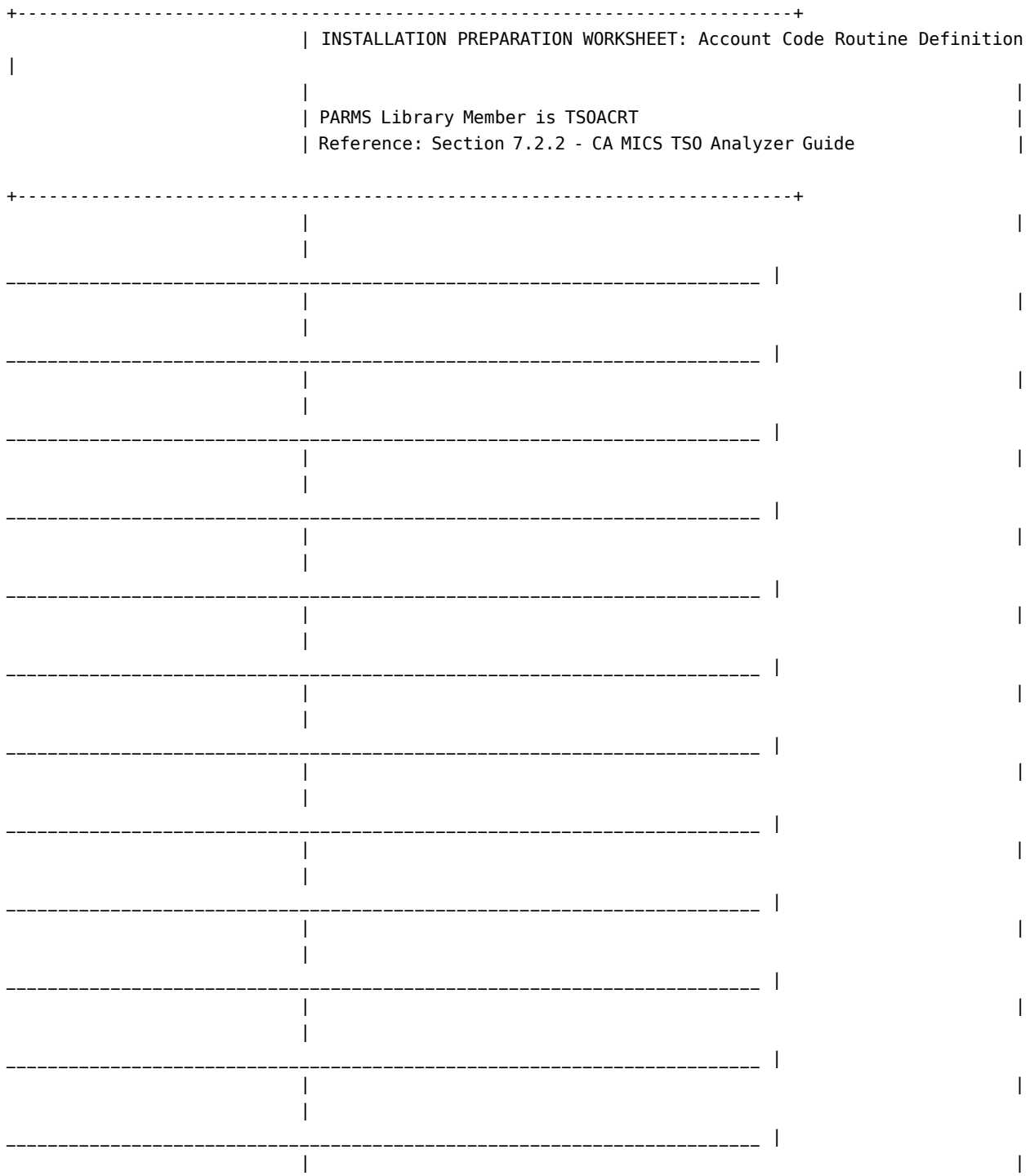
In the next example, the MVS accounting information fields for the TSO logon session as recorded by TSO/MON (Release 5.0 and higher) are assigned to the TSOACTn variables. The TSOACCT member for the account definition for this example is:

```
    1 10 'DIVISION'
    2 10 'USER'
```

The SAS code defined for the user account code exit would be as follows:

```
/*----------------------------------------------------------*/
/*                                                          */
/* SAMPLE TSO ACCOUNT CODE DERIVATION EXIT                  */
/*                                                          */
/*  IN THIS EXAMPLE, TWO ACCOUNT CODES ARE DEFINED.         */
/*                                                          */
/*  DIVISION AND USER ARE BUILT FROM THE FIRST TWO LEVELS   */
/*  OF MVS ACCOUNTING INFORMATION.  THIS INFORMATION IS     */
/*  ONLY PRESENT WHEN THE INPUT DATA SOURCE IS TSO/MON      */
/*  RELEASE 5.0 AND HIGHER.                                 */
/*                                                          */
/*----------------------------------------------------------*/
  IF TSMONVER GE '50' THEN DO;
     TSOACT1=ACTFLD1;
     TSOACT2=ACTFLD2;
  END;
```

Use the worksheet in Figure 7-2 to code your account code exit routine (TSOACRT).


INSTALLATION PREPARATION WORKSHEET: Account Code Routine Definition
PARMS Library Member is TSOACRT
Reference: Section 7.2.2 - CA MICS TSO Analyzer Guide

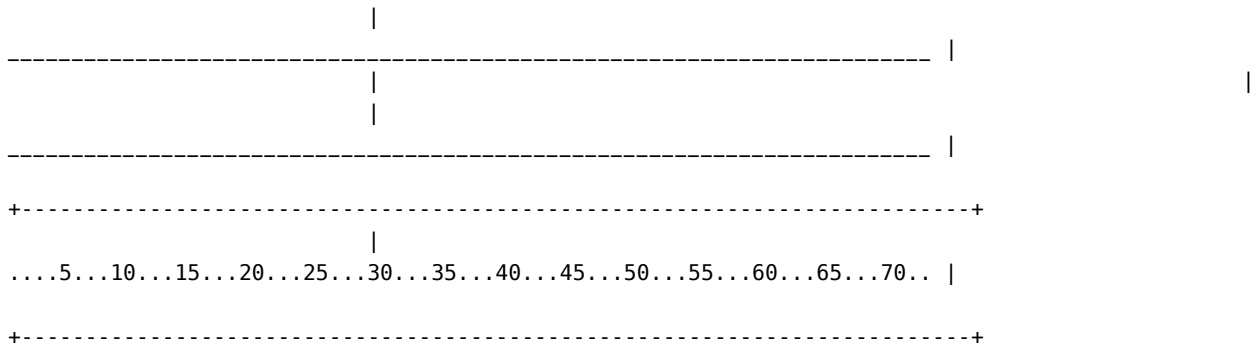


Figure 7-2. TSO Account Code Exit Routine Worksheet

7.2.3 Analyzer Definition Statements (TSOGENIN)

A Generation Definition Statement member is provided for the CA MICS TSO Analyzer in the TSOGENIN member of the sharedprefix.MICS.GENLIB library. TSOGENIN contains the component definition input to the component generation job in sharedprefix.MICS.CNTL(TSOCGEN). Review this member to check the component definitions and make any desired changes as described below. If you need more information on the use and modification of Generation Definition Statements, refer to Section 4.2.4 of the System Modification Guide.

Activating Account Codes

To activate account codes in the CA MICS TSO Analyzer, change the COMP statement keyword from NOACCT to ACCT. You must run the TSOCGEN job to make the TSOGENIN change effective. Then you must code the TSOACCT and TSOACRT parameter members discussed earlier in this chapter.

Changing Input Data Source Specifications

By default, TSO/MON writes the Command and System Records to SMF using record types 199 and 200, respectively. If your installation changed the default record type numbers, be sure to update the INPUTSOURCE statement.

When defining the new SMF record numbers on the INPUTSOURCE statement, code the Command record number before the System record number. For example, if the TSO/MON Command record has been assigned the SMF record type of 205 and the TSO/MON System record has been assigned the SMF record type of 206, then the INPUTSOURCE statement would be coded as:

```
INPUTSOURCE SMF 205 206
```

7.3 Unit Level Parameters

This section contains information on the unit level parameters for the TSO Analyzer:

1 - TSO Application Unit Derivation Routine (TSOAURT)
2 - JCL Control Definitions (JCLDEF)
3 - Database Space Modeling (DBMODEL)
4 - TSO Processing Options (TSOOPS)
5 - INPUTRDR and INPUTTSO PARMS Members

7.3.1 TSO Application Unit Derivation Routine (TSOAURT)

The TSO Application Unit Identifier (TSOAPU) data element is used for transaction accounting by CA MICS Accounting and Chargeback. It is present in the following files:

TSO User Command Counts File (TSOTSC)
TSO User Interactive Usage File (TSOTSI)
TSO Batch User Command Counts File (TSO_BC)
TSO Batch Command Information File (TSO_BI)

TSOAPU is normally set to the value of COMMAND (the TSO command name). For the TSOTSI and TSO_BI files, TSOAPU can optionally be set to the value of PROGRAM (the name of the program executed). TSOAPU differs from the cccAPU field of other CA MICS products in that it is not part of the file's key.

The TSO application unit derivation routine (TSOAURT), a user-written routine, assigns a value to the TSOAPU (TSO Application Unit) variable.

The TSOAURT routine is invoked once for each observation to be placed in the files. If an observation is being placed in the TSOTSC and TSO_BC files, the value of the work variable WRKTSC is 1. If an observation is being placed in the TSOTSI and TSO_BI files, the value of the work variable WRKTSI is 1. These work variables make it possible to determine which file is currently in use, and to take specific action in the TSOAURT routine based on the requirements of the file.

The application unit routine is written in SAS and stored in prefix.MICS.PARMS(TSOAURT). Coding and testing the accuracy of the exit is your responsibility. However, a sample application unit derivation routine is provided in the distributed TSOAURT member. The worksheet for coding the TSO Application Unit Derivation Routine is shown in Figure 7-3.

PREPARATION

Follow these guidelines for coding this CA MICS exit routine:

1. Validate input data to ensure that they have valid application units. When invalid codes are encountered, they should be assigned to the application codes representing the installation's overhead account.

2. Ensure that all of the fields that you require are

available for application unit construction.

3. Refer to the discussion of exit coding in Notes on Coding CA MICS Parameters, Section 2.3.1.5 of the CA MICS Planning, Installation, Operation, and Maintenance Guide.

SAMPLE

A sample application unit exit routine is shown below.

```
/* ********************************************************
** TSOAURT - TSO APPLICATION UNIT EXIT ROUTINE SAMPLE     **
** ********************************************************/

/* THIS ROUTINE SETS THE VALUE OF TSOAPU FROM THE COMMAND */
/* NAME FOR THE TSOTSI AND TSOTSC FILES.  OTHERWISE, IT IS*/
/* SET TO BLANKS.                                         */

IF WRKTSI OR WRKTSC THEN TSOAPU=COMMAND;
ELSE TSOAPU=BLANKS;
```

```
+-------------------------------------------------------------------------+
                           | INSTALLATION PREPARATION WORKSHEET: TSO Application Unit Routine     |
                           |                                  Definition                          |
                           | PARMS Library Member is TSOAURT                                      |
                           | Reference:  Section 7.3.1 - CA MICS TSO Analyzer Guide               |

+-------------------------------------------------------------------------+
                           |                                                                      |
                           | * VALIDATE FOR VALID APPLICATION UNITS, WHERE POSSIBLE ;             |
                           |                                                                      |
                           |
_____________________________________________________________________________ |
                           |                                                                      |
                           |
_____________________________________________________________________________ |
                           |                                                                      |
                           |
_____________________________________________________________________________ |
                           |                                                                      |
```

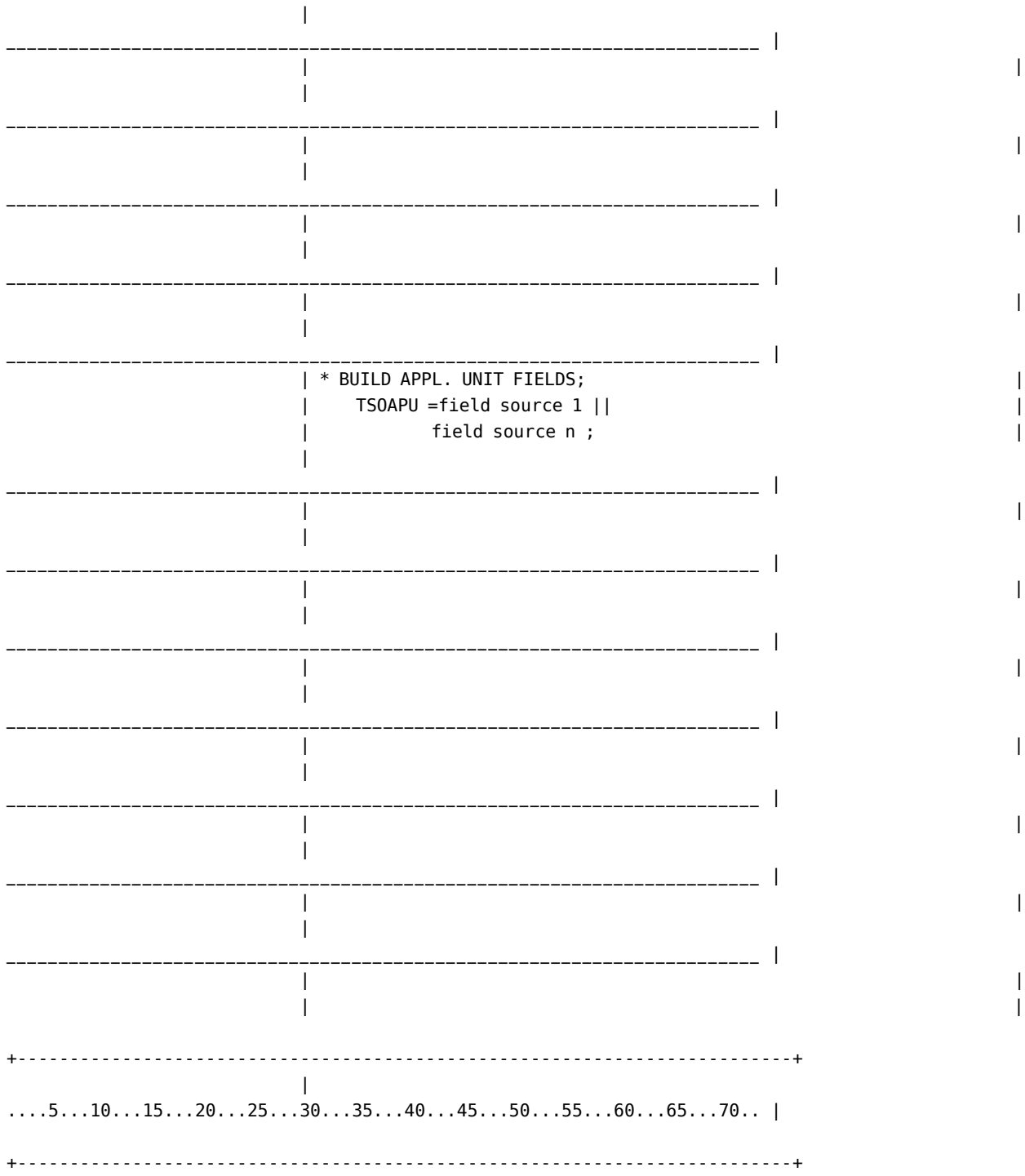


Figure 7-3. TSO Application Unit Routine Worksheet

7.3.2 JCL Control Definitions (JCLDEF)

Use the chart below to determine if you need to code TSO/MON data set names in prefix.MICS.PARMS(JCLDEF) as part of installing the CA MICS TSO Analyzer.

TSO/MON release being input to TSO Analyzer	prefix.MICS.PARMS JCLDEF control statements to code
5.0 to 5.3.2	TSMLINK* TSMPARMS
6	none

* If the TSO/MON load library is not in the system link list, you must code the TSMLINK control statement.

Section 2.3.3.2.1.2 of the CA MICS Planning, Installation, Operation, and Maintenance Guide (PIOM) describes the JCLDEF control statements.

7.3.3 Database Space Modeling (DBMODEL)

This section describes the information required to define the Analyzer to the Database Space Modeling Facility. Specifically, the user must provide values for the cycle (data retention) definitions. The special considerations for defining the FILE input statements to the Database Space Modeling facility are discussed.

Section 2.3.4 of the PIOM, Database Space Modeling Facility, explains how these values are used in estimating the DASD requirements of the database, and how the user can input these values to the modeling facility.

This section covers the following topics:

1 - Data Retention Specifications (FILE Statements)

2 - DBMODEL Input Statements

7.3.3.1 Data Retention Specifications (FILE Statements)

Data retention specifications tell the CA MICS database how many cycles of data, for each file in each supported timespan, to save both online and in archive mode. Figure 7-4 is the worksheet to help you collect this information.

The worksheet is organized by information area. Each file in the area is listed by name. For each file, a line is formatted to allow six definitions in the online database and two in the archive database:

- The online database files quantify the number of cycles of data that is maintained in the DETAIL, DAYS, WEEKS, MONTHS, and YEARS timespans and the TABLES data area.

- The two definitions for the archive database files quantify the number of cycles of data to be retained, up to the cutoff limit defined. The archive definitions have no impact on the size of the database and can be specified whethert the weekly and/or monthly archive history files have actually been activated (see Section 2.3.3, CA MICS JCL Planning and Parameters, of the PIOM).

The worksheet formats provide an underscored area for the user's definition, followed by the recommended value, shown within parentheses. If the underscored area contains a value of 00, the file is not supported for the indicated timespan. To add support, perform database tailoring as described in Section 6.2, Tailoring the Database, of the System Modification Guide (SMG).

When specifying a retention limit, remember that the number may never be zero if the file has been defined to be active in the timespan.

INSTALLATION PREPARATION WORKSHEET: Database Data Retention Definitions

PARMS Library Member is DBMODEL

Reference: Section 7.3.3.1, CA MICS TSO Analyzer Guide

	Online Database Retention					Archive Cut-O ff	
File Name	DETAIL __(NA)	DAYS __(NA)	WEEKS __(NA)	MONTHS __(NA)	YEARS _(NA)	TABLES __(NA)	WEEKS ___ (NA)	MONTHS ___ (NA)
TSOTSO	__(02)	__(33)	__(09)	__(06)	_(1)	00(00)	___ (053)	___ (024)

```
|TSOTSU| __(01)  __(08)  __(00)  __(06)   _(1)  00(00) |___ (000) ___ (024)|
|      |                                               |                   |
|TSOTSA| __(01)  __(00)  __(00)  __(00)   _(0)  00(00) |___ (000) ___ (000)|
|      |                                               |                   |
|TSO_TA| __(00)  __(08)  __(00)  __(18)   _(0)  00(00) |___ (000) ___ (000)|
|      |                                               |                   |
|TSOTSC| __(10)  __(00)  __(00)  __(02)   _(0)  00(00) |___ (000) ___ (006)|
|      |                                               |                   |
|TSOTSI| __(10)  __(00)  __(00)  __(02)   _(0)  00(00) |___ (000) ___ (006)|
|      |                                               |                   |
|TSO_BC| __(10)  __(00)  __(00)  __(02)   _(0)  00(00) |___ (000) ___ (006)|
|      |                                               |                   |
|TSO_BD| __(01)  __(00)  __(00)  __(00)   _(0)  00(00) |___ (000) ___ (000)|
|      |                                               |                   |
|TSO_BI| __(10)  __(00)  __(00)  __(02)   _(0)  00(00) |___ (000) ___ (006)|
|      |                                               |                   |
|TSO_BU| __(01)  __(08)  __(00)  __(06)   _(1)  00(00) |___ (000) ___ (024)|
|      |                                               |                   |
|TSODRU| __(10)  __(00)  __(00)  __(02)   _(0)  00(00) |___ (000) ___ (006)|
|      |                                               |                   |
|TSOTSW| __(02)  __(10)  __(09)  __(06)   _(1)  00(00) |___ (053) ___ (024)|
+------+-----------------------------------------------+-------------------+
```

Figure 7-4. Data Retention Specifications Worksheet (FILE Statement)

7.3.3.2 DBMODEL Input Statements

The DBMODEL member of prefix.MICS.PARMS provides the input to the Database Space Modeling Facility.

Using the information collected on the worksheet in Figure 7-4, code the DBMODEL member. To actually perform the space modeling, submit the jobs as described in the CA MICS Planning, Installation, Operation, and Maintenance Guide, Section 2.3.4.2.

7.3.4 TSO Processing Options (TSOOPS)

```
This section shows you how to specify the operational
statements that control the CA MICS TSO Analyzer processing.

Operational statements are stored in the prefix.MICS.PARMS
cccOPS member, where ccc is the component identifier, and are
incorporated into the CA MICS system by running the
prefix.MICS.CNTL(cccPGEN) job.

************************************************************
*                                                          *
*  NOTE:  CHANGES to prefix.MICS.PARMS(cccOPS) members     *
*         REQUIRE EXECUTION of prefix.MICS.CNTL(cccPGEN)   *
*         to take effect.                                  *
*                                                          *
*         In addition, any change to parameters that       *
*         impact the DAILY operational job JCL such as,    *
*                                                          *
*         o  changing RESTART NO to RESTART YES,           *
*                                                          *
*         o  WORK parameter changes when RESTART NO is in  *
*            effect,                                       *
*                                                          *
*         o  Specifying TAPEfff (if this product supports  *
*            a DETAIL level TAPE option),                  *
*                                                          *
*         o  or changes to prefix.MICS.PARMS(INPUTccc),    *
*                                                          *
*         will require regeneration of the DAILY job by    *
*         executing prefix.MICS.CNTL(JCLGEND) or by        *
*         specifying DAILY in prefix.MICS.PARMS(JCLGENU)   *
*         and executing prefix.MICS.CNTL(JCLGENU).         *
*                                                          *
*         Refer to the checklist (if provided) for updating *
*         cccOPS parameters and running required generation *
*         jobs.                                            *
************************************************************

To define the CA MICS TSO Analyzer to the CA MICS system,
specify the following parameters in member
prefix.MICS.PARMS(TSOOPS):

   WORK    n data_set_allocation_parameters  (Optional)
   MULTWORK|NOMULT fff fff ... fff          (Optional)
   RESTART YES/NO                           (Optional)

These statements and parameters are described in detail
below.  Once they are defined and coded, implementation of
```

the specified parameter values occurs with the successful execution of the parameter generation routine, prefix.MICS.CNTL(TSOPGEN), in each unit containing the CA MICS TSO Analyzer product. The TSOPGEN job builds unit level macros representing the coded statements. These macros direct certain aspects of the DAY010 step execution. Changes made to the TSOOPS member do not take effect until after successful execution of the TSOPGEN job.

The TSOOPS member contains the following statements, described in detail below.

WORK

This statement is optional. It enables sites experiencing either SAS WORK space allocation problems or out of work space conditions during DAYnnn or INCRnnn (where nnn is the job step number), daily or incremental update processing, to allocate multiple WORK files.

You can allocate multiple WORK files for use during the daily and/or incremental update job step. The maximum number of WORK files you can allocate varies by product. These additional work files are used in conjunction with the single work data set allocated by default using the JCLDEF parameters WORKUNIT and WORKSPACE.

Because the individual space allocation requirement for each WORK file is typically much smaller, it is more likely to be satisfied.

To take advantage of multiple WORK files support, edit prefix.MICS.PARMS(cccOPS) and insert a WORK statement as shown below:

WORK n data_set_allocation_parameters

where n is the number of WORK data sets

NOTE: The default is one (1).
The maximum is nine (9).

data_set_allocation_parameters is one or more data set allocation parameters (for example, STORCLAS or SPACE) separated by spaces.

You can also specify the WORK parameter as the following:

```
WORK n XXX pppp ssss
```

where:

```
  n    is the number of WORK data sets
  XXX  is TRK or CYL
  pppp is the primary allocation
  ssss is the secondary allocation
```

Note: When allocating any number of SAS WORK data sets, be aware that one additional SAS WORK data set is automatically allocated to facilitate sorting. For example, if you allocate six SAS WORK data sets, you will actually get seven.

If you omit the data_set_allocation_parameters or the WORK parameter, the work data sets are allocated according to the values you specified for the WORKUNIT and WORKSPACE parameters in prefix.MICS.PARMS(JCLDEF). Use the data_set_allocation_parameters to override this default, either to alter the space allocation or to use System Managed Storage (SMS) parameters to control data set placement and characteristics.

Note: If you allocate insufficient space for the WORK data sets, DAYnnn and/or INCRnnn processing will fail and can only be restarted from the beginning.

Note: If internal step restart is active, you can override the WORK data set allocation parameters at execution-time using the //PARMOVRD facility. For more information about execution-time override of dynamic data set allocation parameters, see the PIOM, section 2.3.6.

Specify data set allocation parameters, separated by blanks, according to SAS LIBNAME statement syntax. If you need multiple lines, repeat the WORK keyword on the continuation line.

WORK accepts the engine/host options documented in the SAS Companion for the z/OS environment, including STORCLAS, UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

Important! Do not specify the DISP parameter.

Example 1:

```
WORK n STORCLAS=MICSTEMP SPACE=(XXX,(pppp,ssss),RLSE)
```

```
where:

  n        - is the number of WORK data sets.
  STORCLAS - specifies a storage class for a new data set.
             The name can have up to 8 characters.
  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.
  XXX      - is TRK or CYL.
  pppp     - is the primary allocation.
  ssss     - is the secondary allocation.
  RLSE     - specifies that free-space should be released
             when the data set is closed.

Example 2:

WORK n XXX pppp ssss

where:

  n        - is the number of WORK data sets.
  XXX      - is TRK or CYL.
  pppp     - is the primary allocation.
  ssss     - is the secondary allocation.

Example 3 (multiple lines):

WORK n STORCLAS=MICSTEMP UNIT=SYSDA
WORK   SPACE=(xxxx,(pppp,ssss),,,ROUND))

where:

  n        - is the number of WORK data sets.
  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.
  UNIT     - specifies the generic unit for a new data set.
             The name can have up to eight characters.
  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.
  XXX      - is TRK or CYL.
  pppp     - is the primary allocation.
  ssss     - is the secondary allocation.

Note:  Since there is some performance impact when using
multiple WORK files, you should specify the minimum number of
WORK data sets to meet your work space requirements.  As a
start, try incrementing the number gradually beginning from
the default.
```

```
WORK Considerations
-------------------

How Much Space Should You Allocate?

o  First Time Implementation of Multiple Work Files

   If this is the first time you are implementing multiple
   work files for this product in this unit, review
   prefix.MICS.PARMS(JCLDEF) and find the WORKSPACE
   parameter.  It will resemble this sample statement:

   WORKSPACE      TRK 500 250

   The value shows the current SAS WORK space allocation for
   the unit as a single data set.  It also serves as the
   default value used in the unit's DAYnnn daily update
   (and/or INCRnnn incremental update) step unless you
   provide a WORK parameter.

   To achieve the equivalent work space allocation of
   WORKSPACE TRK 500 250 using multiple WORK data sets that
   will collectively share the work space requirements of
   the daily and/or incremental update step, you could code
   either one of these:

   WORK 2 SPACE=(TRK,(250,125))

   WORK 5 SPACE=(TRK,(100,50))

   To determine the total work space, multiply the number of
   WORK files (n) by the primary (pppp) and secondary (ssss)
   values specified.

   Note:  To simplify the example, only the SPACE parameter
   is shown above.  You can follow either with data set
   allocation parameters like UNIT or STORCLAS as required
   for your site.

o  Adjusting Allocation for Existing Multiple WORK Files

   If you have previously implemented multiple WORK file
   support for this product in this unit, and you want to
   change either the number of WORK files or the space
   allocations, examine prefix.MICS.PARMS(cccOPS) and find
   the existing WORK statement.

   -  If the existing WORK statement only specifies the
```

number of WORK files but does not contain space allocation information as shown below:

WORK 5

Then each of the multiple WORK files is allocated using the values from the WORKSPACE parameter of prefix.MICS.PARMS(JCLDEF), as described earlier under First Time Implementation of Multiple Work Files.

To increase workspace, you can increase the number of WORK files (for example, change WORK 5 to WORK 6,7,8, or 9), increase the space allocation in the WORKSPACE parameter, or do both.

To decrease workspace, you can decrease the number of WORK files (for example, change WORK 5 to WORK 4,3,2, or 1), decrease the space allocation in the WORKSPACE parameter, or do both.

You can also elect to explicitly specify the multiple WORK file space allocation by adding the space allocation values directly to the WORK statement. This will remove the link to the prefix.MICS.PARMS(JCLDEF) WORKSPACE parameter for multiple WORK file space allocation. This is recommended as it serves to clearly document, in one place, how multiple WORK files are allocated.

- If the existing WORK statement does include space allocation as shown in the examples below:

  WORK 5 TRK 200 100

  or

  WORK 5 SPACE=(TRK,(200,100)) STORCLAS=MICSTEMP

  Simply change the values to meet your needs.

  If you need more work space, you can increase the number of WORK files (for example, change WORK 5 to WORK 6,7,8, or 9), increase the space allocation (for example, change TRK 200 100 to TRK 250 120), or do both.

  To decrease work space, you can decrease the number of WORK files (for example, change WORK 5 to WORK 4,3,2, or 1), decrease the space allocation (for example,

```
      change TRK 200 100 to TRK 150 80), or do both.

Note:  If internal step restart is NOT active (RESTART NO)
and you change the WORK parameter, you must:

o  Run cccPGEN
o  Run JCLGENU for DAILY (to regenerate DAILY) and, if
   incremental update is enabled, INCRccc

When internal step restart is active, (RESTART YES), then,
when you change WORK and run cccPGEN, changes take effect
immediately.  There is no need to run JCLGENU.


SASWORK
-------

This statement is optional.

The WORK DD statement in the CA MICS procedures allocates
a temporary data set where SAS keeps its temporary data
files and other items that SAS uses during processing of
the current job.

By default, the space allocated is defined in the member
prefix.MICS.PARMS(JCLDEF) with the WORKSPACE and WORKUNIT
parameters, then generated into all the JCL procedures for
a given unit.

With the SASWORK statement you have the option to override
this unit-wide definition to specify the space allocation
individually for the current step.

The format of the SASWORK statement is:

SASWORK data_set_allocation_parameters

where data_set_allocation_parameters is one or more data set
allocation parameters (for example, STORCLAS or SPACE)
separated by spaces.

You can also specify the SASWORK parameter as the following:

SASWORK XXX pppp ssss

where:

  XXX  is TRK or CYL
  pppp is the primary allocation
```

```
  ssss is the secondary allocation

If you omit the data_set_allocation_parameters or the SASWORK
statement, the WORK data set is allocated according to the
values you specified for the WORKUNIT and WORKSPACE
parameters in prefix.MICS.PARMS(JCLDEF).  Use the
data_set_allocation_parameters to override this default,
either to alter the space allocation or to use System Managed
Storage (SMS) parameters to control data set placement and
characteristics.

Specify data set allocation parameters, separated by blanks,
according to SAS LIBNAME statement syntax.  If you need
multiple lines, repeat the SASWORK keyword on the
continuation line.

Example:

SASWORK STORCLAS=MICSTEMP SPACE=(XXX,(pppp,ssss))

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to 8 characters.
  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.
  XXX      - is TRK or CYL.
  pppp     - is the primary allocation.
  ssss     - is the secondary allocation.


Note:  If you change the SASWORK parameter, you must:

o  Run cccPGEN
o  Run JCLGENU for DAILY (to regenerate DAILY) and, if
   incremental update is enabled, INCRccc


MULTWORK|NOMULT fff fff ... fff
-------------------------------

Since multiple work files usage impacts performance, this
product provides these optional parameters so you can
restrict multiple work files usage to only those files having
excessive space requirements.

Note:  You can only use one of these optional parameters with
the WORK statement, NOT both.
```

```
The MULTWORK parameter restricts the use of multiple WORK
files to ONLY those listed after the MULTWORK keyword.

MULTWORK fff fff ... fff

where fff is the unique three character identifier

If you need multiple lines, repeat the MULTWORK on the
continuation line.

The NOMULT parameter forces the use of multiple WORK files
for all files EXCEPT those specified after the NOMULT
keyword.

NOMULT fff fff ... fff

where fff is the unique three character identifier

If you need multiple lines, repeat the NOMULT on the
continuation line.


The default is
    MULTWORK _BC _BD _BI _BU _TA DRU TSA TSC TSI TSO TSU TSW
if neither MULTWORK or NOMULT parameters are specified.

The following files are eligible for multiple WORK support:

  _BC    TSO BATCH USER COMMAND COUNTS FILE
  _BD    TSO BATCH DATA SET NAME FILE
  _BI    TSO BATCH COMMAND INFORMATION FILE
  _BU    TSO BATCH USER ACTIVITY FILE
  _TA    TSO TERMINAL ACTIVITY FILE
  DRU    TSO DYNAMIC RESOURCE USAGE FILE
  TSA    TSO DATA SET NAME FILE
  TSC    TSO USER COMMAND COUNTS FILE
  TSI    TSO USER INTERACTIVE USAGE FILE
  TSO    TSO SYSTEM ACTIVITY FILE
  TSU    TSO USER ACTIVITY FILE
  TSW    TSO WORKLOAD MANAGER DEFINITION FILE


RESTART YES/NO
--------------

This statement is optional.  Specify this to activate
internal step restart for this product's DAILY and/or INCRccc
database update job steps:
```

```
RESTART YES


If you do not specify or enable the RESTART parameter, then
this option defaults to the following and internal step
restart is disabled:

RESTART NO


************************************************************
*                                                          *
*  Note:  Changing the RESTART parameter (either from NO   *
*         to YES or from YES to NO) requires regeneration  *
*         of the DAILY operational job by executing        *
*         prefix.MICS.CNTL(JCLGEND) or by specifying       *
*         DAILY in prefix.MICS.PARMS(JCLGENU) and          *
*         executing prefix.MICS.CNTL(JCLGENU).             *
*                                                          *
*         If incremental update is active for this product, *
*         you must also regenerate the INCRccc job.        *
*                                                          *
************************************************************

Internal step restart can significantly reduce time and
resource usage to recover from daily and/or incremental
update processing failures.  CA MICS uses a
checkpoint/restart technique.

o  When internal step restart is activated, the database
   update job step "checkpoints" (or saves) intermediate
   results (work file contents) and the operational
   environment at the end of each processing phase.

o  Then, if required, the database update step can resume
   execution at the beginning of the processing phase in
   which the failure occurred.

o  Restart is accomplished by restoring the operational
   environment from the last checkpoint, bypassing completed
   processing phases, and resuming execution using
   intermediate results (work files) from the last
   checkpoint.

Note:  When you activate internal step restart (RESTART YES),
       the following optional restart parameters are enabled.
       These parameters have no effect if restart is disabled
       (RESTART NO).  For more details, see the individual
       parameter descriptions later in this section.
```

- RESTARTCKPT data_set_allocation_parameters
- RESTARTWORK data_set_allocation_parameters
- DYNAMWAIT minutes

Processing Phases:

This product employs two database update processing phases followed by the two common roll-up phases.

Phase	Description
FORMAT	Read raw input data, convert to SAS format, and output to intermediate work files.
DBUPDATE	Sort intermediate work file contents, eliminate duplicate input data, merge data across optional multiple work files, enhance data content, and create the new DETAIL cycle.
DYSUM	Summarize DETAIL data to create new DAYS cycles and to update current week-to-date and month-to-date cycles.
DYAGE	Cutover new database cycles to production and "age" existing cycles.

RESTART Considerations

- Overhead

  Enabling internal step restart adds some overhead to the database update job step -- the cost of taking checkpoints and managing saved materials. Since this overhead is relatively constant and independent of input data volume, you may find that costs outweigh potential savings when input data volume is low, for example in a test unit. For high volume, production units, internal step restart support overhead should be a minor portion of total resource usage.

o Cataloged Work Files

When internal step restart is enabled, the SAS work data set, internal step restart control data set, and multiple work file data sets are allocated and cataloged with permanent dataset names so they will be retained for use in restart if the step abends. These data sets are deleted when the step completes successfully.

Prior to enabling internal step restart support, these data sets were probably allocated on system "scratch" space with a temporary, system assigned data set names. If your installation standards do not allow "permanent" data sets on DASD volumes used for temporary work space, you may need to use the WORK, RESTARTCKPT, and RESTARTWORK parameters to direct the internal step restart data sets to a generic unit or storage class that allows cataloged data sets.

o Dynamic Allocation

When internal step restart is active, dynamic allocation is employed for the work data sets. If your installation restricts dynamic allocation of large, cataloged data sets, you may need to use the WORK, RESTARTCKPT, and RESTARTWORK parameters to direct work data set allocation to a generic unit or storage class where dynamic allocation is allowed.

o Data Set Names

The SAS work data set, internal step restart control data set, and multiple work file data sets are allocated and cataloged according to the standard CA MICS unit database data set name conventions. The default DDNAME and data set names are:

  o SAS work data set,
    //cccXWORK DD DSN=prefix.MICS.cccXWORK,.....

  o Internal step restart control data set,
    //cccXCKPT DD DSN=prefix.MICS.cccXCKPT,.....

  o Multiple work file data sets,
    //WORKnn   DD DSN=prefix.MICS.cccWRKnn,.....

Since these data sets conform to the same data set name conventions as your existing CA MICS data sets, there

```
    should be few, if any, data set name related allocation
    issues.  However, it is possible to override the data set
    names if required.  Please contact CA MICS Product
    Support for assistance if you must alter data set names.


RESTARTCKPT
-----------

This statement is optional.  Specify the following to
override default data set allocation parameters for the
internal step restart checkpoint data set:

RESTARTCKPT   data_set_allocation_parameters

Note:  RESTARTCKPT is ignored when you specify RESTART NO.

The internal step restart checkpoint data set (or cccXCKPT
data set) contains processing status, control, and SAS
environmental information for internal step restart
processing checkpoints.  This includes a copy of the SAS WORK
format and macro catalogs, current macro variable values, and
a description of work files that may be needed to restart
DAYnnn processing.

By default, the cccXCKPT data set is allocated according to
the values you specified for the WORKUNIT and WORKSPACE
parameters in prefix.MICS.PARMS(JCLDEF).  Specify RESTARTCKPT
to override this default, either to alter the space
allocation or to use System Managed Storage (SMS) parameters
to control data set placement and characteristics.

Note:  If you allocate insufficient space for the cccXCKPT
data set, DAYnnn processing will fail and can only be
restarted from the beginning.

Note:  You can override the RESTARTCKPT data set allocation
parameters at execution-time using the //PARMOVRD facility.
For more information about execution-time override of dynamic
data set allocation parameters, see the PIOM, section 2.3.6.

Specify data set allocation parameters, separated by blanks,
according to SAS LIBNAME statement syntax.  If you need
multiple lines, repeat the RESTARTCKPT keyword on the
continuation line.

RESTARTCKPT accepts the engine/host options documented in the
SAS Companion for the z/OS Environment, including STORCLAS,
```

```
UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

Important!  DO NOT SPECIFY THE DISP PARAMETER.

Example 1:

RESTARTCKPT  STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated, where:

             xxxx is TRK, CYL, or blklen
             pp is the primary allocation
             ss is the secondary allocation

             and ROUND specifies that the allocated space be
             "rounded" to a cylinder boundary when the unit
             specified was a block length.  ROUND is ignored
             with the TRK or CYL options.

Example 2 (multiple lines):

RESTARTCKPT  STORCLAS=MICSTEMP UNIT=SYSDA
RESTARTCKPT  SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  UNIT     - specifies the generic unit for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.



RESTARTWORK
-----------

This statement is optional.  Specify the following to
override default data set allocation parameters for the
internal step restart WORK data set:
```

```
RESTARTWORK   data_set_allocation_parameters

Note:  RESTARTWORK is ignored when you specify RESTART NO.

The internal step restart WORK data set (or cccXWORK data
set) contains the intermediate work files that are not
enabled to multiple work file support, including those files
you may have specified on the optional NOMULT statement.

By default, the cccXWORK data set is allocated according to
the values you specified for the WORKUNIT and WORKSPACE
parameters in prefix.MICS.PARMS(JCLDEF).  Specify RESTARTWORK
to override this default, either to alter the space
allocation or to use System Managed Storage (SMS) parameters
to control data set placement and characteristics.

Note:  If you allocate insufficient space for the cccXWORK
data set, DAYnnn processing will fail and can only be
restarted from the beginning.

Note:  You can override the RESTARTWORK data set allocation
parameters at execution-time using the //PARMOVRD facility.
For more information about execution-time override of dynamic
data set allocation parameters, see the PIOM, section 2.3.6.

Specify data set allocation parameters, separated by blanks,
according to SAS LIBNAME statement syntax.  If you need
multiple lines, repeat the RESTARTWORK keyword on the
continuation line.

RESTARTWORK accepts the engine/host options documented in
"SAS Companion for the z/OS Environment", including STORCLAS,
UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

Important!  DO NOT SPECIFY THE DISP PARAMETER.

Example 1:

  RESTARTWORK  STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated, where:
```

```
              xxxx is TRK, CYL, or blklen
              pp is the primary allocation
              ss is the secondary allocation

              and ROUND specifies that the allocated space be
              "rounded" to a cylinder boundary when the unit
              specified was a block length.  ROUND is ignored
              with the TRK or CYL options.

Example 2 (multiple lines):

  RESTARTWORK  STORCLAS=MICSTEMP UNIT=SYSDA
  RESTARTWORK  SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  UNIT     - specifies the generic unit for a new data set.
             The name can have up to 8 characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.



INCRUPDATE
----------

This statement is optional.  Specify this to enable
incremental update for this product:

INCRUPDATE YES

If you do not specify or enable the INCRUPDATE parameter,
then this option defaults to this and incremental update is
disabled:

INCRUPDATE NO

*************************************************************
*                                                           *
*  Note:  Changing the INCRUPDATE parameter (either from NO *
*         to YES or from YES to NO) requires regeneration   *
*         of the DAILY operational job by executing         *
*         prefix.MICS.CNTL(JCLGEND) or by specifying        *
*         DAILY in prefix.MICS.PARMS(JCLGENU) and           *
*         executing prefix.MICS.CNTL(JCLGENU).              *
```

```
*                                                             *
*        If you specify INCRUPDATE YES, you must also         *
*        generate the INCRccc, cccIUALC, and cccIUGDG jobs *
*        (where ccc is the 3 character product ID).           *
*        Depending on the options you select, you may also *
*        need to execute the cccIUALC and/or cccIUGDG         *
*        jobs.                                                *
*                                                             *
***************************************************************
```

Incremental update can significantly reduce time and resource usage in the DAILY job by letting you split out a major portion of daily database update processing into multiple, smaller, incremental updates executed throughout the day.

- Standard CA MICS database update processing involves (1) reading and processing raw input data to generate DETAIL and DAYS level CA MICS database files, followed by (2) summarization of DETAIL/DAYS level data to update week-to-date and month-to-date database files.

- When you activate incremental update:

  - You can execute the first-stage processing (raw data input to create DETAIL/DAYS files) multiple times throughout the day, each time processing a subset of the total day's input data.

  - Then, during the final update of the day (in the DAILY job), the incremental DETAIL/DAYS files are "rolled-up" to the database DETAIL and DAYS timespans, and then summarized to update the week-to-date and month-to-date files.

- Incremental update is independent of your internal step restart or DBSPLIT specifications. You have the option to perform incremental updates with or without internal step restart support.

- Incremental update is activated and operates independently by product. The incremental update job for this product, INCRccc (where ccc is the product ID), can execute concurrently with the incremental update job for another product in the same unit database.

- The CA MICS database remains available for reporting and analysis during INCRccc job execution.

```
***************************************************************
```

```
*                                                               *
*  Note:  CA MICS is a highly configurable system               *
*         supporting up to 36 unit databases, each of which *
*         can be configured and updated independently.          *
*         Incremental update is just one of the options you *
*         can use to configure your CA MICS complex.            *
*                                                               *
*         All efforts should be made to employ CA MICS          *
*         configuration capabilities to minimize issues         *
*         prior to activating incremental update.  For          *
*         example:                                              *
*                                                               *
*         o  Splitting work to multiple units is an             *
*            effective way to enable parallel database          *
*            update processing                                  *
*                                                               *
*         o  Adjusting account code definitions to ensure       *
*            adequate data granularity while minimizing         *
*            total database space and processing time           *
*                                                               *
*         o  Tailoring the database to drop measurements        *
*            and metrics of lesser value to your                *
*            data center, thereby reducing database update      *
*            processing and resource consumption                *
*                                                               *
*         While incremental update is intended to reduce        *
*         DAILY job elapsed time, total resource usage of       *
*         the combined INCRccc and DAILY jobs steps can         *
*         increase due to the additional processing             *
*         required to maintain the incremental update           *
*         "to-date" files and for roll-up to the unit           *
*         database.  The increased total resource usage         *
*         will be more noticeable with small data volumes,      *
*         where processing code compile time is a greater       *
*         percentage of total processing cost.                  *
*                                                               *
*****************************************************************

Note:  When you activate incremental update (INCRUPDATE YES),
the following optional incremental update parameters are
enabled.  These parameters have no effect if incremental
update is disabled (INCRUPDATE NO).  For more details, see
the individual parameter descriptions later in this section.

o INCRDB     PERM/TAPE/DYNAM

o INCRDETAIL data_set_allocation_parameters

o INCRDAYS   data_set_allocation_parameters
```

o INCRCKPT data_set_allocation_parameters

o INCRSPLIT USE/IGNORE data_set_allocation_parameters

Incremental update processing reads and processes raw measurement data to create and maintain DETAIL and DAYS level "to-date" files for the current day.

- These incremental update database files are maintained on unique z/OS data sets, independent of the standard CA MICS database files, and independent of any other product's incremental update database files. There is one data set each for DETAIL and DAYS level "to-date" data and a single incremental update checkpoint data set for this product in this unit.

- The incremental update DETAIL and DAYS files can be permanent DASD data sets, or they can be allocated dynamically as needed and deleted after DAILY job processing completes. Optionally, you can keep the incremental update DETAIL and DAYS files on tape, with the data being loaded onto temporary DASD space as needed for incremental update or DAILY job processing. See the INCRDB PERM/TAPE/DYNAM option for more information.

After activating incremental update, you will use three incremental update facility jobs found in prefix.MICS.CNTL (Note that ccc is the product ID):

- cccIUALC

  You execute this job to allocate and initialize the incremental update checkpoint file, and optionally the incremental update DETAIL and DAYS database files. cccIUALC is generally executed just ONE time.

- cccIUGDG

  You execute this job to add generation data group (GDG) index definitions to your system catalog in support of the INCRDB TAPE option. cccIUGDG is generally executed just ONE time.

- INCRccc

  This is the job you execute for each incremental update. You will integrate this job into your database update

```
   procedures for execution one or more times per day
   to process portions of the total day's measurement data.

   Note:  The DAILY job is run once at the end of the day.
   It will perform the final incremental update for the day's
   data, and then roll-up the incremental DETAIL/DAYS files
   to the database DETAIL and DAYS timespans and update the
   week-to-date and month-to-date files.


INCRUPDATE Considerations
-------------------------

o  Overhead

   Incremental update is intended to reduce DAILY job
   resource consumption and elapsed time by offloading a
   major portion of database update processing to one or
   more executions of the INCRccc job.  In meeting this
   objective, incremental update adds processing in the
   INCRccc and DAILY jobs to accumulate data from each
   incremental update execution into the composite "to-date"
   DETAIL and DAYS incremental update files, and also adds
   processing in the DAILY job to copy the incremental
   update files to the unit database DETAIL and DAYS
   timespans.  The amount of this overhead and the savings in
   the DAILY job are site-dependent, and will vary based on
   input data volume and on the number of times INCRccc is
   executed each day.

   In addition, activating incremental update will cause
   additional compile-based CPU time to be consumed in the
   DAYnnn DAILY job step.  The increase in compile time is
   due to additional code included for each file structure in
   support of the feature.  This increase should be static
   based on the scope of the CA MICS data integration product
   in terms of files.  This compile-time increase does not
   imply an increase in elapsed or execution time.
   Incremental update allows I/O bound, intensive processing
   (raw data inputting, initial CA MICS transformation, etc.)
   to be distributed outside of the DAILY job.  I/O
   processing is the largest contributor to elapsed time in
   large volume applications.  Thus, the expected overall
   impact is a decrease in the actual runtime of the DAYnnn
   job step.

o  Increased "Prime Time" Workload

   By offloading work from the DAILY job to one or more
```

INCRccc executions throughout the day, you are potentially moving system workload and DASD work space usage from the "off-hours," (when the DAILY job is normally executed) to periods of the day where your system resources are in highest demand. You should schedule INCRccc executions carefully to avoid adverse impact to batch or online workloads. For example, if your site's "prime shift" is 8:00 AM to 5:00 PM, you might choose to schedule incremental updates for 7:00 AM (just before "prime shift") and 6:00 PM (just after "prime shift"), with the DAILY job executing just after midnight.

- Increased DASD Usage

  The DASD space required for the incremental update DETAIL and DAYS database files is in addition to the DASD space already reserved for the CA MICS database. By default, the incremental update database files are permanently allocated, making this DASD space unavailable for other applications. In general, you can assume that the incremental update database files will require space equivalent to two cycles of this product's DETAIL and DAYS timespan files.

  Alternatively, the incremental update database files can be allocated in the first incremental update of the day and deleted by the DAILY job (see the INCRDB DYNAM option later in this section). This approach reduces the amount of time that the DASD space is dedicated to incremental update, and lets the amount of DASD space consumed increase through the day as you execute each incremental update.

  A third option is to store the incremental update database files on tape (see the INCRDB TAPE option). With this approach, the DASD space is required just for the time that each incremental update or DAILY job step is executing. Note that while this alternative reduces the "permanent" DASD space requirement, the total amount of DASD space required while the incremental update or DAILY jobs are executing is unchanged. In addition, the TAPE option adds processing to copy the incremental update files to tape, and to reload the files from tape to disk.

  Note: The incremental update checkpoint file is always a permanently allocated disk data set. This is a small data set and should not be an issue.

- Operational Complexity

  Incremental update expands your measurement data management and job scheduling issues. You must ensure that each incremental update and the DAILY job processes your measurement data chronologically; that is, each job must see data that is newer than the data processed by the prior job. By incrementally updating the database, you have more opportunities to miss a log file, or to process a log out of order.

- Interval End Effects

  Each incremental update processes a subset of the day's measurement data, taking advantage of early availability of some of the day's data, for example, when a measurement log fills and switches to a new volume. This can cause a problem if the measurement log split occurs while the data source is logging records for the end of a measurement interval, thus splitting the data for a single measurement interval across two log files. When an incremental update processes the first log file, the checkpoint high end timestamp is set to indicate that this split measurement interval has been processed. Then, when the rest of the measurement interval's data is encountered in a later update, it can be dropped as duplicate data (because data for this measurement interval end timestamp has already been processed).

  Appropriate scheduling of log dumps and incremental updates can avoid this problem. For example, if you plan to run incremental updates at 7:00 AM and 6:00 PM, you could force a log dump in the middle of the measurement interval just prior to the scheduled incremental update executions. This is an extension of the procedure you may already be using for end-of-day measurement log processing. The objective is to ensure that all records for each monitor interval are processed in the same incremental update.

- Dynamic Allocation

  When you activate incremental update and specify TAPE or DYNAM for the INCRDB parameter, dynamic allocation is employed for the incremental update database files. If your site restricts dynamic allocation of large, cataloged data sets, you must use the INCRDETAIL and INCRDAYS parameters to direct incremental update data set allocation to a generic unit or storage class where

```
   dynamic allocation is allowed.

o  Data Set Names

   The incremental update database files are allocated and
   cataloged according to standard CA MICS unit database
   data set name conventions.  The DDNAME and default data
   set names are (where ccc is the product ID):

   o  Incremental update checkpoint file,
          //IUCKPT   DD DSN=prefix.MICS.ccc.IUCKPT,.....

   o  Incremental update DETAIL
          //IUDETAIL DD DSN=prefix.MICS.ccc.IUDETAIL,.....

   o  Incremental update DAYS
          //IUDAYS   DD DSN=prefix.MICS.ccc.IUDAYS,....

   Since these data sets conform to the same data set name
   conventions as your existing CA MICS data sets, there
   should be few, if any, data-set-name-related allocation
   issues.  However, it is possible to override the data set
   names if required.  Contact Technical Support at
   http://ca.com/support for assistance if you must change
   data set names.


 INCRDB
 ------

 This statement is optional.  The default is this:

 INCRDB PERM

 Note:  INCRDB is ignored when you specify INCRUPDATE NO.

 Specify this statement or take the default, to keep the incremental
 update database DETAIL and DAYS files on permanently
 allocated DASD data sets:

 INCRDB PERM

 Execute the prefix.MICS.CNTL(cccIUALC) job to allocate the
 incremental update database files.

 ************************************************************
 *                                                          *
 *  Note:  The incremental update checkpoint file is always  *
 *         a permanently allocated DASD data set.           *
```

```
*                                                              *
****************************************************************
```

Specify this to offload the incremental update DETAIL and DAYS files to tape between incremental update executions:

```
INCRDB TAPE #gdgs UNIT=name
```

With the TAPE option, the incremental update DETAIL and DAYS DASD data sets are dynamically allocated at the beginning of the incremental update job or DAILY job step, and then are deleted after the job step completes.

- The first incremental update job of the day allocates and initializes the incremental update database files. At the end of the job, the DETAIL and DAYS files are copied to a new (+1) generation of the incremental update tape data sets. Then the DASD files are deleted.

- Subsequent incremental update jobs restore the DASD incremental update database files from the current, (0) generation, incremental update tape data sets before processing the input measurement data. At the end of the job, the DETAIL and DAYS files are copied to a new (+1) generation of the incremental update tape data sets. Then the DASD files are deleted.

- The DAILY job step also restores the DASD incremental update database files from the (0) generation tape files before processing the input data, but does NOT copy the incremental update database files to tape. Thus, the DAILY job actually creates a new, null (+1) generation.

- Use the #gdgs parameter to specify the maximum number of incremental update tape generations. The minimum is 2 and the maximum is 99, with a default of 5.
  Set the number of generations equal to or greater than the number of incremental updates, including the DAILY job you plan to execute each day. This facilitates restart and recovery if you encounter problems requiring you to reprocess portions of the daily measurement data.

- Use the optional UNIT=name parameter to specify a tape unit name for the incremental update database output tapes. The default is to use the same tape unit as the input tapes.

- A special index must be created in your system catalog for

```
   each of the incremental update tape data set generation
   data groups.  The prefix.MICS.CNTL(cccIUGDG) job will
   generate the statements to create the incremental update
   GDG index definitions.

   -  Before each index is built, it is deleted.  These
      DLTX (or DELETE) statements causes an error
      message if no entry exists.  This is done so that you
      can change the number of entries without having to
      delete each of the index entries.

   -  DLTX and BLDG (or DELETE and DEFINE) fail if
      there is a cataloged data set with the same index.
      IDCAMS (or IEHPROGM) issues a message and gives
      a return code of 8.  This issue is not a problem for
      non-GDG entries or if the GDG already has the
      desired number of entries.

   -  If you want to change the number of entries kept in
      a GDG with cataloged data sets, do the
      following:

      1. Uncatalog any existing entries in the GDG.
      2. Delete the index with a DLTX (or DELETE).
      3. Create the index with a BLDG (or DEFINE).
      4. Catalog any entries that are uncataloged in step 1.

o  The incremental update tape data set names are as follows,
   where ccc is the product ID:

   -  Incremental update tape DETAIL file
         tapeprefix.MICS.ccc.IUXTAPE.GnnnnV00

   -  Incremental update tape DAYS file
         tapeprefix.MICS.ccc.IUDTAPE.GnnnnV00

************************************************************
*                                                          *
*  Note:  The INCRDETAIL and INCRDAYS parameters are       *
*         required when you specify INCRDB TAPE.           *
*                                                          *
************************************************************


Specify this parameter to allocate dynamically the
incremental update  DETAIL and DAYS DASD data sets in the first
incremental update of the day, and then delete these data sets
at the end of the DAILY job step:
```

```
INCRDB DYNAM


o  With this option, no space is used for the incremental
   update database files during the time between the end of
   the DAILY job step and the beginning of the next day's
   first incremental update.

o  With this approach, you can set the data set allocation
   parameters so that the incremental update DETAIL and DAYS
   data sets start out with a minimum allocation and then
   grow through secondary allocations as more space is
   required for subsequent incremental updates. For
   example, enough space for one incremental update.

************************************************************
*                                                          *
*  Note:  The INCRDETAIL and INCRDAYS parameters are       *
*         required when you specify INCRDB DYNAM.          *
*                                                          *
************************************************************



INCRDETAIL
----------

This statement is required if you specify either of these:

INCRDB TAPE

INCRDB DYNAM

Otherwise, this statement is optional.  There is no default.


Specify this to define data set allocation parameters for the
incremental update DETAIL data set (IUDETAIL):

INCRDETAIL    data_set_allocation_parameters

Note:  INCRDETAIL is ignored when you specify INCRUPDATE NO.

The incremental update DETAIL data set (IUDETAIL) contains
the current incremental update detail-level database files,
and the DETAIL "to-date" data for the current daily update
cycle.  You should allocate DASD space equivalent to two
cycles of this product's DETAIL timespan data.
```

If you specified INCRDB PERM (the default), your INCRDETAIL parameter specifications are used in generating the cccIUALC job (where ccc is the product ID).

- You will execute the cccIUALC job to allocate and initialize the incremental update database and checkpoint files.

- Omit the INCRDETAIL parameter if you prefer to specify data set allocation parameters directly in the generated prefix.MICS.CNTL(cccIUALC) job.

If you specified INCRDB TAPE or INCRDB DYNAM, your INCRDETAIL parameter specifications are used in incremental update DETAIL data set dynamic allocation during incremental update or DAILY job step execution.

- The INCRDETAIL parameter is required for the TAPE or DYNAM option.

- Specify data set allocation parameters, separated by blanks, according to SAS LIBNAME statement syntax. If you need multiple lines, repeat the INCRDETAIL keyword on the continuation line.

- INCRDETAIL accepts the engine/host options documented in the SAS Companion for the z/OS Environment, including STORCLAS, UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

  Important! DO NOT SPECIFY THE DISP PARAMETER.

- You can override the INCRDETAIL data set allocation parameters at execution-time using the //PARMOVRD facility. For more information about execution-time override of dynamic data set allocation parameters, see the PIOM, section 2.3.6.

Example 1:

```
INCRDETAIL   STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)
```

where:

```
  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated, where:
```

```
              xxxx is TRK, CYL, or blklen
              pp   is the primary allocation
              ss   is the secondary allocation

              and ROUND specifies that the allocated space be
              "rounded" to a cylinder boundary when the unit
              specified was a block length.  ROUND is ignored
              with the TRK or CYL options.

Example 2 (multiple lines):

INCRDETAIL   STORCLAS=MICSTEMP UNIT=SYSDA
INCRDETAIL   SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  UNIT     - specifies the generic unit for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.



INCRDAYS
--------

This statement is required if you specify either of these:

INCRDB TAPE

INCRDB DYNAM

Otherwise, this statement is optional.  There is no default.


Specify this to define data set allocation parameters for the
incremental update DAYS data set (IUDAYS):

INCRDAYS      data_set_allocation_parameters

Note:  INCRDAYS is ignored when you specify INCRUPDATE NO.

The incremental update DAYS data set (IUDAYS) contains the
current incremental update days-level database files, and the
```

DAYS "to-date" data for the current daily update cycle. You should allocate DASD space equivalent to two cycles of this product's DAYS timespan data.

If you specified INCRDB PERM (the default), your INCRDAYS parameter specifications are used in generating the cccIUALC job (where ccc is the product ID).

- You will execute the cccIUALC job to allocate and initialize the incremental update database and checkpoint files.

- Omit the INCRDAYS parameter if you prefer to specify data set allocation parameters directly in the generated prefix.MICS.CNTL(cccIUALC) job.

If you specified INCRDB TAPE or INCRDB DYNAM, your INCRDAYS parameter specifications are used in incremental update DAYS data set dynamic allocation during incremental update or DAILY job step execution.

- The INCRDAYS parameter is required for the TAPE or DYNAM option.

- Specify data set allocation parameters, separated by blanks, according to SAS LIBNAME statement syntax. If you need multiple lines, repeat the INCRDAYS keyword on the continuation line.

- INCRDAYS accepts the engine/host options documented in the SAS Companion for the z/OS Environment, including STORCLAS, UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

  Important! DO NOT SPECIFY THE DISP PARAMETER.

- You can override the INCRDAYS data set allocation parameters at execution-time using the //PARMOVRD facility. For more information about execution-time override of dynamic data set allocation parameters, see the PIOM, Section 2.3.6.

Example 1:

```
INCRDAYS     STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)
```

where:

STORCLAS - specifies a storage class for a new data set.

```
              The name can have up to eight characters.

  SPACE     - specifies how much disk space to provide for
              a new data set being allocated, where:

              xxxx is TRK, CYL, or blklen
              pp   is the primary allocation
              ss   is the secondary allocation

              and ROUND specifies that the allocated space be
              "rounded" to a cylinder boundary when the unit
              specified was a block length.  ROUND is ignored
              with the TRK or CYL options.

Example 2 (multiple lines):

INCRDAYS      STORCLAS=MICSTEMP UNIT=SYSDA
INCRDAYS      SPACE=(xxxx,(pp,ss),,,ROUND)

where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  UNIT     - specifies the generic unit for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.



 INCRCKPT
 --------

 This statement is optional.  Specify this to override default
 data set allocation parameters for the incremental update
 checkpoint data set:

 INCRCKPT      data_set_allocation_parameters

 Note:  INCRCKPT is ignored when you specify INCRUPDATE NO.


 The incremental update checkpoint data set tracks incremental
 update job status and the data that has been processed during
 the current daily update cycle.  The incremental update
 checkpoint is used to detect and block the input of duplicate
 data during incremental update processing.  This data set
```

```
will be exactly the same size as prefix.MICS.CHECKPT.DATA
(the unit checkpoint data set), usually 20K to 200K depending
on the prefix.MICS.PARMS(SITE) CKPTCNT parameter (100-9999).

Your INCRCKPT parameter specifications are used in generating
the cccIUALC job (where ccc is the product ID).

o  You will execute the cccIUALC job to allocate and
   initialize the incremental update checkpoint file.  If you
   specified INCRDB PERM, then the cccIUALC job will also
   allocate the incremental update DETAIL and DAYS database
   files.

o  By default the incremental update checkpoint data set is
   allocated as SPACE=(TRK,(5,2)) using the value you
   specified for the prefix.MICS.PARMS(JCLDEF) DASDUNIT
   parameter.

o  Omit the INCRCKPT parameter if you prefer to override
   data set allocation parameters directly in the generated
   prefix.MICS.CNTL(cccIUALC) job.

Specify data set allocation parameters, separated by blanks,
according to SAS LIBNAME statement syntax.  If you need
multiple lines, repeat the INCRCKPT keyword on the
continuation line.

INCRCKPT accepts the engine/host options documented in the
SAS Companion for the MVS Environment, including STORCLAS,
UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

Important!  DO NOT SPECIFY THE DISP PARAMETER.


Example 1:

INCRCKPT     STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)


where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated, where:

             xxxx is TRK, CYL, or blklen
             pp   is the primary allocation
```

```
              ss   is the secondary allocation

              and ROUND specifies that the allocated space be
              "rounded" to a cylinder boundary when the unit
              specified was a block length.  ROUND is ignored
              with the TRK or CYL options.


 Example 2 (multiple lines):

 INCRCKPT     STORCLAS=MICSTEMP UNIT=SYSDA
 INCRCKPT     SPACE=(xxxx,(pp,ss),,,ROUND)


 where:

   STORCLAS - specifies a storage class for a new data set.
              The name can have up to eight characters.

   UNIT     - specifies the generic unit for a new data set.
              The name can have up to eight characters.

   SPACE    - specifies how much disk space to provide for
              a new data set being allocated.



INCRSPLIT
---------

This statement is optional and defaults to this:

INCRSPLIT IGNORE

Specify the following if you want the incremental update job
for this product to get input measurement data from the
output of the SPLITSMF job.  The optional
data_set_allocation_parameters are used by the SPLITSMF job
when creating the measurement data file for this product.

INCRSPLIT  USE  data_set_allocation_parameters

Note:  INCRSPLIT is ignored when you specify INCRUPDATE NO.

This option would be used when multiple products in a
single unit database are enabled to incremental update.  The
SPLITSMF job performs the same function for incremental
update jobs as the DAILY job DAYSMF step performs for the
DAYnnn database update steps.
```

- The SPLITSMF job dynamically allocates, catalogs, and populates prefix.MICS.ccc.IUSPLTDS data sets for each product in the unit database for which you specified both the INCRUPDATE YES and INCRSPLIT USE parameters. These data sets are then deleted after processing by the appropriate INCRccc job.

- Specify data set allocation parameters, separated by blanks, according to SAS LIBNAME statement syntax. If you need multiple lines, repeat the INCRSPLIT keyword on each continuation line.

- INCRSPLIT accepts the engine/host options documented in the SAS Companion for the MVS Environment, including STORCLAS, UNIT, SPACE, BLKSIZE, DATACLAS, MGMTCLAS, and VOLSER.

  Important! DO NOT SPECIFY THE DISP PARAMETER.

Specify the following or accept the default if you want the incremental update jobs for this product to get their input measurement data from the data sets specified in the INPUTccc (or INPUTSMF) member of prefix.MICS.PARMS:

```
INCRSPLIT  IGNORE
```

When you specify INCRSPLIT IGNORE, this product will NOT participate in SPLITSMF job processing.

Example 1:

```
INCRSPLIT USE  STORCLAS=MICSTEMP SPACE=(xxxx,(pp,ss),,,ROUND)
```

where:

```
  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated, where:

             xxxx is TRK, CYL, or blklen
             pp   is the primary allocation
             ss   is the secondary allocation
```

```
              and ROUND specifies that the allocated space be
              "rounded" to a cylinder boundary when the unit
              specified was a block length.  ROUND is ignored
              with the TRK or CYL options.


Example 2 (multiple lines):

INCRSPLIT  USE  STORCLAS=MICSTEMP UNIT=SYSDA
INCRSPLIT       SPACE=(xxxx,(pp,ss),,,ROUND)


where:

  STORCLAS - specifies a storage class for a new data set.
             The name can have up to eight characters.

  UNIT     - specifies the generic unit for a new data set.
             The name can have up to eight characters.

  SPACE    - specifies how much disk space to provide for
             a new data set being allocated.


DYNAMWAIT
---------

This statement is optional.  Specify the following:

     DYNAMWAIT   minutes

to override the default amount of time, in minutes, the DAILY
and/or INCRccc job will wait for an unavailable data set.

Note:  This optional parameter is not normally specified.
       The system default is adequate for most data centers.

Internal Step Restart and Incremental Update facilities use
z/OS dynamic allocation services to create new data sets and
to access existing data sets.  Data set naming conventions
and internal program structure are designed to minimize data
set contention.  However, if data set allocation does fail
because another batch job or online user is already using a
data set, DAILY and/or INCRccc processing will wait 15
seconds and then try the allocation again.  By default, the
allocation will be attempted every 15 seconds for up to 15
minutes.  After 15 minutes, the DAILY or INCRccc job will
abort.
```

If data set contention in your data center does cause frequent DAILY or INCRccc job failures, and you are unable to resolve the contention through scheduling changes, you may want to use the DYNAMWAIT parameter to increase the maximum number of minutes the DAILY and/or INCRccc jobs will wait for the data set to become available.

On the other hand, if your data center standards require that the DAILY and/or INCRccc jobs fail immediately if required data sets are unavailable, specify the following:

```
DYNAMWAIT 0
```

Note: You can override the DYNAMWAIT parameter at execution-time using the //PARMOVRD facility. For more information about execution-time override of dynamic data set allocation parameters, see the PIOM, section 2.3.6.

7.3.5 INPUTRDR and INPUTTSO PARMS Members

The prefix.MICS.PARMS members INPUTRDR and INPUTccc are used to specify the input data for the Data Integration Application component step.

To determine whether INPUTccc or INPUTRDR or both are used, review the DAYSMF, SMFRECORDING, and SMFDRCTR specifications in prefix.MICS.PARMS(JCLDEF). Consider the following table and comments for the row:

ROW	PARAMETER IN JCLDEF	INPUTRDR WHERE USED	INPUTccc WHERE USED
1	DAYSMF OFF	Not Used	Each Comp Step
2	DAYSMF FILE(S) ...	DAYSMF Step	Not Used
3	Only 1 SMF Comp	Comp Step	Not Used
4	SMFDIRECTOR	Not Used	Comp Step
5	DAYSMF EXCLUDE ccc	Not Used	Comp ccc Step
6	SMFRECORDING ccc	It depends	Comp ccc Step

Row 1: When DAYSMF OFF is specified in JCLDEF, then the prefix.MICS.PARMS(INPUTccc) member is used for each component step.

Row 2: When DAYSMF FILES PERMANENT or TEMPORARY is specified in JCLDEF, the prefix.MICS.PARMS(INPUTRDR) member is used in DAYSMF.

Row 3: If there is only one SMF recording component in this unit, DAYSMF will not be generated and the component step with SMF input data will use the prefix.MICS.PARMS(INPUTRDR) member.

Row 5: If the use of DAYSMF EXCLUDE ccc results in only one component remaining as DAYSMF eligible, DAYSMF will automatically be deactivated, and row 1 applies.

Row 6: Some components accept data from both SMF and non-SMF sources, such as CIC and VCA. In this case, the component may optionally input data from the INPUTRDR member, but will always include the INPUTccc member. Refer to the component's guide.

For details on the DAYSMF parameters, see PIOM section 2.3.3.2.1, JCL Option Definitions (JCLDEF).

For details on deactivating DAYSMF, see PIOM section 5.10, Removing the DAYSMF Step from the DAILY Job.

The following sections describe how to specify the input data set JCL definitions.

1 - INPUTRDR PARMS Member JCL Definition
2 - INPUTTSO PARMS Member JCL Definition

7.3.5.1 INPUTRDR PARMS Member JCL Definition

The INPUTRDR member of prefix.MICS.PARMS defines the DD statements that specify the SMF input data for all products in the units that use SMF data. The INPUTSMF DD statements are used by the DAYSMF step, which reads and splits the SMF data into separate files, one for each CA MICS product.

The INPUTRDR member defines the input SMF data sets when DAYSMF FILES PERMANENT or TEMPORARY is specified in the prefix.MICS.PARMS(JCLDEF) member.

An INPUTSMF DD statement is required for each SMF data source. A worksheet for preparing the INPUTRDR member is provided below. If you change the contents of the INPUTRDR member, you must regenerate the CA MICS DAILY job using either JCLGENU or JCLGEND in prefix.MICS.CNTL.

For example, if you want to read your SMF data from a data set named SMF.DAILY.DATA, you would change the INPUTRDR member to contain the name of the SMF data set as follows:

```
//INPUTSMF DD DISP=SHR,DSN=SMF.DAILY.DATA
```

If there is only one SMF recording component in this unit, DAYSMF will not be generated and the component step with SMF input data will use the prefix.MICS.PARMS(INPUTRDR) member directly.

If DAYSMF has been deactivated by the DAYSMF OFF statement specified in the prefix.MICS.PARMS(JCLDEF) member, then each component step will read its input from their corresponding prefix.MICS.PARMS(INPUTccc) member.

```
+-------------------------------------------------------------------------+
                          | INSTALLATION PREPARATION WORKSHEET:  SMF Input DD Statements          |
                          |                                                                       |
                          | PARMS Library Member is INPUTRDR                                      |

+-------------------------------------------------------------------------+
                          |                                                                       |
                          | This definition is required to specify the DD statement for SMF data  |
                          | which will be read by the DAILY CA MICS job.                          |
                          |                                                                       |
                          |   //@                                                                 |
```

```
                            |  //@ WARNING: ALWAYS MAKE CHANGES IN PARMS(INPUTRDR) AND NOT         |
                            |   //@         &CNTL(DAILY).                                         |
                            |   //@         CHANGES MADE TO &CNTL(DAILY)                          |
                            |   //@        WILL BE GONE WHEN DAILY REGENERATED BY JCLGEN.         |
                            |   //@                                                               |
                            |   //INPUTSMF DD DISP=SHR,DCB=BUFNO=3,DSN=_____________________________
|
                            |   //        DD DISP=SHR,DCB=BUFNO=3,DSN=_____________________________
|
                            |                                                                     |
                            |                                                                     |

+---------------------------------------------------------------------------+
```

Figure 7-5. INPUTRDR JCL Definition Worksheet

7.3.5.2 INPUTTSO PARMS Member JCL Definition

The INPUTTSO member of prefix.MICS.PARMS contains the DD statements to specify the input data for the CA MICS Analyzer for CA-TSO/MON. The //INPUTSMF DD and, optionally, the //SMFDRCTR DD statements are used by the DAY010 step of the DAILY job.

The INPUTTSO member contains the input SMF data sets when ANY of the following JCLDEF options is used:

- DAYSMF OFF is specified
- SMFDRCTR/SMFDIRECTOR TSO is specified
- DAYSMF EXCLUDE TSO is specified

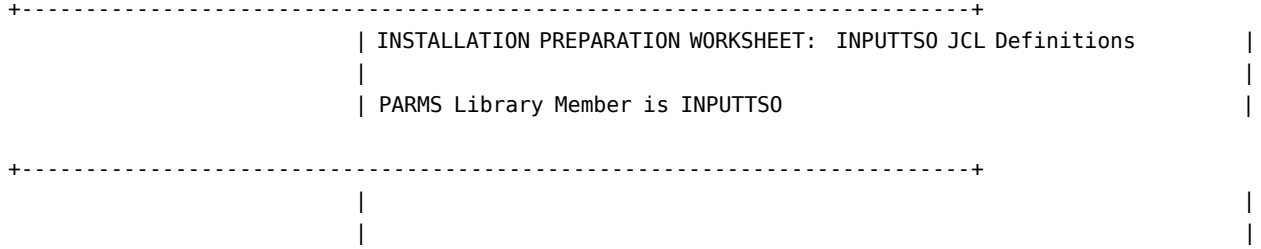
A //INPUTSMF DD statement is required for each SMF data source.

A //SMFDRCTR DD statement is only required when CA SMF Director split indices are used.

A worksheet for preparing the INPUTTSO member is provided below in Figure 7-6.

If you change the contents of the INPUTTSO member, you must regenerate the CA MICS DAILY job using either JCLGENU or JCLGEND in prefix.MICS.CNTL.

NOTE: If your site has CA SMF Director installed, you can use it to extract specific SMF record types and subtypes at SMF dump time. For more details on this product feature see section 6.3, CA MICS and CA SMF Director Interface, of this guide.



```
                          | This definition is required to specify the DD statement for data      |
                          | that will be read by the DAILY CA MICS job.                           |
                          |                                                                       |
                          |   //@                                                                 |
                          |  //@ WARNING: ALWAYS MAKE CHANGES IN PARMS(INPUTTSO) AND NOT          |
                          |   //@         &CNTL(DAILY).                                           |
                          |   //@         CHANGES MADE TO &CNTL(DAILY)                            |
                          |   //@        WILL BE GONE WHEN DAILY REGENERATED BY JCLGEN.           |
                          |   //@                                                                 |
                          |  //INPUTSMF DD DISP=SHR,DCB=BUFNO=5,DSN=___________ _____________     |
                          |   //       DD DISP=SHR,DCB=BUFNO=5,DSN=___________ _____________      |
                          |   //@                                                                 |
                          |  //SMFDRCTR DD DISP=SHR,DCB=BUFNO=5,DSN=___________ _____________     |
                          |   //       DD DISP=SHR,DCB=BUFNO=5,DSN=___________ _____________      |
                          |                                                                       |
                          |                                                                       |
                          |                                                                       |

+-------------------------------------------------------------------------+
```

Figure 7-6. INPUTTSO JCL Definition Worksheet

Chapter 8: INSTALLATION

Install the CA MICS TSO Analyzer by following the instructions in the Planning, Installation, Operation, and Maintenance (PIOM) Guide. Chapter 7 of this guide provides instructions for the correct definition of parameters that are specific to the TSO Analyzer. The SYSID, SITE, ZONE, and other parameter files that are used by more than one CA MICS product are defined in Chapter 2 of the CA MICS PIOM Guide. Section 3.8 of the PIOM Guide provides step-by-step checklists that you must follow to ensure the successful installation of this product.

Chapter 9: PROCESSING

The processing information in this chapter provides an overview of how data from CA TSO/MON becomes part of the CA MICS Data Base.

This section contains the following topics:

9.1 Processing Overview

The TSO Analyzer uses the standard data base update and summarization facilities of CA MICS to maintain its data in the online and offline data bases. TSO/MON data is supplied to CA MICS in the DAY010 step of the DAILY data base update job.

The daily update step:

- Reads and formats the raw data.
- Translates command abbreviations into command names.
- Maintains data integrity by eliminating duplicate data.
- Summarizes activity by hour.
- Builds the accounting journal files, if the CA MICS Accounting and Chargeback Product is used.
- Adds new cycles to the DETAIL and DAYS time-spans.
- Updates the week-to-date and month-to-date cycles.

A more detailed description of DAY010 processing is presented in the next section.

Weekly processing is performed by the WEEK010 and WEEK300 steps. The WEEK010 step splits the week-to-date files into a new week-to-date and a new weekly '01' cycle. The WEEK300 step creates the offline data base files.

Monthly processing is performed in steps MONTH010 and MONTH300. The MONTH010 step splits the month-to-date files into a new month-to-date and a new cycle '01'. It also updates the year-to-date cycle. The MONTH300 step creates the monthly offline data base files.

Finally, the optional yearly processing is performed by the YEAR010 step, which splits the year-to-date files into a new year-to-date and a new cycle '01'.

9.2 Daily Update Processing Flow

The DAY010 step of the DAILY job processes information in the following phases.

Phase 1 - Input Raw Data
: Formats the TSO/MON data.

Phase 2 - Information Area Processing
: Eliminates duplicate data, summarizes device and step activity, and builds the journal files using the Accounting and Chargeback Product.

Phase 3 - Data Base Time-Span Processing
: Creates DAYS time-span files from DETAIL and updates week-to-date and month-to-date information where applicable.

Phase 4 - File Aging
: Ages the DETAIL and DAYS cycles, deleting the oldest cycle. Also replaces the week-to-date and month-to-date cycles.

The sections that follow describe the general logic flow in each of the phases, as well as the location of standard user routines and user exits. In the figures that follow, exits that are user-modifiable are shown in boxes whose corners are made of asterisks (*).

9.2.1 Input Raw Data Phase

In this phase, records are read from SMF data sets using the INPUTSMF DD statements. The data is processed and formatted to create SAS observations.

The following user exits are invoked in this phase:

- General Exits

  _USRSEL - input record selection

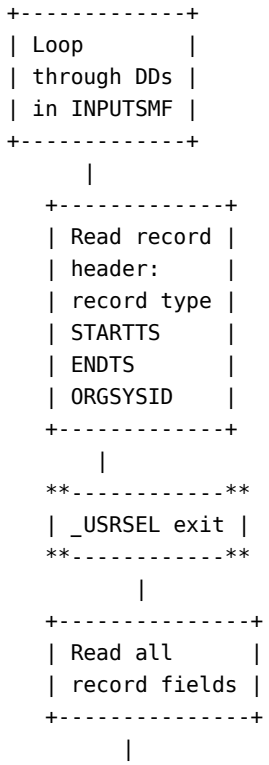
- Output Exits

  _USRSTSA - TSOTSA record selection
  _USRS_BD - TSO_BD record selection
  _USRSTSW - TSOTSW record selection

- Parameter Related Exits

  TSOAURT - application unit
  TSOACRT - account code derivation

This phase is shown in Figure 9-1.



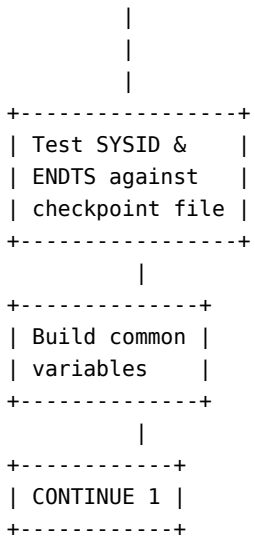
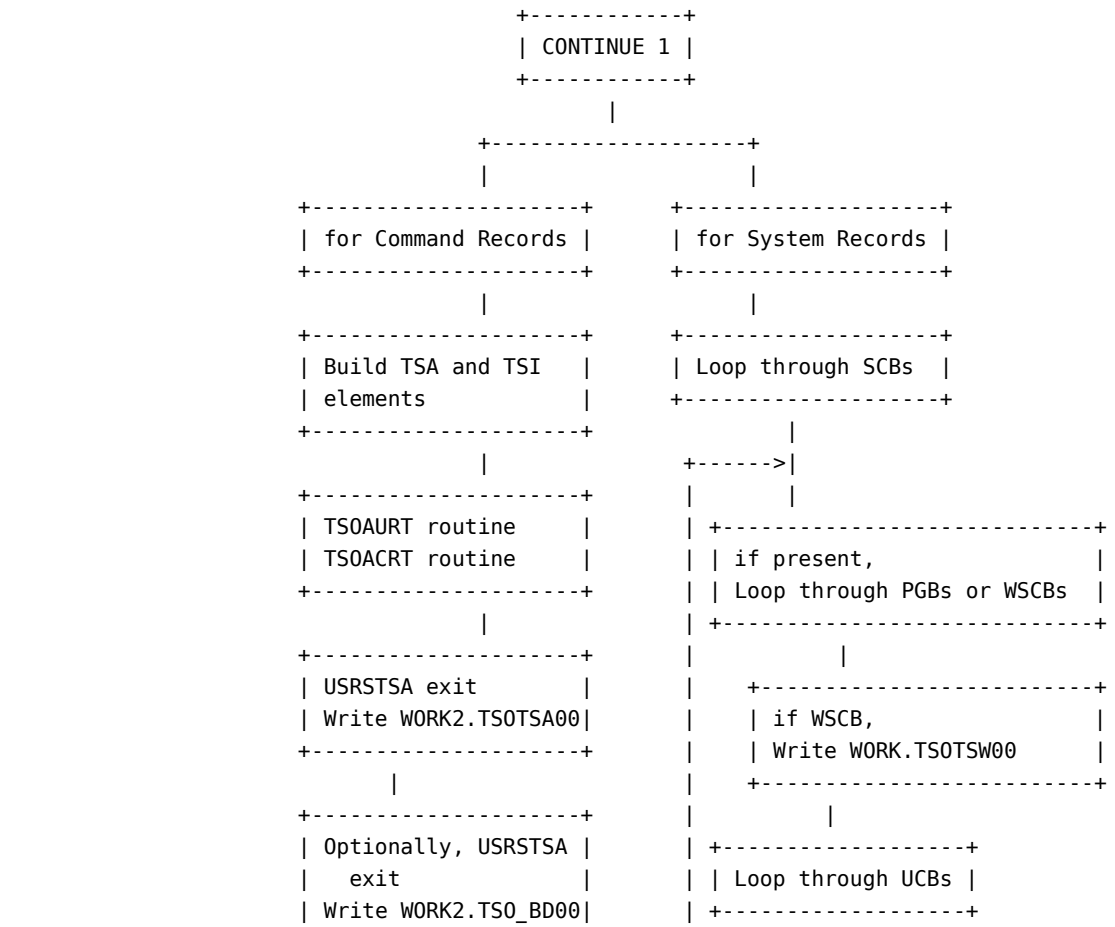


Figure 9-1. Input Raw Data Phase (Part 1 of 2)



```
+---------------------+       |          |
       |                      |    +--------------------------+
+---------------------+       |    | Loop through CCBs & FCBs |
| Write WORK.TSOTSI00 |       |    +--------------------------+
| Optionally,         |       |           |
| Write WORK.TSO_BI00 |       |    +--------------------------+
+---------------------+       |    | Write WORK.TSOTSC00      |
                              |    | Optionally,              |
                              |    | Write WORK.TSO_BC00      |
                              |    +--------------------------+
                              |          |
                              | +---------------------+
                              | | Write WORK.TSOTSU00 |
                              | | Optionally,         |
                              | | Write WORK.TSO_BU00 |
                              | +---------------------+
                              |       |
                              +<---- DONE?
                                      |
                             +---------------------+
                             | Write WORK.TSOTSO00 |
                             +---------------------+
```

Figure 9-1. Input Raw Data Phase (Part 2 of 2)

9.2.2 TSO Information Area Processing Phase

This phase takes the work files from Phase I and manipulates them to produce the new cycles for the DETAIL time-span.

The following user exits are invoked in this phase:

- Output Exits

  _USRSTSC - TSOTSC record selection
  _USRSTSI - TSOTSI record selection
  _USRSTSO - TSOTSO record selection
  _USRSTSU - TSOTSU record selection
  _USRS_BC - TSO_BC record selection
  _USRS_BI - TSO_BI record selection
  _USRS_BU - TSO_BU record selection
  _USRSDRU - TSODRU record selection
  _USRSTSW - TSOTSW record selection

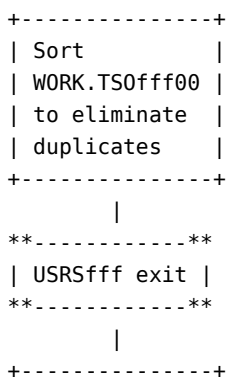
- Parameter Related Exits

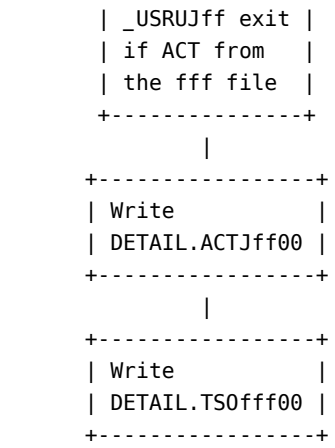
  TSOAURT - application unit routine
  TSOACRT - account code derivation

The interface to CA MICS Accounting and Chargeback contains the following exits that are not normally modified:

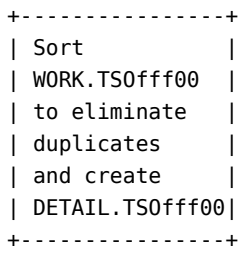
  _USRUJTC - TSOTSC accounting interface
  _USRUJTI - TSOTSI accounting interface
  _USRUJTU - TSOTSU accounting interface
  TSOJ_BC - TSO_BC accounting interface
  TSOJ_BI - TSO_BI accounting interface
  TSOJ_BU - TSO_BU accounting interface

For the TSI, TSU, and TSC files, processing follows this model:

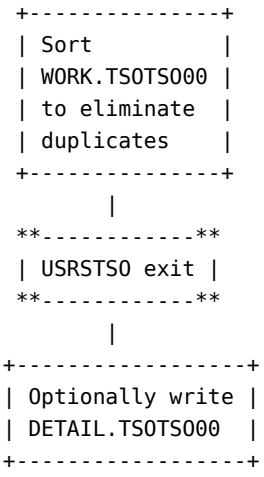




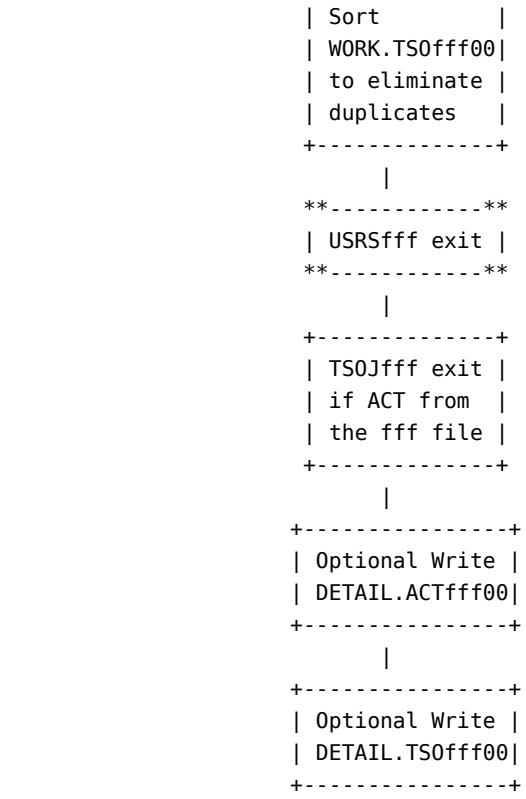
For the TSA and _BD files, processing follows this model:



For the TSO file, processing follows this model:



For the _BC, _BI, and _BU files, processing follows this model:

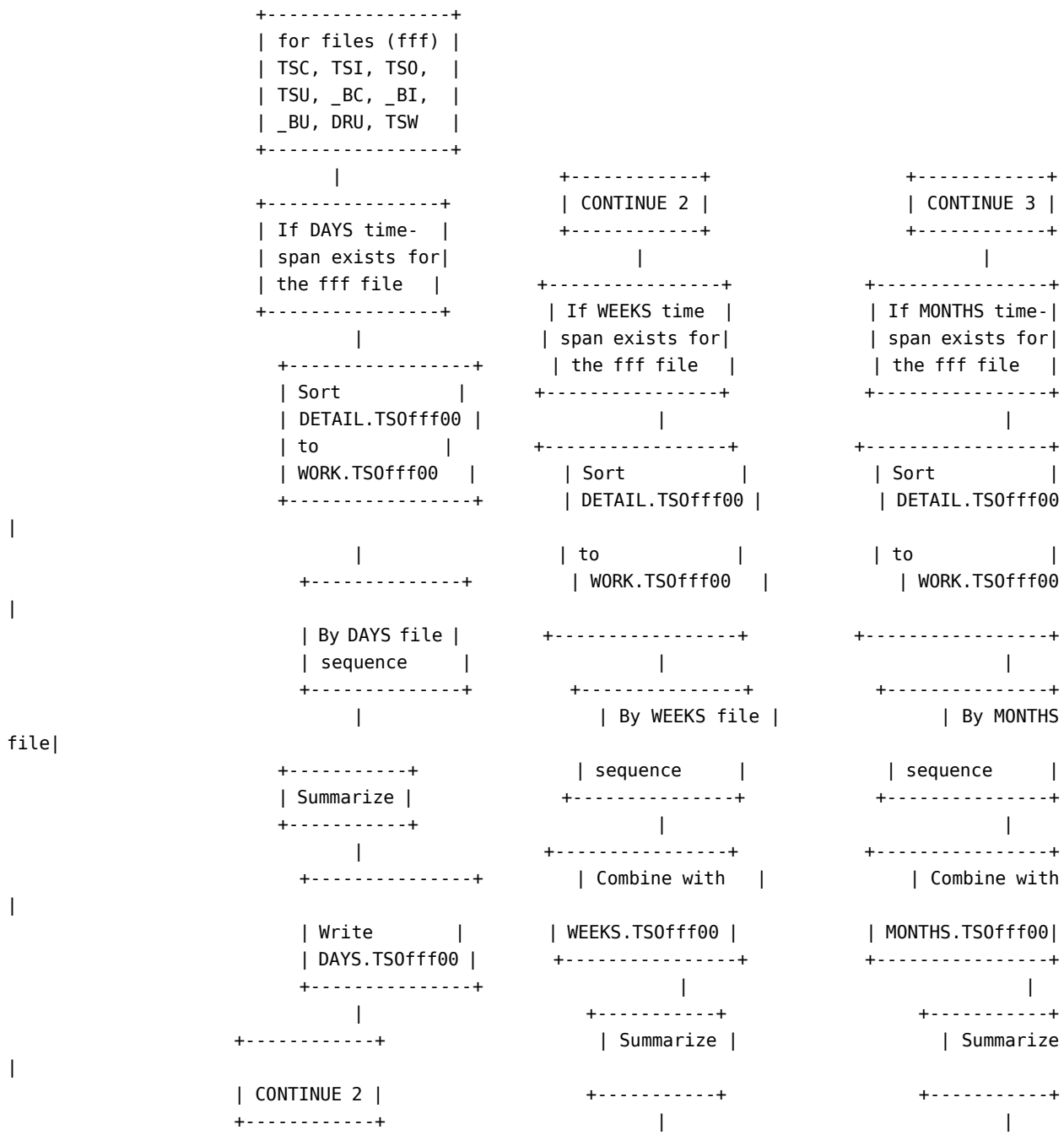


For the DRU and TSW files, processing follows this model:

9.2.3 Data Base Time-Span Update Phase

Processing in this phase updates the week-to-date and month-to-date cycles of the files shown in Figure 9-2.

No user exits are invoked in this phase.



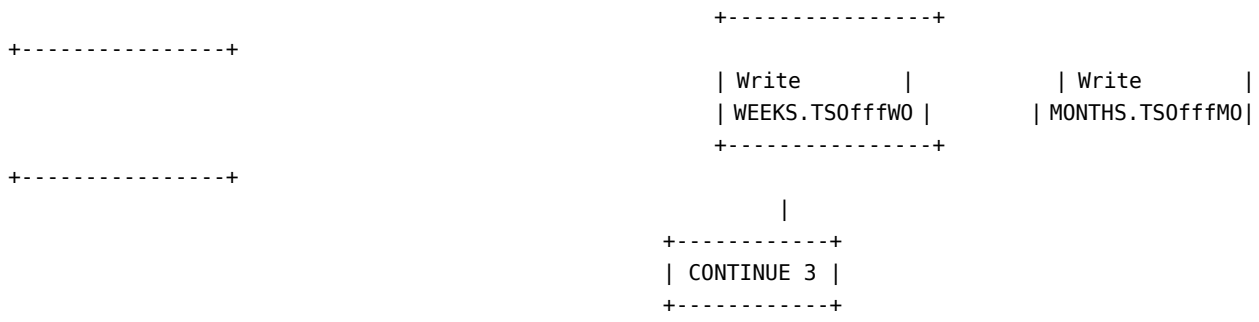
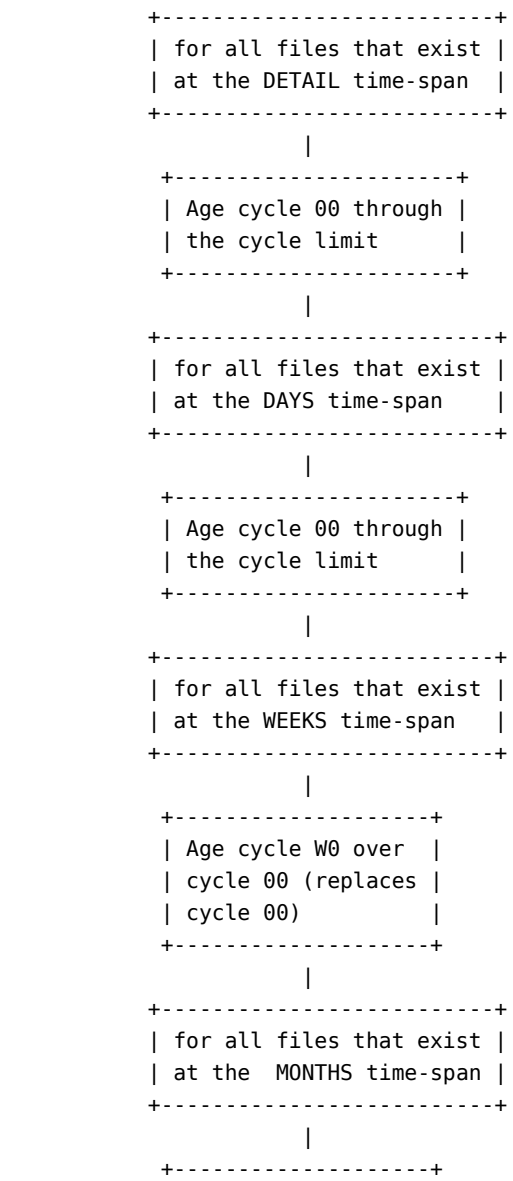


Figure 9-2. Data Base Time-Span Update Phase

9.2.4 File Aging Phase

The aging phase deletes the oldest cycles of the DETAIL and DAYS cycles and replaces them with the next oldest cycle and so forth until the new interim cycle ('00') becomes the current cycle ('01'). This phase also replaces the existing week-to-date and month-to-date cycles ('00') with the updated cycles ('W0' and 'M0', respectively).

No user exits are invoked in this phase, which is illustrated in Figure 9-3.



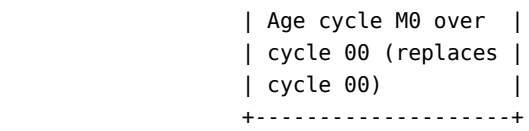


Figure 9-3. File Aging Phase

Chapter 10: MODIFICATION

At times, additional system customizing is needed to tailor CA MICS to your installation. Many user exit points are provided within CA MICS. Each of these points corresponds to a position in the CA MICS logic where user modification:

- Is likely to occur, based on customer experience with the product.
- Presents only a slight possibility of compromising CA MICS database or operational integrity.
- Is relatively easy to document and understand.

Using the CA MICS exit facilities to augment CA MICS processing logic is the safest method of system modification. Generally, the CA MICS System Administrator has four levels or methods by which CA MICS can be augmented, changed, and enhanced:

- CA MICS Standard Option and Parameter Definitions

  The diverse installation and definition options provide most users with adequate provisions for customizing CA MICS.

- Modification Through User Exits

  Often, installation-dependent requirements are not adequately addressed through the standard options and parameters. In these cases, you can use one or more of the user exits provided with CA MICS to insert user-written routines that satisfy the requirements.

- Extension Through User-Written Components

  Although most users do not at first consider this as a way of modifying CA MICS, the development of user-written products may be the most advantageous way of addressing the need to modify a standard CA MICS product. For example, many times it may be better to write a user product to handle additional SMF data than to attempt to modify the logic of the MVS Batch and Operations Analyzer.

```
    o  System Code Modification

       Finally, if all else fails, you may be able to satisfy
       your installation's requirements by implementing a
       source code change.

This chapter explains the user exits that are provided with
the TSO Analyzer.  You must carefully explore whether it is
necessary to develop a user exit routine.  You should first
ensure that the requirement cannot be satisfied through one
of the standard options or definitions.  To help you decide
which process to use, contact the CA MICS Product Support
Group.

BEFORE ATTEMPTING TO ACTIVATE AN EXIT, you should read and
fully understand the information contained in Section 4.3 of
the CA MICS System Modification Guide, User Exit Facilities.
The following material is intended to supplement, not
replace, that discussion.

The design, coding, testing, and implementation of CA MICS
user exit routines should be approached with caution because
errors may result that can corrupt the data.  You should
meticulously define and validate the exit routines to ensure
that the system integrity and performance will not be
adversely affected.

The following sections identify the user exits available for
TSO Analyzer processing, provide a general overview of
product processing logic, and describe in detail each of the
user exits.
```

This section contains the following topics:

10.1 Parameter Modification

Parameter modifications are described below. The parameters themselves are documented in Chapter 7 of this guide. The checklists in this section are to be used when changing the CA MICS TSO Analyzer after it has been installed and running. They are not intended to be used for installation purposes.

For a more thorough description of the tasks to perform, refer to Chapter 6 in the CA MICS System Modification Guide. Chapter 6 discusses database tailoring.

Modifying TSOGENIN

The TSOGENIN member of sharedprefix.MICS.GENLIB controls the key structure and element content of the product files, including activating account codes for the Analyzer. Before making any changes to this member, carefully review the description of the CA MICS Component Generator in Chapter 4 of the System Modification Guide.

___ 1. Save a copy of sharedprefix.MICS.GENLIB(TSOGENIN) in sharedprefix.MICS.LOCALMOD.CNTL for recovery purposes.

___ 2. Code your TSOGENIN changes in IEBUPDTE format.

___ 3. Update sharedprefix.MICS.GENLIB(TSOGENIN) using IEBUPDTE to apply the change. Be sure that the step completes with a condition code of zero and that the updates applied as expected.

___ 4. Submit sharedprefix.MICS.CNTL(TSOCGEN) to implement the change.

___ 5. If you activated files, complete the steps in the Modifying DBMODEL checklist in this section. If you did not activate files, this checklist is complete.

Modifying TSOACCT or TSOACRT

Changes to TSOACCT may be required to increase the length of an account element. It is also possible to add, delete, change the sequence, or change the timespans at which an element exists.

```
Since these types of modifications can impact update
processing, you should contact CA Product Support before
attempting them.  Also, changes of this type may require
modifications to sharedprefix.MICS.PARMS(TSOACRT).

___ 1.  Save a copy of sharedprefix.MICS.PARMS members
        TSOACCT and TSOACRT in
        sharedprefix.MICS.LOCALMOD.CNTL for recovery
        purposes.

___ 2.  Edit sharedprefix.MICS.PARMS(TSOACCT) and make any
        required changes.

___ 3.  Submit sharedprefix.MICS.CNTL(TSOCGEN) to implement
        the change.  This completes this checklist.

___ 4.  If necessary, edit sharedprefix.MICS.PARMS(TSOACRT)
        and make any required changes.  Please note that
        changes made to this member take effect immediately.

Modifying DBMODEL
-----------------

The DBMODEL member controls the cycle retention limits for
all files in the unit.  Activating a file or adding a file to
a new timespan also requires changes to TSOGENIN.

___ 1.  Save a copy of prefix.MICS.PARMS(DBMODEL) in
        sharedprefix.MICS.LOCALMOD.CNTL for recovery
        purposes.

___ 2.  Edit prefix.MICS.PARMS(DBMODEL) and make any required
        changes.

___ 3.  If necessary, perform steps 4 through 7 to reallocate
        the database unit files.  Otherwise proceed to step
        8.

___ 4.  If necessary, submit prefix.MICS.CNTL(BACKUP) to
        obtain a current backup of the unit.

___ 5.  Delete the following data sets:

          prefix.MICS.CHECKPT.DATA
          prefix.MICS.DETAIL
          prefix.MICS.DAYS
          prefix.MICS.WEEKS
          prefix.MICS.MONTHS
```

```
          prefix.MICS.YEARS

___ 6.  Edit prefix.MICS.CNTL(ALLOCATE) to specify the new
        data set space requirements and submit.

___ 7.  Submit prefix.MICS.CNTL(RESTORE) to restore the data
        sets.

___ 8.  If the cycle retention limits have been changed,
        submit prefix.MICS.CNTL(CYCLEGEN) to make the changes
        effective.
```

10.2 Standard User Exits

Two types of user exits can be used to modify CA MICS logic: the general exits, which apply to all the installed products, and the product exits, which apply only to the product for which they are provided.

The general exits are briefly described in this guide. They are described in more detail in Section 4.3, User Exit Facilities, in the CA MICS System Modification Guide.

The product exits are classified according to their purpose and include product input, output, parameter related, and accounting exits.

Input exits are invoked as the raw input records are read. Output exits are invoked just before CA MICS writes an observation to the CA MICS data base.

The TSO Analyzer provides the general input exit, _USRSEL. This exit can be used to select or exclude input data that meets special installation-defined criteria, to add data elements, or to modify record fields as they are read.

One output exit routine is provided for each product file. This output exit routine may be used to selectively block the writing of specified records, alter data elements in the records, or produce additional records for the target file or a user-defined file.

The product parameter related exits are also user exits, but they are defined as part of the standard CA MICS installation process. They are normally associated with other parameters or options. For example, the Account Code Derivation Routine is a user exit routine for completing values for account codes that were defined in the separate, but related TSOACRT member of prefix.MICS.PARMS. TSOACRT is the Account Code Definition parameter member. These exits are identified in this chapter but are described in Chapter 7, Defining TSO Parameters.

The user exits for the TSO Analyzer are identified below and discussed in the sections noted:

1 - General Exits

_USRSEL - Input record selection

2 - Input Exits

```
    None

3 - Parameter-Related Exits

    TSOACRT  - TSO account code derivation
    TSOAURT  - TSO application unit

4 - Output Exits

    _USRS_DB - TSO_DB record selection
    _USRS_DC - TSO_DC record selection
    _USRS_DI - TSO_DI record selection
    _USRS_DU - TSO_DU record selection
    _USRS_TA - TSO_TA record selection
    _USRSDRU - TSODRU record selection
    _USRSTSA - TSOTSA record selection
    _USRSTSC - TSOTSC record selection
    _USRSTSI - TSOTSI record selection
    _USRSTSO - TSOTSO record selection
    _USRSTSU - TSOTSU record selection
    _USRSTSW - TSOTSW record selection
```

10.2.1 General Exits

This section provides a description of the general exits that are shared by TSO with the other installed CA MICS products.

Each exit description includes the name and title, a description of its purpose, when it is invoked, and whether or not it has an interface to the CA MICS Accounting and Chargeback Product. It also shows which data elements are available, the special considerations to note, and a sample user exit.

```
+---------------+
| _ U S R S E L |  Input Record Selection Exit (_USRSEL)
+---------------+

DESCRIPTION:
The _USRSEL exit provides the ability to select records that
may be processed by the TSO input format routine.  It is
similarly invoked to provide data selection for each CA MICS
component.

INVOCATION:
The  _USRSEL exit gains control during the input format phase
of the TSO daily update process step (DAY010).  It is invoked
after the account data SYSID header and other common fields
have been read, but before the front end record processing.
See Chapter 9 of this guide for more information.

ACCOUNTING INTERFACE:
No interface is provided.

USES:
This exit may be used to exclude records from processing
based on their source, type, or origin.

ELEMENTS AVAILABLE:
This exit is referenced by many different CA MICS products.
To help identify the caller, the ROUTINE variable is
initialized with the module name.

The element SKIP_REC is initialized to zero just prior to the
exit.  If the exit code sets SKIP_REC to one, that record
will be bypassed.

CODING RESTRICTIONS:  Refer to the System Modification Guide,
Refer to the System Modification Guide, Section 4.4.2.1
```

10.2.2 Input Exits

No input exits exist for the TSO Analyzer.

10.2.3 Parameter-Related Exits

```
+---------------+
| T S O A C R T |  TSO Account Code Derivation (TSOACRT)
+---------------+

DESCRIPTION:
The TSOACRT exit derives the value of the account code
elements described in prefix.MICS.PARMS(TSOACCT).

INVOCATION:
The exit is referenced once for each of the following files:
TSOTSC, TSOTSI, TSOTSU, TSO_BC, TSO_BI, and TSO_BU.

ACCOUNTING INTERFACE:
No interface is provided.

USES:
This exit sets the value of the TSOACTx variables.

ELEMENTS AVAILABLE:
All DETAIL time-span elements of the files are available.

CODING RESTRICTIONS:  Refer to Chapter 7 of this guide.

SPECIAL NOTES:
The exit code is contained in
sharedprefix.MICS.PARMS(TSOACRT).

SAMPLE USER EXIT:
See Chapter 7 for a sample exit.
```

```
+---------------+
| T S O A U R T |  TSO Application Unit Derivation (TSOAURT)
+---------------+

DESCRIPTION:
The TSOAURT exit derives the value of the Application Unit
Identifier (TSOAPU) data element used for transaction
accounting by the CA MICS Accounting and Chargeback Product.

INVOCATION:
The exit is referenced once for each of the following files:
TSOTSC, TSOTSI, TSO_BC, and TSO_BI.

ACCOUNTING INTERFACE:
No interface is provided.

USES:
This exit sets the value of the TSOAPU variable.

ELEMENTS AVAILABLE:
All DETAIL time-span elements of the files are available.
WRKTSC is set to 1 while processing the TSOTSC and TSO_BC
files.  WRKTSI is set to 1 while processing the TSOTSI and
TSO_BI files.

CODING RESTRICTIONS:  Refer to Chapter 7 of this guide.

SPECIAL NOTES:
The exit code is contained in prefix.MICS.PARMS(TSOAURT).

SAMPLE USER EXIT:
See Chapter 7 for a sample exit.
```

10.2.4 Output Exits

```
Output exits are invoked just prior to adding the observation
to the DETAIL time-span of the file.  This exit can be used
to modify the value of elements or prevent selected
observations from being added.

The following exit description applies to these files:

  TSO_BC - TSO Batch Command Counts File
  TSO_BD - TSO Batch Data Set Names File
  TSO_BI - TSO Batch Command Information File
  TSO_BU - TSO Batch User Activity File
  TSO_TA - TSO Terminal Activity File
  TSODRU - TSO Dynamic Resource Usage File
  TSOTSA - TSO Data Set Names File
  TSOTSC - TSO User Command Counts File
  TSOTSI - TSO User Interactive Usage File
  TSOTSO - TSO System Activity File
  TSOTSU - TSO User Activity File
  TSOTSW - TSO Workload Manager File


+-----------------+
| _ U S R S f f f |  TSO File Selection Exit (_USRSfff)
+-----------------+

DESCRIPTION:
The _USRSfff exit provides the ability to modify or select
observations immediately prior to output.

INVOCATION:
These exits are invoked in the information area processing
phase immediately before output of the file.  See Chapter 9
of this guide for more information.

ACCOUNTING INTERFACE:
No interface is provided.

USES:
The exit allows elements to be modified and observations to
be selected from processing.

ELEMENTS AVAILABLE:
All elements in the file are available.

CODING RESTRICTIONS:  Refer to the System Modification Guide,
Section 4.4.2.2
```

10.3 File and Data Element Customization

See Chapter 4 of the CA MICS System Modification Guide for information.

10.4 Change the Number of Work Files for DAY010

To change the number of work files used in the CA MICS TSO Analyzer processing in Step DAY010, follow the checklist provided below for each unit.

See Section 7.3.3.4 of this guide for a detailed description of the statement syntax.

```
   ************************************************
   *                                              *
   *          CHANGE NUMBER OF WORK FILES         *
   *                                              *
   ************************************************
```

___ 1. Update the WORK statement in prefix.MICS.PARMS(cccOPS), where (ccc) is the component identifier, to specify the number of work data sets required. Below is an example:

```
WORK n STORCLAS=MICSTEMP SPACE=(XXX,(pppp,ssss))
```

where:

```
n        - is the number of WORK data sets.
STORCLAS - specifies a storage class for a new data
           set.  The name can have up to eight
           characters.
SPACE    - specifies how much disk space to provide
           for a new data set being allocated.
XXX      - is TRK or CYL.
pppp     - is the primary allocation.
ssss     - is the secondary allocation.
```

You should specify the minimum number of WORK data sets to meet your work space requirements. As a start, try incrementing the number gradually beginning from the default.

___ 2. If this is the first time you are implementing multiple work files for this product, then continue with Step 2. If you are just changing the number currently in use, or simply the space definitions, then proceed to Step 3 of this checklist.

Browse sharedprefix.MICS.PROTOLIB(DYcccnnn) and sharedprefix.MICS.PROTOLIB(cccINCR), where (nnn) is the job step number and (ccc) is the product ID for this product, checking for the presence of the WORK

symbolic on the EXEC statement to determine if you have previously modified this product to increase the allocation of SAS WORK space.

___ 2a. If you find a WORK symbolic, simply divide the primary and secondary allocation values from the WORK symbolic by the number of work files specified above (value of n on the WORK statement coded in Step 1).

Coding the resulting values will yield the same aggregate space allocation you have been using with a single WORK file. To double your available WORK space, carry out the division, double the results and use the values in the WORK definition above.

___ 2b. If you did not find a WORK symbolic in PROTOLIB, examine prefix.MICS.PARMS(JCLDEF) for each CA MICS unit containing this product. Find the WORKSPACE keyword. The space allocation specified is used for a single SAS WORK file. Perform the same division as described in the previous paragraph to determine the quantity that will yield equivalent total allocation with multiple WORK files. Then adjust the values upward to meet your needs.

___ 3. Submit the job in prefix.MICS.CNTL(cccPGEN).

___ 4. If you specified RESTART YES in the product's cccOPS, you are done. Otherwise, you must do Steps 5, 6, and 7.

___ 5. Edit prefix.MICS.PARMS(JCLGENU) so that it contains a single line that reads:

DAILY

or, if incremental update is enabled for this product in this unit database, specify:

DAILY INCRccc

where ccc is the product ID.

___ 6. Submit the job in prefix.MICS.CNTL(JCLGENU). Ensure that there are no error messages in MICSLOG or SYSTSPRT, that the MICSLOG contains the normal termination message, BAS10999I, and that the job completes with a condition code of zero.

```
___ 7.  The following operational job(s) have changed:

        DAILY

        INCRccc (if incremental update is enabled)

        If your site has implemented the operational CA MICS
        processes in a scheduling product, the JCL may have
        to be refreshed in that product.  See the scheduling
        product's administrator for the exact processes
        involved in updating that product's representation of
        the CA MICS jobs.
```

10.5 Enable Internal Step Restart

To enable the internal step restart in the CA MICS TSO Analyzer, follow the checklist provided below:

See Section 7.3.3.4 of this guide for a detailed description of of the statement syntax.

```
**************************************************
*                                                *
*           ENABLE INTERNAL STEP RESTART         *
*                                                *
**************************************************
```

___ 1. Edit prefix.MICS.PARMS(cccOPS), where (ccc) is the component identifier, and specify:

RESTART YES

For additional information on related topic, review the documentation for this product on WORK, RESTARTWORK, and RESTARTCKPT parameters to override default data set allocation parameters.

___ 2. Submit the job in prefix.MICS.CNTL(cccPGEN).

___ 3. Edit prefix.MICS.PARMS(JCLGENU) so that it contains a single line that reads:

DAILY

or, if incremental update is enabled for this product in this unit database, specify:

DAILY INCRccc

where ccc is the product ID.

___ 4. Submit the job in prefix.MICS.CNTL(JCLGENU). Ensure that there are no error messages in MICSLOG or SYSTSPRT, that the MICSLOG contains the normal termination message, BAS10999I, and that the job completes with a condition code of zero.

___ 5. The following operational job(s) have changed:

DAILY

INCRccc (if incremental update is enabled)

If your site has implemented the operational CA MICS processes in a scheduling product, the JCL may have to be refreshed in that product. See the scheduling product's administrator for the exact processes involved in updating that product's representation of the CA MICS jobs.

10.6 Implement Incremental Update

To implement incremental update in the CA MICS TSO Analyzer, follow the checklist provided below:

See Section 7.3.4 of this guide for a detailed description of the statement syntax.

```
   ************************************************
   *                                              *
   *          IMPLEMENT INCREMENTAL UPDATE        *
   *                                              *
   ************************************************
```

___ 1. Edit prefix.MICS.PARMS(cccOPS), where (ccc) is the component identifier:

- Specify the following:

  ```
  INCRUPDATE  YES
  ```

- If you want to store the incremental update database files on tape between incremental updates, specify this:

  ```
  INCRDB  TAPE  #gdgs
  ```

- If you want to allocate the incremental update database files during the first incremental update of the day and delete these data sets at the end of the DAILY job step, specify this:

  ```
  INCRDB  DYNAM
  ```

- If you specified INCRDB TAPE or INCRDB DYNAM, then you must also specify this:

  ```
  INCRDETAIL  data_set_allocation_parameters
  INCRDAYS    data_set_allocation_parameters
  ```

- If you want the incremental update job for this product to get input measurement data from the output of the SPLITSMF job, specify this:

  ```
  INCRSPLIT  USE  data_set_allocation_parameters
  ```

- For additional information on related topic, review the documentation for this product on

INCRCKPT, INCRDETAIL, INCRDAYS, or INCRSPLIT parameters to override default data set allocation parameters.

___ 2. Submit the job in prefix.MICS.CNTL(cccPGEN).

___ 3. Edit prefix.MICS.PARMS(JCLGENU) so that it contains two or more lines reading:

```
DAILY
INCRccc cccIUALC cccIUGDG
```

___ 4. Submit the job in prefix.MICS.CNTL(JCLGENU). Ensure that there are no error messages in MICSLOG or SYSTSPRT, that the MICSLOG contains the normal termination message, BAS10999I, and that the job completes with a condition code of zero.

___ 5. Edit the job in prefix.MICS.CNTL(cccIUALC).

- Inspect and/or specify data set allocation parameters for the incremental update database and checkpoint files. If you specified INCRDB TAPE or INCRDB DYNAM, the cccIUALC job will only allocate the incremental update checkpoint data set.
- Submit the job. Ensure that there are no error messages in MICSLOG or SASLOG, and that the job completes with a condition code of zero.

___ 6. If you specified INCRDB TAPE, submit the job in prefix.MICS.CNTL(cccIUGDG) to define generation group indexes for the incremental update DETAIL and DAYS tape data sets. Examine SASLOG, MICSLOG, and SYSPRINT to verify that the generation group indexes were correctly defined.

Note: You may see error messages for the DLTX (or DELETE) statements. This is not a problem. cccIUGDG deletes each index prior to defining it, and an error message is issued if the index does not yet exist (e.g., if this is the first time you ran the cccIUGDG job).

___ 7. The following operational job(s) have changed:

```
DAILY  INCRccc
```

If your site has implemented the operational CA MICS

processes in a scheduling product, the JCL may have to be refreshed in that product. See the scheduling product's administrator for the exact processes involved in updating that product's representation of the CA MICS jobs.

___ 8. Implement operational procedures for gathering input measurement data and executing incremental updates (INCRccc) during the day.

You may also need to modify operational procedures for the DAILY job to ensure that processing is limited to input measurement data that has not been input to one of the day's incremental update executions.

Appendix A: Messages

This appendix lists the messages generated by the TSO Analyzer. The messages are printed on both the MICSLOG and SASLOG data sets. When reviewing the output of a job, first look at the MICSLOG data set because it will contain fewer lines of information, thus making it easier to see whether or not a job or job step completed as expected. If the MICSLOG message does not provide enough information, consult this appendix for more information about the message. If you still need more information, consult the SASLOG to help debug the problem.

The format of a MICSLOG message is

```
    hh:mm:ss.hs cccnnnnns ttttttttttttttttttttttttttttttttttt
```

where:

hh:mm:ss.hs is the time that the message was issued.

cccnnnnns	is the message identifier. The message identifier consists of three parts:
	ccc — three letter component identifier
	nnnnn — the message number
	s — the severity identifier, where I is an informational message, W indicates a warning, and E indicates an error
ttt...ttt:	is the message text. If the text spans more than one line, the message identifier is repeated.

The remainder of this appendix shows the MICSLOG messages produced for the TSO Analyzer. In addition to the message identifier and text, this section presents the reason for the message, suggests actions to take to resolve the problem, and refers you to additional sources of information to help you understand the problem and its resolution.

```
+----------------+
| T S O 0 0 0 9 7 |
+----------------+
```

TEXT: _____.

TYPE: Information

REASON: The text of this message will vary from program to program and will contain general information about the processing being done at that moment in time. The information in the message should be self-explanatory and should not require any additional supporting documentation. This message differs from TSO00098 and TSO00099, in that it is used when the information is to be written only on the MICSLOG.

ACTION: None

REFERENCES: None

```
+-----------------+
| T S 0 0 0 0 9 8 |
+-----------------+

   TEXT:  _____________________________________________________.

   TYPE:  Information

   REASON:  The text of this message will vary from program
            to program and will contain general information
            about the processing being done at that moment in
            time.  The information in the message should be
            self-explanatory and should not require any
            additional supporting documentation.  This
            message differs from TSO00097 and TSO00099, in
            that it is used when the information is to be
            written only on the SASLOG.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S 0 0 0 0 9 9 |
+-----------------+

   TEXT:  _____________________________________________________.

   TYPE:  Information

   REASON:  The text of this message will vary from program
            to program and will contain general information
            about the processing being done at that moment in
            time.  The information in the message should be
            self-explanatory and should not require any
            additional supporting documentation.  This
            message differs from TSO00097 and TSO00098, in
            that it is used when the information is to be
            written to both the MICSLOG and SASLOG.

   ACTION:  None

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 1 0 0 |
+-----------------+

   TEXT:  FIRST INPUT TIMESTAMP THIS RUN=________ FROM SYSTEM
          _________.

   TYPE:  Information

   REASON:  The TIMESTAMP and SYSTEM ID shown in the message
            are from the first valid record.  This identifies
            the starting point of the data processed in the
            DAY010 step.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S O 0 0 1 0 1 |
+-----------------+

   TEXT:  COMMAND RECORD NOT DEFINED IN GENLIB(TSOGENIN)
          INPUTSOURCE STATEMENT.

   TYPE:  Error

   REASON:  The SMF Record Type of the TSO/MON Command
            Records being input to this DAY010 update does
            not match the Command Record type specified on
            the INPUTSOURCE statement in the TSOGENIN member
            of sharedprefix.MICS.GENLIB.

   ACTION:  Correct the specification of the SMF record type
            number used for the TSO/MON Command Records in
            sharedprefix.MICS.GENLIB(TSOGENIN).  Then rerun
            the DAY010 step.

   REFERENCES:  TSO Analyzer Guide, Section 7.2.4
```

```
+-----------------+
| T S 0 0 0 1 0 2 |
+-----------------+

   TEXT:  SYSTEM RECORD NOT DEFINED IN GENLIB(TSOGENIN)
          INPUTSOURCE STATEMENT.

   TYPE:  Error

   REASON:  The SMF Record Type of the TSO/MON System Records
            being input to this DAY010 update does not match
            the System Record type specified on the
            INPUTSOURCE statement of the TSOGENIN member of
            sharedprefix.MICS.GENLIB.

   ACTION:  Correct the specification of the SMF record type
            number used for the TSO/MON System Records in
            sharedprefix.MICS.GENLIB(TSOGENIN).  Then rerun
            the DAY010 step.

   REFERENCES:  TSO Analyzer Guide, Section 7.2.4

+-----------------+
| T S 0 0 0 1 0 4 |
+-----------------+

   TEXT:  INVALID COMMAND OR SYSTEM RECORD

   TYPE:  Error

   REASON:  The SMF record type of the input record is not
            one of the valid TSO/MON record types as
            specified on the INPUTSOURCE statement in
            sharedprefix.MICS.GENLIB(TSOGENIN).

   ACTION:  Verify the specification of the TSO/MON record
            types on the INPUTSOURCE statement in
            sharedprefix.MICS.GENLIB(TSOGENIN) and correct
            them if necessary.  Also verify that the correct
            input file is being processed.  Rerun the DAY010
            update step after corrections have been made.

   REFERENCES:  TSO Analyzer Guide, Section 7.2.4
```

```
+-----------------+
| T S O 0 0 1 0 5 |
+-----------------+

   TEXT:  DATA PRIOR TO TSO/MON VERSION 5.0 NOT SUPPORTED

   TYPE:  Error

   REASON:  The TSO/MON input records were created using a
            release of TSO/MON earlier than Release 5.0.
            Data from TSO/MON releases earlier than Release
            5.0 cannot be processed by CA MICS.

   ACTION:  Use TSO/MON input records created using TSO/MON
            Release 5.0 or higher in the next DAY010 update.

   REFERENCES:  TSO Analyzer Guide, Section 1.6

+-----------------+
| T S O 0 0 1 0 7 |
+-----------------+

   TEXT:  USER DELETED ____ DRU OBSERVATIONS VIA USRSDRU EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRSDRU exit.

   ACTION:  None

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 1 0 8 |
+-----------------+
```

TEXT: USER DELETED ____ TSI OBSERVATIONS VIA USRSTSI EXIT

TYPE: Information

REASON: This is the number of observations that were deleted by the user-specified instructions in the USRSTSI exit.

ACTION: None

REFERENCES: None

```
+-----------------+
| T S O 0 0 1 0 9 |
+-----------------+
```

TEXT: USER DELETED ____ TSA OBSERVATIONS VIA USRSTSA EXIT

TYPE: Information

REASON: This is the number of observations that were deleted by the user-specified instructions in the USRSTSA exit.

ACTION: None

REFERENCES: None

```
+-----------------+
| T S O 0 0 1 1 0 |
+-----------------+
```

TEXT: THE TSMLINK LOAD DATA SET NAME IS -- _____

TYPE: Information

REASON: This message identifies the TSO/MON load data set containing the TSMPARMS routine, which is used to find the Command Table used in the DAY010 update.

ACTION: Verify that the data set specified contains an up to date version of TSMPARMS.

REFERENCES: None

```
+-----------------+
| T S O 0 0 1 1 1 |
+-----------------+

   TEXT:  THE TSO/MON COMMAND TABLE MEMBER NAME REQUESTED IS
          -- ________

   TYPE:  Information

   REASON:  This message identifies the TSO/MON Command Table
            member name to be used in the DAY010 update.

   ACTION:  Verify the table name. Unpredictable command
            abbreviation translations can occur if you use an
            obsolete or incorrect command table.

   REFERENCES:  None

+-----------------+
| T S O 0 0 1 1 2 |
+-----------------+

   TEXT:  ERROR ENCOUNTERED DURING OPEN OF TSMLINK

   TYPE:  Error

   REASON:  The data set specified in the TSMLINK DD
            statement of the DAY010 update could not be
            opened.

   ACTION:  If the TSO/MON load data set is not in your
            normal library setup, you must specify a TSMLINK
            DD statement that references a data set
            containing a current version of the TSMPARMS
            program.

   REFERENCES:  TSO Analyzer Guide, Section 7.3.2
```

```
+----------------+
| T S O 0 0 1 1 3 |
+----------------+

   TEXT:  THE TSO/MON COMMAND TABLE WAS FOUND IN DATA SET

   TYPE:  Information

   REASON:  This message identifies the data set containing
            the TSO/MON Command Table used in the DAY010
            update.

   ACTION:  Verify that the data set used was the correct
            one.  Use of an obsolete or incorrect command
            table may cause unpredictable translation of
            command abbreviations.

   REFERENCES:  None

+----------------+
| T S O 0 0 1 1 9 |
+----------------+

   TEXT:  TSO/MON COMMAND TABLE PROCESSING ENDED

   TYPE:  Information

   REASON:  This message indicates that the TSO/MON Command
            Table was successfully located, opened,
            processed, and closed in this DAY010 update.

   ACTION:  None

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 1 3 0 |
+-----------------+

   TEXT:  ERRORS FOUND ON INPUT PARAMETERS. CORRECT AND
          RESUBMIT.

   TYPE:  Error

   REASON:  At least one error encountered during validation
            of the TSOOPS member of the PARMS library.

   ACTION:  Correct the error(s) listed in other messages in
            the MICSLOG and rerun TSOPGEN.


   REFERENCES:  None

+-----------------+
| T S O 0 0 2 0 0 |
+-----------------+

   TEXT:  USER DELETED ____ TSU OBSERVATIONS VIA USRSTSU EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRSTSU exit.

   ACTION:  None

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 2 0 1 |
+-----------------+

   TEXT:  USER DELETED ____ TSO OBSERVATIONS VIA USRSTSO EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRSTSO exit.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S O 0 0 2 0 2 |
+-----------------+

   TEXT:  USER DELETED ____ TSC OBSERVATIONS VIA USRSTSC EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRSTSC exit.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S O 0 0 2 0 3 |
+-----------------+

   TEXT:  USER DELETED ____ _BI OBSERVATIONS VIA USRS_BI EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRS_BI exit.

   ACTION:  None

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 2 0 4 |
+-----------------+

   TEXT:  USER DELETED ____ _BU OBSERVATIONS VIA USRS_BU EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRS_BU exit.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S O 0 0 2 0 5 |
+-----------------+

   TEXT:  USER DELETED ____ _BC OBSERVATIONS VIA USRS_BC EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRS_BC exit.

   ACTION:  None

   REFERENCES:  None

+-----------------+
| T S O 0 0 2 0 6 |
+-----------------+

   TEXT:  USER DELETED ____ _BD OBSERVATIONS VIA USRS_BD EXIT

   TYPE:  Information

   REASON:  This is the number of observations that were
            deleted by the user-specified instructions in the
            USRS_BD exit.

   ACTION:  None

   REFERENCES:  None
```

```
+----------------+
| T S 0 0 0 5 0 0 |
+----------------+

   TEXT:  DAYS TSO_TA INPUT/OUTPUT FILE STATISTICS

   TYPE:  Information

   REASON:  This is the first of several messages which list
            the input/output observation counts for the
            TSO_TA file created in this DAY010 update.

   ACTION:  None

   REFERENCES:  Messages TSO00500 to TSO00505 describe the
                input/output statistics for the TSO_TA file,
                which is inactive by default.  If you
                activate the file, messages TSO00500,
                TSO00501, TSO00504, and TSO00505 will be
                produced.  Messages TSO00502 and TSO00503
                will be produced only if observations are
                deleted under the conditions described by
                those messages.

                You can use the totals shown in these
                messages to account for all observations
                processed to create the TSO_TA file:

                TSO00502 TERMID missing deletes +
                   TSO00503 USER specified deletes =
                      TSO00504 total number of deletes

                TSO00501 total observations read  -
                   TSO00504 total number of deletes =
                      TSO00505 total TSO_TA observations kept
```

```
+-----------------+
| T S O 0 0 5 0 1 |
+-----------------+
```

TEXT: TOTAL TSOTSU OBSERVATIONS READ -------- _______

TYPE: Information

REASON: This messages shows the number of observations read from the TSOTSU file that were used to create observations in the TSO_TA file.

ACTION: None

REFERENCES: See the references for message TSO00500.

```
+-----------------+
| T S O 0 0 5 0 2 |
+-----------------+
```

TEXT: TERMID/LINETYPE MISSING, DELETE ------- _______

TYPE: Information

REASON: This message shows the number of observations deleted from the TSO_TA file due to missing termid and/or line type.

ACTION: None

REFERENCES: See the note in the REFERENCES section of message TSO00500.

```
+-----------------+
| T S O 0 0 5 0 3 |
+-----------------+
```

TEXT: USER DELETED VIA USRS_TA EXIT --------- _______

TYPE: Information

REASON: This message shows the number of observations that were deleted from the TSO_TA file due to user request.

ACTION: None

REFERENCES: See the note in the REFERENCES section of message TSO00500.

```
+-----------------+
| T S O 0 0 5 0 4 |
+-----------------+
```

TEXT: TOTAL TSO_TA OBSERVATIONS DELETED ----- _______

TYPE: Information

REASON: This message shows the total number of observations that were deleted from the TSO_TA file.

ACTION: None

REFERENCES: See the note in the REFERENCES section of message TSO00500.

```
+-----------------+
| T S O 0 0 5 0 5 |
+-----------------+

   TEXT:  TOTAL TSO_TA OBSERVATIONS KEPT -------- _______

   TYPE:  Information

   REASON:  This message shows the number of observations
            that were written to the TSO_TA file.

   ACTION:  None

   REFERENCES:  See the note in the REFERENCES section of
                message TSO00500.

+-----------------+
| T S O 0 0 6 0 0 |
+-----------------+

   TEXT:  ERROR ENCOUNTERED DURING LOAD OF TSO/MON COMMAND
          TABLE -- RETURN CODE IS ___

   TYPE:  Error

   REASON:  An error occurred while loading the TSO/MON
            Command Table into memory.

   ACTION:  Notify the TSO/MON System Administrator.

   REFERENCES:  None
```

```
+-----------------+
| T S O 0 0 6 0 4 |
+-----------------+

   TEXT:  TSMPARMS DD STATEMENT IS MISSING

   TYPE:  Error

   REASON:  The TSMPARMS DD statement was not present in the
            JCL for the DAY010 update.  Note:  TSMPARMS is
            required to locate the Command Table.

   ACTION:  Include a TSMPARMS DD statement that references a
            data set that contains a valid TSO/MON Command
            Table.

   REFERENCES:  TSO Analyzer Guide, Section 7.3.2

+-----------------+
| T S O 0 0 6 0 8 |
+-----------------+

   TEXT:  ERROR ENCOUNTERED DURING OPEN OF TSMPARMS

   TYPE:  Error

   REASON:  The data set specified in the TSMPARMS DD
            statement of the DAY010 update could not be
            opened.

   ACTION:  Include a TSMPARMS DD statement that references a
            data set containing a valid TSO/MON Command
            Table.

   REFERENCES:  TSO Analyzer Guide, Section 7.3.2
```

```
+-----------------+
| T S O 0 0 6 1 2 |
+-----------------+

   TEXT:  COMMAND TABLE (________) NOT FOUND IN TSMPARMS

   TYPE:  Error

   REASON:  The data set specified in the TSMPARMS DD
            statement of the DAY010 update step did not
            contain the requested Command Table.

   ACTION:  Check with your TSO/MON System Administrator to
            verify that you are using the proper TSMPARMS
            data set and/or Command Table suffix number.

   REFERENCES:  TSO Analyzer Guide, Section 7.3.2

+-----------------+
| T S O 0 0 6 1 6 |
+-----------------+

   TEXT:  SYNTAX ERROR WHILE PARSING THE TSO/MON COMMAND
          TABLE

   TYPE:  Error

   REASON:  The TSO/MON Command Table specified contains
            syntax errors.

   ACTION:  Ensure that you have specified the correct
            Command Table suffix number.  If correct, notify
            the TSO/MON System Administrator.

   REFERENCES:  TSO Analyzer Guide, Section 7.3.2
```

```
+----------------+
| T S 0 0 0 6 2 0 |
+----------------+

   TEXT:  GETMAIN FAILURE WHILE PROCESSING THE TSO/MON
          COMMAND TABLE

   TYPE:  Error

   REASON:  The TSO/MON TSMPARMS utility program used to load
            the Command Table failed to obtain memory to hold
            the table.

   ACTION:  Increase the region size parameter on the DAY010
            step and restart the DAILY job.

   REFERENCES:  None

+----------------+
| T S 0 0 0 6 2 4 |
+----------------+

   TEXT:  TSMCMD CALL PARAMETER LIST IS INVALID

   TYPE:  Error

   REASON:  One of the variables needed in the TSMCMD CALL
            statement is invalid.  It may be missing, the
            wrong length, not a character element, or in the
            wrong order.

   ACTION:  Contact your CA MICS System Administrator.

   REFERENCES:  None
```

```
+----------------+
| T S 0 0 0 6 2 8 |
+----------------+

   TEXT:  COMMAND ABBREVIATION (__) NOT FOUND IN COMMAND
          TABLE

   TYPE:  Information

   REASON:  The command abbreviation could not be found in
            the TSO/MON Command Table.  A maximum of 25
            messages will be shown.  At termination, another
            message will be shown with the total number of
            command abbreviations not found.

   ACTION:  The command name is set to    *UNKNOWN.  Check to
            see if you are using the same Command Table being
            used by TSO/MON.  Notify the TSO/MON System
            Administrator.

   REFERENCES:  None
```

Appendix B: DATA DICTIONARY

The Data Dictionary is only available at your site, where it has been customized to your configuration and your product change level.

To see the Data Dictionary at your site, follow the instructions under Document Browse in the Document Access guide.