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WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS). H-6000 --ETC(U)
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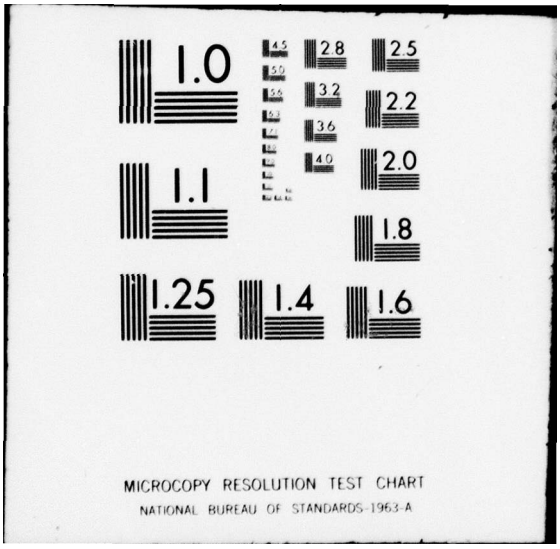
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TECHNICAL MEMORANDUM
TM 180-78
VOLUME IV
3 FEBRUARY 1978

LEVEL II

COMMAND & CONTROL TECHNICAL CENTER

WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS)

H6000 TUNING GUIDE

VOLUME IV - APPENDICES

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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER: CCTC-TM-180-78 VOL-4	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): Worldwide Military Command and Control System (WWMCCS). H-6000 Tuning Guide. Volume IV. Appendices.	5. TYPE OF REPORT & PERIOD COVERED: Technical memorandum
6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s): Barry M. Wallack, George H. Gero	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Command and Control Technical Center, Attn: CCTC/CPE/C702, Washington, DC 20301	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Same as above	12. REPORT DATE: 3 February 1978
	13. NUMBER OF PAGES: 68
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): 72p.	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

SBIE

DDC RECEIVED NOV 6 1978 B

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

AD-E100 096

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Computers, Test and evlauation, Performance tests, Time sharing

Honeywell 6000 computers, Computer systems, Federal Computer Performance and Evaluation and Simulation Center

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Federal Computer Performance Evaluation and Simulation Center (FEDSIM) has developed a document for WWMCCS installations that can be used by site personnel to analyze the performance characteristics of their Honeywell 6000 (H-6000) computer systems. This document, called an H-6000 Tuning Guide, incorporates detailed analyses procedures that guide the analyst in applying specific techniques to improve system performance.

This volume provides the appendixes referenced by the other volumes of the Tuning Guide. The volume provides detailed descriptions of report formats and other data

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COMMAND AND CONTROL TECHNICAL CENTER

TECHNICAL MEMORANDUM TM 180-78

3 FEBRUARY 1978

H-6000 TUNING GUIDE

VOLUME IV - APPENDIXES

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PREFACE

This report is based on detailed analysis of a large amount of technical information concerning the H6000 computer tuning. The results address procedures for the analysis of batch turnaround time and GCOS Time Sharing System response time in Worldwide Military Command and Control Systems (WWMCCS). Because of the complexity of the analysis procedures and their dependence on the WWMCCS workloads and operational environments, generalizing the procedures beyond the described environment or extracting conclusions without their respective qualifying conditions is not practical. Questions related to this report or to the possibility of extending the stated conclusions or recommendations should be addressed to the Computer Performance Evaluation Office, Command and Control Technical Center (C702), the Pentagon, Washington, D.C. 20301.

To gain a general understanding of the approach of the H-6000 Tuning Guide, Volume I, Section 2, Volume II, Section 2, and Volume III, Section 2, should be read. One or more of the hypothesis tests (search procedures) in Volume II, Sections 4-12, and Volume III, Sections 3-10, should also be read. Not all these tests have to be read at the start of a tuning effort. Each should be read as it needs to be applied. To start a tuning effort, Volume I should be read and applied. The procedure for analysis of batch turnaround time begins in Volume II, Section 3. The procedure for analysis of Time Sharing response time begins in Volume III, Section 2.

The H-6000 Tuning Guide has never been tested by a novice in performance evaluation, although field tests have been conducted by FEDSIM personnel. For this reason, it remains a preliminary version.

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ILLUSTRATIONS

ABSTRACT

The Federal Computer Performance Evaluation and Simulation Center (FEDSIM) has developed a document for WWMCCS installations that can be used by site personnel to analyze the performance characteristics of their Honeywell 6000 (H-6000) computer systems. This document, called an H-6000 Tuning Guide, incorporates detailed analysis procedures that guide the analyst in applying specific techniques to improve system performance.

The four volumes of the Tuning Guide (Technical Memorandum TM 180-78) present a precisely structured system of procedures for the analysis of the performance of WWMCCS computer services and systems:

Volume I — WWMCCS System Tuning Process. The first volume describes the overall structure and application of the Tuning Guide. It explains the approach, procedures, and processes taken by the Tuning Guide to provide analyses of batch job turnaround time and GCOS Time Sharing System (TSS) response time.

Volume II — Batch Turnaround Time Analysis Procedures. The second volume presents a set of procedures for analysis of batch job turnaround time. It first presents a model of the processes and queue points associated with batch job turnaround time and then describes nine tests that use the model to direct the analysis of turnaround time.

Volume III — TSS Response Time Analysis Procedures. The third volume serves the same general purpose and has the same general structure as Volume II. Volume III presents a complete set of procedures for investigating the response time of GCOS Time Sharing System (TSS) interactions. The volume first presents a model of the processes and queue points associated with TSS response time and then describes eight tests to direct an analysis of TSS response time.

Volume IV — H-6000 Tuning Guide Appendixes. The fourth volume provides the appendixes referenced by the other volumes of the Tuning Guide. The volume contains detailed descriptions of report formats and other references data.

APPENDIX A

INTRODUCTION

INTRODUCTION

This volume contains the Appendixes to the H-6000 Tuning Guide. The four volumes of the Tuning Guide (referred to in this volume as the Guide) present a precisely structured system of procedures for analysis of the batch turnaround time and Time Sharing System response time in WWMCCS computer systems. The titles of the four Guide volumes are: (I) WWMCCS System Tuning Process, (II) Batch Turnaround Time Analysis Procedures, (III) TSS Response Time Analysis Procedures, and (IV) H-6000 Tuning Guide Appendixes.

References are made in the other Guide volumes to certain measurement reports. This volume describes these reports.

Appendixes B through G are referenced by the Batch Turnaround Time Analysis Procedures (Guide Volume II).

The Guide TSS Response Time Analysis Procedures reference the contents of Appendix H (TSS Response Time Analysis System).

APPENDIX B

BATCH TURNAROUND TIME ANALYSIS SYSTEMS USERS GUIDE

DATA REDUCTION PROGRAMS

SECTION 1. INTRODUCTION

1.1 Purpose. The purpose of this user guide is to provide the user of the Batch Turnaround Time Model data reduction programs with a general description of the programs and to provide the user with a description of available input options, JCL needed to execute the programs, and reports produced by the programs.

1.2 Application. The data reduction programs described in this document support a Batch Turnaround Time Model designed by the Federal Simulation Center (FEDSIM) for the Command and Control Technical Center (CCTC). Reports generated by these programs will be used to identify the usage of time by certain components of the Turnaround Time Model. Specifically, they will be used in searching for performance bottlenecks in areas defined by the model. The method for using the reports is detailed in the CCTC Tuning Guide.

1.3 System Overview. The collector/analyzer concept upon which the Turnaround Model is based is pictured in Figure A.1. The data collection phase is performed in real time by CCTC's Generalized Monitor Facility (GMF) for which a FEDSIM monitor capability has been developed (see GMF Users Manual for the GMF operating instructions). GCOS trace data is captured, manipulated, buffered, and written to a data collection tape. The data collection tape then becomes the primary input for subsequent data reduction runs.

There are two primary data reduction modules, RPT12 and RPT34, each of which is supported by its own mathematical calculation and array manipulation subroutine, PCT90 and CMPT34, respectively. RPT12 and RPT34 get trace records for analysis by making calls to the subroutine NXTRAC. Through this interface, the primary module tells NXTRAC which trace(s) are of interest. NXTRAC retrieves every trace record on the data tape through calls to the subroutine NXTRECRD. NXTRAC makes repeated calls to NXTRECRD until a trace record of interest to the primary module is detected, at which time some time stamp manipulation is performed and the trace is passed to the primary module for analysis.

1.4 Turnaround Model Concepts. For the purposes of the turnaround model and its associated data reduction programs, a Local Batch job life-cycle is comprised of three distinct phases called pre-processing, system processing, and post-processing (figure A-2). The pre-processing phase include manual processes performed at the local computer installation related to a batch job before it enters the computer. The system processing phase includes automatic processes related to a batch job while it is resident in the computer system. These processes are well defined as:

- Input and Scheduling
- Peripheral Allocation
- Core Allocation

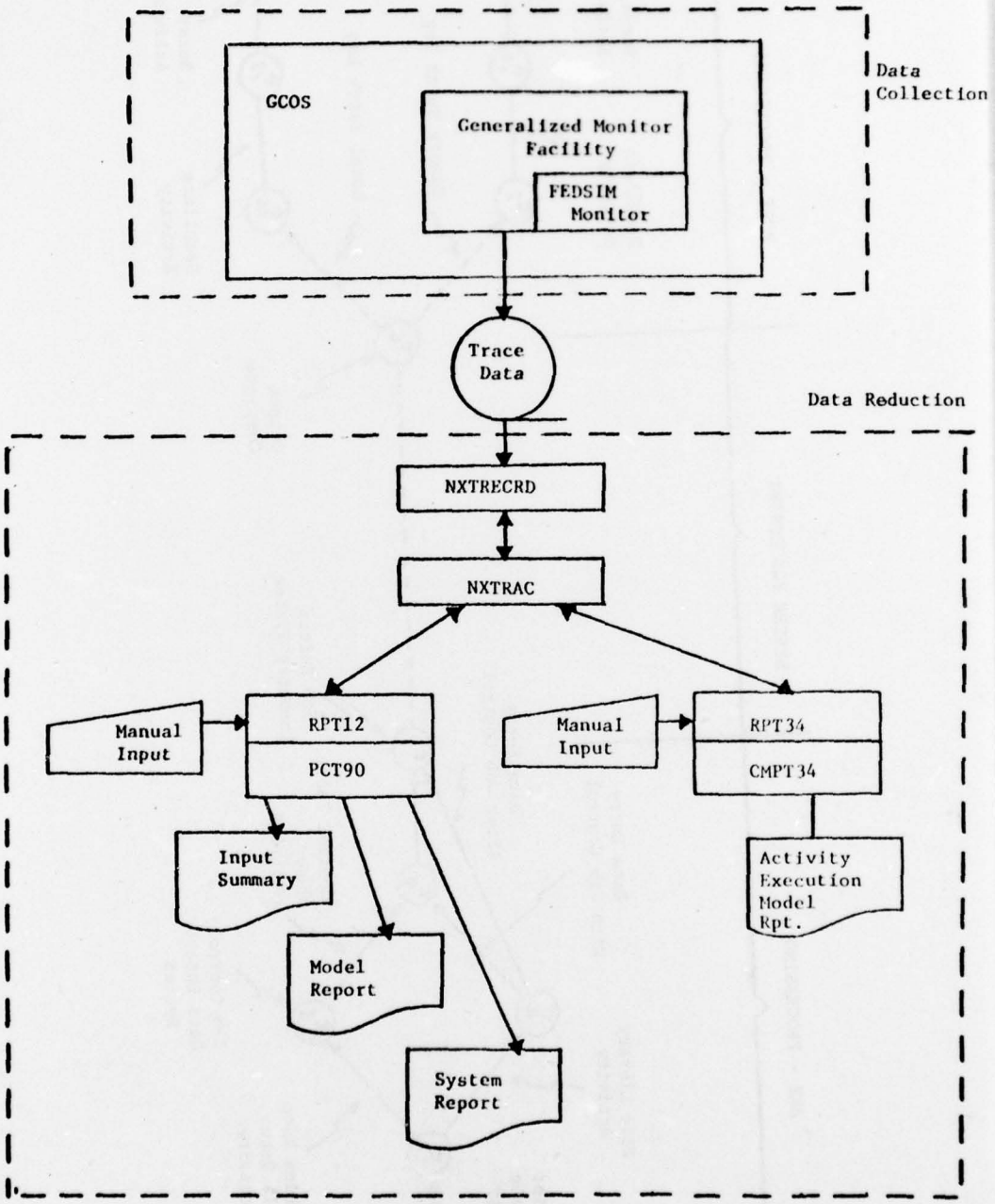

Figure A-1. Collector/Analyzer Concept

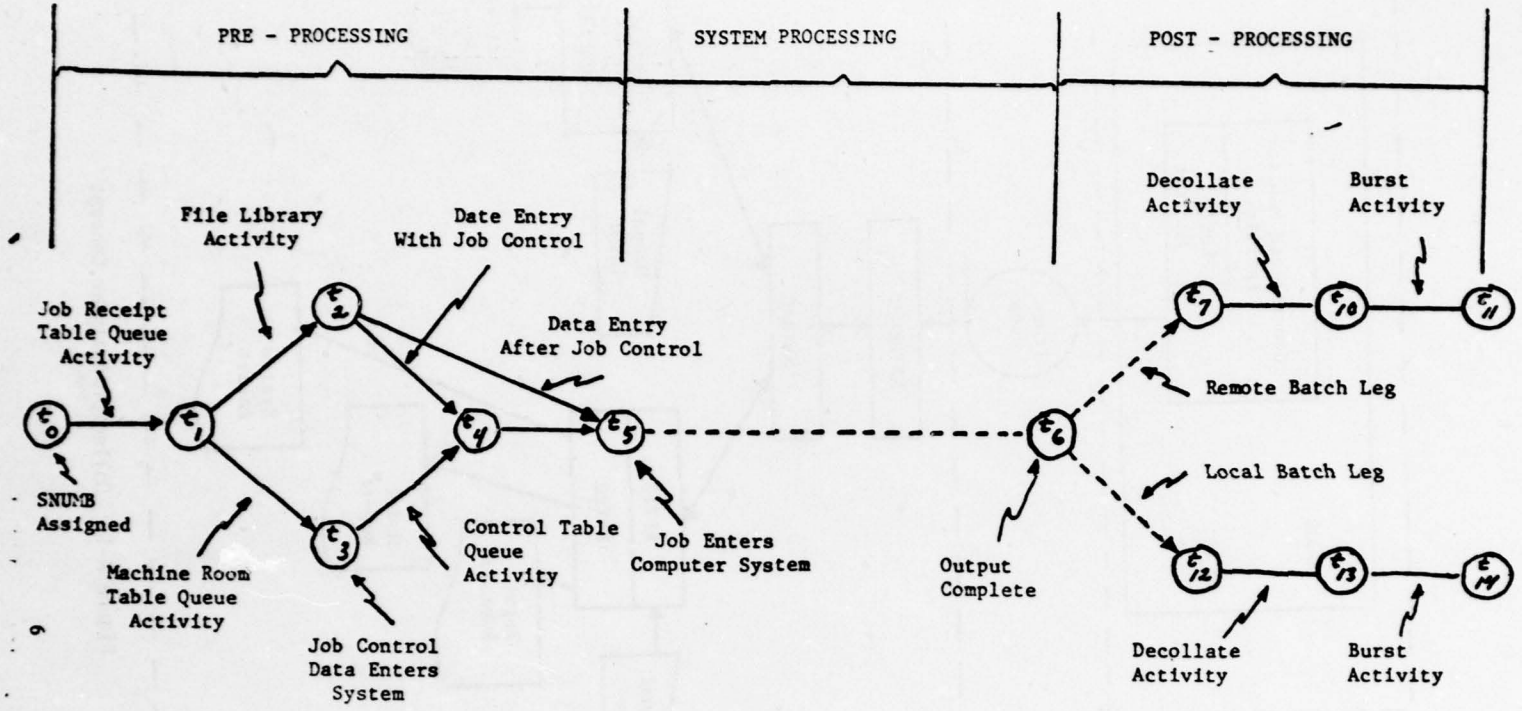

Figure A-2. Sample Machine Room Flow

- o Execution
- o Termination
- o Waiting (to commence output)
- o System Output

The postprocessing phase includes manual processes performed at the local computer installation related to a batch job once its output is complete.

Within the general definition of a 3-phase life-cycle of a batch job are two special cases:

a. Jobs initiated at a remote terminal with output at the local computer center (i.e., no preprocessing), and

b. Jobs initiated at a remote terminal with output returned to a remote device (no pre- or postprocessing).

These latter two cases are called the Remote Batch "B" Model and Remote Batch "A" Model, respectively.

To summarize, the following can be stated:

- o Batch jobs are comprised of three distinct phases called preprocessing, system processing, and postprocessing.
- o Batch jobs may be categorized as belonging to one of three model types called local batch, remote batch "A", and remote batch "B" based upon the presence or absence of pre- and/or postprocessing phases. (The system processing phase is always present).
- o Processes of the system processing phase are well defined.
- o Processes of the pre- and postprocessing phases depend upon individual site operational characteristics and, as such, cannot be well defined.

The Turnaround Model data reduction program RPT12 has been structured around the above summary. The beginning and ending points of system processes are easily defined by GCOS system traces (table A-1). Non-system processes, on the other hand, cannot be completely defined by GCOS traces. To accommodate these processes, the concept of user traces tyy ($00 < yy \leq 14_8$) has been instituted. The sample machine room flow depicted in figure A-2 makes use of all allowable user traces. In general, the maximum number of user traces will not be required. A simple example is shown in figure A-3. The user can define processes of the pre- and postprocessing phases by name and relative endpoints (beginning and ending traces) through the use of input parameter cards. He can also specify the SNUMBs of those jobs he wants summarized by RPT12, and include the time of day any or all user traces occurred for each

job. PRT12 will automatically type and report each job as local, remote batch "A", or remote batch "B" based upon the presence or absence of activity within the pre- and/or post-processing phases. Table A-2 summarizes how model typing is performed by RPT12.

Data reduction program RPT34 summarizes system-processing data by job activity rather than by job SNUMB. Therefore, no capability to identify specific jobs by SNUMB or to describe specific non-system processes via GCOS and user traces is required.

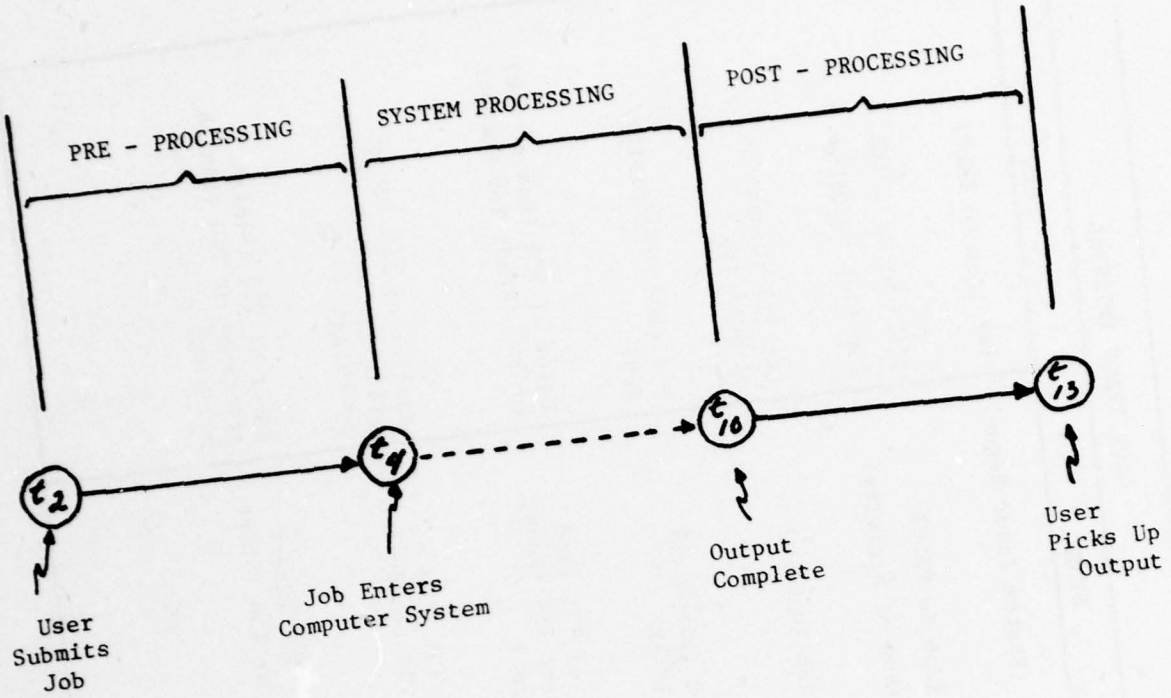

Figure A-3. Simple Batch Job Life Cycle

Table A-1. System Processing Phase Process Definitions

PROCESS NAME	GCOS TRACE INTERVAL	
	START	END
Input & Scheduling	T45 (System Input Begun)	T47 (Job to PALC)
Peripheral Allocation	T47 (Job to PALC) T51 (End of Activity)	T50 (Job to CALC) T50 (Job to CALC)
Core Allocation	T50 (Job to CALC)	1st T13 (Dispatch) of Activity
Execution	1st T13 (Dispatch) of Activity	T51 (End of Activity/ Job)
Termination	Earlier of T51 (End of Job) or T54 (Ready for Output)	Later of T51 (End of Job) or T54 (Ready for Output)
Waiting	Later of T51 (End of Job) or T54 (Ready for Output)	Earlier of T55 (Start printing) or T56 (Start punching)
System Output	Earlier of T55 (Start printing) or T56 (Start punching)	Later of T57 (Finish printing) or T60 (Finish punching)

Table A-2. Model Typing Based Upon Absence/Presence of Phase Activity

Pre-Processing Activity	System Processing Activity	Post-Processing Activity	Model Type
No	No*	No	Unknown
No	No*	Yes	"B"
Yes	No*	Yes	Local
Yes	No*	No	Local
Yes	Yes	Yes	Local
Yes	Yes	No	Local
No	Yes	Yes	"B"
No	Yes	No	"A"

* Can occur if user-requested job is not found on data tape.

SECTION 2. RPT12 OPERATING INSTRUCTIONS

2.1 Input. Input to RPT12 consists of a GMF-produced trace data tape and optional card input.

2.1.1 Tape.

2.1.1.1 Description. The input tape (file code 10) is a trace data tape created by the GMF program with the batch trace collector (GMF monitor #7) turned on. Refer to GMF User documentation for further details pertaining to the data collection tool.

2.1.1.2 Characteristics. The data tape is comprised of 4094-word blocks with one logical 4092-word record per block. The tape contains no header or trailer labels and no block serial number processing is performed. This file may be multireel, in which case all tape mounting procedures are controlled by the NXTRECRD subroutine.

Each physical block is comprosed of numerous trace information "records". The data reduction programs use only those trace records which have a trace type 74 or Bit 29 turned on in the record control word. Bit 29 is used by GMF to identify special records signifying end-of-file, lost data, and other special situations. Trace 74 uniquely identifies a record as having been generated by the FEDSIM monitor within GMF.

2.1.1.3 Required Traces. The GCOS traces that the batch reduction program RPT12 expects to find on the input tape are 13, 45, 47, 50, 51, 54, 55, 56, 57 and 60.

2.1.2 Card.

2.1.2.1 Description. Card input (file code I* or 05) to program RPT12 is user generated data which (1) define processes by name and symbolic end points (GCOS and/or user trace numbers) for pre- and postprocessing phases, (2) define a time interval of the data input tape to be analyzed (if entire tape is not desired), and (3) identify specific SNUMBs to be extracted from the tape along with specific time values for any user traces defined as described in (1) above.

This entire file is optional. If no card data file (file code 05 or I*) is included in the job stream, the following default options will apply:

a. No pre- or post-processing processes will be defined.

b. The entire time interval contained on the tape will be reported.

c. All jobs found on the data tape will be reported.

Note that under these circumstances, all jobs will be reported as model type Remote Batch "A" since RPT12 will not be aware of any pre- or postprocessing for any job.

2.1.2.2 PRE Card. A PRE-processing card defines one preprocessing process by name and by time interval end points in terms of GCOS traces Gnn ($00 \leq nn \leq 63_8$) and/or user defined symbolic traces Tyy ($00 \leq yy \leq 14_8$). The cards are optional. If used, a maximum of ten (10) is allowed and all must precede the *SNUMB card.

Column	Description	Contents
1-6	Card ID	"PRE000"
7-30	Process name	Any alpha-numeric characters
31	Blank	
32-34	Process initiation trace	Gnn or Tyy (see above)
35	"0" or "-" (optional)	Earlier/Later Indicator
36-38	Alternate initiation trace (optional)	Gnn or Tyy (see above) If present, means to use the later (col 35 = "0") or earlier (col 35 = "-") of the time values associated with this trace and the trace defined in columns 32-34.
39-44	Blank	
45-47	Process termination trace	Gnn or Tyy (see above)
48	"0" or "-" (optional)	Either/Later Indicator
49-51	Alternate termination trace (optional)	Gnn or Tyy (see above) If present, means to use the later (col 48 = "0") or earlier (col 48 = "-") of the times associated with this trace and the trace defined in columns 45-57.
52-72	Blank	
73-80	Card sequence no. (optional)	

2.1.2.3 POST Card. A POST-processing card defines one postprocessing process by name and by time interval endpoints in terms of GCOS traces Gnn ($00 \leq nn \leq 63_8$) and/or user defined symbolic traces Tyy ($00 \leq yy \leq 14_8$). The cards are optional. If used, a maximum of ten (10) is allowed and all must precede the *SNUMB card. The format is identical to the PRE card (see 2.1.2.2) except that columns 1-6 must contain "POST00".

2.1.2.4 LIMITS Card. The LIMITS card is an optional card that allows the user to define a time interval of the data input tape to be analyzed. If used, this card must precede the *SNUMB card.

Column	Description	Value
1-6	Card ID	"LIMITS"
7	Blank	
8-11	Interval start time	Time of day in HHMM format
12	Blank	
13-16	Interval stop time	Time of day in HHMM format
17-72	Blank	
73-80	Card sequence no. (optional)	

2.1.2.5 *SNUMB Card. The *SNUMB card signals the end of all PRE, POST and LIMITS cards. All remaining cards in the input stream will be interpreted as SNUMB selection cards (see 2.1.2.6). If no SNUMB selection cards are in the input stream, the *SNUMB card is optional.

Column	Description	Value
1-6	Card ID	"*SNUMB"
7-72	Blank	
73-80	Card sequence no. (optional)	

2.1.2.6 SNUMB Selection Cards. SNUMB selection cards allow the user to identify specific jobs to be extracted from the data tape and reported. All other jobs will be ignored. If SNUMB selection card(s) are present, they must be preceded by a *SNUMB card (see 2.1.2.5). If no SNUMB selection cards are used, the program will select and report each job found on the tape. A maximum of 750 SNUMB selection cards can be used.

Column	Description	Value
1-5	SNUMB	5 Alphanumeric characters
6-7	Blank	
8-11	Time value for user trace 00	Time of day in HHMM, or blanks
12	Blank	
13-16	Time value for user trace 01	Time of day in HHMM, or blanks

Column	Description	Value
17	Blank	
18-21	Time value for user trace 02	Time of day in HHMM, or blanks
22	Blank	
23-26	Time value for user trace 03	Time of day in HHMM, or blanks
27	Blank	
28-31	Time value for user trace 04	Time of day in HHMM, or blanks
32	Blank	
33-36	Time value for user trace 05	Time of day in HHMM, or blanks
37	Blank	
38-41	Time value for user trace 06	Time of day in HHMM, or blanks
42	Blank	
43-46	Time value for user trace 07	Time of day in HHMM, or
47	Blank	
48-51	Time value for user trace 10	Time of day in HHMM, or blanks
52	Blank	
53-56	Time value for user trace 11	Time of day in HHMM, or blanks
57	Blank	
58-61	Time value for user trace 12	Time of day in HHMM, or blanks
62	Blank	
63-66	Time value for user trace 13	Time of day in HHMM, or blanks

Column	Description	Value
67	Blank	
68-71	Time value for user trace 14	Time of day in HHMM, or blanks
72	Blank	
73-80	Card sequence no. (optional)	

2.1.3 Example. Figure B-1 shows PRE and POST data cards that might be used to describe the sample machine room flow diagrammed in figure A-2. Of particular note is that time point t5 of figure A-2 is defined by GCOS trace number T45 (System Input Begun) in the data cards.(line 6) Recall that T45, by definition (see table A-1), also initiates the system processing phase. Thus, by telling the program to use T45 to terminate the preprocessing phase, the user guarantees no overlap or loss of time accounting at the transition point between preprocessing and system processing.

Similarly, time point t6 of figure A-2 is defined by the later of GCOS traces T57 (SNUMB Finished Printing) and T60 (SNUMB Finished Punching). (lines 8,9) Again, defining the start of post-processing in this manner insures a continuous time accounting at the transition point between system processing and postprocessing.

2.2 Output. Output from RPT12 consists of three major reports written under separate report codes on P*.

2.2.1 Summary Report. The summary report (report code 24) consists of two parts. Part one is a listing of all data cards found in the input stream, along with any error messages generated during editing of these cards.

The second part of this report summarizes for each job the elapsed time (in minutes) spent in the preprocessing, system processing, and postprocessing phases. For system processing only, subtotals are provided for each of the processes (input and scheduling, core allocation, peripheral allocation, execution, termination, waiting to output, and output). The derived model type for each job is also printed.

2.2.2 Model Report. The Model Report (report code 25) summarizes on one page the total elapsed time spent in each phase for each model type. The purpose of this report is to direct the search to one of several system-level reports.

Within the page heading information, the "Requested Time Interval" is the time specified by the user on a LIMITS card. The "Monitor Session Time" represents the elapsed clock time covered in this report and may or may not represent the total elapsed time that the monitor (GMF) was in execution,

depending upon whether a LIMITS card was used or not. The "From" and "To" date/time are each in the format MMDDYY/HHMM.MMM.

2.2.3 System Report. The System Report (report code 26) is a 3-page report consisting of a model summary on each page. For each model, the total elapsed time spent in each process of each phase is summarized. The format of this report matches that of the Model Report.

2.3 Execution JCL.

```
$   SNUBM    RUN12
$   IDENT
$   USERID   USERID$PASSWORD/UZZ
$   OPTION   FORTRAN,NOMAP
$   LOWLOAD
$   USE      RPT12
$   ENTRY    RPT12
$   LIBRARY  UL
$   EXECUTE  DUMP
$   LIMITS   ,47K,-2K
$   PRMFL    UL,R,R,USERID/FEDLIB
$   FFILE    P*,LGU/(06,20,21,22,42)
$   FFILE    10,NSTDLB,NOSRLS,BUFSIZ/4094,FIXLNG/4094,ERRXIT/KILL1
$   TAPE     10,X1D,,tape#,,TRACE-DATA
$   DATA     I*  (add ,NULL if no data used)
(PRE, POST and LIMITS cards) - optional
*SNUMB                       - required only if SNUMB selection cards
                               follow
(SNUMB Selection Cards)      - optional
$   ENDJOB
***EOF
```

```
PRE   JOB RECEIPT TABLE QUEUE        T00          T01
PRE   FILE LIBRARY                   T0L          T02
PRE   MACHINE ROOM TABLE QUEUE       T0L          T03
PRE   CONSOLE TABLE QUEUE            T03          T04
PRE   DATA ENTRY WITH JCL            T02          T04
PRE   DATA ENTRY AFTER JCL           T02          G45
PRE   READER QUEUE                   T04          G45
POST  REM. OUTPUT WAITS PICKUP       G57 G60      T07
POST  LOC. OUTPUT WAITS PICKUP       G57 G60      T12
POST  REMOTE DECOLLATION             T07          T10
POST  LOCAL DECOLLATION              T12          T13
POST  REMOTE BURSTING                T10          T11
POST  LOCAL BURSTING                 T13          T14
PRE   ELAPSED PRE-PROCESSING         T00          G45
POST  ELAPSED POST-PROCESSING        G57 G60      TLL T14
*SNUMB
```

SNUMB SELECTION CARDS

Figure B-1. Example of Pre and Post Data Card Input

SECTION 3. RPT34 OPERATING INSTRUCTIONS

3.1 Input. Input to RPT34 consists of a GMF produced trace data tape and optional card input.

3.1.1 Tape.

3.1.1.1 Description. The input tape (file code 10) is a trace data tape created by the GMF program when:

a. The batch trace collector (GMF monitor #7) is turned on.

b. A nonblank character is punched in column 79 of the GMF input parameter card.

Refer to separate GMF monitor user guide for further details pertaining to the data collection tool.

3.1.1.2 Characteristics. The data tape is comprised of 4094-word blocks, with one logical 4092-word record per block. The tape contains no header or trailer labels and no block serial number processing is performed. The file may be multireel, in which case all tape mounting procedures are controlled by the NXTRECRD subroutine.

Each physical block is comprised of numerous trace information "records". The Batch Turnaround data reduction programs use only those trace records which have either Trace Type 74 or Bit 29 turned on in the record control word. Bit 29 is used by GMF to identify special records signifying end-of-file, lost data, and other special situations. Trace 74 uniquely identifies a record as having been generated by the batch turnaround monitor within GMF.

3.1.1.3 Required Traces. The GCOS traces that the batch reduction program RPT34 expects to find on the input tape are 00, 01, 02, 04, 07, 17, 21, 37, 43, 44, 51 and 65.

3.1.2 Card.

3.1.2.1 Description. The LIMITS card is an optional card that allows users to define a time interval of the data input tape to be analyzed.

Column	Description	Value
1-6	Card ID	"LIMITS"
7	Blank	
8-11	Interval start time	Time of day in HHMM format
12	Blank	

Column	Description	Value
13-16	Interval stop time	Time of day in HHMM format
17-72	Blank	
73-80	Card sequence no. (optional)	

3.2 Output. Output from RPT34 consists of two reports. One is a crude debug report (report code 31) which is of little or no value to the average user and will not be described in detail here. The second is the Activity Execution Model Report (report code 27). The objective of this report is to provide data on system operation at the lowest formalized search model level. Subsequent hypotheses can be developed from these data, as described in the CCTC Tuning Guide.

Within the page heading information, the "Requested Time Interval" is the time specified by the user on a LIMITS card. The "Monitor Session Time" represents the elapsed clock time covered in this report and may or may not represent the total elapsed time that the monitor (GMF) was in execution, depending upon whether a LIMITS card was used or not. The "From" and "To" date/time are each in the format MMDDYY HHMM.MMMM.

All data summarized in this report is extracted from GCOS trace records. In the following discussion, Tnn ($00 \leq nn \leq 63_8$) will deonte GCOS trace numbers:

- CPU EXECUTION - Sum of all active (nonidle) time for all configured CPUs. Thus, in a multiprocessor system, this figure could conceivably exceed the session length. A processor is assumed to go idle when a T21 is issued, and remains idle until the next T0, T1, T2, T37, or T65 occurs. All subsequent time is then considered active time until the next T21.

- SWAP/COMPACTION TIME - Sum of all time slices initiated by a T43 and terminated by a matching T44.

- I/O PROCESS TIME

  -- TAPE SUM - Sum of four following lines, i.e., service, queue, device, and wait only figures.

  -- SERVICE - Sum of all time spent by CPUs in servicing tape I/O requests. Contributing to this total are two time slices: (1) those initiated by a T22 and terminated by a T23, and (2) those initiated by a T4 and terminated by the next T4 or T17, whichever occurs first.

  -- QUEUE - Sum of all time spent by tape I/O requests in an I/O queue. Contributing to this total are time slices initiated by a T22 responsible for placing a tape I/O request in an I/O queue and terminated by the T7 responsible for removing that request from the queue.

-- DEVICE - Sum of all time spent outside the mainframe in performance of tape I/O. Contributing to this total are time slices initiated by a T7 issuing a connect for tape I/O, and terminated by the corresponding T4 signalling I/O complete.

-- WAIT ONLY - Clock time during which all configured CPUs were idle and the only type of outstanding I/O was tape.

The data definition for disk (IAS) and UNIT RECORD devices are identical to those presented for TAPE. The "TOTAL SERVICE TIME" is the sum of the service times for tape, IAS, and unit record devices.

3.3 Execution JCL.

```
$  SNUMB      RUN34
$  IDENT
$  USERID     USERID$PASSWORD/UZZ
$  OPTION     FORTRAN,NOMAP
$  LOWLOAD
$  USE        RPT34
$  ENTRY      RPT34
$  LIBRARY    UL
$  EXECUTE    DUMP
$  LIMITS     ,38K,-2K
$  PRMFL      UL,R,R,USERID/FEDLIB
$  FFILE      P*,LGU/(06,23,24,25,42)
$  FFILE      10,NSTDLB,NOSRLS,BUFSIZ/4094,FIXLNG/4094,ERRXIT/KILL2
$  TAPE       10,X1D,,tape#,,TRACE-DATA
$  DATA       I* (add ,NULL if no data)
LIMITS from to - optional
$  ENDJOB
***EOF
```

APPENDIX C

MASS STORE MONITOR/CHANNEL MONITOR

C.1 Mass Store Monitor.

This appendix describes the five Mass Store Monitor (MSM) reports that are used in the Guide Batch Turnaround Time Analysis Procedures. For a complete description of the Mass Store Monitor (both data collector and data reduction) the reader should reference the General Monitor Facility Users Manual, CSM UM 246-78.

1. Report Formats and Data Elements

Five MSM reports are used in the Batch Turnaround Time Analysis Procedures (see Volume II).

a. Seek Movement Report. The Seek Movement Histogram (figure C-1) is produced for each device in the mass storage subsystems monitored. This report is generated using the absolute values of the differences between the cylinder addresses of each successive access to the device. A column headed "CYLINDER MOVED" contains the range of seek movement distance for each line of the report. The column headed "INDIV. NUMBER" contains the numbers of accesses which caused the arm to be moved that distance. The "INDIV. PROB." and "CUMUL. PROB." columns give the individual and cumulative percentages of the accesses which resulted in a particular range of cylinder movement. The percentages are based on the total accesses to that individual device. The statistics at the bottom of the report relate to the average, variance, and standard deviation of seek lengths expressed in cylinders.

b. Space Utilization Report. The device Space Utilization Histogram (figure C-2) is produced for each device on the mass storage subsystem selected for analysis. The entries in the column "CYLNDR NUMBER" give the ranges of cylinders that form each histogram bucket. The number of cylinders in each bucket is a function of the device type. The entries in the column headed "INDIV. PROB." gives the percentages of all accesses to the device which were made within each cylinder range.

c. System File Use Summary Report. Figure C-3 shows the format of the System File Use Summary Report. This report shows where each GCOS System File is located and the extent to which it was accessed during the measurement session. Only those files accessed are displayed. The sum of accesses to all system files is displayed as a percentage of all mass storage accesses. This report also lists all GCOS modules loaded into hard core.

d. File Summary Report. The File Summary Report (see figure C-4) lists the file description and activity for each mass storage file during the monitoring. Files with no activity are not reported. Each activity is identified by SNUMB, Activity Number, and $IDENT Card display. There is one data line for each mass storage file used by the activity. Each

```
                          DISTRIBUTION COLLECTED ON SYSTEM OSCC    AT 14:03:15 ON 78-03-30

                                  SEEK MOVEMENT OF IOM-0,PUB-08,DEVICE-01-- DSS191

INDIV.   CUMUL.    CUMUL.   INDIV.   CYLNDR              PERCENT PROBABILITY OF OCCURRENCE                   REPORT
NUMBER   NUMBER    PROB.    PROB.    MOVED      00   05   10   15   20   25   30   35   40   45   50          6
                                                I....I....I....I....I....I....I....I....I....I....I
  1427     1427    0.431    0.431      0-   0   IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  1262     2689    0.812    0.381      1-   9   IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
   102     2791    0.843    0.031     10-  19   IXXX
   489     3280    0.990    0.148     20-  29   IXXXXXXXXXXXXXXX
     0     3280    0.990    0.        30-  39   I
     0     3280    0.990    0.        40-  49   I
     0     3280    0.990    0.        50-  59   I
     0     3280    0.990    0.        60-  69   I
     0     3280    0.990    0.        70-  79   I
     0     3280    0.990    0.        80-  89   I
     2     3282    0.991    0.001     90-  99   I
     0     3282    0.991    0.       100- 109   I
     0     3282    0.991    0.       110- 119   I
     0     3282    0.991    0.       120- 129   I
     0     3282    0.991    0.       130- 139   I
     0     3282    0.991    0.       140- 149   I
     0     3282    0.991    0.       150- 159   I
     0     3282    0.991    0.       160- 169   I
     0     3282    0.991    0.       170- 179   I
     4     3286    0.992    0.001    180- 189   I
     3     3289    0.993    0.001    190- 199   I
    23     3312    1.000    0.007    200- 209   IX

3312 ENTRIES TOTAL     AVERAGE =    6.26842    VARIANCE =  402.549     STANDARD DEVIATION =     20.064
```

Figure C-1. MSM Seek Movement Report

file is identified by its two-character file code, the device on which it was allocated ("ALLOCATED DEVICE"), and its origin on that device ("FILE ORIGIN") in units of llinks (320 words) and cylinders relative to the beginning of the device. The size of the file ("FILE SIZE") is displayed in llinks and cylinders. The column headed "CONNECTS" gives the number of accesses made to the file.

e. Individual Module Activity Report. This report (Figure C-5) includes a single line entry for each GCOS module accessed. Each entry includes the System File Name, Module Name, and Module Type. The module location, access count, and percentage of System File usage are then reported.

```
                    DISTRIBUTION COLLECTED ON SYSTEM OSCC    AT 14:03:15 ON 78-03-30

                         SPACE UTILIZATION OF IOM-0,PUB-08,DEVICE-01-- DSS191

INDIV.   CUMUL.   CUMUL.   INDIV.  CYLNDR            PERCENT PROBABILITY OF OCCURRENCE                   REPORT
NUMBER   NUMBER   PROB.    PROB.   NUMBER   00   10   20   30   40   50   60   70   80   90   100           5
                                            I....I....I....I....I....I....I....I....I....I....I
2804     2804     0.847    0.847    14-  19 IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  99     2903     0.877    0.030    20-  29 IX
 391     3294     0.995    0.118    30-  39 IXXXXXX
   0     3294     0.995    0.       40-  49 I
   0     3294     0.995    0.       50-  59 I
   0     3294     0.995    0.       60-  69 I
   0     3294     0.995    0.       70-  79 I
   0     3294     0.995    0.       80-  89 I
   0     3294     0.995    0.       90-  99 I
   0     3294     0.995    0.      100- 109 I
   2     3296     0.995    0.001   110- 119 I
   0     3296     0.995    0.      120- 129 I
   0     3296     0.995    0.      130- 139 I
   0     3296     0.995    0.      140- 149 I
   0     3296     0.995    0.      150- 159 I
   0     3296     0.995    0.      160- 169 I
   0     3296     0.995    0.      170- 179 I
   0     3296     0.995    0.      180- 189 I
   0     3296     0.995    0.      190- 199 I
   0     3296     0.995    0.      200- 209 I
  16     3312     1.000    0.005   210- 219 I

3312 ENTRIES TOTAL       AVERAGE =     18.79136      VARIANCE =      245.775      STANDARD DEVIATION =      15.677
```

Figure C-2. MSM Space Utilization Report

```
**********************************************************
* * *          SYSTEM FILE USE SUMMARY                * * *
**********************************************************
```

FILE NUMBER	FILE NAME	IOM-PLD-DEV	STARTING SECTOR/CYLINDER		LENGTH (SECTOR)	ACESSES
2	SYSTEM FILE2	0- 8- 2	40/	0	5000	36
3	SYSTEM FILE3	0- 8- 2	6300/	8	2500	188
4	SYSTEM FILE4	0- 8- 1	11040/	14	4000	2793
5	SYSTEM FILE5	0- 8- 2	13300/	17	10000	578
7	SYSTEM FILE7	0- 8- 1	15040/	19	7600	64
9	SYSTEM FILE9	0-12- 7	9500/	12	16000	86
10	SYSTM FILE10	0-12- 7	25500/	33	12000	110
					TOTAL	3855(11%)

.MBRT1	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MCP10	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MDISP	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	41522
.MDNET	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	19
.MDUMP	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MFALT	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	401
.MGEPR	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	430
.MSC11	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	5087
.MGP01	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MGP10	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MIDSC	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MIOS	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	45694
.MMTAP	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MPR10	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MROUT	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	51
.MSYOT	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	59
.MTYPE	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MDSX1	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MDSX5	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MDSX6	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MFS10	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	2633
.MSECR	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	206
.MXX06	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	8355
.MXX01	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	763
.MDNWW	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MRTWW	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MM776	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0
.MM777	LOADED BY STARTUP	TYPE IS	HRD CORE MOD	# ACCESSES =	0

Figure C-3. MSM System File Use Summary Report

```
                          ************************************
                          **       F I L E   S U M M A R Y   **
                          ************************************

SNUMB,ACTVY #,IDENT,USERID  96832- 2   1829115/10/6052,SARA-H                                      728IDP12
-------------------------------------           FILE  SIZE          ALLOCATED        FILE ORIGIN
        FILE CODE      CONNECTS             (LLINK/CYLINDER)          DEVICE       (LLINK/CYLINDER)
         S1 T R N F       449                  6000/ 40              0-12- 7         52013/342
         S6 T R N F       249                  6000/ 40              1-10-13         50255/330
         S5 T R N F       197                  6000/ 40              2- 9- 4         50536/332
         S4 T R N F        75                  6000/ 40              0- 8- 6         55332/364
         S3 T R N F        78                  6000/ 40              0- 8-10         16349/107
         S2 T R N F        92                  6000/ 40              0- 8- 6         49332/324
         00                20                     0/  0              1- 8- 1             0/  0
         -- P R N F         1                     0/  0              0- 8- 5             0/  0

SNUMB,ACTVY #,IDENT,USERID  $GENB- 0 1820251/30/3044,C702                                               000
-------------------------------------           FILE  SIZE          ALLOCATED        FILE ORIGIN
        FILE CODE      CONNECTS             (LLINK/CYLINDER)          DEVICE       (LLINK/CYLINDER)
        00                 44                     0/  0              0- 8- 1             0/  0
        RD T S N F          4                     1/  1              1-10- 9         47693/313
        *J T R N F          4                   144/  1              1- 8- 9         46678/307
        J* T R N F          4                    12/  1              0-12- 5         51484/338

SNUMB,ACTVY #,IDENT,USERID  46157- 2   1820011/30/6071,LANT1                                       498CDP10
-------------------------------------           FILE  SIZE          ALLOCATED        FILE ORIGIN
        FILE CODE      CONNECTS             (LLINK/CYLINDER)          DEVICE       (LLINK/CYLINDER)
         AD P R C F      7692                     0/  0              0- 8-12         15733/103
         QR T S N F         1                  4440/ 30              1- 8- 5         56939/374
```

Figure C-4. MSM File Summary Report

• • • INDIVIDUAL MODULE ACTIVITY • • •

SYSTEM FILE	MODULE NAME	TYPE	IOM-PUB-DEVICE	SECTOR IN FILE	# ACCESSES	% OF ACTIVITY	# CALLS
SYSTEM FILE5	.MAC10	STANDARD SSA	0- 8- 2	13710	7	0	7
SYSTEM FILE5	.MAC02	STANDARD SSA	0- 8- 2	13719	14	0	14
SYSTEM FILE4	.MALC5	STANDARD SSA	0- 8- 1	11060	30	0	30
SYSTEM FILE4	.MALC6	STANDARD SSA	0- 8- 1	11069	113	2	113
SYSTEM FILE4	.MALC7	STANDARD SSA	0- 8- 1	11078	10	0	10
SYSTEM FILE5	.MALCT	STANDARD SSA	0- 8- 2	14001	2	0	2
SYSTEM FILE4	.MALC9	STANDARD SSA	0- 8- 1	11087	109	2	154
SYSTEM FILE4	.MBRT2	STANDARD SSA	0- 8- 1	11096	13	0	13
SYSTEM FILE4	.MBRT6	ABSOLUTE PRG	0- 8- 1	11149	11	0	0
SYSTEM FILE4	.MCAL1	STANDARD SSA	0- 8- 1	11217	204	5	61
SYSTEM FILE5	.MCAL2	STANDARD SSA	0- 8- 2	14029	9	0	9
SYSTEM FILE4	.MFLT1	STANDARD SSA	0- 8- 1	11393	208	5	13
SYSTEM FILE4	.MFS01	STANDARD SSA	0- 8- 1	11403	2	0	7
SYSTEM FILE4	.MFS02	STANDARD SSA	0- 8- 1	11410	2	0	3
SYSTEM FILE4	.MFS03	STANDARD SSA	0- 8- 1	11419	284	7	753
SYSTEM FILE4	.MFS04	STANDARD SSA	0- 8- 1	11428	234	6	234
SYSTEM FILE4	.MFS05	STANDARD SSA	0- 8- 1	11437	18	0	18
SYSTEM FILE4	.MFS07	STANDARD SSA	0- 8- 1	11455	52	1	112
SYSTEM FILE4	.MFS08	STANDARD SSA	0- 8- 1	11464	210	5	213
SYSTEM FILE4	.MFS09	STANDARD SSA	0- 8- 1	11473	252	6	18
SYSTEM FILE4	.MFS10	STANDARD SSA	0- 8- 1	11482	1	0	3
SYSTEM FILE4	.MFS15	STANDARD SSA	0- 8- 1	11522	64	1	64
SYSTEM FILE4	.MFS16	STANDARD SSA	0- 8- 1	11531	21	0	21
SYSTEM FILE4	.MFS18	STANDARD SSA	0- 8- 1	11549	4	0	4
SYSTEM FILE4	.MFS19	STANDARD SSA	0- 8- 1	11557	10	0	48
SYSTEM FILE4	.MFS20	STANDARD SSA	0- 8- 1	11566	1	0	1
SYSTEM FILE4	.MFS23	STANDARD SSA	0- 8- 1	11592	18	0	18
SYSTEM FILE4	.MFS24	STANDARD SSA	0- 8- 1	11599	15	0	15
SYSTEM FILE4	.MFS27	STANDARD SSA	0- 8- 1	11625	11	0	11
SYSTEM FILE4	.MGEIN	ABSOLUTE PRG	0- 8- 1	12219	10	0	0
SYSTEM FILE4	.MGENA	ABSOLUTE PRG	0- 8- 1	12183	2	0	0
SYSTEM FILE4	.MGENB	ABSOLUTE PRG	0- 8- 1	12200	27	0	0
SYSTEM FILE5	.MSCM2	STANDARD SSA	0- 8- 2	19298	7	0	7
SYSTEM FILE5	.MSCM3	STANDARD SSA	0- 8- 2	19305	12	0	12
SYSTEM FILE3	.MGNAT	STANDARD SSA	0- 8- 2	6306	18	0	18
SYSTEM FILE4	.MGOU1	STANDARD SSA	0- 8- 1	12329	17	0	17
SYSTEM FILE4	.MGOU3	STANDARD SSA	0- 8- 1	12347	12	0	12
SYSTEM FILE4	.MGP03	EXCEPT PROC	0- 8- 1	12405	1	0	1
SYSTEM FILE4	.MGP04	EXCEPT PROC	0- 8- 1	12410	1	0	1
SYSTEM FILE4	.MGP09	EXCEPT PROC	0- 8- 1	12425	1	0	1

Figure C-5. MSM Individual Module Activity Report

C.2. Channel Monitor.

This appendix describes a series of Channel Monitor (PSM) reports that are used in the Guide Batch Turnaround Time Analysis Procedures. For a complete description of the Channel Monitor (both data collector and data reduction) the reader should reference the General Monitor Facility Users Manual, CSM UM 246-78.

1. Report Formats and Data Elements

Six PSM reports are used in the Batch Turnaround Time Analysis Procedures (see Volume II).

a. Physical Device, Device ID Correlation Table

The Device ID Correlation Table (see figure C-6) associates a unique device ID # with an actual configured device. The reason for this is because devices configured on different channels can have the same device #. (See figure C-6 ID #1, #16, #28.) In order to differentiate between these different devices, a unique ID is associated with each.

b. Channel-Device Busy Report (figure C-7)

In the Honeywell system queuing for a channel will occur only on the physical channel and not on any of the logical channels. This queuing will occur however, only when the physical channel and all logical channels are busy. This report displays the number of connects to a particular device over a given channel configuration (physical and logical channels) that had to be queued by IOS because all physical and logical channels and the device were busy at the time of the I/O service request.

c. Channel Busy - Device Free Report

(figure C-8). The same as in B except that in this case the device was free at the time of the I/O service request.

d. Channel Free - Device Busy Report

(figure C-9). The same as in B except that at least one logical channel was free but the device was busy.

e. Channel Free - Device Free Report

(figure C-10) This report displays the number of connects to a particular device which were serviced immediately without any queuing for either a channel or the device.

THE PHYSICAL DEVICE, DEVICE ID CORRELATION TABLE

```
DEVICE ID-  1 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #01
DEVICE ID-  2 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #02
DEVICE ID-  3 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #03
DEVICE ID-  4 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #04
DEVICE ID-  5 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #05
DEVICE ID-  6 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #06
DEVICE ID-  7 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #07
DEVICE ID-  8 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #08
DEVICE ID-  9 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #09
DEVICE ID- 10 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #10
DEVICE ID- 11 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #11
DEVICE ID- 12 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #12
DEVICE ID- 13 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #13
DEVICE ID- 14 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #14
DEVICE ID- 15 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #15
DEVICE ID- 16 IS FOUND ON IOM-0 PUB-08 AND IS DEVICE #16
DEVICE ID- 17 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #01
DEVICE ID- 18 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #02
DEVICE ID- 19 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #03
DEVICE ID- 20 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #04
DEVICE ID- 21 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #05
DEVICE ID- 22 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #06
DEVICE ID- 23 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #07
DEVICE ID- 24 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #08
DEVICE ID- 25 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #09
DEVICE ID- 26 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #10
DEVICE ID- 27 IS FOUND ON IOM-0 PUB-12 AND IS DEVICE #11
DEVICE ID- 28 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #01
DEVICE ID- 29 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #02
DEVICE ID- 30 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #03
DEVICE ID- 31 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #04
DEVICE ID- 32 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #05
DEVICE ID- 33 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #06
DEVICE ID- 34 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #07
DEVICE ID- 35 IS FOUND ON IOM-0 PUB-14 AND IS DEVICE #08
DEVICE ID- 36 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #01
DEVICE ID- 37 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #02
DEVICE ID- 38 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #03
DEVICE ID- 39 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #04
DEVICE ID- 40 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #05
DEVICE ID- 41 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #06
DEVICE ID- 42 IS FOUND ON IOM-2 PUB-14 AND IS DEVICE #07
```

Figure C-6. The Physical Device, Device ID Correlation Table

```
                    CHANNEL-DEVICE BUSY REPORT

CHANNEL  8 AND DEVICE ID  1 BOTH BUSY    20 TIMES
CHANNEL  8 AND DEVICE ID  2 BOTH BUSY    51 TIMES
CHANNEL  8 AND DEVICE ID  4 BOTH BUSY     3 TIMES
CHANNEL  8 AND DEVICE ID  5 BOTH BUSY     3 TIMES
CHANNEL  8 AND DEVICE ID  7 BOTH BUSY     3 TIMES
CHANNEL  8 AND DEVICE ID  8 BOTH BUSY    13 TIMES
CHANNEL  8 AND DEVICE ID  9 BOTH BUSY     3 TIMES
CHANNEL  8 AND DEVICE ID 12 BOTH BUSY     1 TIMES
CHANNEL  8 AND DEVICE ID 15 BOTH BUSY    36 TIMES
CHANNEL  8 AND DEVICE ID 16 BOTH BUSY     2 TIMES
CHANNEL 12 AND DEVICE ID 17 BOTH BUSY     9 TIMES
CHANNEL 12 AND DEVICE ID 19 BOTH BUSY    26 TIMES
CHANNEL 12 AND DEVICE ID 20 BOTH BUSY    23 TIMES
CHANNEL 12 AND DEVICE ID 21 BOTH BUSY    64 TIMES
CHANNEL 12 AND DEVICE ID 22 BOTH BUSY    52 TIMES
CHANNEL 12 AND DEVICE ID 23 BOTH BUSY     3 TIMES
CHANNEL 12 AND DEVICE ID 24 BOTH BUSY    10 TIMES
CHANNEL 12 AND DEVICE ID 25 BOTH BUSY     9 TIMES
CHANNEL 12 AND DEVICE ID 26 BOTH BUSY     3 TIMES
CHANNEL 12 AND DEVICE ID 27 BOTH BUSY     1 TIMES
```


Figure C-7. Channel-device Busy Report

```
                    CHANNEL BUSY AND DEVICE FREE REPORT

CHANNEL  8 BUSY AND DEVICE ID  1 NOT BUSY      7 TIMES
CHANNEL  8 BUSY AND DEVICE ID  3 NOT BUSY      4 TIMES
CHANNEL  8 BUSY AND DEVICE ID  4 NOT BUSY     17 TIMES
CHANNEL  8 BUSY AND DEVICE ID  5 NOT BUSY      2 TIMES
CHANNEL  8 BUSY AND DEVICE ID  7 NOT BUSY      5 TIMES
CHANNEL  8 BUSY AND DEVICE ID  8 NOT BUSY      4 TIMES
CHANNEL  8 BUSY AND DEVICE ID  9 NOT BUSY      1 TIMES
CHANNEL  8 BUSY AND DEVICE ID 12 NOT BUSY      5 TIMES
CHANNEL  8 BUSY AND DEVICE ID 13 NOT BUSY      2 TIMES
CHANNEL  8 BUSY AND DEVICE ID 14 NOT BUSY      1 TIMES
CHANNEL  8 BUSY AND DEVICE ID 15 NOT BUSY      6 TIMES
CHANNEL  8 BUSY AND DEVICE ID 16 NOT BUSY      3 TIMES
CHANNEL 12 BUSY AND DEVICE ID 17 NOT BUSY     43 TIMES
CHANNEL 12 BUSY AND DEVICE ID 19 NOT BUSY     35 TIMES
CHANNEL 12 BUSY AND DEVICE ID 20 NOT BUSY     32 TIMES
CHANNEL 12 BUSY AND DEVICE ID 21 NOT BUSY    111 TIMES
CHANNEL 12 BUSY AND DEVICE ID 22 NOT BUSY    128 TIMES
CHANNEL 12 BUSY AND DEVICE ID 23 NOT BUSY     44 TIMES
CHANNEL 12 BUSY AND DEVICE ID 24 NOT BUSY     36 TIMES
CHANNEL 12 BUSY AND DEVICE ID 25 NOT BUSY     29 TIMES
CHANNEL 12 BUSY AND DEVICE ID 26 NOT BUSY     22 TIMES
CHANNEL 12 BUSY AND DEVICE ID 27 NOT BUSY     43 TIMES
```

Figure C-8. Channel Busy and Device Free Report

CHANNEL FREE DEVICE BUSY REPORT

DEVICE ID	1	BUSY	5406	TIMES
DEVICE ID	2	BUSY	4271	TIMES
DEVICE ID	3	BUSY	32	TIMES
DEVICE ID	4	BUSY	794	TIMES
DEVICE ID	5	BUSY	606	TIMES
DEVICE ID	7	BUSY	1890	TIMES
DEVICE ID	8	BUSY	891	TIMES
DEVICE ID	9	BUSY	278	TIMES
DEVICE ID	10	BUSY	120	TIMES
DEVICE ID	12	BUSY	37	TIMES
DEVICE ID	13	BUSY	32	TIMES
DEVICE ID	14	BUSY	20	TIMES
DEVICE ID	15	BUSY	3701	TIMES
DEVICE ID	16	BUSY	1224	TIMES
DEVICE ID	17	BUSY	107	TIMES
DEVICE ID	19	BUSY	1064	TIMES
DEVICE ID	20	BUSY	283	TIMES
DEVICE ID	21	BUSY	3304	TIMES
DEVICE ID	22	BUSY	2572	TIMES
DEVICE ID	23	BUSY	46	TIMES
DEVICE ID	24	BUSY	192	TIMES
DEVICE ID	25	BUSY	841	TIMES
DEVICE ID	26	BUSY	33	TIMES
DEVICE ID	27	BUSY	46	TIMES
DEVICE ID	35	BUSY	1	TIMES
DEVICE ID	36	BUSY	8	TIMES
DEVICE ID	42	BUSY	296	TIMES

Figure C-9. Channel Free Device Busy Report

CHANNEL FREE DEVICE FREE REPORT

DEVICE ID	1	FREE	8505	TIMES
DEVICE ID	2	FREE	12414	TIMES
DEVICE ID	3	FREE	18588	TIMES
DEVICE ID	4	FREE	27587	TIMES
DEVICE ID	5	FREE	9972	TIMES
DEVICE ID	6	FREE	168	TIMES
DEVICE ID	7	FREE	43133	TIMES
DEVICE ID	8	FREE	4765	TIMES
DEVICE ID	9	FREE	5345	TIMES
DEVICE ID	10	FREE	4249	TIMES
DEVICE ID	11	FREE	90	TIMES
DEVICE ID	12	FREE	1577	TIMES
DEVICE ID	13	FREE	1206	TIMES
DEVICE ID	14	FREE	1150	TIMES
DEVICE ID	15	FREE	13005	TIMES
DEVICE ID	16	FREE	12198	TIMES
DEVICE ID	17	FREE	4597	TIMES
DEVICE ID	18	FREE	146	TIMES
DEVICE ID	19	FREE	6635	TIMES
DEVICE ID	20	FREE	2155	TIMES
DEVICE ID	21	FREE	28464	TIMES
DEVICE ID	22	FREE	28737	TIMES
DEVICE ID	23	FREE	2160	TIMES
DEVICE ID	24	FREE	2277	TIMES
DEVICE ID	25	FREE	4151	TIMES
DEVICE ID	26	FREE	867	TIMES
DEVICE ID	28	FREE	74	TIMES
DEVICE ID	29	FREE	160	TIMES
DEVICE ID	30	FREE	12	TIMES
DEVICE ID	31	FREE	64	TIMES
DEVICE ID	32	FREE	90	TIMES
DEVICE ID	33	FREE	30	TIMES
DEVICE ID	34	FREE	223	TIMES
DEVICE ID	35	FREE	164	TIMES
DEVICE ID	36	FREE	736	TIMES
DEVICE ID	37	FREE	163	TIMES
DEVICE ID	38	FREE	255	TIMES
DEVICE ID	39	FREE	161	TIMES
DEVICE ID	40	FREE	161	TIMES
DEVICE ID	41	FREE	162	TIMES
DEVICE ID	42	FREE	2406	TIMES

Figure C-10. Channel Free Device Free Report

f. PSM Configuration Report

(figure C-11) This report describes the entire disk configuration and the number of connects issued over each configured channel. If a channel is not listed it means that no connects were issued over that channel.

```
*** PHYSICAL STORAGE MONITOR ***

                TAPE # 24092 24143
OSCC .M6.3.1   77-12-13      13:36:28      14:07:04

MONITOR COSTS: CALLS- 136945, COST-     13(SECS), COST/CALL-      99(USECS)

CONFIGURATION: QUAD PROCESSOR 6680, TRIPLE IOM, 896K MEMORY - 61 OF WHICH WERE MCM

                    IOM NUMBER  0

CHANNEL          TYPE          CROSSBAR          CONNECTS
 0-08           .DS191            0-09             57471
                                  0-10
                                  0-11
                                  1-08
                                  1-09
                                  1-10
                                  1-11
 0-09           .DS191         SEE ABOVE            9934
 0-10           .DS191         SEE ABOVE           23191
 0-11           .DS191         SEE ABOVE             301
 0-12           .DS191            0-13             32499
                                  2-12
                                  2-13
 0-13           .DS191         SEE ABOVE            2232
 0-14           .DS181            0-15               27
                                  0-16
                                  0-17
                                  1-14
                                  1-15
                                  1-16
                                  1-17
 0-16           .DS181         SEE ABOVE              31
                    IOM NUMBER  1

CHANNEL          TYPE          CROSSBAR          CONNECTS
 1-08           .DS191         SEE ABOVE           36238
 1-09           .DS191         SEE ABOVE            1211
 1-10           .DS191         SEE ABOVE           51461
 1-11           .DS191         SEE ABOVE            3969
 1-14           .DS181         SEE ABOVE             675
 1-16           .DS181         SEE ABOVE              24
                    IOM NUMBER  2

CHANNEL          TYPE          CROSSBAR          CONNECTS
 2-12           .DS191         SEE ABOVE           48986
 2-13           .DS191         SEE ABOVE            8532
 2-14           .DS181            2-15              4586
                                  2-16
                                  2-17
 2-16           .DS181         SEE ABOVE             165
```

Figure C-11. Physical Storage Monitor

APPENDIX D

GCOS REPORTS

GCOS REPORTS

This appendix describes the GCOS reports that are used in the Batch Turnaround Time Analysis Procedures. The source for this information is the GCOS System Startup and Operation Manual (DA06).

Three GCOS startup reports are referenced in batch turnaround time analysis procedures: (1) GCOS File Map, (2) GCOS Memory Map, and (3) GCOS System Map.

1. GCOS File Map

This report (see figure D-1) lists the GCOS libraries and files defined during the startup process. For each file, the following information is listed: (1) file name, (2) device housing the file, (3) starting llink of the file, and (4) total number of llinks in the file.

2. GCOS Memory Map

This report (see figure D-2) lists the GCOS modules loaded into hard core. The following information is listed for each module: (1) module name, (2) origin address, (3) entry address, and (4) file from which module was loaded.

3. GCOS System Map

This report (see figure D-3) lists the GCOS programs in all catalogued GCOS libraries. The following information is listed for each module: (1) program name, (2) section number where file begins, and (3) file where program is recorded. The GCOS File Map indicates the device where each library is housed.

GCOS III FILE MAP(75)a19

FILE	DEVICE	STARTING LLINK	TOTAL LLINKS	FILE	DEVICE	STARTING LLINK	TOTAL LLINKS
MASTER ST1	ST1	7	1	AUTO_LOAD	ST1	8	800
ST1	ST1	808	300	MMIX-SOFTW	ST1	1608	1000
GCOS-MMI-USE	ST1	2608	460	IND-INSERT	ST1	3088	720
SOFTW-SYSLIB	ST1	3808	900	GCOS-MI-USE	ST1	4608	800
GCOS-LO-USE	ST1	5408	2000	I-AND-D	ST1	7408	900
TSS-SUB-SYS	ST1	8308	900	SOFTW-PRIME	ST1	9208	1500
SOFTW-SECOND	ST1	10708	3200	DMS-SOFTW	ST1	13908	2200
DUMP	ST1	16108	144	BACKDOOR	ST1	16252	12
PRIMIMAGE	ST1	16264	24	SSFILE	ST1	16288	36
MASTER ST2	ST2	7	1	SYSOUT	ST2	8	13000
SYSOUT	ST2	13008	13000				

Figure D-1. GCOS File Map

GECOS III MEMORY MAP

MODULE	ORIGIN	ENTRY	FILE
.MSECR	007510	007510	CARD READER
.MSRT1	021760	021760	GECOS-LO-JSE
.MDISP	022510	022521	GECOS-LO-JSE
.MJUMP	027420	027702	GECOS-LO-JSE
.MFALT	031400	031435	GECOS-LO-JSE
.MGEPR	035620	035620	GECOS-LO-JSE
.MSCM1	040470	040505	GECOS-LO-JSE
.MGP01	041470	041470	GECOS-MI-JSE
.MIOS	042330	042350	GECOS-LO-JSE
.MMTAP	053450	053450	GECOS-LO-JSE
.MPRIO	054700	054700	GECOS-LO-JSE
.MSYDT	055230	055230	GECOS-LO-JSE
.MTYPE	061130	061130	GECOS-LO-JSE
.MOSX1	061570	061570	GECOS-LO-JSE
.MOSX5	063260	063310	GECOS-LO-JSE
.MOSX6	064710	064730	GECOS-LO-JSE
.MFSIO	066320	066320	GECOS-MI-JSE
.MONWW	067140	067140	GECOS-MI-JSE
.MRTWW	103770	103770	GECOS-MI-JSE
.MCPIO	111630	111630	GECOS-LO-JSE
.MGPIO	112110	112110	GECOS-LO-JSE
.MIOSC	112350	112350	GECOS-LO-JSE
.MPOPM	115630	157061	GECOS-

Figure D-2. GCOS Memory Map

GECOS III SYSTEM MAP

PROGRAM	SECTOR IN	FILE	PROGRAM	SECTOR IN	FILE	PROGRAM	SECTOR IN	FILE
.MALC0	5	GECOS-LO-USE	.MALC2	14	GECOS-LO-USE	.MALC3	22	GECOS-LO-USE
.MALC1	31	GECOS-LO-USE	.MALC2	5	GECOS-HI-USE	.MALC3	243	GECOS-LO-USE
.MALC4	249	GECOS-LO-USE	.MALC5	13	GECOS-HI-USE	.MALC6	22	GECOS-HI-USE
.MALC7	31	GECOS-HI-USE	.MALCT	285	GECOS-LO-USE	.MALC9	40	GECOS-HI-USE
.MBRT1	383	GECOS-LO-USE	.MBRT2	49	GECOS-HI-USE	.MBRT3	58	GECOS-HI-USE
.MBRT4	57	GECOS-HI-USE	.MBRT5	75	GECOS-HI-USE	.MBRT6	102	GECOS-HI-USE
.MCAL1	179	GECOS-HI-USE	.MCAL2	324	GECOS-LO-USE	.MCALJ	330	GECOS-LO-USE
.MDMK1	338	GECOS-LO-USE	.MDP10	347	GECOS-LO-USE	.MDISP	428	GECOS-LO-USE
.MDR20	584	GECOS-LO-USE	.MDS16	592	GECOS-LO-USE	.MDS20	601	GECOS-LO-USE
.MDS27	609	GECOS-LO-USE	.MDUMP	760	GECOS-LO-USE	.MFSRC	5223	GECOS-LO-USE
.MFALT	1313	GECOS-LO-USE	.MFLT1	355	GECOS-HI-USE	.MFS01	365	GECOS-HI-USE
.MFS02	372	GECOS-HI-USE	.MFS03	381	GECOS-HI-USE	.MFS04	390	GECOS-HI-USE
.MFS05	399	GECOS-HI-USE	.MFS06	408	GECOS-HI-USE	.MFS07	417	GECOS-HI-USE
.MFS08	426	GECOS-HI-USE	.MFS09	435	GECOS-HI-USE	.MFS10	444	GECOS-HI-USE
.MFS11	455	GECOS-HI-USE	.MFS12	462	GECOS-HI-USE	.MFS13	469	GECOS-HI-USE
.MFS14	477	GECOS-HI-USE	.MFS15	484	GECOS-HI-USE	.MFS16	493	GECOS-HI-USE
.MFS17	502	GECOS-HI-USE	.MFS18	511	GECOS-HI-USE	.MFS19	519	GECOS-HI-USE
.MFS20	528	GECOS-HI-USE	.MFS21	536	GECOS-HI-USE	.MFS22	545	GECOS-HI-USE
.MFS23	554	GECOS-HI-USE	.MFS24	561	GECOS-HI-USE	.MFS25	570	GECOS-HI-USE
.MFS26	578	GECOS-HI-USE	.MFS27	587	GECOS-HI-USE	.MFS28	596	GECOS-HI-USE
.MFS29	603	GECOS-HI-USE	.MGEIN	1181	GECOS-HI-USE	.MGENA	1145	GECOS-HI-USE
.MGEN3	1152	GECOS-HI-USE	.MGENC	1273	GECOS-HI-USE	.MGEOT	1489	GECOS-LO-USE
.MGEP2	1718	GECOS-LO-USE	.MSLM1	6584	GECOS-LO-USE	.MSLM2	5593	GECOS-LO-USE
.MSLM3	5599	GECOS-LO-USE	.MGNAT	74	GECOS-HI-USE	.MGOU1	1291	GECOS-HI-USE
.MGOU2	1308	GECOS-HI-USE	.MGOU3	1309	GECOS-HI-USE	.MGOU4	1316	GECOS-HI-USE
.MGOU5	1324	GECOS-HI-USE	.MGP01	1352	GECOS-HI-USE	.MGP02	1361	GECOS-HI-USE
.MGP03	1367	GECOS-HI-USE	.MGP04	1372	GECOS-HI-USE	.MGP05	1377	GECOS-HI-USE
.MGP09	1387	GECOS-HI-USE	.MGP10	1392	GECOS-HI-USE	.MGP11	1397	GECOS-HI-USE
.MGP12	1402	GECOS-HI-USE	.MGP13	1407	GECOS-HI-USE	.MGP14	1412	GECOS-HI-USE
.MGP15	1417	GECOS-HI-USE	.MGP16	1422	GECOS-HI-USE	.MGP17		
.MGP19	1431	GECOS-HI-USE	.MGP20	1435	GECOS-HI-USE	.MGP2[illegible]		
.MGP22	1441	GECOS-HI-USE	.MGP30	1448	GECOS-HI-USE			
	1458	GECOS-HI-USE	.MGP33	1463	GECOS-HI-USE			
	1473	GECOS-HI-USE	.MGP94	1933	GECOS-HI-USE			
		GECOS-LO-USE	.MGP97	1946				

Figure D-3. GCOS System Map

APPENDIX E

MEMORY UTILIZATION MONITOR

MEMORY UTILIZATION MONITOR/CPU MONITOR

This appendix describes the four reports generated by Memory Utilization Monitor (MUM), the CPU Monitor and the Tape Monitor that are used in the Batch Turnaround Time Analysis Procedures. The source for this information is the General Monitor Facility Users Guide. For a complete description of both the data collector and data reduction program the reader should refer to the GMF Users Guide.

The four reports used in the Batch Turnaround Time Analysis Procedures are described in the following paragraphs.

1. Total Elapsed Time An Activity Was In Memory Report.

This report (see figure E-2) shows the duration of elapsed time each activity had memory allocated to it. An entry is made for each activity that terminates.

2. The Elapsed Wait Time For Memory Requests In I/10 Second.

This report (see figure E-3) shows how long activities waited for memory. When an activity requests memory, either at first demand or upon swap, the time is marked. Upon allocation for the activity, the time is again marked and the difference used in the value for this report. The 1/10 second time span can be altered by parameter. An entry is made whenever an activity is allocated memory.

3. CPU Utilization Report. This report (see figure E-4) provides several metrics of CPU utilization. The report is generated for specific intervals during the measurement session. Data entry line number one (see figure E-4) displays the cumulative CPU time for system and user jobs. Line two displays Overhead and Idle Time for each processor in the configuration. Line three displays the following values for the intermediate display period: (1) Percent System CPU, (2) Percent TSS CPU, (3) Percent PWIN CPU, (4) Percent User CPU, and (5) Percent Idle Time. Line four displays the same data values for the monitor session.

DISTRIBUTION COLLECTED ON SYSTEM NMCS1 AT 17:14:53 . 77-02-07

THE TOTAL ELAPSED TIME AN ACTIVITY WAS IN MEMORY

INDIV. NUMBER	CUMUL. NUMBER	CUMUL. PROB.	INDIV. PROB.	TENTHS SECOND	PERCENT PROBABILITY OF OCCURRENCE 00 10 20 30 40 50 60 70 80 90 100	REPORT 21
323	323	0.524	0.524	15- 99	IXXXXXXXXXXXXXXXXXXXXXXXXX	
87	410	0.665	0.141	100- 199	IXXXXXXX	
29	439	0.712	0.047	200- 299	IXX	
18	457	0.741	0.029	300- 399	IX	
12	469	0.760	0.019	400- 499	IX	
16	485	0.786	0.026	500- 599	IX	
18	503	0.815	0.029	600- 699	IX	
6	509	0.825	0.010	700- 799	I	
7	516	0.836	0.011	800- 899	IX	
11	527	0.854	0.018	900- 999	IX	
8	535	0.867	0.013	1000-1099	IX	
7	542	0.878	0.011	1100-1199	IX	
1	543	0.880	0.002	1200-1299	I	
5	548	0.888	0.008	1300-1399	I	
3	551	0.893	0.005	1400-1499	I	
3	554	0.898	0.005	1500-1599	I	
2	556	0.901	0.003	1600-1699	I	
6	562	0.911	0.010	1700-1799	I	
0	562	0.911	0.	1800-1899	I	
3	565	0.916	0.005	1900-1999	I	
0	565	0.916	0.	2000-2099	I	
2	567	0.919	0.003	2100-2199	I	
1	568	0.921	0.002	2200-2299	I	
0	568	0.921	0.	2300-2399	I	
1	569	0.922	0.002	2400-2499	I	
1	570	0.924	0.002	2500-2599	I	
0	570	0.924	0.	2600-2699	I	
2	572	0.927	0.003	2700-2799	I	
1	573	0.929	0.002	2800-2899	I	
1	574	0.930	0.002	2900-2999	I	
0	574	0.930	0.	3000-3099	I	
0	574	0.930	0.	3100-3199	I	
1	575	0.932	0.002	3200-3299	I	
0	575	0.932	0.	3300-3399	I	
0	575	0.932	0.	3400-3499	I	
1	576	0.934	0.002	3500-3599	I	
0	576	0.934	0.	3600-3699	I	
1	577	0.935	0.002	3700-3799	I	

617 ENTRIES TOTAL AVERAGE = 1820.35818 VARIANCE =65540502.500 STANDARD DEVIATION = 8095.709
40 OUT OF RANGE AVERAGE FOR THESE = 23734.07495

Figure E-1. MUM Total Elapsed Time An Activity Was In Memory Report

DISTRIBUTION COLLECTED ON SYSTEM NMCS1 AT 17:14:53 ON 77-02-07

THE ELAPSED WAIT TIME FOR MEMORY REQUESTS IN 1/10 SECOND

INDIV. NUMBER	CUMUL. NUMBER	CUMUL. PROB.	INDIV. PROB.	WAIT TIME	PERCENT PROBABILITY OF OCCURRENCE 00 10 20 30 40 50 60 70 80 90 100	REPORT 22
303	308	0.508	0.508	0- 24	IXXXXXXXXXXXXXXXXXXXXXXXX	
106	414	0.683	0.175	25- 49	IXXXXXXXXX	
39	453	0.748	0.064	50- 74	IXXX	
24	477	0.787	0.040	75- 99	IXX	
29	506	0.835	0.048	100- 124	IXX	
14	520	0.858	0.023	125- 149	IX	
13	533	0.880	0.021	150- 174	IX	
10	543	0.896	0.017	175- 199	IX	
8	551	0.909	0.013	200- 224	IX	
4	555	0.916	0.007	225- 249	I	
3	558	0.921	0.005	250- 274	I	
4	562	0.927	0.007	275- 299	I	
4	566	0.934	0.007	300- 324	I	
3	569	0.939	0.005	325- 349	I	
2	571	0.942	0.003	350- 374	I	
1	572	0.944	0.002	375- 399	I	
2	574	0.947	0.003	400- 424	I	
1	575	0.949	0.002	425- 449	I	
4	579	0.955	0.007	450- 474	I	
3	582	0.960	0.005	475- 499	I	
3	585	0.965	0.005	500- 524	I	
3	588	0.970	0.005	525- 549	I	
2	590	0.974	0.003	550- 574	I	
0	590	0.974	0.	575- 599	I	
1	591	0.975	0.002	600- 624	I	
0	591	0.975	0.	625- 649	I	
1	592	0.977	0.002	650- 674	I	
1	593	0.979	0.002	675- 699	I	
3	596	0.983	0.005	700- 724	I	
0	596	0.983	0.	725- 749	I	
1	597	0.985	0.002	750- 774	I	
0	597	0.985	0.	775- 799	I	
0	597	0.985	0.	800- 824	I	
0	597	0.985	0.	825- 849	I	
1	598	0.987	0.002	850- 874	I	
0	598	0.987	0.	875- 899	I	
0	598	0.987	0.	900- 924	I	
1	599	0.988	0.002	925- 949	I	

606 ENTRIES TOTAL AVERAGE = 95.55776 VARIANCE = 92771.577 STANDARD DEVIATION = 304.584
7 OUT OF RANGE AVERAGE FOR THESE = 2016.85715

Figure E-2. MUM Average Elapsed Wait Time Report

```
DATE  05-22-77                                        UNCLASSIFIED

 ELAPSED TIME THUS FAR IN SECONDS IS     5864


 CPU TIME USED THUS FAR IN HUNDRETHS OF A SECOND

    CALC     MALC     SYOT     RTIN      TSS      T/OS     TMAX     LOGN     FSYS     PWIN     DMTEX   MONITR     USER
   10421    54031    51779     2876   103775       51        0     3869        0    95705         0      406   703332
 OVERHEAD AND IDLE TIMES IN HUNDTHS OF A SEC FOR EACH CPU

   CPU 1    CPU 1    CPU 2    CPU 2    CPU 3    CPU 3    CPU 4    CPU 4
  402383    58368    64628    92621    69467    66536        0        0


 % SYSTEM CPU, % TSS CPU, % PWIN CPU, % USER CPU AND % IDLE TIME SINCE LAST OUTPUT
       37             5            4           52             0

 % SYSTEM CPU, % TSS CPU, % PWIN CPU % USER CPU AND % IDLE TIME SINCE START OF RUN
       36             5            5           39            12
```

Figure E-3. MUM CPU Utilization Report

4. Tape Delay Report. This report (see figure E-5) displays data concerning the delay of batch jobs caused by an insufficient number of available tape drives. Report entries are produced for each program and for the system (bottom of figure E-5).

```
   THE PROGRAM WAITED FOR A MAX OF   0 TAPES

   NUMBER OF DRIVES CURRENTLY IN USE =     6
********************************************************************************


 TAPES FOR PROGRAM  66442      TYPE              UNIT     CHANNEL NUMBER     TIME IN USE (SECONDS)
                          TAPE 9 TRACK            2              19( 1)                    33

   THIS PROGRAM WAS DELAYED FOR TAPE ALLOCATION A TOTAL OF       290  SECONDS

   THE PROGRAM WAITED FOR A MAX OF   1 TAPES

   NUMBER OF DRIVES CURRENTLY IN USE =    14
********************************************************************************


 TAPES FOR PROGRAM  62554      TYPE              UNIT     CHANNEL NUMBER     TIME IN USE (SECONDS)
                          TAPE 9 TRACK            3              20( 2)                    87
                          TAPE 9 TRACK            5              20( 2)                    87

   THIS PROGRAM WAS DELAYED FOR TAPE ALLOCATION A TOTAL OF       409  SECONDS

   THE PROGRAM WAITED FOR A MAX OF   2 TAPES

   NUMBER OF DRIVES CURRENTLY IN USE =    12
********************************************************************************


NUMBER OF JOBS =  189     NUMBER OF TAPE JOBS =   43

TIME OF ALLOCATION IN SECONDS FOR 7 TRACK DRIVES, 9 TRACK DRIVES, 500 DRIVES   , 600 DRIVES   ,TOTAL WAIT TIME (MIN)
                                  659          20825             0             0          42.85
```

Figure E-4. MUM Tape Delay Report

APPENDIX F

HONEYWELL ERROR ANALYSIS AND LOGGING SYSTEM II

HONEYWELL ERROR ANALYSIS AND LOGGING SYSTEM II

This appendix describes the Honeywell Error Analysis and Logging System (HEALS) II reports that are used in the Batch Turnaround Time Analysis Procedures. The source for this information is the HEALS II Manual (DB50).

1. Concepts and Facilities

The HEALS II system is used to reduce data collected on the GCOS Statistical Collection File (SCF) to track system device errors (see figure F-1).

2. Report Formats and Data Elements

Three HEALS II reports are used in the Device Errors Test of the Batch Turnaround Time Analysis Procedures: (1) Tape Unit Error Variance Report, (2) Tape Error By Unit/Reel Number Report, and (3) MPC Statistics Report.

a. Tape Unit Error Variance Report. This report (figure F-2) is used to determine which tape device is experiencing the most data alerts. Report column headings are described below:

(1) Handler. This is the device address for which the data alerts were reported.

(2) Connect Values (Left Column). This is the total number of connects on the device up to and including the last detection of a data alert. This does not include connects since the last data alert.

(3) Alert Values (Left Column). This is the total number of data alerts for the tape handler.

b. Tape Error By Unit/Reel Number Report. This report displays tape errors grouped by tape handler and reel (see figure F-3). Column headings for the report are described below:

(1) Tape Handler. The physical address of the device.

(2) Tape Number. This is the tape reel number.

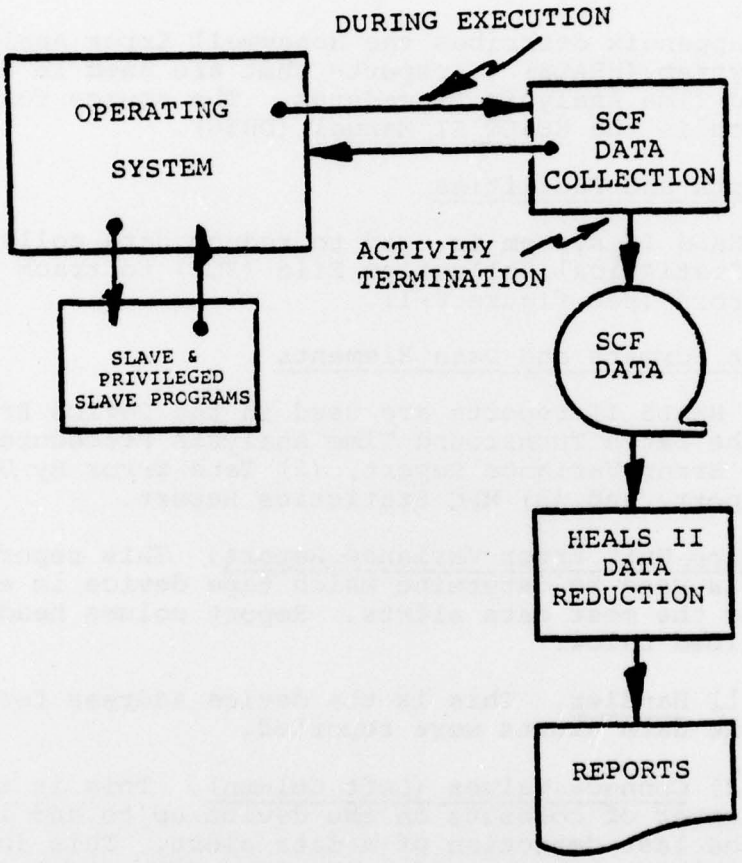

Figure F-1. HEALS II System

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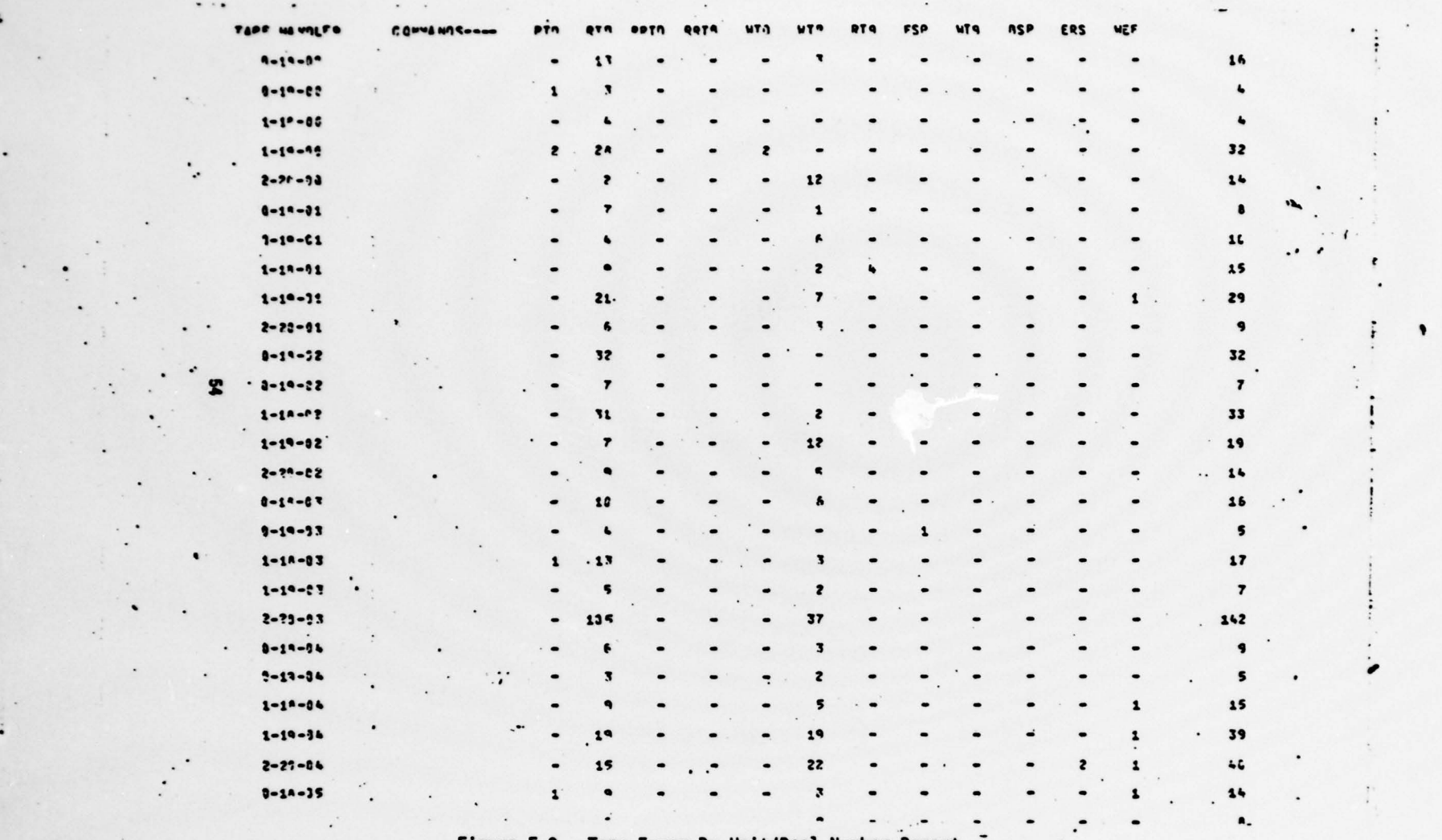
HEALS 01-24-79 [illegible] TAPE UNIT ERROR VARIANCE PAGE 2

HANDLER	TOTAL (TO .01%)	CONNECTS/ALERT RATIOS	CONNECT VALUES	ALERT VALUES	
8-19-83	.041 <-> .077	161911 <-> 269811	8196 <-> 8194	5 <-> 3	20434
8-19-84	.042 <-> .025	275111 <-> 391711	11755 <-> 11753	5 <-> 3	20439
8-29-81	.070 <-> .070	259611 <-> 329711	23011 <-> 23009	9 <-> 7	VLROR

Figure F-2. HEALS II Tape Unit Error Variance Report



TAPE NUMBER	COMMAND	PTO	RTO	OPTO	ORTO	WTO	WTO	RTO	FSP	WTO	RSP	ERS	WEF	
0-10-00		-	11	-	-	-	7	-	-	-	-	-	-	18
0-10-00		1	3	-	-	-	-	-	-	-	-	-	-	4
1-10-00		-	4	-	-	-	-	-	-	-	-	-	-	4
1-10-00		2	28	-	-	2	-	-	-	-	-	-	-	32
2-20-00		-	2	-	-	-	12	-	-	-	-	-	-	14
0-10-01		-	7	-	-	-	1	-	-	-	-	-	-	8
1-10-01		-	6	-	-	-	6	-	-	-	-	-	-	12
1-10-01		-	8	-	-	-	2	4	-	-	-	-	-	15
1-10-01		-	21	-	-	-	7	-	-	-	-	-	1	29
2-20-01		-	6	-	-	-	3	-	-	-	-	-	-	9
0-10-02		-	32	-	-	-	-	-	-	-	-	-	-	32
0-10-02		-	7	-	-	-	-	-	-	-	-	-	-	7
1-10-02		-	31	-	-	-	2	-		-	-	-	-	33
1-10-02		-	7	-	-	-	12	-	-	-	-	-	-	19
2-20-02		-	8	-	-	-	6	-	-	-	-	-	-	14
0-10-03		-	10	-	-	-	6	-	-	-	-	-	-	16
0-10-03		-	4	-	-	-	-	-	1	-	-	-	-	5
1-10-03		1	13	-	-	-	3	-	-	-	-	-	-	17
1-10-03		-	5	-	-	-	2	-	-	-	-	-	-	7
2-20-03		-	136	-	-	-	37	-	-	-	-	-	-	142
0-10-04		-	6	-	-	-	3	-	-	-	-	-	-	9
0-10-04		-	3	-	-	-	2	-	-	-	-	-	-	5
1-10-04		-	9	-	-	-	5	-	-	-	-	-	1	15
1-10-04		-	19	-	-	-	19	-	-	-	-	-	1	39
2-20-04		-	15	-	-	-	22	-	-	-	-	2	1	40
0-10-05		1	9	-	-	-	3	-	-	-	-	-	1	14

Figure F-3. Tape Error By Unit/Reel Number Report

c. MPC Statistics Report. This report (see figure F-4) displays statistical counters of disk subsystem activity that are updated by the MPC application firmware for logged events. Each channel and device address is displayed on this report.

(1) Movement Seeks. This is the number of actuator movements for the device.

(2) Data Transfer Commands Executed. This is the total number of read and write commands issued to the device.

(3) Seek Incompletes. This is the total number of seek incompletes received from the device.

(4) Data Check Character Alerts. This is the number of data errors detected from the disk pack.

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HEALS 05 01-24-79 15.991 MPC STATISTICS READ DIRECTLY FROM THE CONTROLLER PAGE 4

STATISTICS FOR DCS191 IOM-2 CH-10 RELEASED/ASSIGNED	DEVICE-01 ASSIGNED	DEVICE-02 ASSIGNED	DEVICE-03 ASSIGNED	DEVICE-04 ASSIGNED	DEVICE-05 ASSIGNED	DEVICE-06 ASSIGNED	DEVICE-07 ASSIGNED	DEVICE-08 ASSIGNED
MOVEMENT SEEKS	11310	51620	11884	53694	37941	4658	9700	46118
DATA SECTORS WRITTEN	29247	8947	9102	5451	13994	4017	6261	54384
DATA SECTORS READ	38861	14512	55272	37041	34227	48305	5887	31530
DATA TRANSFER COMMANDS EXECUTED	66215	62373	44214	10928	2405	49133	63080	18057
SEEK INCOMPLETES	0	0	0	0	0	0	0	0
HEADER VERIFICATION ERRORS	0	0	0	0	0	0	0	0
TRANSFER TIMING ERRORS	0	0	0	0	0	0	0	1
DATA CHECK CHARACTER ALERTS	0	13	0	0	0	0	0	2
COUNT CHECK CHARACTER ALERTS	0	0	0	0	0	0	0	0
OLI PARITY ERRORS	1	0	0	0	0	0	0	0
ALTERNATE TRACKS PROCESSED	0	0	0	0	0	0	0	0
EDAC CORRECTABLE ERRORS	0	2	0	0	0	0	0	0
EDAC UNCORRECTABLE ERRORS	0	0	0	0	0	0	0	0
POSITION OFFSETS	0	0	0	0	0	0	0	0
DATA CORRECTIONS INITIATED	0	2	0	0	0	0	0	0
SEARCH ALERTS	0	0	0	0	0	0	0	0

STATISTICS FOR DCS191 IOM-0 CH-13 RELEASED/ASSIGNED	DEVICE-09 ASSIGNED	DEVICE-10 ASSIGNED	DEVICE-11 ASSIGNED	DEVICE-12 ASSIGNED	DEVICE-13 ASSIGNED	DEVICE-14 ASSIGNED	DEVICE-15 ASSIGNED	DEVICE-16 ASSIGNED
MOVEMENT SEEKS	28127	53777	276	19811	53285	25265	23440	5741
DATA SECTORS WRITTEN	22229	6151	928	61647	5455	55866	8999	19021
DATA SECTORS READ	39649	52470	12330	61597	46714	42157	39515	3061
DATA TRANSFER COMMANDS EXECUTED	9037	18986	19146	64549	42247	16082	41488	64481
SEEK INCOMPLETES	0	0	0	0	0	0	0	1
HEADER VERIFICATION ERRORS	0	0	0	0	0	0	0	0
TRANSFER TIMING ERRORS	1	0	0	0	1	0	0	0
DATA CHECK CHARACTER ALERTS	0	0	0	0	0	0	0	1
COUNT CHECK CHARACTER ALERTS	0	2	0	0	0	0	0	1
OLI PARITY ERRORS	0	0	0	0	0	0	0	1
ALTERNATE TRACKS PROCESSED	0	0	0	0	0	0	0	1
EDAC CORRECTABLE ERRORS	0	0	0	0	0	0	0	0
EDAC UNCORRECTABLE ERRORS	0	0	0	0	0	0	0	0
POSITION OFFSETS	0	0	0	0	0	0	0	1
DATA CORRECTIONS INITIATED	0	0	0	0	0	0	0	1
SEARCH ALERTS	0	0	0	0	0	0	0	1

Figure F-4. HEALS II MPC Statistics Report

APPENDIX G

GENERAL SUMMARY EDIT PROGRAM (GESEP)

GENERAL SUMMARY EDIT PROGRAM (GESEP)

This appendix describes the General Summary Edit Program (GESEP) report used in the Guide Batch Turnaround Time Analysis Procedures. The source for this information is the General Summary Edit Program Manual (B507).

1. Concepts and Facilities

GESEP is the accounting data reduction system provided with H-6000 systems to display data collected on the H-6000 Statistical Collection File (SCF).

a. System Operation. GESEP always prints a summary report. The operator has the option of printing: (1) only the summary, (2) the summary and all processed SCF record types, or (3) the summary and selected record types. SCF data is collected as an integral part of GCOS system operation (see figure G-1).

b. Operating Options. Report types produced by GESEP are selected from two sources: (1) using the sense switch options on the $PROGRAM card or $EXECUTE card or (2) using the operator type-in at the console.

2. Report Formats and Data Elements

The Allocator/Termination Report (see figure G-2) is the only GESEP report used by the Guide Batch Turnaround Time Analysis Procedures. The Urgency Code Test scans the report for an activity's initial Urgency Code and current (i.e., final) Urgency Code values:

a. IURG. This field displays the initial urgency code of the activity in decimal.

b. CURG. This field displays the current (i.e., final) urgency code of the activity in decimal.

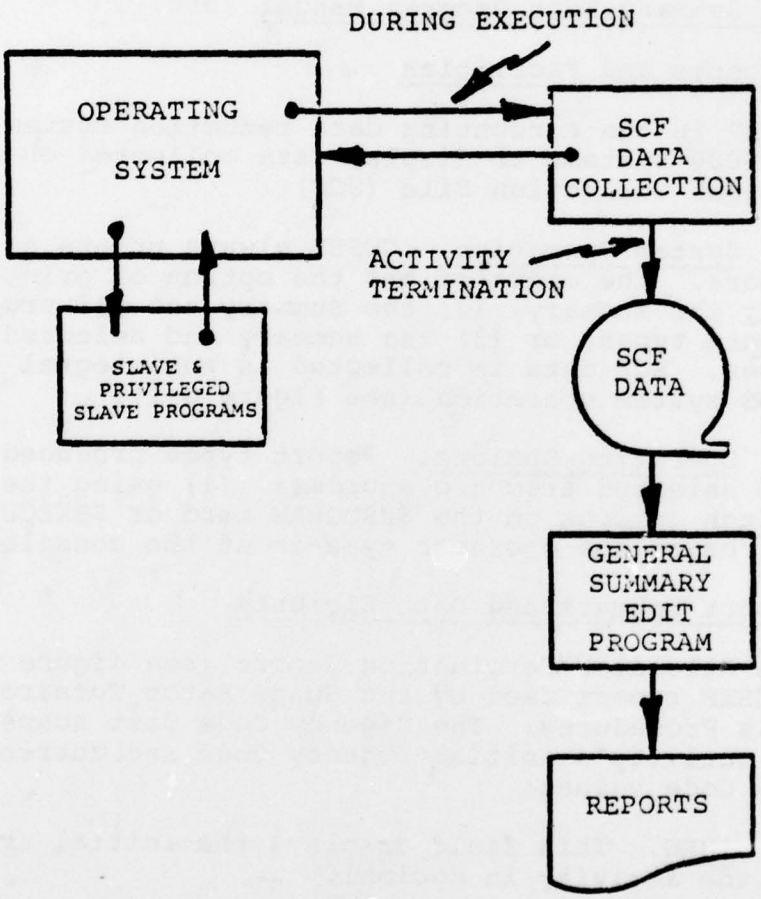

Figure G-1. GESEP

```
SNUMB-ACT/TYPE    START TIME/IURG   STOP  TIME/CURG   SYSOUT/LIMITS          TIME/LIMITS          MEMORY   MEM*TIME ENDING
09137-05 GELOAD   11:04:01.785  5   11:04:20.386  5       41   5000   00:00:03.257 00:06:00.000    4096     131833 GEFINI

$       IDENT   95CDCK72,JL SCHUTTENBERG

SSA INFORMATION
GECALL     TIME/DEVICE    00:00:02.060 DSS180
PUSHDOWN   TIME/DEVICE    00:00:00.238 DSS180
SSA I/O    TIME/DEVICE    00:00:02.504 DSS180
GESYOT     TIME/DEVICE    00:00:00.151 DSS180

PERIPHERAL ENTRY FOR MASS STORAGE                                  CHANNEL      #-OF-LLINKS    REL.-BLOCK   REMOVABLE
DEVICE   ICCDD  FC DISP  CAT?      TYPE                           USE TIME     INIT    MAX    INIT  FINAL   PACK NO.
DSS181   00804  B* R     N    TEMPORARY LINKED                  00:00:01.195   384    384     33     33      N/A
DSS181   00802  I* R     N    PERMANENT LINKED                  00:00:00.030     1      1      0      1      N/A
DSS181   00801  L* R     N    PERMANENT RANDOM                  00:00:05.035   516    516      0      0      N/A
DSS181   00802  R* R     N    PERMANENT LINKED                  00:00:00.020     1      1      0      0      N/A

PERIPHERAL ENTRY FOR MAGNETIC TAPE                                 CHANNEL          FILE          ENDING
DEVICE   ICCDD  FC DISP  DEN    CONNECTS ERRORS                   USE TIME     SERIAL   NO.     RECORD  FILE
ASA9     00905  OP S     H           476      1                  00:00:05.920   MOUNT #X460        0      9

PERIPHERAL ENTRY FOR UNIT RECORD DEVICES                           CHANNEL        TIME OF          TIME OF
DEVICE   ICCDD  FC DISP         CONNECTS ERRORS                   USE TIME      ALLOCATION      DE-ALLOCATION
PRINTR   01500  OT R                 181      0                  00:00:10.211  10:47:47.873    10:48:10.959

   MEDIA          SYSOUT REPORT CODE   RECORD COUNT   REMOTE STATION ID
PUNCH CARDS              75                 26            N/A
PUNCH CARDS              76                 12            N/A
PRINT LINES              74                240            N/A
```

Figure G-2. GESEP Allocator/Termination Report

APPENDIX H

TSS RESPONSE TIME ANALYSIS SYSTEM

(The contents of this appendix will be supplied with the delivery of Volume III)