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COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

2219 0094

B1800/B1700 EDP-TABS

PRODUCT SPECIFICATION

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
B	1/25/79	<i>Hall</i>	<p>Changes for the VIII.0 Release</p> <ul style="list-style-type: none">1-2 Added TABS/DMS to Specialized Report Generation.3-1 Added TABS/UPDATE section. Renumbered remaining sections.4-2 Added NOTE pertaining to TABS/LOGOUT.4-3 Added Setting 2 to Switch 8.4-4 Updated TABS/LOGOUT table.12-2 Updated CHARGE UNITS paragraph.15-1 Added new section ABNORMAL EOJ.15-3 Added new section COLDSTART RESTART AND RECOVERY (SW8=2).15-4 Added new section COLDSTART RESTART.15-6 Added new section COLDSTART RECOVERY.

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 P.S. 2219 0C94 (B)

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INTRODUCTION

The Burroughs Electronic Data Processing Time Analysis and Billing System (EDP-TABS), as implemented for the Burroughs B1800/B1700 series, provides each user with the capability of obtaining a comprehensive analysis of the system log file (LUG/#<n>). The log file is created by the Master Control Program (MCP) and contains information about all jobs executed on the system along with their associated files.

EDP-TABS is designed to analyze the log file, using the extracted statistics to generate reports on machine utilization and program performance. As the reports are produced, month-to-date and billing-period-to-date statistics are maintained in permanent data files. Together with the information on installation costs, entered by the EDP manager, these statistics can be used to distribute the cost of the entire system equitably among the individuals, departments, or applications utilizing the computer service.

It is the system operator's responsibility to insure that the log files are on disk. The MCP LOG option must always be set if the reports produced by EDP-TABS are to reflect an accurate picture of the system's usage.

If the billing capabilities of the TABS package are to be used, the MCP CHRG option should be set. This insures that every job will be assigned a charge number. If the CHRG option is not set, then all jobs executed without a charge number will be assigned to the system charge number.

RELATED DOCUMENTATION

Name -----	Number -----
SYSTEM/LOGOUT B1800/B1700 Software Operational Guide	P.S. 2222 2640 1068731

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IABS PACKAGE

The EDP-TABS package consists of eleven programs and six permanent data files. To facilitate saving either the files or the programs, all the programs have a multifile-id of TABS and all the data files have a multifile-id of TAB.

The EDP-TABS programs include:

TABS/LOGOUT	for log extraction
TABS/REPORTGEN	for general report generation
TABS/ACCTS TABS/MIX TABS/SUM TABS/HDWR TABS/EXEC TABS/ERR TABS/DMS	for specialized report generation
TABS/BILLING	for billing
TABS/UPDATE	for user interface

The EDP-TABS permanent data files are:

TAB/MASTER
 TAB/CUSTOMERS
 TAB/PERIPH
 TAB/YTDCHGS
 TAB/OVERLAP
 TAB/JOBOVERLAP

In the initial run of the TABS package, the permanent data files must be created by executing TABS/UPDATE with the CREATE option set. After the files have been created, TABS/LOGOUT is the only program that needs to be executed. TABS/BILLING will be automatically ZIPPed at the end of the month if the AUTO BILL option is set. However, TABS/UPDATE and TABS/BILLING can be executed whenever necessary, independent of TABS/LOGOUT.

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All programs access TAB/CUSTOMERS to determine the settings of the various TABS options, such as page-length. The rest of the permanent data files are accessed only by the programs which need them. TABS also uses seven temporary data files to pass information from program to program. The EDP-TABS temporary data files are:

TAB/CLEARSTART
TAB/EVENTS
TAB/JOBINFO
TAB/FILEINFO
TAB/DAILYPROG
TAB/ERRINFO
TAB/DMS

These files are removed by TABS/LOGOUT after each day's processing.

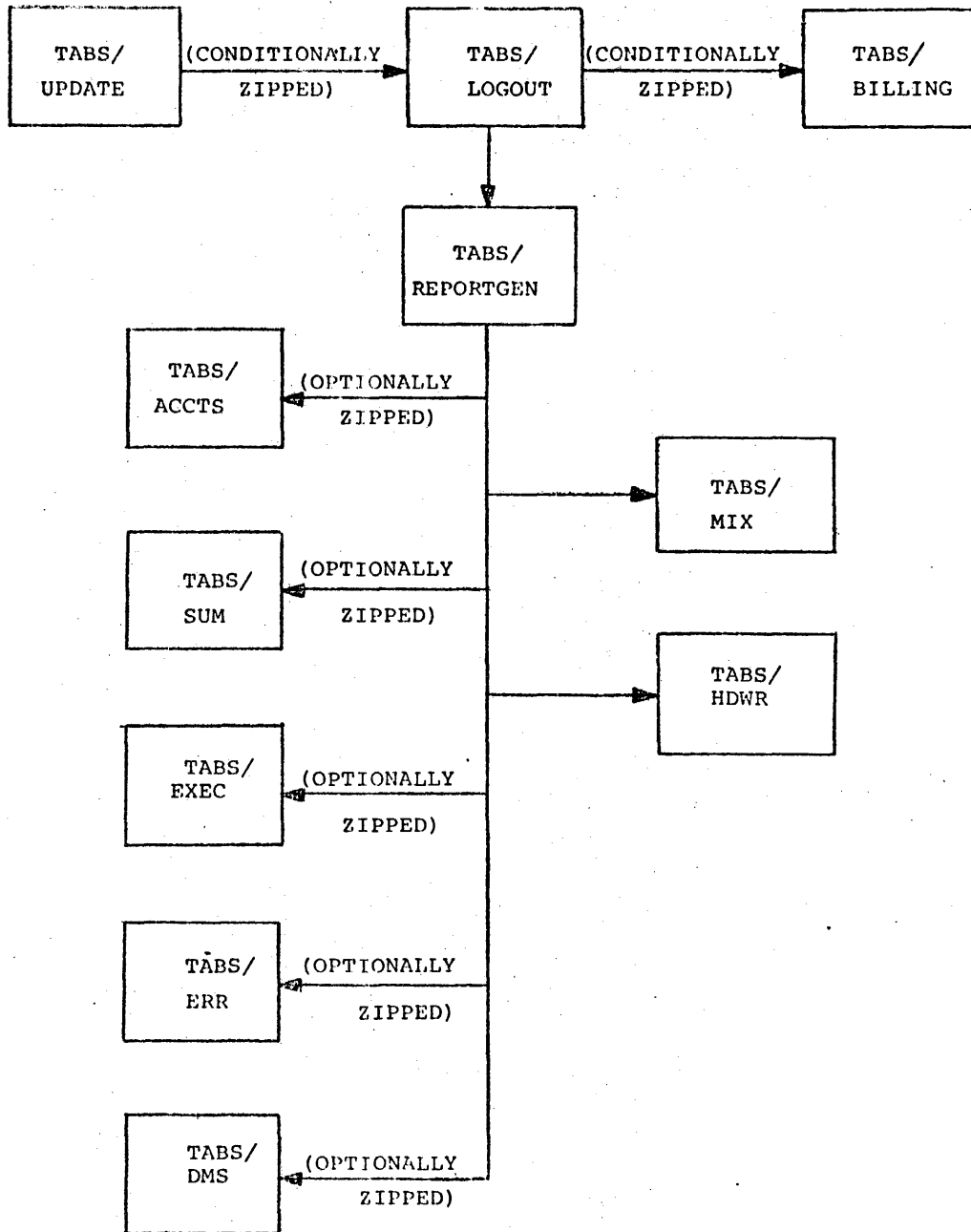


Figure 1.1 TABS Programs

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OPERATING INSTRUCTIONS

SETTING UP THE SYSTEM FOR TABS

The TABS package will not run on a release prior to 7.0. The 8.0 release of EDP-TABS will not run on any release prior to 8.0. To run TABS for the first time:

1. The operator should execute TABS/UPDATE with the CREATE option set to create the permanent data files. If the data files are to be on a user pack, the instructions on EXECUTING FROM A USER PACK, section 14, should be followed.
2. The operator should set the LOG option with the message:

SL <integer-1>[<integer-2>]

The integer-1 entry is the size of each area to be assigned to the SYSTEM/LOG. It must be between 100 and 1000 disk segments. The integer-2 entry is optional and is the maximum number of areas desired. It must be between 2 and 105. The default is 25.

The TABS option forces a date and time reset after every Clear/Start, and does not allow the operator to reset the time or date when any jobs are running.

3. A Clear/Start is required to invoke this option. Once these initial actions have been performed, follow the instructions for running the TABS package.

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RUNNING THE TABS PACKAGE

TABS works with 24 hour days, so the operator can run the TABS package whenever convenient. To execute TABS, the operator has two choices:

1. "LG TABS"--This will transfer the log and fire up TABS/LOGOUT.
2. "EX TABS/LOGOUT"--This does not cause the current SYSTEM/LOG to be transferred.

When TABS/LOGOUT is executed for the first time, it will search the disk for all files called LOG/#<6 digit number>. It will use the first log entry it finds to determine the starting date and log number for subsequent executions. If no log files are present, the program will terminate with the message:

NO TABS LOG FILES ON DISK -- TRANSFER LOG AND REEXECUTE

After the initial execution of TABS/LOGOUT, the program will continue with the last date and log processed, building reports for every consecutive day.

To utilize the automatic monthly billing feature of TABS, set the AUTO BILL option with TABS/UPDATE. For other than monthly billing, or to obtain cumulative statistics from the TAB/YTDCHGS file, execute TABS/BILLING separately.

To change the option settings, and to modify information in the permanent data files, execute TABS/UPDATE.

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SUGGESTED OPERATING PROCEDURES

1. Execute the package on a daily basis.

Since TABS must process each day separately no matter how often it is run, nothing is gained by postponement. In fact, because the voluminous and constantly growing logs must be maintained until TABS has processed them, delaying the package's execution could become extremely costly.

2. Backup the permanent files by setting the SAVE option with TABS/UPDATE. It is impossible to restart a TABS run unless the permanent TAB/= data files are available in their pre-run condition. Recovery is also impossible if files have become corrupted.

3. Regularly backup log files.

Logs are removable and, if not present, TABS has no information to process.

4. Set the REMOVE option with TABS/UPDATE.

This permits TABS to programmatically remove log files it no longer needs as soon as possible. Allowing the program to perform this necessary function is both easier and safer than physically removing what appear to the user to be "old" log files.

5. Execute TABS at non-peak periods.

TABS processes a huge amount of information about every job, file, and peripheral accessed during a period of time. The package consists of eleven separate programs and may require three slots in the mix (TABS/LCGOUT, a report generating program, and a sort) at certain times during its execution.

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TABS/UPDATE

This program allows the user to create and maintain the EDP-TABS permanent data files. It also allows the user to specify default options for the reports and programs. All information is entered through the input file TCARDS. TABS/UPDATE must be run with the CREATE option set (SW8=1) before TABS/LOGOUT can be executed for the first time. It is to the user's advantage to run TABS/UPDATE whenever new information becomes available, in order to keep the information used by the EDP-TABS package as accurate and up-to-date as possible.

Several run-time options can be specified for TABS/UPDATE, by setting program switch 8 to the following values:

Switch Setting	Result
-----	-----
0	Update Files
1	Create main files
2	Create TAB/EXECCHGS
3	Zip TABS/LOGOUT after updating files

The operator must run TABS/UPDATE with the CREATE option set in order to initially create the permanent data files. Thereafter, the operator can add and delete certain information in these files, using the UPDATE option.

TAB/MASTER This file contains information on each program charge-number combination. The program status can be set to either OPERATIONAL, TESTING, SPECIAL, NEW, or DISCONTINUED. A description of the program can be entered, as well as the programmer's name.

TAB/CUSTOMERS This file contains the name and address associated with each charge number.

MASTER

Columns 1-7 contain a 7 digit charge number. Column 8 should contain the program status:

- O - Operational
- T - Testing
- S - Special
- N - New
- D - Discontinued

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The program name is left justified in columns 9-29. Columns 30-33 must be blank. Columns 34-63 contain a 30 character description of the program. Columns 64-78 contain a 15 character programmer name.

CUSTOMERS

Columns 1-7 contain the 7-digit charge number. Column 8 contains the record number, which must be either a 1, 2, or 3. A 1 indicates the next 50 characters are the account name. A 2 indicates that the first and second lines of the address appear in columns 9-33 and 34-58. A 3 indicates the third and fourth lines of the address are in the record. Each address line is 25 characters.

Note: The customer description associated with the charge number which has 0's corresponding to each X in the mask (i.e., mask: 0000XXX; charge number: 1234000) is used as the category description on all bills and audits.

DELETE

Columns 1-7 contain the 7-digit charge number. Column 8 must be blank. Columns 30-32 must contain "DEL". Columns 9-29 are for the program name, left justified. If a name is in this field, then the corresponding entry in TAB/MASTER is deleted. If the name field is blank, then the corresponding entry in TAB/CUSTOMERS is deleted, along with all associated TAB/MASTER program entries.

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CONTROL

Control options can be set by the operator; however, control cards cannot be used if Switch 8=2 (see Section 10). All of the following control options, with the exception of the REPORT option may appear in the same 80-column record, each option separated from the other by a comma (,). A dollar sign (\$) must appear in the first column of the statement and for clarification, a semicolon (;) can be used as the first entry in the statement.

Of the AUTO BILL, BILL, and NO BILL options, only one can be used for input. The others are mutually exclusive.

If Switch 5 is set or reset to a value from 0 to 9, the ORDER option cannot be used in the same statement and vice versa.

Figure 3.1 is the railroad syntax showing the various control options and their uses. A list of semantics describing the variables follows the diagram.

If the control options are not set, the default and description of each option are as listed.

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```

-----, <-----|
|
--> | /1\ REPORT --- <report name> ----- ; ---#
|
| <-----, <-----|
|
| /1\-----> SAVE ----->|
| | _ NO _ |
|
| /1\-----> LOST ----->|
| | _ NO _ |
|
| /1\-----> REMOVE ----->|
| | _ NO _ |
|
| /1\-----> MASK <7 mask digits> ----->|
|
| /1\-----> SYSCFG <7 digits> ----->|
|
| /1\-----> PAGE <2-digit number> ----->|
|
| /1\-----> HCWR <hardware type> ----->|
|
| /1\-----> SW <switch number><switch value>-->|
|
| /1\-----> ORDER <order type> ----->|
|
| /1\-----> BILL ----->|
| | AUTO BILL__|
| | NO BILL ___|

```

Figure 3.1 Control Options

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SEMANTICS

The following list describes the various options indicated in the railroad syntax diagram (Figure 3.1), their defaults, and the use of their variables.

OPTION -----	DEFAULT AND DESCRIPTION -----
REPORT <report name>	<p>In addition to requesting reports via the SW option, REPORT allows specific reports to be requested by name. If more than one report name is requested, they are separated by commas within the command string. The following list provides report names that can be used.</p> <p>ACCOUNT SUMMARY COMBINED SOFTWARE REPORT JOB MIX REPORT MIX SIZE REPORT JOB ANALYSIS REPORT CLEAR/START SUMMARY PERIPHERAL USAGE REPORT PERIPHERAL UTILIZATION REPORT PROGRAM EXECUTION REPORT ITEMIZED EXECUTION REPORT ABNORMAL JOB END SUMMARY ABNORMAL JOB END DETAIL DATA BASE MANAGEMENT STATISTICS REPORT</p>
SAVE	<p>All data files are dumped to magnetic tape at the end of each run. The default is OFF.</p>
LOST	<p>Users are billed for lost time due to an abnormal job end. The default is CN.</p>
REMOVE	<p>Log files no longer needed are removed after TABS/LOGOUT has extracted the necessary information. The default is CN.</p>

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MASK <7 digits>

This sets the default billing mask and uses 0 or X as digits. 0 means use this digit for billing and X means ignore this digit (see 13-1). The default is 0000000.

SYSCHG <7 digits>

This sets the system charge number. The digits can be any number from 0 to 9 or an X. If X is used, that digit is ignored in determining the system charge number. The use of all zeros is not allowed and the default is 9999999.

PAGE <2-digit number>

This sets the number of lines per page for printer output. The 2-digit number ranges from 15-99, and the default is 60.

HDWR <hardware type>

This sets the type of charge unit used to bill for hardware devices. It can be either L, P, O, or C and the values for these are:

L = logical I/Os
 P = physical I/Os
 O = open time
 C = control time

See sections on TABS/HDWR and TABS/BILLING.

SW <switch number><switch value>

This option specifies which reports are produced by TABS/LOGOUT. The switch number is set to a switch value. The switch numbers range from 0 to 7, inclusive, and are set to a value from 0-3, inclusive. The exception to this is switch number 5. When used, switch 5 can be set to a value from 0 to 9, inclusive and in that case, cannot be used in conjunction with the ORDER option. The default value for any switch number is 0.

ORDER <order type>

If the REPORT option is used to request either of TAB/EXEC's reports, and a special ordering of these reports is desired, the ORDER option can be used. The order types are TIME, CHARGE, or NAME.

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BILL
NO BILL
AUTOBILL

There are three possible actions to take on billing statistics. AUTO BILL causes all billing statistics to be maintained and TABS/BILLING to be zip-executed at the end of the month. BILL maintains billing statistics, but does not zip-execute TABS/BILLING. NO BILL does not maintain billing statistics making it impossible for the customer to be billed. The default is AUTO BILL.

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SUMMARY REPORTS

TABS/UPDATE will produce two reports, depending on what functions have been performed. The "Update Summary" provides a record of all updates made by TABS/UPDATE, for use in verifying that the desired changes were made. The "Error Summary" is printed only when there are input errors.

"Error Summary" lists the record in error, with the offending characters flagged with either a "?" or a "\$". "?" indicates an unknown option. "\$" indicates an invalid setting for an allowable option. Possible error messages include:

- INVALID CHARGE NUMBER The charge number must be seven numeric digits, and cannot be zero.
- INVALID STATUS CODE Column eight must contain either a 0, 1, S, N, D, 1, 2, or 3.
- INVALID PROGRAM NAME Neither the multifile-id nor the file-id can be longer than ten characters.
- INVALID CONTROL SPECIFICATION Only valid control options can be specified in a control record. Valid options are listed at the beginning of this section.

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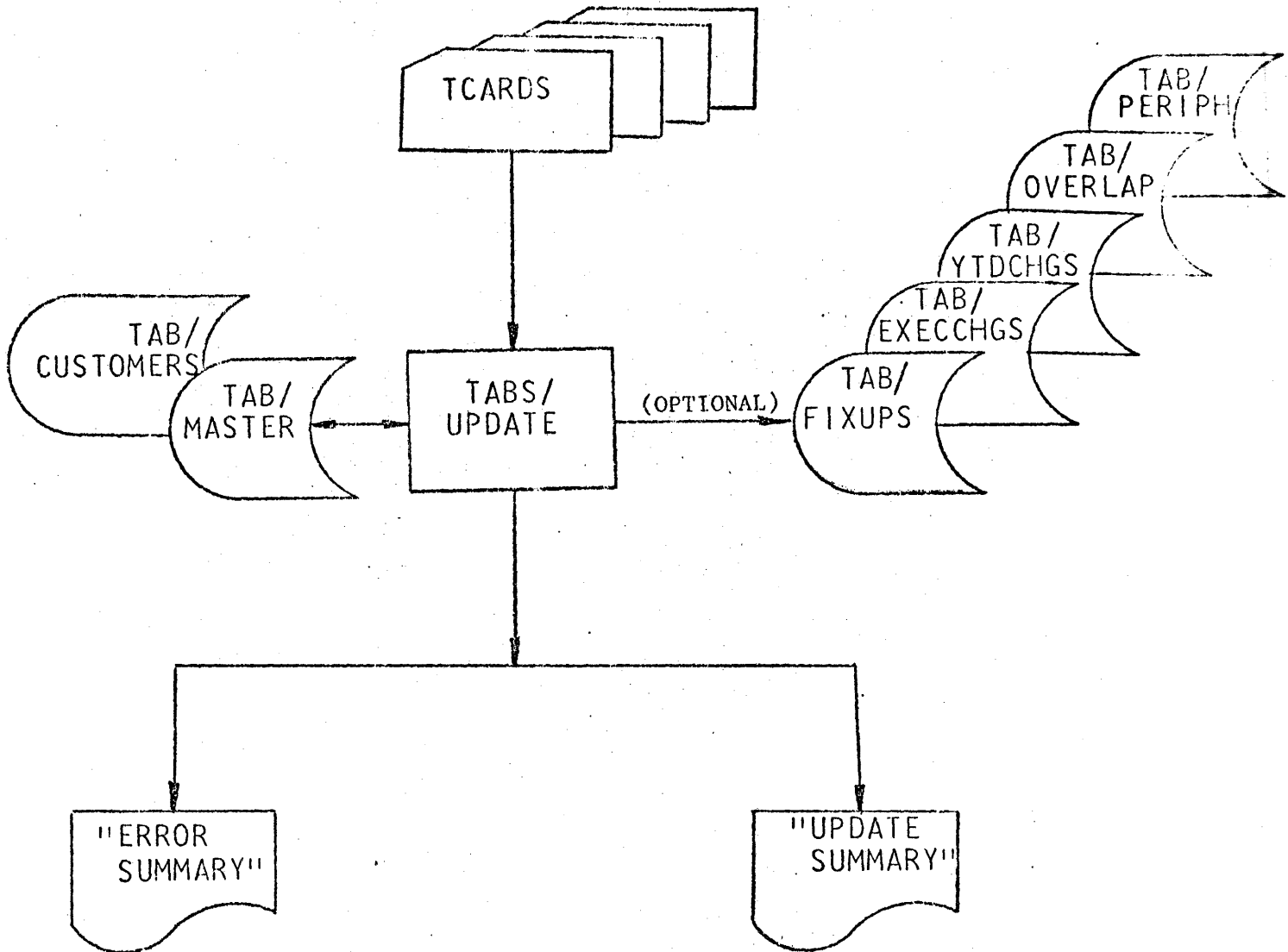


Figure 3.2 TABS/UPDATE Flowchart.

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UPDATE SUMMARY

LOST = ON	REMOVE = OFF	BILL = OFF	HDWR = P	SAVE = OFF	
MASK = 0000000		SYSCHG = 9999999		PAGE = 60	
SW1 = 3	SW2 = 3	SW3 = 3	SW4 = 3	SW5 = 3	SW6 = 3

*** CHANGES TO TAB/CUSTOMERS ***

CHARGE #	NAME AND ADDRESS
0000123	ASSOCIATED CONTRACTORS 6512 SILVER SPUR ROAD GOLETA, CA 93017
0001956	SOUTH BAY REALTORS, ASSOC. 11 SO. TORRANCE BLVD TORRANCE CALIFORNIA 90271

*** CHANGES TO TAB/MASTER ***

CHARGE #	PROGRAM NAME	DESCRIPTION	PROGRAMMER
0000123	BUILDING/SCHEDULE	SCHEDULES COMPLETIONS DATES	P. ACKER
0001956	COMM/RATES	COMPUTES COMMISSIONS	H. SMYTHE
0001956	PR/LGH75	MONTHLY PAYROLL	ACCOUNTING

Figure 3.3 Update Summary

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TABS/LOGOUT

This is the main program of the EDP-TABS package. All the other programs, with the exception of TABS/UPDATE, will be called by this program to produce the desired reports. TABS/LGGOUT produces daily reports based on a 24-hour day starting at 0000 hours. Reports are produced for all days since the last report date, up to and including the most recent complete day in the log files. TABS/LOGOUT searches for all the log files present, and creates 24-hour files for further use by TABS/REPORTGEN.

TABS/LOGOUT will call TABS/REPORTGEN and the seven report programs to process each active day. If there has been no activity for the day (no Clear/Starts and no jobs executed), then TABS/LGGOUT will print one short report as follows instead of the individual reports.

```
TABS/LOGOUT...
NO ACTIVITY FOR <date>
```

If no logs are present, TABS displays:

```
NO LOG FILES ON DISK -- TRANSFER LOG AND REEXECUTE
```

The program then goes to EOJ.

After it has completed one 24-hour day, it will continue on to process each complete day included in the log file(s). It will stop if the current month ends and a new month begins, displaying the following message before going to end-of-job.

```
END OF MONTH REACHED--COMPLETE THRU <date>
```

If the log file(s) do not contain a complete day, then TABS will terminate with the message:

```
NO DAYS PROCESSED
```

Otherwise, it will stop when the log file(s) are exhausted, displaying the message:

```
LAST COMPLETE DAY PROCESSED--COMPLETE THRU <date>
```

If the SAVE option is set, TABS/LOGOUT will ZIP SYSTEM/COPY to dump the TAB/= files to a tape called TABS.TAPE. The operator should make sure that a scratch tape is mounted.

If the REMOVE option is set, TABS/LOGOUT will remove the log files after it has finished processing them. Without the REMOVE option, this message is displayed:

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REMOVE OPTION NOT SET. EDP-TABS HAS COMPLETELY PROCESSED
LOGS NUMBERED <#> THROUGH <#>. THEY MAY BE REMOVED FROM DISK.

TABS/LGGOUT handles only complete days which may be reached in mid-log processing. Because of this, caution should be exercised while manually removing "old logs". The best policy is to set the REMOVE option with TABS/UPDATE and let TABS remove the files.

Note: Logs created before a COLDSTART recovery or a COLDSTART restart will not be removed by EDP-TABS.

If the AUTO BILL option is set, and the end of the month is reached, TABS/LOGOUT will ZIP TABS/BILLING before going to end-of-job.

The permanent TABS data files, TAB/MASTER, TAB/CUSTOMERS, TAB/PERIPH, TAB/OVERLAP, and TAB/JOBOVERLAP must be present for the TABS package to be successfully executed. TAB/YTDCHGS need only be present when an end-of-the-month merge is done. The programs TABS/LOGOUT, TABS/REPORTGEN, TABS/MIX and TABS/HDWR must also be present. TABS/ACCTS, TABS/SUM, TABS/EXEC, TABS/ERR, TAB/DMS and TABS/BILLING need only be present if the corresponding reports are requested. See EXECUTING FROM A USER PACK, Section 14.

Switches in TABS/LOGOUT control report selection and restart-recovery capabilities, and will override the settings made in TABS/UPDATE if program switch 9 = 1. It is best to set permanent values with TABS/UPDATE, and use the switches only for temporary changes.

The program switches for TABS/LOGOUT, with their values, are shown in Figures 4.1 and 4.2. Note that report selection switches will override the options set in TABS/UPDATE only if program switch 9 equals 1.

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 P.S. 2219 0094 (B)

Switch -----	Setting -----
0	0 = Do not remove old log files, do not dump TABS files to magnetic tape. (NO SAVE, NO REMOVE) 1 = Remove old log files. (REMOVE) 2 = Dump TABS files to magnetic tape. (SAVE) 3 = Remove old log files, dump TABS files to magnetic tape. (SAVE and REMOVE)
1	TABS/ACCTS
2	TABS/MIX 0 = No reports printed
3	TABS/SUM 1 = Print first program report only
4	TABS/HDWR 2 = Print any second program report only
5	TABS/EXEC 3 = Print both reports
6	TABS/ERR
7	TABS/DMS See figure 4.2 for detail
8	1 = Restart or recover TABS package following abnormal EOJ. 2 = Restart or recover TABS package following COLDSTART.
9	0 = Use TABS/UPDATE Defaults and ignore Switches 0-7 1 = Use Switches 0-7; and ignore the defaults

9 is valid setting for SW1 (see TABS/ACCTS)
 4-9 are valid settings for SW5 (see TABS/EXEC, figure 10.1)

Figure 4.1 TABS/LOGOUT Switch Settings (General)

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The following chart shows the switch settings required to print each daily report. An "X" indicates that the report will be printed.

Report	Switch	Setting									
		0	1	2	3	4	5	6	7	8	9
Account Summary	1		X		X						
Combined Software Report	1				X	X					
Job Mix Report	2		X		X						
Mix Size Report	2				X	X					
Job Analysis Report	3		X		X						
Clear/Start Summary	3				X	X					
Peripheral Usage Report	4		X		X						
Peripheral Utilization Report	4				X	X					
Program Execution Report	5		X		X	X		X	X		X
Itemized Execution Report	5				X	X		X	X		X
Abnormal Job End Summary	6		X		X						
Abnormal Job End Detail	6				X	X					
Data Base Management	7		X		X						
Statistics Report											

Figure 4.2 TABS/LOGOUT Switch Settings (Detailed)

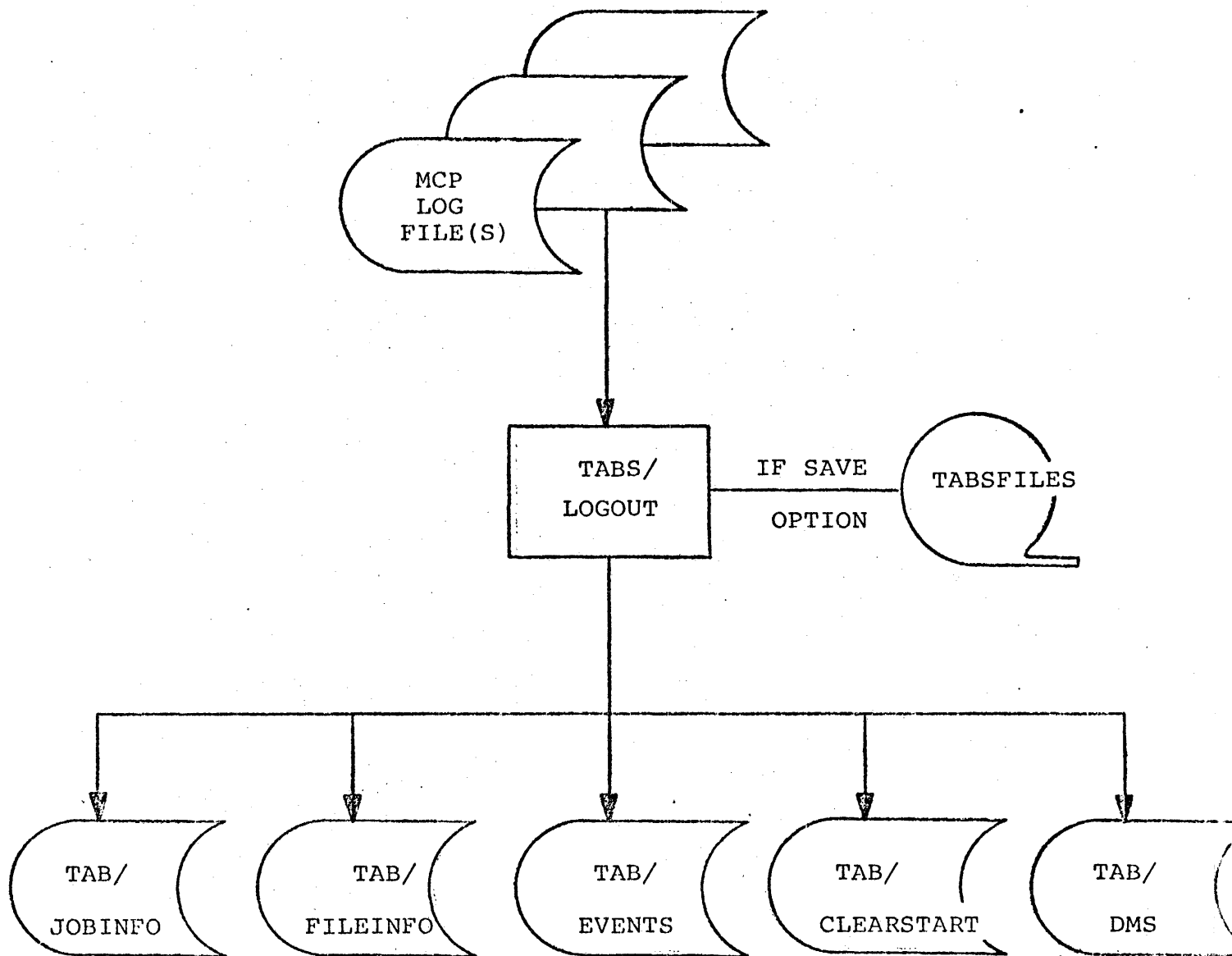


Figure 4.3 TABS/LOGOUT Flowchart

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TABS/REPORTGEN

This program takes the information extracted from the log by TABS/LOGOUT, and sets up the files needed by the seven report programs. TABS/REPORTGEN updates TAB/MASTER and TAB/CUSTOMERS with any new program-charge combinations extracted from the log, and it also updates the month-to-date program totals in all the permanent data files.

If any new program-charge combinations are added to the data files, then the report "New Programs Added to TAB/MASTER" will be printed. These programs will have a status of NEW, which can be changed by running TABS/UPDATE with the appropriate data cards. The first occurrence of each new charge number is flagged so that customer name and address information can be entered.

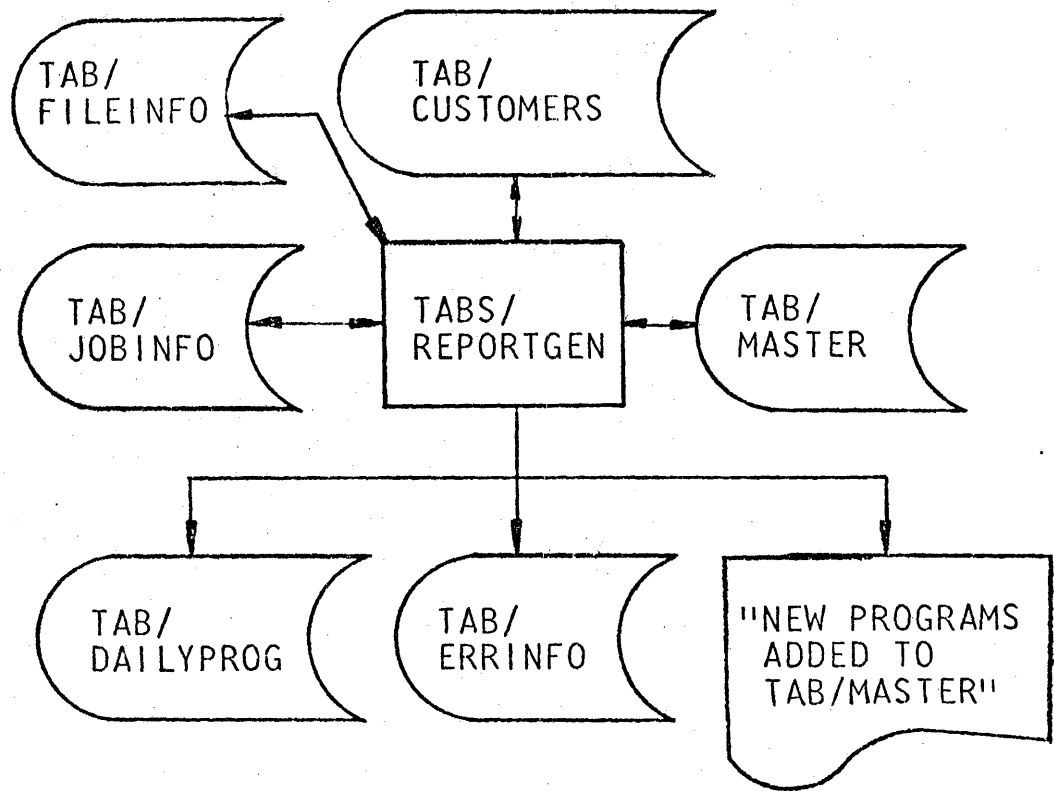


Figure 5.1 Flowchart of TABS/REPORTGEN

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SEP. 11, 1978 NEW PROGRAMS ADDED TO TAB/MASTER

CHARGE #	PROGRAM NAME	
0212121	SYSTEM/DISK.INIT	*** NEW CHARGE NUMBER ***
0920000	SYSTEM/BUILDTRAIN	*** NEW CHARGE NUMBER ***
9999999	(MEYERS)/HANSRC0	*** NEW CHARGE NUMBER ***
9999999	(MEYERS)/POOLO	
9999999	(MEYERS)/SCHEDSRC0	
9999999	COBCL	
9999999	DISKMAP/UTILITY	
9999999	NC516V	
9999999	NDL	
9999999	REMGTE/LISTER	
9999999	SORT/VSORT	
9999999	SYSTEM/DISK.INIT	
9999999	SYSTEM/ELOGOUT	
9999999	SYSTEM/MAKEUSER	
9999999	TEST/LOOPTF	

15 NEW PROGRAM-CHARGE COMBINATIONS HAVE BEEN ADDED TO TAB/MASTER

Figure 5.2 New Programs Added To TAB/MASTER

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B1800/B1700 EDP-TABS
P.S. 2219 0094 (9)

TABS/ACCIS

This program is the first of the report generation programs. It produces the "Account Summary Report" and the "Combined Software Report", describing operational, test, special, new and discontinued software. If none of these reports are requested, the program will not be executed.

ACCOUNT SUMMARY (SW1=1 or SW1=3)

This report provides statistics on the programs maintained in the TAB/MASTER file. It gives the number of operational, testing, special, new, and discontinued programs for each charge number. The total number of programs will be indicated for each charge number. Overall totals are given for each program status type.

SOFTWARE REPORTS (SW1=2 or SW1=3)

Reports for each of the five software categories (operational, testing, special, new, and discontinued) provide detailed information on the programs in each category. The reports, each of which has the same format, are ordered by ascending charge number. Both the charge number and account name and address are given. Information provided for each program associated with the charge number includes the program name, a description of the program, and the name of the programmer responsible. This information should be entered by the EDP-manager through the use of TABS/UPDATE. The "Combined Software Report" includes information on all software categories; the "Operational Software Report" describes only operational software; the "Test Software Report" describes software in the testing category; the "Special Software Report" describes special software; the "New Software Report" describes new software; and the "Discontinued Software Report" describes discontinued software.

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TABS/ACCTS may be run separately, without being called by TABS/LOGOUT. Both TAB/MASTER and TAB/CUSTOMERS must reside on disk. Program switch 1 controls which reports are to be printed.

Switch 1 Setting -----	Result -----
0	No reports
1	Account Summary
2	Combined Software Report
3	Both reports
9	Use the file TCARDS for input

If the input file is used, the user can specify the following options:

1. Reports:

The operator must specify which of the reports are to be printed. The options are: A or ACCOUNT, O or OPERATIONAL, T or TEST, S or SPECIAL, N or NEW, D or DISCONTINUED, and C or CCMBINED. This information must be on the first data record, with each option separated by either a blank or a comma.

2. Charge Numbers:

The operator may specify that only certain charge numbers be included in the report. Each number must be seven digits. More than one number may be specified per record, but in that case the numbers must be separated by either a blank or a comma.

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B1800/B1700 ECP-TABS
P.S. 2219 0C94 (B)

A sample deck for running TABS/ACCTS is shown below:

```
-----  
/ ? END | |  
-----  
/ 0076321 | |  
-----  
/ O P A T | |  
-----  
/ ? DATA TCARDS | |  
-----  
/ ?EX TABS/ACCTS SW1=9; | |  
-----  
| |  
-----
```

Figure 6.1 TABS/ACCTS Execute Deck

This deck would produce the "Account Summary", "Operational Software", and "Test Software" reports for charge number 0076321 only.

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P.S. 2219 0094 (B)

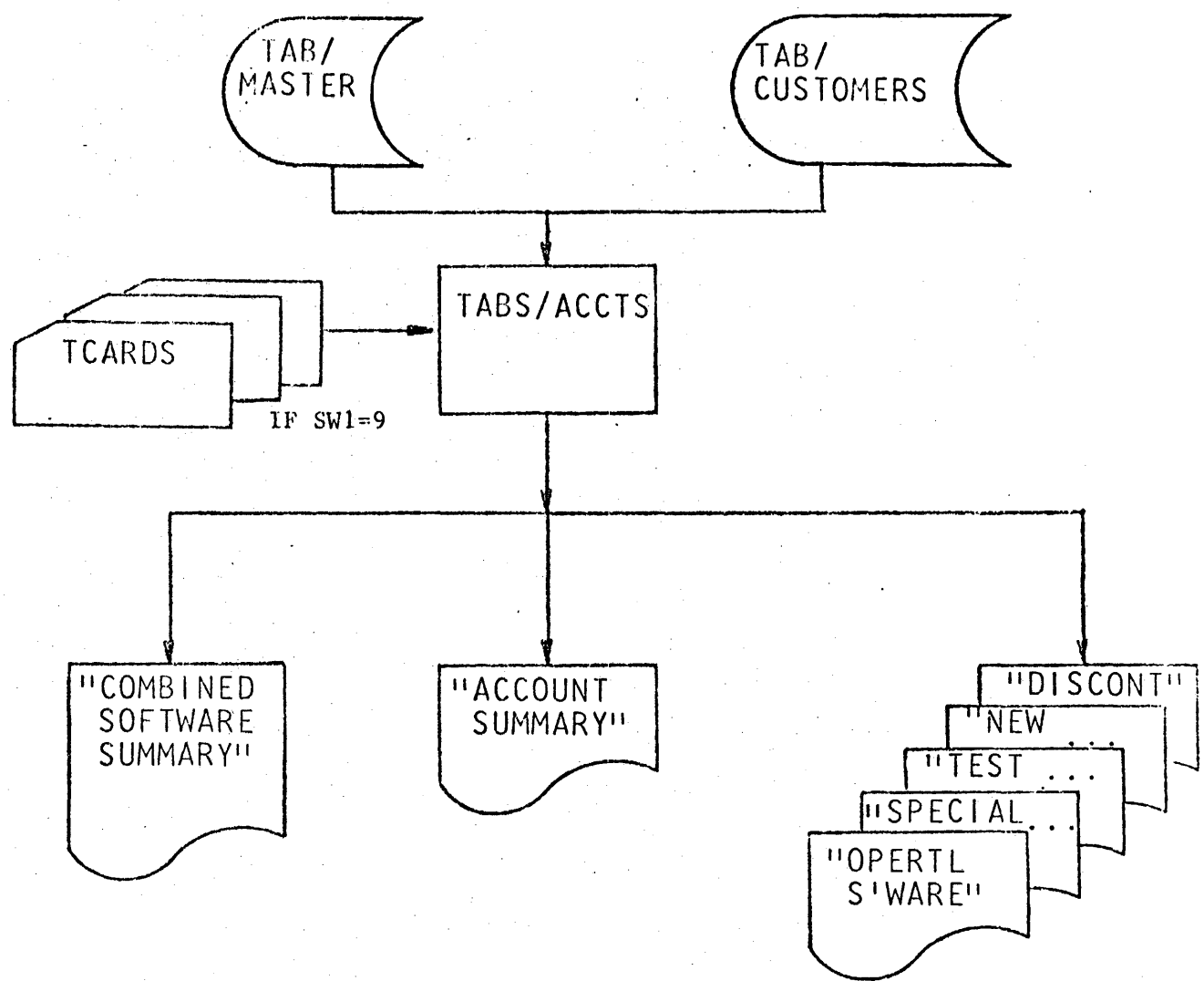


Figure 6.2 TABS/ACCTS Flowchart

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 81800/81700 EDP-TABS
 P.S. 2219 0094 (8)

MAY 24, 1977

A C C O U N T S U M M A R Y

CHARGE #	OPERATIONAL	TEST	SPECIAL	NEW	DISCONTINUED	TOTAL
000005	0	0	0	1	0	
0000123	1	0	0	8	0	
0001956	1	0	1	0	0	
0654123	0	0	0	2	0	
0999999	0	0	0	1	0	
9999999	0	0	0	13	0	

TOTALS	2	0	1	25	0	

Figure 6.3 Account Summary

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (B)

JUNE 20, 1977

C O M B I N E D S O F T W A R E S U M M A R Y

CHARGE # 0000123 ASSOCIATED CONTRACTORS
 6512 SILVER SPUR ROAD
 GOLETA, CA 93017

OPERATIONAL SOFTWARE:	PROGRAM	DESCRIPTION	PROGRA
	BUILDING/SCHEDULE	SCHEDULES COMPLETIONS DATES	P. ACK

CHARGE # 0001954

NEW SOFTWARE:	PROGRAM	DESCRIPTION	PROGRA
	CHECK/LOAD.DUMP DISK/COPY DMPALL SYSTEM/DISK.INIT SYSTEM/LOAD.DUMP		

CHARGE # 0001956 SOUTH BAY REALTORS, ASSOC.
 11 SO. TORRANCE BLVD
 TORRANCE
 CALIFORNIA 90271

OPERATIONAL SOFTWARE:	PROGRAM	DESCRIPTION	PROGRA
	PR/LGM75	MONTHLY PAYROLL	ACCOUN

SPECIAL SOFTWARE:	COMM/RATES	COMPUTES COMMISSIONS	M. SHY
-------------------	------------	----------------------	--------

CHARGE # 9999999

NEW SOFTWARE:	PROGRAM	DESCRIPTION	PROGRA
	DISK/COPY DISKMAP/UTILITY DMPALL SYSTEM/BUILDTRAIN SYSTEM/LOAD.DUMP SYSTEM/LOGOUT TABS/LOGOUT		

Figure 6.4 Combined Software Summary

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
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COMPANY CONFIDENTIAL
B1800/B1700 EDP-TABS
P.S. 2219 0094 (8)

IABS/MIX

This program is the second report generation program. It produces two reports: the "Job Mix Report" and the "Mix Size Report". Together, they show the multiprogramming use of the system. Even if these two reports are not requested, TABS/MIX will still be called by TABS/LOGOUT, in order to update the monthly mix size totals.

JOB MIX REPORT (SW2=1 or SW2=3)

This report shows the number of jobs scheduled, the number of executes, and the maximum mix size for fifteen-minute intervals during the day. The idle time and percentage of idle time are given for one-hour intervals. Idle time is defined to be time when there are no jobs in the mix.

MIX SIZE REPORT (SW2=2 or SW2=3)

This report provides statistics pertaining to the multiprogramming effectiveness of the system. The # JOBS column of the report shows the number of jobs in the mix at any one given time. The largest value in this column is the maximum number of jobs in the mix at any one time during the month. The DAILY column gives the time and percentage of total time that the specified number of jobs were in the mix during the indicated day. The MONTH-TO-DATE column provides an accumulation of the DAILY figures.

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COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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B1800/B1700 EDP-TABS
P.S. 2219 0C94 (B)

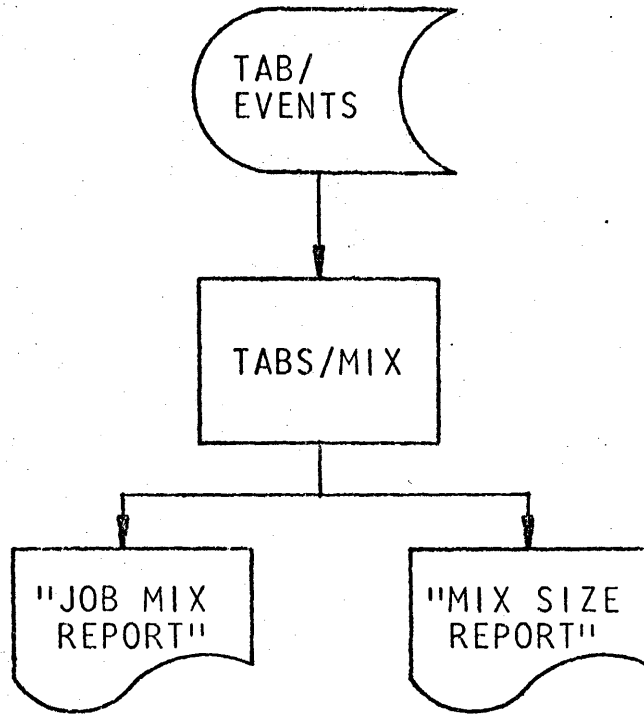


Figure 7.1 TABS/MIX Flowchart

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (8)

SEP. 13, 1978

J O B M I X R E P O R T

TIME	JOB SCHEDULED	EXECUTES	MAXIMUM MIX	IDLE TIME	
00:00	0	0	4		
:15	0	0	4		
:30	3	3	6		
:45	0	0	6	0:00:00.0	.0 X
01:00	2	2	6		
:15	2	2	6		
:30	1	1	6		
:45	1	1	6	0:00:00.0	.0 X
02:00	4	3	6		
:15	2	3	7		
:30	0	0	7		
:45	2	2	7	0:00:00.0	.0 X
03:00	1	1	7		
:15	0	0	4		
:30	0	0	4		
:45	0	0	4	0:00:00.0	.0 X
04:00	0	0	4		
:15	0	0	4		
:30	0	0	4		
:45	0	0	4	0:00:00.0	.0 X
05:00	0	0	4		
:15	0	0	4		
:30	0	0	4		
:45	0	0	4	0:00:00.0	.0 X
06:00	0	0	4		
:15	0	0	4		
:30	0	0	4		
:45	1	1	3	0:00:00.0	.0 X
07:00	1	1	3		
:15	4	4	4		
:30	1	1	4		
:45	0	0	4	0:00:00.0	.0 X
08:00	2	2	5		
:15	3	3	5		
:30	6	6	7		
:45	9	9	9	0:02:32.7	4.2 X
09:00	10	10	7		
:15	3	3	7		
:30	4	4	7		
:45	4	4	7	0:04:16.2	7.1 X
10:00	6	6	10		
:15	0	0	6		
:30	2	2	3		
:45	6	6	3	0:01:39.8	2.8 X
11:00	5	5	3		
:15	8	8	4		
:30	0	0	4		
:45	0	0	4	0:04:29.9	7.5 X
12:00	0	0	3		
:15	5	5	5		
:30	0	0	3		
:45	1	1	4	0:00:00.0	.0 X

Figure 7.2.1 Job Mix Report

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (B)

SEP. 13, 1978

J O B M I X R E P O R T

TIME	J O B S S C H E D U L E D	E X E C U T E S	M A X I M U M M I X	I D L E T I M E	
13:00	0	0	4		
:15	6	6	7		
:30	3	3	7		
:45	3	3	8	0:00:00.0	-0 %
14:00	2	2	8		
:15	2	2	8		
:30	1	1	8		
:45	4	4	8	0:00:00.0	-0 %
15:00	3	3	8		
:15	7	7	11		
:30	3	3	11		
:45	5	5	10	0:00:00.0	-0 %
16:00	4	3	9		
:15	4	3	3		
:30	4	3	3		
:45	0	0	0	0:46:28.9	77.5 %
17:00	6	4	2		
:15	0	0	0		
:30	6	4	4		
:45	4	3	3	0:40:35.3	67.6 %
18:00	8	7	4		
:15	3	3	3		
:30	1	0	2		
:45	0	0	0	0:30:18.8	50.5 %
19:00	0	0	0		
:15	3	2	2		
:30	2	2	2		
:45	4	3	5	0:31:08.5	51.9 %
20:00	3	2	2		
:15	3	3	3		
:30	0	0	3		
:45	0	0	3	0:11:25.2	19.0 %
21:00	3	3	3		
:15	0	0	3		
:30	3	3	5		
:45	0	0	2	0:00:00.0	-0 %
22:00	0	0	2		
:15	0	0	2		
:30	0	0	2		
:45	0	0	0	0:26:26.7	44.1 %
23:00	3	3	2		
:15	2	2	2		
:30	3	3	3		
:45	1	1	1	0:34:12.2	57.0 %
TOTALS	208	195	--	3:53:34.2	16.2 %

Figure 7.2.2 Job Mix Report (cont.)

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 P.S. 2219 0094 (B)

SEP. 13, 1978 MIX SIZE REPORT

# JOBS	DAILY		MONTH-TO-DATE	
	TIME	PERCENT	TIME	PERCENT
0	3:53:34.2	16.2 %	14:30:18.1	20.1 %
1	0:59:28.8	4.1 %	4:41:37.7	6.5 %
2	3:01:37.3	12.6 %	5:05:20.6	7.1 %
3	2:58:12.1	12.4 %	20:15:37.8	28.1 %
4	6:14:27.5	26.0 %	15:07:10.7	21.0 %
5	1:21:08.8	5.6 %	4:25:28.6	6.1 %
6	2:26:43.8	10.2 %	3:33:34.6	4.9 %
7	1:41:05.3	7.0 %	2:17:08.1	3.2 %
8	0:53:17.0	3.7 %	1:17:53.3	1.8 %
9	0:14:17.5	1.0 %	0:26:40.7	.6 %
10	0:14:48.3	1.0 %	0:17:50.4	.4 %
11	0:01:19.4	.1 %	0:01:19.4	.0 %
TOTALS	24:00:00.0	100.0 %	72:00:00.0	100.0 %

Figure 7.3 Mix Size Report

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TABS/SUM

This program is the third report generation program. It produces the "Job Analysis Report" and the "Clear/Start Summary".

JOB ANALYSIS REPORT (SW3=1 or SW3=3)

This report classifies programs as production, testing, compiles or utility services. Compiles are all source program compilations or assemblies. Utility services include MCP and/or user-written utility functions charged to the system charge number. Executes are all user or Burroughs programs except those defined as compiles or utility services. Executes of jobs classified as NEW or TEST software are included in the testing category. All other executions are classified under production. Both daily and month-to-date totals are shown within each category for number of jobs run, amount of processor time, and amount of elapsed time. Daily and month-to-date totals are provided for idle time and average processor utilization. Processor utilization is defined to be total processor time divided by total elapsed time.

CLEAR/START SUMMARY (SW3=2 or SW3=3)

This report provides a record of all Clear/Starts on the system during the day. The time of each Clear/Start is shown, as well as the system software implemented at the time of the Clear/Start. This information includes:

- MCP Name
- MCP Version
- Interpreter Name
- GISMO Name
- Micro-MCP Name

Clear/Starts that are not in correct time sequence are flagged.

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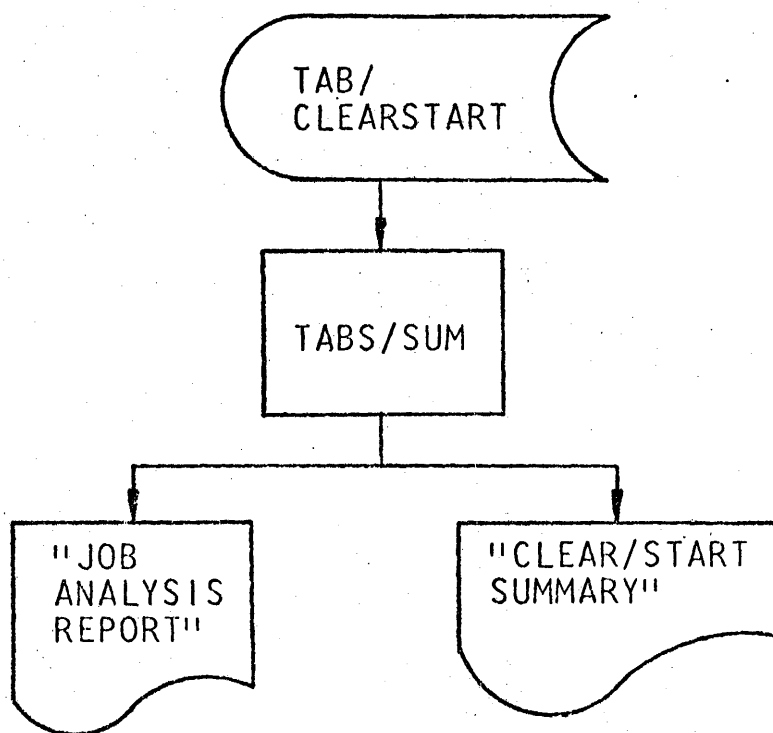


Figure 8.1 TABS/SUM Flowchart

SEP. 13, 1978

J O B A N A L Y S I S R E P O R T

JOB TYPE	-----DAILY-----					-----MONTH-TO-DATE-----				
	# JOBS	PROCESSOR TIME		ELAPSED TIME		# JOBS	PROCESSOR TIME		ELAPSED TIME	
PRODUCTION	95	0:30:56.7	21.2%	22:51:26.5	39.8%	202	0:49:52.5	18.0%	759:41:34.0	49.5%
TESTING	20	0:05:14.9	3.6%	8:15:35.5	14.4%	36	0:09:42.5	3.5%	374:15:05.2	24.4%
COMPILES	21	0:55:15.2	37.8%	3:32:01.8	6.1%	79	2:21:35.8	51.2%	8:36:49.7	0.6%
UTILITIES	62	0:54:47.2	37.5%	22:49:00.2	39.7%	123	1:15:38.7	27.3%	391:56:07.2	25.5%
TOTALS	198	2:26:14.0	100.0%	57:28:04.0	100.0%	440	4:36:49.5	100.0%	534:29:36.1	100.0%

DAILY IDLE TIME = 3:53:34.2 16.2%
 MONTH-TO-DATE IDLE TIME = 14:30:18.1 20.1%

AVERAGE DAILY PROCESSOR UTILIZATION = 4.2%
 AVERAGE MONTH-TO-DATE PROCESSOR UTILIZATION = 0.3%

Figure 8.2 Job Analysis Report

SEP. 13, 1978

CLEAR / START SUMMARY

TIME	MCP	VERSION	INTERPRETER	GISMO	MICRO-MCP	S MEM BYTES
8:57:27.3	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
10:54:45.5	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
16:06:07.2	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
16:20:02.6	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
16:32:42.3	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
17:12:22.6	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
17:02:25.7	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
***** OUT OF SEQUENCE						
17:38:04.2	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
17:34:35.0	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
***** OUT OF SEQUENCE						
17:52:37.3	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
18:10:34.7	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
18:33:11.8	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
19:25:09.1	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
19:56:27.8	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
19:59:20.7	MCPII8.0/0911	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
20:13:40.9	MCPII8.0/0911	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
22:33:33.3	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288
23:42:32.8	MCPII8.0/0904	VIII.0.0	SDL/INTERP1M	GISMO/DEBUG	MCPII/MICRO.MCP	524288

18 CLEAR/STARTS TOTAL

Figure 8.3 Clear/Start Summary

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IABS/HQWR

This program is the fourth report generation program. It produces the "Peripheral Usage Report", and the "Peripheral Utilization Report". This program updates the monthly peripheral totals, so it is always called by TABS/LCGOUT, even when no reports are to be printed.

PERIPHERAL USAGE REPORT (SW4=1 or SW4=3)

This report provides both daily and month-to-date statistics on peripheral usage for each hardware device. Daily statistics are given for the number of records accessed (logical I/O's), number of blocks accessed (physical I/O's), and number of hardware errors. Both daily and month-to-date open time and control time are shown. Control time is time during which a peripheral was assigned to a program, even though a file was not actually open on it. For example, if a plain close is used on a tape file, no other program can use that unit until the file is released, or the program goes to end-of-job.

For normal-state programs that do their own I/O, no information regarding records, blocks or hardware errors can be obtained. The only information available is the control time of the device -- in this case the amount of time the program, rather than the MCP, had control of the device.

PERIPHERAL UTILIZATION REPORT (SW4=2 or SW4=3)

This report reflects the average daily utilization of each peripheral that has been used during the current month. It consists of four six-hour graphs, each of which is broken down into five-minute intervals. A peripheral is flagged as in use if a program was in control of that device some time during the five minute interval under consideration.

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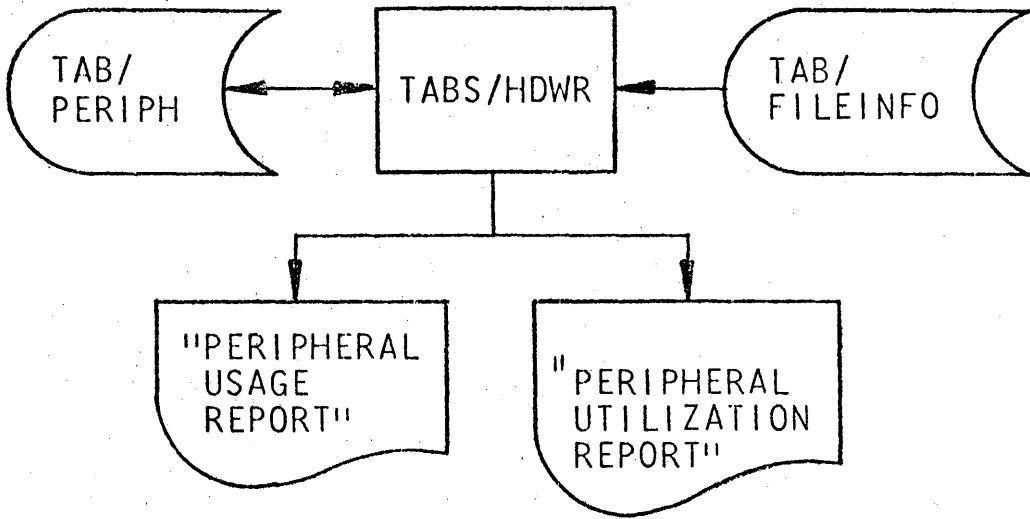


Figure 9.1 TABS/HDWR Flowchart

SEP. 13, 1978

PERIPHERAL USAGE REPORT

UNIT	RECORDS	BLOCKS	ERRORS	-----DAILY-----		-----MONTH-TO-DATE-----	
				OPEN TIME	CONTROL TIME	OPEN TIME	CONTROL TIME
CRA	0	0	0	0:00:00.0	0:00:00.0	0:02:09.8	0:02:09.8
DPA	475207	182277	0	138:43:58.6	152:43:09.3	393:00:14.5	436:59:28.9
DPB	27477	3239	0	1:22:00.6	1:22:00.6	2:47:49.2	2:47:49.2
DPC	55806	21578	1	11:26:53.4	11:59:57.4	29:53:54.6	31:39:33.3
DPD	20696	2451	0	7:16:08.6	7:16:08.6	25:15:13.2	25:15:13.2
DPE	56859	6442	0	1:42:07.9	1:42:07.9	8:34:18.2	8:34:18.2
DPF	120915	14339	1	1:55:11.9	1:55:11.9	6:25:57.7	6:25:57.7
LPA	100904	100904	0	2:45:17.7	2:45:17.7	4:28:17.0	4:28:17.0
MTA	47128	4860	3	0:25:13.9	0:30:01.7	0:36:54.9	0:42:52.2
MTB	75551	7599	5	0:18:35.5	0:21:28.6	0:30:09.2	0:35:30.6
QUEUE	3386	--	0	153:29:19.8	153:29:33.5	441:08:04.0	441:09:18.8
REMOTE	23419138	--	0	39:04:27.0	39:05:08.1	123:15:57.9	123:15:39.0
STATIC MEMORY =				1513 K			
DYNAMIC MEMORY =				363 K			
TOTAL MEMORY =				1983 K			

Figure 9.2 Peripheral Usage Report

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HOURS 0 THRU 6

	0		1		2		3		4		5		0		1		3		4		0		1		3		4													
	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4								
CRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
DPA	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4
DPB	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5
DPC					*	*		**	*																															
DPD	*****																																							
DPE									**				***																											
DPF									*	*		*	***			*																								
LPA					*				*				*	*		*																								
MTA					*	*		**	*	*		***	***			***																								
MTB					**			*				**	*****																											
QUEUE	*****																																							
REMOTE	*****																																							

HOURS 6 THRU 12

	0		1		2		3		4		5		6		7		8		9		0		1		3		4		0		1		3		4									
	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4	0	1	3	4				
CRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DPA	6	7	8	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DPB	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5
DPC									*			*	*****			*****																												
DPD	*****																																											
DPE					*								***	*****											****																			
DPF									*	*		*	*****	**		****																												
LPA					**			*	*	*		*	*	*		*	*****	*****																										
MTA								*	*	*		*	*	*		*																												
MTB												*				*																												
QUEUE	*****																																											
REMOTE	*****																																											

Figure 9.3.1 Peripheral Utilization Report

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SEP. 13, 1978 PERIPHERAL UTILIZATION REPORT

HOURS 12 THRU 18

	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
CRA	0	1	3	4	0	0	1	3	4	0	0	1	3	4	0	0	1	3	4	0	0	1	3	4	0
DPA	0	5	0	5	0	0	5	0	5	0	0	5	0	5	0	0	5	0	5	0	0	5	0	5	0
DPB	*****																								
DPC	*****																								
DPE	*****																								
DPF	*****																								
LPA	*****																								
MTA	*****																								
MTB	*****																								
QUEUE	*****																								
REMOTE	*****																								

HOURS 18 THRU 24

	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
CRA	0	1	3	4	0	0	1	3	4	0	0	1	3	4	0	0	1	3	4	0
DPA	0	5	0	5	0	0	5	0	5	0	0	5	0	5	0	0	5	0	5	0
DPB	*****																			
DPC	*****																			
DPE	*****																			
DPF	*****																			
LPA	*****																			
MTA	*****																			
MTB	*****																			
QUEUE	*****																			
REMOTE	*****																			

Figure 9.3.2 Peripheral Utilization Report (cont.)

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TABS/EXEC

This program is the fifth report generation program. It produces the "Program Execution Report", and the "Itemized Execution Report". It will not be executed if the reports are not requested.

Switch 5 controls which reports are produced, and how the "Program Execution Report" is ordered.

Switch	Results	Order
0	No report	
1	Program Execution Report only	Month-to-date elapsed time
2	Itemized Execution Report only	
3	Both reports	Month-to-date elapsed time
4	Program Execution Report only	Charge number
5	Itemized Execution Report only	
6	Both reports	Charge number
7	Program Execution Report only	Program name
8	Itemized Execution Report only	
9	Both reports	Program name

Figure 10.1 Switch Setting for TABS/EXEC

PROGRAM EXECUTION REPORT (SW5=1, SW5=3, SW5=4, SW5=6, SW5=7, or SW5=9)

This report gives both daily and month-to-date totals of the number of executions, elapsed time and processor time for each program-charge-number combination active during the month-to-date. The report may be ordered by decreasing month-to-date elapsed time, by ascending charge numbers with subtotals for each charge number, or by program name, with subtotals. Program switch 5 specifies the ordering to be used.

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ITEMIZED EXECUTION REPORT (SW5=2, SW5=3, SW5=5, SW5=6, SW5=8, or SW5=9)

This report provides detailed information on every job run during the day. Programs are grouped by charge number. Program information includes:

- program name
- charge number
- job number
- BOJ time
- EOJ time
- compile date
- program type
- processor priority
- memory priority
- processor time
- elapsed time
- EOJ type
- static memory requirements
- dynamic memory requirements
- total memory requirements
- number of code overlays
- number of data overlays
- number of files
- object name (for compiles only)

If a job is still running at the end of the day, then only the program name, charge number, job number, BOJ time, and program type are given. The total number of incomplete jobs will be printed at the end of the report.

Reported information about each file consists of:

- internal file name
- external file name
- unit name
- number of buffers
- file space
- hardware type
- number of records accessed
- number of blocks accessed
- number of hardware errors
- time of open
- time of close
- open type
- close type

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 P.S. 2219 0C94 (8)

- file open time
- file control time
- record size
- block size
- serial number (for tape only)
- reel number (for tape only)
- access type (for disk only)
- file type (psuedo reader, printer backup, punch backup only)

For data bases:

- logical data base name
- physical data base name
- time of open
- open type
- unit name
- device type
- time of close
- pack name
- processor time devoted to this data base (included in job's processor time)
- number of update operations
- number of non-update operations
- data base open time

For normal-state programs which do their own I/O, information will be printed about each unit assigned to the program. Reported information includes:

- unit name
- hardware type
- time unit was assigned to the program
- time unit was released back to MCP control
- unit control time

File open and close types are abbreviated as follows:

AUD	-	AUDIT
CNDL	-	CONDITIONAL
CRCH	-	CRUNCH
IN	-	INPUT
INS	-	INSECURE
INT	-	INTERPRET
I/O	-	INPUT/OUTPUT
LKT	-	LOCKOUT
LOCK	-	LOCK
NEW	-	NEW
NRWD	-	NO REWIND
OUT	-	OUTPUT

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PG - PURGE
PKT - POCKET
PRT - PRINT
PUN - PUNCH
REEL - REEL
REV - REVERSE
RLS - RELEASE
RMV - REMOVE
ROLL - ROLLOUT
TERM - TERMINATE

Specific charge numbers may be selected for listing, instead of the entire day's jobs, if a disk file called TAB/EXECCHGS is present on disk. The file is created with TABS/UPDATE using the EXECCHG option and contains the charge numbers the user has selected. When this file is present, only those charge numbers included in TAB/EXECCHGS will be used to produce the two reports. If this file is not present, all active charge numbers will be used.

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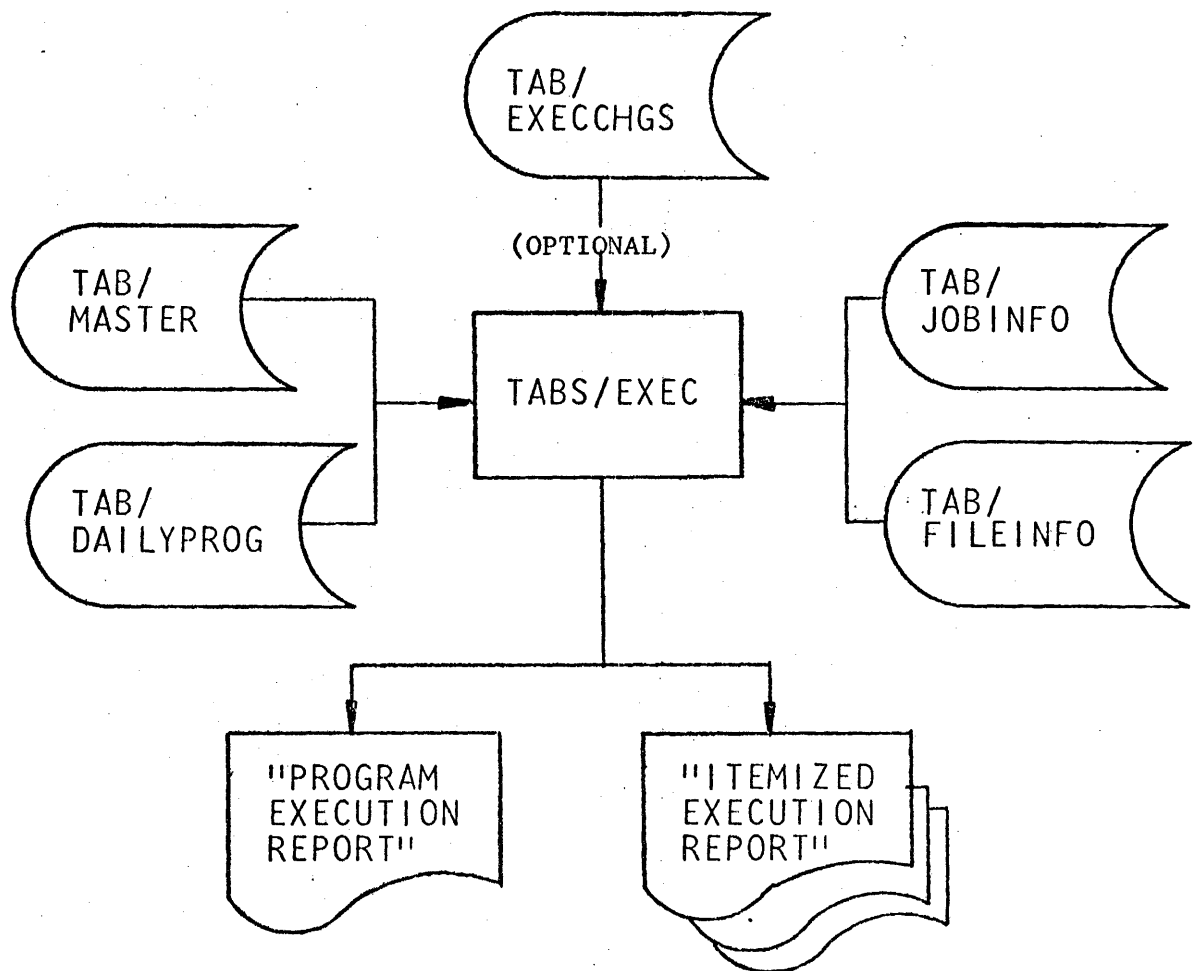


Figure 10.2 TABS/EXEC Flowchart

PROGRAM	CHARGE #	-----DAILY-----			-----MONTH-TO-DATE-----		
		EXECUTES	PROCESSOR TIME	ELAPSED TIME	EXECUTES	PROCESSOR TIME	ELAPSED TIME
SMCS	0911000	20	0:04:22.8	8:35:37.0	25	0:05:31.3	373:25:40.7
CANDE	0912000	8	0:15:23.4	7:37:39.5	9	0:24:58.6	371:53:53.4
BAMBI	0913000	5	0:00:54.8	4:16:09.2	6	0:01:38.2	368:32:23.1
NC516V	9999999	4	0:15:08.7	3:02:19.0	8	0:29:26.9	367:40:27.1
SYSTEM/BACKUP	0923000	30	0:07:47.9	4:38:08.8	83	0:11:34.2	11:14:03.8
SMCS/NC5L6.0913	9999999	12	0:19:20.6	5:23:14.2	12	0:19:20.6	5:23:14.2
SMCS	9999999	7	0:00:15.8	3:28:08.8	7	0:00:15.8	3:28:08.6
SMCS/NC5L6.0914	9999999	7	0:02:07.4	3:26:45.5	7	0:02:07.4	3:26:45.5
TAPE/ARCHIVE	0929000	4	0:00:06.3	2:10:03.3	6	0:00:09.0	2:50:16.9
MEDIC	9999999	3	0:00:19.1	2:43:02.1	3	0:00:19.1	2:43:02.1
COBOL	9999999	4	0:15:54.6	1:11:33.6	20	0:50:12.3	2:39:53.7
SQUASH/USER.DISK	9999999	0	0:00:00.0	0:00:00.0	1	0:04:28.7	2:27:47.8
NEWARCH1	9999999	6	0:00:09.0	1:18:30.6	14	0:00:16.6	2:16:25.4
SDL7.0	0932100	2	0:04:48.7	0:15:03.6	11	0:32:36.3	2:08:17.6
MCPII/ANALYZER	9999999	4	0:14:33.1	1:41:18.5	4	0:14:33.1	1:41:18.5
NDL	0933000	9	0:12:05.7	0:49:05.0	17	0:17:35.9	1:21:58.8
DMPALL	0922000	10	0:00:04.2	0:47:18.1	25	0:00:14.0	1:10:24.8
SYSTEM/LOAD.DUMP	0929000	5	0:02:01.3	1:01:53.0	8	0:02:31.0	1:08:54.0
CHECK/LOAD.DUMP	0929000	3	0:02:05.1	0:43:55.9	5	0:02:49.2	1:02:14.5
DISK/COPY	0921000	9	0:01:56.8	0:44:07.0	20	0:02:41.7	0:59:07.1
COBOL	0931000	2	0:07:34.7	0:26:59.6	7	0:18:49.9	0:52:12.6
SDL	0932000	3	0:09:58.9	0:34:22.3	5	0:11:14.8	0:38:40.8
SYSTEM/DISK.INIT	0212121	0	0:00:00.0	0:00:00.0	2	0:00:48.1	0:36:20.3
CHECK/LOAD.DUMP	9999999	1	0:00:11.9	0:36:18.3	1	0:00:11.9	0:36:18.3
SYSTEM/LOAD.DUMP	0924000	40	0:00:41.8	0:14:45.9	23	0:01:28.7	0:34:22.0
(MEYERS)/SCHEDSRCO	9999999	0	0:00:00.0	0:00:00.0	11	0:00:08.9	0:26:42.4
DASDL	0934000	0	0:00:00.0	0:00:00.0	6	0:00:57.0	0:18:43.8
SYSTEM/MAKEUSER	9999999	3	0:00:13.7	0:14:40.0	4	0:00:48.1	0:18:14.1
SORT/VSORT	9999999	4	0:00:45.1	0:14:30.4	9	0:00:48.6	0:16:26.6
SDL	9999999	1	0:04:52.6	0:14:57.7	1	0:04:52.6	0:14:57.7
NDL	9999999	0	0:00:00.0	0:00:00.0	6	0:04:33.4	0:12:48.3
DASDL	9999999	0	0:00:00.0	0:00:00.0	6	0:00:43.6	0:11:16.4
SYSTEMS.O/LOGOUT	9999999	1	0:00:45.6	0:10:38.0	1	0:00:45.6	0:10:38.0
DISK/COPY	9999999	3	0:00:11.0	0:10:02.8	3	0:00:11.0	0:10:02.8
SYSTEM/LOGOUT	9999999	1	0:00:42.2	0:08:50.2	1	0:00:42.2	0:08:50.2
DOCTOR	0941000	1	0:00:01.0	0:01:29.9	6	0:01:54.4	0:07:16.3
(MEYERS)/POOL0	9999999	0	0:00:00.0	0:00:00.0	3	0:00:08.6	0:08:54.3
DUMP/ANALYZER	0926000	3	0:00:21.1	0:03:18.9	6	0:00:51.8	0:06:39.1
DISKMAP/UTILITY	0925000	2	0:00:30.8	0:06:31.6	2	0:00:30.8	0:06:31.6
SMCS/NC5L6.0912	9999999	1	0:00:00.2	0:04:44.1	1	0:00:00.2	0:04:44.1
(MEYERS)/MANSRCO	9999999	0	0:00:00.0	0:00:00.0	3	0:00:02.5	0:04:32.1
SORT/CELLATE	9999999	0	0:00:00.0	0:00:00.0	8	0:00:02.7	0:03:48.5
SYCOM	0915000	1	0:00:00.2	0:03:00.1	1	0:00:00.2	0:03:00.1
REORGCOBOL	0954000	0	0:00:00.0	0:00:00.0	5	0:01:24.6	0:02:43.9
(MEYERS)/SCHEDULES	9999999	0	0:00:00.0	0:00:00.0	2	0:00:00.6	0:02:39.8
DMPALL	9999999	1	0:00:00.5	0:02:23.1	1	0:00:00.5	0:02:23.1
SYSTEM/LOGOUT	9999999	2	0:00:02.9	0:01:08.8	4	0:00:05.1	0:02:18.2
BIGMEDIC	9999999	1	0:00:00.4	0:02:17.0	1	0:00:00.4	0:02:17.0
DISKMAP/UTILITY	9999999	0	0:00:00.0	0:00:00.0	1	0:00:11.8	0:02:12.7
MEDIC	0914100	1	0:00:03.2	0:02:10.9	1	0:00:03.2	0:02:10.9
(MEYERS)/MANPOWER	9999999	0	0:00:00.0	0:00:00.0	1	0:00:00.1	0:02:07.0
SDL/SA	9999999	0	0:00:00.0	0:00:00.0	1	0:00:00.0	0:01:24.5
CREATE/JOB CARDS	9999999	0	0:00:00.0	0:00:00.0	1	0:00:00.1	0:01:23.2
SDL/SSC	0932200	0	0:00:00.0	0:00:00.0	1	0:00:00.1	0:01:05.4

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P.S. 2219 OC94 (3)

Figure 10.3.1 Program Execution

SEP. 13. 1978

PROGRAM EXECUTION REPORT

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PROGRAM	CHARGE #	-----DAILY-----			-----MONTH-TO-DATE-----		
		EXECUTES	PROCESSOR TIME	ELAPSED TIME	EXECUTES	PROCESSOR TIME	ELAPSED TIME
TEST/LOOPTF	9999999	0	0:00:00.0	0:00:00.0	4	0:00:04.3	0:01:04.8
REORGCCBOL	9999999	0	0:00:00.0	0:00:00.0	2	0:00:33.6	0:01:01.1
SYSTEM/BUILDTRAIN	0920000	0	0:00:00.0	0:00:00.0	1	0:00:15.0	0:00:38.4
PRODSPEC/TERM	9999999	0	0:00:00.0	0:00:00.0	2	0:00:03.7	0:00:36.9
SORT/VSDRT	0925000	2	0:00:07.2	0:00:34.0	2	0:00:07.2	0:00:34.0
SYSTEM/SPCL3GOUT	0928000	1	0:00:03.7	0:00:18.9	1	0:00:03.7	0:00:18.9
SYSTEM/DISK.INIT	9999999	0	0:00:00.0	0:00:00.0	1	0:00:00.0	0:00:09.3
SSLCAD/HAKCAS	9999999	1	0:00:00.0	0:00:08.8	1	0:00:00.0	0:00:08.8

TOTALS		198	2:26:14.0	57:28:04.0	440	4:36:49.5	534:29:36.1

Figure 10.3.2 Program Execution Report (cont.)

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81800/81700 EDP-TABS
P.S. 2219 0094 (8)

SEP. 13 1978

ITEMIZED EXECUTION REPORT

CHARGE # 0922000

```

1 DMPALL                                JOB # = 270
BOJ DATE = 09/13/78 7:17:12.2          PROGRAM TYPE = EXECUTE          STATIC MEMORY = 9189
EOJ DATE = 09/13/78 7:17:45.1          EOJ TYPE = NORMAL              DYNAMIC MEMORY = 0
COMPILE DATE = 08/01/78 16:22:17.1     PROCESSOR TIME = 0:00:00.8      TOTAL MEMORY = 9684
PROC. PRIORITY = 9                     ELAPSED TIME = 0:00:32.9       # CODE OVERLAYS = 12
MEM. PRIORITY = 9                      # FILES = 7                   # DATA OVERLAYS = 0

INP.FILE   FILE ID = SL6/USER.CODES      OPENED AT 7:17:34.1           IN
          UNIT = DPA (DISK PACK)         CLOSED AT 7:17:42.9          RLS
          # BUFFERS = 2                  FILE SPACE = 2886
          # RECORDS = 264                REC LENGH/BLK FACTOR = 96/1
          # BLOCKS = 264                 OPEN TIME = 0:00:08.8
          # ERRORS = 0                   ACCESS TYPE = SERIAL

OUTP.FILE  FILE ID = SL6/USER.CODES      OPENED AT 7:17:34.9          OUT NEW
          UNIT = DPD (DISK PACK)         CLOSED AT 7:17:43.8          LOCK
          # BUFFERS = 2                  FILE SPACE = 2886
          # RECORDS = 264                REC LENGH/BLK FACTOR = 96/1
          # BLOCKS = 264                 OPEN TIME = 0:00:08.9
          # ERRORS = 0                   ACCESS TYPE = SERIAL

2 DMPALL                                JOB # = 297
BOJ DATE = 09/13/78 9:04:57.9          PROGRAM TYPE = EXECUTE          STATIC MEMORY = 9189
EOJ DATE = 09/13/78 9:06:23.8          EOJ TYPE = NORMAL              DYNAMIC MEMORY = 0
COMPILE DATE = 08/01/78 16:22:17.1     PROCESSOR TIME = 0:00:01.8      TOTAL MEMORY = 9684
PROC. PRIORITY = 9                     ELAPSED TIME = 0:01:25.9       # CODE OVERLAYS = 12
MEM. PRIORITY = 9                      # FILES = 7                   # DATA OVERLAYS = 0

INP.FILE   FILE ID = (CRIN)/SL6.AC       OPENED AT 9:05:56.5           IN
          UNIT = DPA (DISK PACK)         CLOSED AT 9:06:16.0          RLS
          # BUFFERS = 2                  FILE SPACE = 30150
          # RECORDS = 290                REC LENGH/BLK FACTOR = 90/20
          # BLOCKS = 15                  OPEN TIME = 0:00:19.5
          # ERRORS = 0                   ACCESS TYPE = SERIAL

LIST.FILE  FILE ID = BACKUP.WRT/111      OPENED AT 9:06:00.5          OUT NEW
          UNIT = DPA (DISK PACK)         CLOSED AT 9:06:17.5          RLS CRCH LOCK
          # BUFFERS = 1                  FILE SPACE = 6398
          # RECORDS = 295                REC LENGH/BLK FACTOR = 133/5
          # BLOCKS = 59                  OPEN TIME = 0:00:17.0
          # ERRORS = 0                   PRINTER BACKUP FILE

3 DMPALL                                JOB # = 345
BOJ DATE = 09/13/78 12:28:01.7          PROGRAM TYPE = EXECUTE          STATIC MEMORY = 9189
EOJ DATE = 09/13/78 12:28:41.5          EOJ TYPE = NORMAL              DYNAMIC MEMORY = 0
COMPILE DATE = 08/01/78 16:22:17.1     PROCESSOR TIME = 0:00:00.2      TOTAL MEMORY = 9684
PROC. PRIORITY = 4                     ELAPSED TIME = 0:00:39.9       # CODE OVERLAYS = 5
MEM. PRIORITY = 4                      # FILES = 7                   # DATA OVERLAYS = 0

```

Figure 10.4 Itemized Execution Report

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 CC94 (8)

SEP. 13. 1978

ITEMIZED EXECUTION REPORT

CHARGE # 0923000

1 SYSTEM/BACKUP

BOJ DATE = 09/13/78	1:09:26.8	PROGRAM TYPE = EXECUTE	JOB # = 253
EOJ DATE = 09/13/78	1:14:45.1	EOJ TYPE = NORMAL	STATIC MEMORY = 3393
COMPILE DATE = 02/27/78	11:14:07.4	PROCESSOR TIME = 0:00:00.4	DYNAMIC MEMORY = 0
PROC. PRIORITY = 12		ELAPSED TIME = 0:05:18.3	TOTAL MEMORY = 3858
MEM. PRIORITY = 12		# FILES = 4	# CODE OVERLAYS = 12
			# DATA OVERLAYS = 0

BACKFILE	FILE ID = (SPO)/#98	OPENED AT 1:09:34.9	IN
	UNIT = DPA (DISK PACK)	CLOSED AT 1:09:42.4	PG
	# BUFFERS = 2	FILE SPACE = 14902	
	# RECORDS = 28	REC LENGTH/BLK FACTOR = 121/7	
	# BLOCKS = 4	OPEN TIME = 0:00:07.5	
	# ERRORS = 0	PRINTER BACKUP FILE	

LINE	FILE ID = LINE	OPENED AT 1:09:37.3	OUT NEW
	UNIT = LPA (LINE PRINTER)	CLOSED AT 1:09:43.6	RLS
	# BUFFERS = 2	FILE SPACE = 3224	
	# RECORDS = 26	REC LENGTH/BLK FACTOR = 132/1	
	# BLOCKS = 26	OPEN TIME = 0:00:06.3	
	# ERRORS = 0		

AUTOPRINT	FILE ID = AUTOPRINT	OPENED AT 1:09:30.1	IN
	UNIT = QUEUE	CLOSED AT 1:14:44.3	RLS
	# BUFFERS = 2	FILE SPACE = 633	
	# RECORDS = 0	REC LENGTH/BLK FACTOR = 31/1	
	# ERRORS = 0	OPEN TIME = 0:05:14.2	

2 SYSTEM/BACKUP

BOJ DATE = 09/13/78	1:53:12.5	PROGRAM TYPE = EXECUTE	JOB # = 257
EOJ DATE = 09/13/78	1:58:36.8	EOJ TYPE = NORMAL	STATIC MEMORY = 3393
COMPILE DATE = 02/27/78	11:14:02.4	PROCESSOR TIME = 0:00:00.0	DYNAMIC MEMORY = 0
PROC. PRIORITY = 12		ELAPSED TIME = 0:05:24.3	TOTAL MEMORY = 3858
MEM. PRIORITY = 12		# FILES = 4	# CODE OVERLAYS = 9
			# DATA OVERLAYS = 0

BACKFILE	FILE ID = (SPO)/#99	OPENED AT 1:53:27.1	IN
	UNIT = DPA (DISK PACK)	CLOSED AT 1:53:34.0	PG
	# BUFFERS = 2	FILE SPACE = 14902	
	# RECORDS = 30	REC LENGTH/BLK FACTOR = 121/7	
	# BLOCKS = 5	OPEN TIME = 0:00:06.9	
	# ERRORS = 0	PRINTER BACKUP FILE	

LINE	FILE ID = LINE	OPENED AT 1:53:28.7	OUT NEW
	UNIT = LPA (LINE PRINTER)	CLOSED AT 1:53:35.4	RLS
	# BUFFERS = 2	FILE SPACE = 3224	
	# RECORDS = 28	REC LENGTH/BLK FACTOR = 132/1	
	# BLOCKS = 28	OPEN TIME = 0:00:06.2	
	# ERRORS = 0		

AUTOPRINT	FILE ID = AUTOPRINT	OPENED AT 1:53:25.4	IN
	UNIT = QUEUE	CLOSED AT 1:58:36.0	RLS
	# BUFFERS = 2	FILE SPACE = 633	
	# RECORDS = 0	REC LENGTH/BLK FACTOR = 31/1	
	# ERRORS = 0	OPEN TIME = 0:05:10.6	

Figure 10.4.1 Iterized Execution Report (cont.)

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 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0C94 (B)

IABSZERR

This program is the sixth report generation program. It produces the "Abnormal Job End Summary" and the "Abnormal Job End Detail" reports. These reports provide information on all programs which were terminated by any method other than a normal EOJ. If neither of the reports are requested, the program will not be executed.

ABNORMAL JOB END SUMMARY (SW6=1 or SW6=3)

This report gives both daily and month-to-date totals on the number of jobs affected by each type of abnormal job end, as well as the total elapsed time lost in each category. The five categories of job ends are:

- PROGRAM ERRORS:** Errors discovered internally by the program; for example, syntax errors in a compilation.
- TEST ERRORS:** Program errors originated by jobs classified as being either test or new software.
- DSed or DPed:** Programs that were DSed or DPed by the system operator.
- CLEAR/STARTS:** Programs which were aborted when the system operator performed a Clear/Start.
- FAMILY DEATH:** The EOJ of a member of a run unit caused the abnormal EOJ of this program.

ABNORMAL JOB END DETAIL (SW6=2 or SW6=3)

This report gives the charge number, program name, and elapsed time lost for every job with an abnormal job end. As in the previous report, the jobs are grouped by type of job end. Within each category, subtotals are given for each charge number.

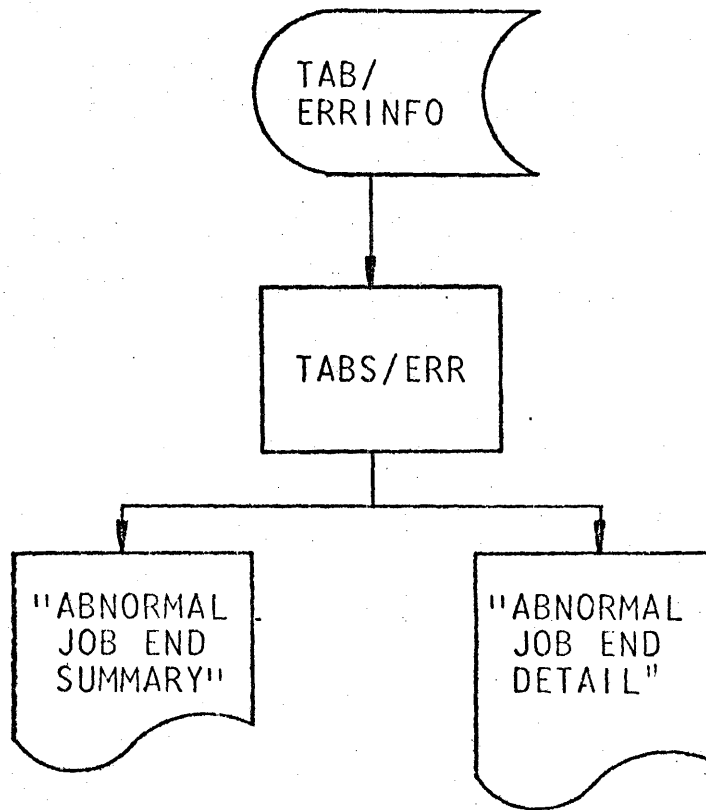


Figure 11.1 TABS/ERR Flowchart

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (B)

SEP. 13, 1978 ABNORMAL JOB END SUMMARY

	----- DAILY -----		----- MONTH-TO-DATE -----	
	JOBS AFFECTED	TIME LOST	JOBS AFFECTED	TIME LOST
PROGRAM ERRORS	7	0:52:06.0	15	1:33:23.6
TEST ERRORS	0	0:00:00.0	9	0:26:08.5
DS-ED OR OP-ED	37	8:17:11.8	54	9:11:33.7
CLEAR/STARTED	48	1:19:52.7	57	8:55:29.9
FAMILY DEATH	1	0:03:31.3	1	0:03:31.3

TOTALS	93	10:32:41.8	136	20:10:07.0

Figure 11.2 Abnormal Job End Summary

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
R1800/B1700 EDP-TABS
P.S. 2219 0094 (8)

SEP. 13, 1978 A B N O R M A L J O B E N D D E T A I L

CHARGE #	PROGRAM NAME	TIME LOST
***PROGRAM ERRORS		
0931000	COBOL	0:16:33.7
TOTAL THIS CHARGE # :	1 JOB	0:16:33.7
0933000	NDL	0:01:50.6
0933000	NDL	0:06:19.5
0933000	NDL	0:02:20.7
0933000	NDL	0:05:21.3
0933000	NDL	0:04:13.3
0933000	NDL	0:15:18.9
TOTAL THIS CHARGE # :	6 JOBS	0:35:32.3
TOTAL PROGRAM ERRORS:	7 JOBS	0:52:06.0
***TEST ERRORS		
TOTAL TEST ERRORS :	0 JOBS	0:00:00.0
***DS-ED CR DP-ED		
0911000	SMCS	0:01:57.9
0911000	SMCS	0:01:01.0
0911000	SMCS	0:00:49.6
0911000	SMCS	0:05:01.5
0911000	SMCS	0:00:51.3
0911000	SMCS	0:02:17.3
0911000	SMCS	0:05:32.5
TOTAL THIS CHARGE # :	7 JOBS	0:17:31.1
0912000	CANDE	1:09:01.6
TOTAL THIS CHARGE # :	1 JOB	1:09:01.6
0913000	BAMBI	0:30:25.6
TOTAL THIS CHARGE # :	1 JOB	0:30:25.6
0915000	SYCOM	0:03:00.1
TOTAL THIS CHARGE # :	1 JOB	0:03:00.1
0922000	DMPALL	0:04:21.5
0922000	DMPALL	0:03:29.7
0922000	DMPALL	0:04:58.3
TOTAL THIS CHARGE # :	3 JOBS	0:12:49.5
0923000	SYSTEM/BACKUP	0:00:48.2
0923000	SYSTEM/BACKUP	0:01:54.8
0923000	SYSTEM/BACKUP	0:40:47.7
0923000	SYSTEM/BACKUP	0:52:00.1
0923000	SYSTEM/BACKUP	0:00:47.2
0923000	SYSTEM/BACKUP	0:35:59.8
0923000	SYSTEM/BACKUP	0:03:13.4
TOTAL THIS CHARGE # :	7 JOBS	2:15:31.2
0929000	TAPE/ARCHIVE	0:00:17.4
TOTAL THIS CHARGE # :	1 JOB	0:00:17.4
9999999	COBOL	0:00:42.0
9999999	MCPII/ANALYZER	0:40:36.9

Figure 11.3 Abnormal Job End Detail

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COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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B1800/B1700 EDP-TABS
P.S. 2219 0094 (B)

TABS/DMS

This program is the seventh report generation program. It produces the "Data Base Management Statistics Report". If this report is not requested, TABS/DMS will not be executed.

DATA BASE MANAGEMENT STATISTICS REPORT (SW7=1 or SW7=3)

This report provides statistics on all data base activity during a day. A section is printed for each DMS structure invocation and provides the following information.

- structure name
- time of invocation
- time of data base close
- physical data base name
- job number
- file name
- hardware unit and device type
- number of finds performed
- number of inserts performed
- number of updates
- number of deletes
- number of system changes
- number of exceptions
- number of reads
- number of writes

This information cannot accurately be assigned to user programs, so the statistics in this report are not reflected in TABS' billing schemes. DMS information which can be assigned to a charge number is recorded in the "Itemized Execution Report" produced by TABS/EXEC.

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COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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B1800/B1700 EDP-TABS
P.S. 2219 0094 (B)

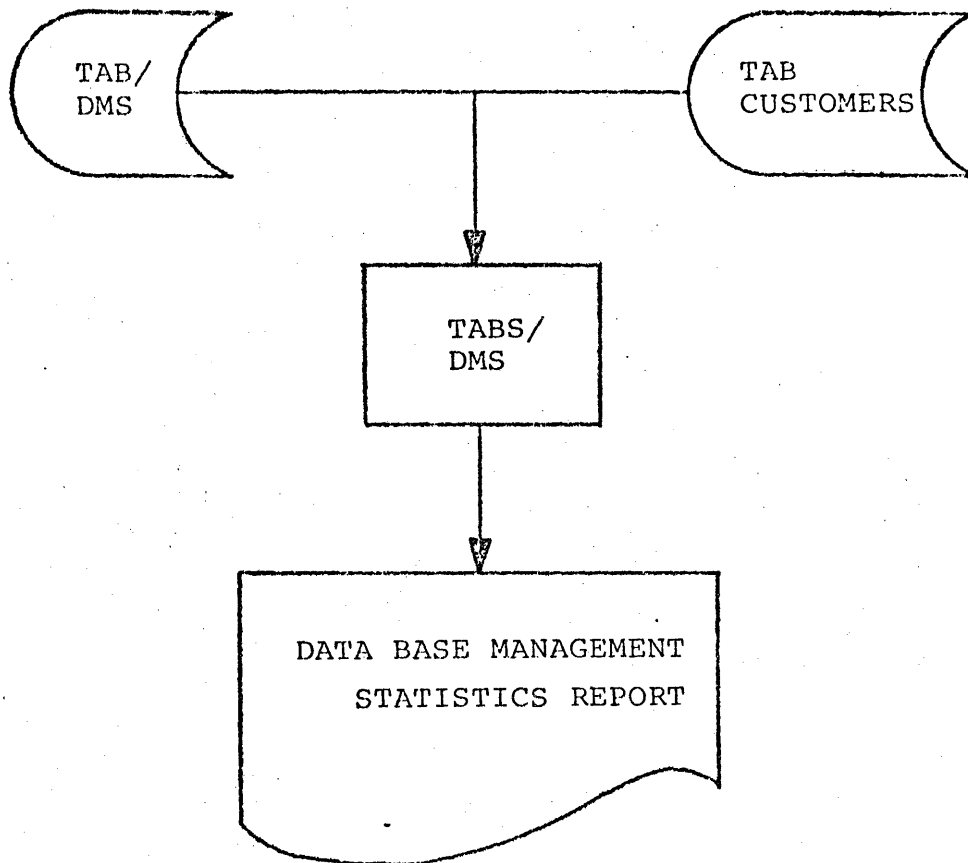


Figure 12.1.1 TABS/DMS Flowchart

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 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (B)

NOV. 2, 1970

DATA BASE MANAGEMENT STATISTICS REPORT

DSA	INVOKED AT 0:34:29.5 DATA BASE = TEST FILE = TEST/DSA # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0	CLOSED AT 0:34:47.5 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 20
AEMBDS	INVOKED AT 0:34:32.9 DATA BASE = TEST FILE = TEST/AEMBDS # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0	CLOSED AT 0:34:40.3 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 20
SETA	INVOKED AT 0:34:32.2 DATA BASE = TEST FILE = TEST/SETA # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 1 # READS = 1	CLOSED AT 0:34:49.0 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 2
SETA1	INVOKED AT 0:34:31.4 DATA BASE = TEST FILE = TEST/SETA1 # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 1 # READS = 0	CLOSED AT 0:34:49.3 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 1
DSB	INVOKED AT 0:34:33.7 DATA BASE = TEST FILE = TEST/DSB # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0	CLOSED AT 0:34:49.7 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 20
BMANSS	INVOKED AT 0:34:37.1 DATA BASE = TEST FILE = TEST/BMANSS # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0	CLOSED AT 0:34:50.4 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 0
B2MANSS	INVOKED AT 0:34:37.7 DATA BASE = TEST FILE = TEST/B2MANSS # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0	CLOSED AT 0:34:50.7 JOB # 130 UNIT = DPA (DISK PACK) # INSERTS = 20 # DELETES = 0 # EXCEPTIONS = 0 # WRITES = 20

Figure 12.1.2 Data Base Management Statistics Report

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 B180C/B170C EDP-TABS
 P.S. 2219 0094 (B)

TABS/BILLING

TABS/BILLING allows the EDP-manager to distribute the system costs equitably among all the users. The program may be run at any time or the AUTO BILL option may be set with TABS/UPDATE, so that the billing will automatically occur at the end of the month. TABS/BILLING expects an input file labelled TCARDS.

Four reports can be produced by TABS/BILLING: "Operating Cost Report", "Charge Distribution Report", "Account Charge Summary", and "Services Rendered" Billing Reports. The reports can be either a preliminary audit, or a final bill. If final bills are requested, the charge totals are zeroed out at the end of the run to prevent duplicate billing reports from being issued. Unless "Services Rendered" billing reports are produced, the run cannot be considered a final billing run. Preliminary audit reports are flagged to eliminate confusion with final billing reports.

Costs are assessed against individual charge numbers. However, some installations might prefer to charge only certain groups of charge numbers. For example, 5673221, 5673522, and 5673723 might all be for the same group, and should be billed as 5673000, with the last three digits having no significance. For this purpose, a mask may be specified for the charge number. The mask is seven characters, where an "X" specifies that the digit should be ignored for billing, and a "D" specifies that the digit should be used. In the above example, the mask would be DDDDXXX. The default mask may be specified in TABS/UPDATE. Any other masks should be specified in TABS/BILLING.

The charge numbering system is illustrated in the following example for a community college.

```
-----
1 1 * 2 * 3 * 4 * 5 * 6 * 7 1
-----
```

<--Department--><-- Instructor --><-- Class Code --><--Type-->

A mask of DDXXXXX would charge departments only; a mask of DDDDXXX would charge individual instructors; and mask of DDXXDDX would charge individual classes within each department, even though they had different instructors.

Note: When a mask is used, the category descriptions appearing

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 P.S. 2219 0094 (R)

on bills and audits are those descriptions entered with TABS/UPDATE whose charge numbers contain 0's corresponding to each X in the mask (i.e., mask: DDDDXXX; charge number 1234000).

CHARGE UNITS

All components are billed by charge units, where charge units measure the usage of the device: PROC uses processor time in tenth-seconds; MEM uses [(total memory in bits * processor time in seconds) + for each active file: (file space in bytes * time in use in seconds)] / 10,000. ELAP uses elapsed time in tenth-seconds.

No memory usage is available for DMS files.

For hardware devices other than disk, the user can specify the type of charge unit to be used by setting the option HDWR in TABS/UPDATE. The four allowable values for HDWR are:

L = logical I/O's
 P = physical I/O's
 O = open time
 C = control time

If the EDP-manager wishes to charge for the time a device was controlled by a program, and thus unavailable to other users, control time (C) should be chosen as the charge unit. If open time (O) is used, users will not be penalized for maintaining control of a device while not actually having a file open on the device. Using logical I/O's (L) for charge units causes users to be billed for the work the MCP must do to perform the I/O; logical I/O's do not reflect actual device usage. Physical I/O's (P) indicate how many times the actual device channel was used in order to complete the I/O; this will reflect the added work required for random file access.

Physical I/O's are not available for queue and DMS files. If HDWR=P, then logical I/O's will be used to calculate charge units for these two file types. Disk usage will always be billed by physical I/O's.

BILLING CONVENTIONS

Some charge unit measures are constant from one execution to another, regardless of varying system conditions; others are not. If the EDP-manager wants a predictable billing scheme, where charges can be determined in advance, only constant charge units and fixed rates should be used. If the manager is willing to sacrifice consistency in order to charge for actual usage and

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guarantee a certain cash intake, varying charge units and variable rates can be used.

Varying charge units do not always vary by a large amount. If a program is always run with the same mix of jobs, the varying charge units will be relatively constant. The only time they will be radically different is when system conditions are radically different.

CONSTANT -----	VARYING -----
PROC	ELAP
MEM	REMOTE
SPEC	QUEUE
	DIST
HDWR=L	HDWR=0
HDWR=P	HDWR=C

OPERATING COST REPORT

This report indicates all operating costs entered by the EDP-manager. The manager can specify the estimated hours of use for a device, so that a fixed rate will be charged for each service. If the estimated hours of use is 0, then a variable rate will be used in order to distribute all costs to the users. The costs are classified as machine costs, hardware costs, special costs (which are assessed against individual charge numbers), and distributed costs (which are charge numbers whose costs should be charged to all other charge numbers as overhead).

The cost and explanation of each charge is given, as well as subtotals for each charge type and each cost group. Estimated hours of use are also given for each component. If zero, then the entire cost will be distributed over the users; if non-zero, a fixed rate will be charged. This information is entered by the EDP-manager in the input file TCARDS. If no cost information is entered for a component, it will be ignored.

CHARGE DISTRIBUTION REPORT

This report shows how each type of charge has been distributed. The categories are MACHINE COSTS, which has a separate entry for memory, processor use, and overhead; HARDWARE COSTS, which is broken down by units; SPECIAL COSTS; and DISTRIBUTED COSTS. Assigned charges are charges that have been assessed against certain charge numbers. Unassigned charges are systems costs that have not yet been assigned to a specific charge number. Rates (cost per charge unit) are given for all machine and

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hardware costs.

Overall statistics are given for the distributed cost category including applicable charge units and rates for the category in general. Applicable charge units are defined as total elapsed time in tenths of seconds (ELAP figure in Machine Costs) - elapsed time in tenths of seconds of jobs whose charge numbers are to be distributed.

Assigned and unassigned totals are given for each of the four charge categories; overall totals are also given.

SERVICES RENDERED BILLING REPORTS

A separate report is produced for each charge number. This report is the customer's bill for services rendered. The number of charge units, cost, and percentage of total charge is given for each type of charge. The report will be flagged as either a "Preliminary Audit" or a "Final Bill".

ACCOUNT CHARGE SUMMARY

This report gives the distribution of charges according to charge number. For each charge number the account name, cost, and percentage of the total assigned charges is given.

REPORT SELECTION

TABS/BILLING program switches control which reports are to be printed:

SW1 = 1 - "Operating Cost Report"
SW2 = 1 - "Charge Distribution Report"
SW3 = 1 - "Services Rendered" Billing Reports
SW4 = 1 - "Account Charge Summary"

The input file can also be used to select reports for printing. If no reports are selected, either through the switches or the input file, then all four reports will be printed.

The input record formats follow.

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 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (B)

CONTROL

This record must have a "1" in column 1, with the option starting in column 2. Allowable options include:

- AUDIT** This execution is a preliminary audit. The "Services Rendered" reports will be flagged as audits.
- BILL** This is a final billing run. The "Services Rendered" reports will be flagged as final bills. The charge unit totals in TAB/CUSTOMERS will be zeroed out after the bills are produced. The BILL option is invalid unless the "Services Rendered" Billing Reports are also requested.
- YTDCHGS** Instead of using TAB/CUSTOMERS as the input file for charging, the program will use TAB/YTDCHGS instead. This file will not be zeroed out after a final billing run.
- MERGE** The charge unit totals from TAB/CUSTOMERS will be merged with the totals in TAB/YTDCHGS to create a new TAB/YTDCHGS file. This file will maintain cumulative statistics for quarterly, semi-annual, and annual reports. A MERGE can only be done in conjunction with a final billing run, to prevent charge totals from being merged more than once.

If neither AUDIT or BILL is requested, the program defaults to AUDIT. If more than one AUDIT or BILL record is found, the last request determines whether the run is a preliminary audit or a final bill.

REPORTS

This record must have "REPORTS" starting in column 1. Columns 8-19 are used to specify which reports are to be printed with either a 1,2,3 or 4 separated by either a comma or blanks.

- 1 - "Operating Cost Report"
- 2 - "Charge Distribution Report"
- 3 - "Services Renderec" Billing Reports
- 4 - "Account Charge Summary"

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MASK

This record must have "MASK" starting in column 8. Columns 1-7 should contain a seven-character mask consisting of "D"'s and "X"'s. A "D" means use this digit for billing, and an "X" means ignore this digit. If no mask record is present, then the program will use the default mask entered through TABS/UPDATE. If more than one mask is entered, the last one found will be used.

DISTRIBUTED CHARGE

This record must have "DIST" starting in column 8. Columns 1-7 should contain a 7 digit charge number. If it is "SYSCHG", then the system charge number, specified in TABS/UPDATE, will be distributed. A maximum of 25 charge numbers can be distributed.

SPECIAL CHARGE

This record must have "SPEC" starting in column 8. Columns 1-7 should contain a 7 digit charge number. Columns 12-19 should contain an 8 digit cost, 6 digits for the dollar cost and 2 digits for the cents, with an implied decimal point between columns 17 and 18. For example, \$123.45 would be coded as 00012345. Columns 20-69 contain a 50 character alphanumeric description of the charge.

UNIT CHARGE

Column 7 must be blank. Columns 1-6 contain a six-character unit name or TABS charge type. The allowable TABS charge types are:

MEM	(for memory)
ELAP	(for overhead)
PROC	(for processor time)
QUEUE	(for queue files)
REMOTE	(for remote files)

The allowable unit names are the MCP defined mnemonics such as DPA, LPA, MTC, etc.

Columns 8-15 contain an 8 digit cost, right justified with an assumed decimal point between columns 13 and 14.

Columns 16-19 contain a 4 digit value for hours. If this field is blank, then zero is assumed.

Columns 20-69 contain a 50 character description of the charge.

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ERROR SUMMARY

If there are any errors in the input file, TABS/BILLING will produce an "Error Summary", listing all the errors. If the "Operating Cost Report" is specified, it will be printed; however, the program will abort before producing the final three reports, to allow the user to correct the errors and reexecute the program.

"Error Summary" will print the record in error, and mark the errors with a "?" under each incorrect character. Possible error messages include:

INVALID CONTROL OPTION	Allowable options are AUDIT, BILL, MERGE, or YTOCHGS.
INVALID CHARGE NUMBER	The charge number must be 7 numeric digits, or SYSCHG. It cannot be zero.
INVALID COST	The cost must be 8 numeric digits.
INVALID HOURS	The hours field must be 4 numeric digits, or blank.
INVALID UNIT NAME	Allowable unit names are the MCP defined mnemonics.
INVALID REPORT REQUEST	Allowable requests are 1, 2, 3, or 4, separated by commas or blanks.
INVALID MASK	The mask must be 7 characters, consisting of D's and X's.
MAX OF 25 DIST CHARGE #S	No more than 25 charge numbers can be distributed as overhead.
DUPLICATE DIST CHARGE #	The same charge number was specified more than once on a DIST record. However, it is not an error if both "SYSCHG" and a charge number which is included in the system charge number are specified. For example, if the system charge number was 998XXXX, then a DIST charge number of 9987300 would not be in error.
NEED REPORT 3 FOR BILL	If this is a billing run, then report 3 must be requested in order to produce final bills.

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CANNCT REMERGE YTDCHGS

The user specified both YTDCHGS and MERGE. TAB/YTDCHGS cannot be merged with itself.

MUST BILL BEFORE MERGE

The user specified MERGE without BILL. BILL must be set in order to zero the charge unit totals in TAB/CUSTOMERS and prevent merging the same information twice.

INVALID INPUT RECORD

The record could not be identified.

Only 105 distinct charge names are allowed (including MEM, OVHD, and PROC). If more than 105 names are specified, then the message "THE FOLLOWING HCWR CHARGES HAVE BEEN IGNORED" will be printed, followed by the extra names. This message will appear in the "Operating Cost Report" if it is requested, otherwise it will appear in the "Error Summary".

If any of these errors occur, TABS/BILLING will display the message

INPUT ERRORS -- TABS/BILLING ABORTED

and will not attempt to produce reports 2, 3, or 4.

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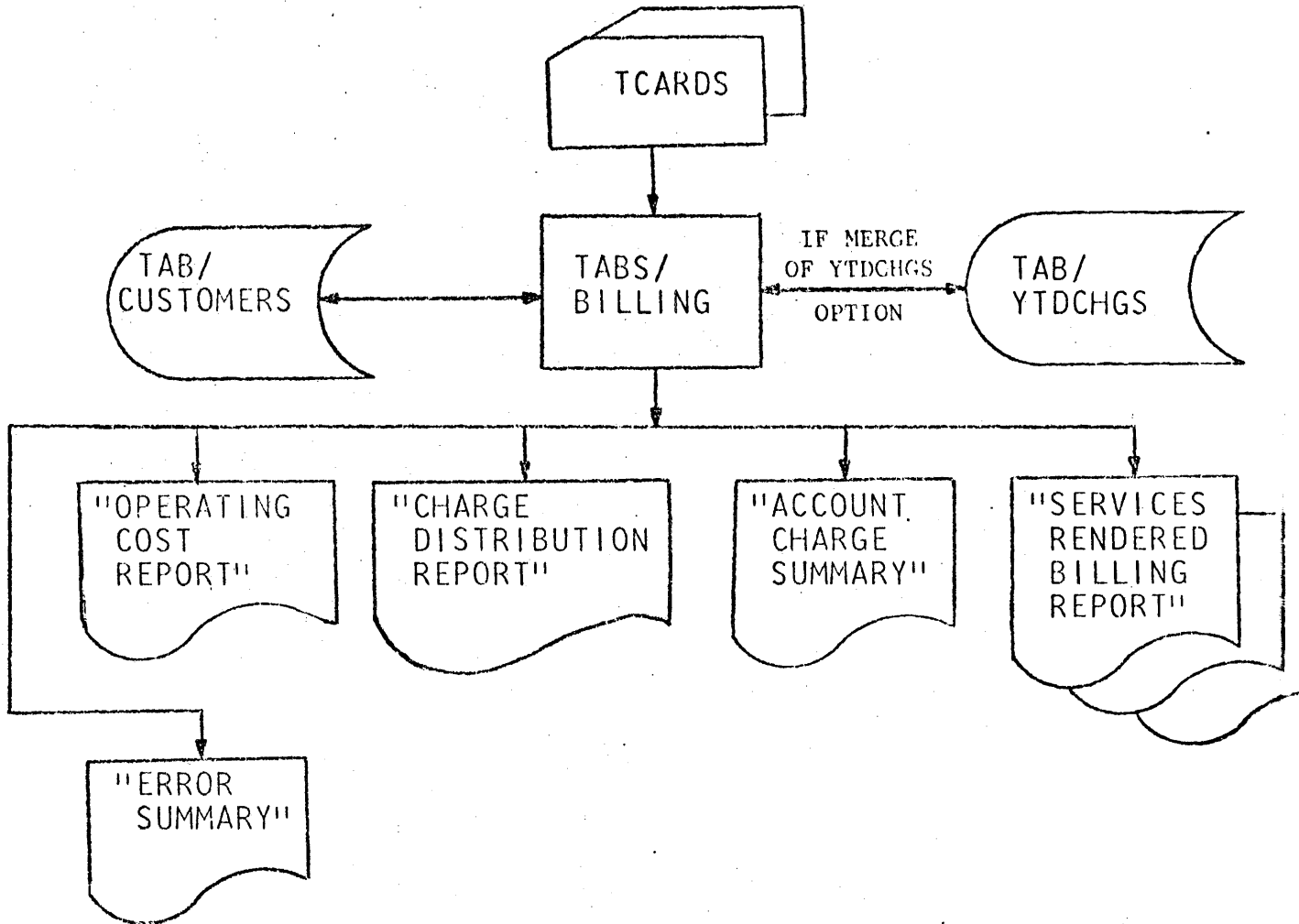


Figure 13.1 TABS/BILLING Flowchart

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NOV. 15, 1978

OPERATING COST REPORT

FROM SEP. 11, 1978 THRU S

UNIT OR CHARGE #	COST	HOURS	DESCRIPTION
** MACHINE COSTS **			
ELAP	2,333.00	0	
	-----	-	
SUBTOTAL	2,333.00	0	
MEM	3,000.00	0	
	-----	-	
SUBTOTAL	3,000.00	0	
PROC	2,000.00	0	
	-----	-	
SUBTOTAL	2,000.00	0	
TOTAL	7,333.00		
** HARDWARE COSTS **			
CRA	262.00	0	
	-----	-	
SUBTOTAL	262.00	0	
DPA	1,630.00	0	
	-----	-	
SUBTOTAL	1,630.00	0	
DPB	500.00	0	
	-----	-	
SUBTOTAL	500.00	0	
DPC	500.00	0	
	-----	-	
SUBTOTAL	500.00	0	
DPD	500.00	0	
	-----	-	
SUBTOTAL	500.00	0	
DPE	500.00	0	
	-----	-	
SUBTOTAL	500.00	0	
DPF	500.00	0	
	-----	-	
SUBTOTAL	500.00	0	
LPA	1,273.00	300	
	-----	---	
SUBTOTAL	1,273.00	300	
MTA	520.00	0	
	-----	-	
SUBTOTAL	520.00	0	

Figure 13.2.1 Operating Cost Report

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NOV. 15, 1978 OPERATING COST REPORT

UNIT OR CHARGE #	COST	HOURS	DESCRIPTION
MTB	520.00	0	
	-----	-	
SUBTOTAL	520.00	0	
QUEUE	10.00	0	
	-----	-	
SUBTOTAL	10.00	0	
REMOTE	814.00	0	
	-----	-	
SUBTOTAL	814.00	0	
TOTAL	7,529.00		

** DISTRIBUTED COSTS **

SYSCHG

TOTAL COSTS 14,862.00

Figure 13.2.2 Operating Cost Report (Continued)

NOV. 15, 1978

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

FROM SEP. 11, 1978 THRU SEP. 14, 1978

TYPE	CHARGE UNITS	-----ASSIGNED COST----- AMOUNT PERCENT	-----UNASSIGNED COST----- AMOUNT PERCENT	ACTUAL COST	RATE
** MACHINE COSTS **					
NEM	162,240	3,000.00 100.0	0.00 0.0	3,000.00	0.01849112
ELAP	1,273,859	2,333.00 100.0	0.00 0.0	2,333.00	0.00183144
PRGC	99,485	2,000.00 100.0	0.00 0.0	2,000.00	0.02010333
CHARGES FOR THIS CATEGORY:		7,333.00 100.0	0.00 0.0	7,333.00	
** HARDWARE COSTS **					
CRA	223	262.00 100.0	0.00 0.0	262.00	1.17488789
DPA	139,485	1,630.00 100.0	0.00 0.0	1,630.00	0.01168584
DPB	24,236	500.00 100.0	0.00 0.0	500.00	0.02063047
DPC	78,894	500.00 100.0	0.00 0.0	500.00	0.00633762
DPD	5,597	500.00 100.0	0.00 0.0	500.00	0.00933357
DPE	11,894	500.00 100.0	0.00 0.0	500.00	0.04283800
DPF	104,477	500.00 100.0	0.00 0.0	500.00	0.00478574
LPA	11,880	14.00 1.1	1,259.00 98.9	1,273.00	0.00117470
MTA	8,533	520.00 100.0	0.00 0.0	520.00	0.06093988
MYB	717	520.00 100.0	0.00 0.0	520.00	0.72524407
QUEUE	8,077	10.00 100.0	0.00 0.0	10.00	0.00123908
RENUTE	4,914	814.00 100.0	0.00 0.0	814.00	0.16564917
CHARGES FOR THIS CATEGORY:		6,270.00 83.3	1,259.00 16.7	7,529.00	
** DISTRIBUTED COSTS **					
OVERALL STATS	820,590				0.00580376
SYSCHG		4,762.51 100.0	0.00 0.0	4,762.51	
CHARGES FOR THIS CATEGORY:		4,762.51 100.0	0.00 0.0	4,762.51	

OVERALL CHARGES:		13,603.00 91.5	1,259.00 8.5	14,862.00	

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Figure 13.4 Charge Distribution Report

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NOV. 15, 1978
 PRELIMINARY AUDIT

SERVICES RENDERED
 FROM SEP. 11, 1978 THRU SEP. 14, 1978

CHARGE # 0924000

SYSTEM/LOAD-DUMP

23 EXECUTES

TYPE	CHARGE UNITS	COST	PERCENT
** MACHINE COSTS **			
MEM	262	4.84	0.8
OVHD	20,620	157.44	26.2
PROC	887	17.83	3.0
		-----	----
TOTAL		180.11	30.0
** HARDWARE COSTS **			
DPA	3,402	39.76	6.6
DPC	18	0.11	0.0
DPD	148	13.22	2.2
DPE	444	18.66	3.1
DPF	7	0.03	0.0
MTA	4,768	290.56	48.4
MTB	80	58.02	9.7
		-----	----
TOTAL		420.36	70.0
TOTAL CHARGES ** AUDIT ONLY **		\$600.47	

Figure 13.5.1 Preliminary Audit

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NOV. 15, 1978
 PRELIMINARY AUDIT

SERVICES RENDERED
 FROM SEP. 11, 1978 THRU SEP. 14, 1978

CHARGE # 0912000 CANDE

1 EXECUTE

TYPE	CHARGE UNITS	COST	PERCENT
** MACHINE COSTS **			
MEM	5,028	92.97	11.3
PROC	4,785	96.19	11.7
TOTAL		189.16	22.9
** HARDWARE COSTS **			
DPA	9,330	109.03	13.2
DPC	605	3.83	0.5
DPO	425	37.97	4.6
DPE	4,953	208.21	25.2
DPF	110	0.53	0.1
QUEUE	4	0.00	0.0
REMOTE	1,667	276.14	33.5
TOTAL		635.71	77.1
TOTAL CHARGES ** AUDIT ONLY **		\$824.87	

Figure 13.5.2 Preliminary Audit (continued)

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MAY 31, 1977		ACCOUNT CHARGE SUMMARY		FROM MAY 1, 1977	
CHARGE #	ACCOUNT	AMOUNT	PERCENT		
0000005	SCIENTIFIC CONSULTING CORP.	2,483.71	4.39		
0000123	ASSOCIATED CONTRACTORS	51,507.96	91.14		
0654123	SYSTEMS MANAGEMENT GROUP	455.49	0.81		
0999999	INTERNATIONAL PLASTIC PRODUCTS	2,068.34	3.66		
TOTAL		56,515.48	100.00		

Figure 13.6 Account Job Summary

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EXECUTING FROM A USER PACK

The EDP-TABS package is designed to run off the system pack on which the log files were created. All the TABS/= programs must reside on this system pack. They cannot run from another pack because of MCP control through the "LG" SPU command.

The permanent TABS/= data files should also reside on the system disk; however, for security reasons, the user might want these files to reside on another pack (for example, one named MYPACK). To do this, the user must

1. Make sure all TABS/= programs are on the system disk.
2. File equate TABS/LOGOUT so the file CUSTOMERS has the appropriate pack-id.

```
?MO TABS/LOGOUT FI CUSTOMERS PID MYPACK;
```

3. Make sure all TABS/= files are on the pack called MYPACK.
4. Execute TABS/LOGOUT in the normal manner, either with a "LG" or an "EX".

It is important that the user does not attempt to file equate any of the other permanent data files in any of the programs, because that will not work. The EDP-TABS package is designed so that TABS/LOGOUT determines the pack-id of the file TAB/CUSTOMERS, and forces all the programs to use the data files on that pack. Some temporary work files for each program will still be on the system disk. However, all files discussed in section 1 under TABS PACKAGE will be on the same pack.

TABS/UPDATE will always create files on the system pack; however, when it updates existing files, it will use the user specified pack determined by TABS/LOGOUT.

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Since TABS/LOGOUT does not need to be executed every day and log files are removeable, the user might wish to copy all the LOG/= files to another pack, for example, one labelled LOGPACK. This will work as long as:

1. The system pack is the pack on which these log files were created.
2. The log files have the same multi-file-id and file-id they had on the system pack.
3. The user modifies TABS/LOGOUT by:

 ?MO TABS/LOGOUT FI LOGFILE PID LOGPACK;

4. All the log files are present on the LOGPACK.

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RECOVERY AND RESTART CAPABILITIES

ABNORMAL EOI

Because EDP-TABS accumulates monthly statistics in its permanent data files, multiple processing of a single day's log information will result in inaccurate overbilling to system users. Thus, an execution which does not complete successfully should not be reexecuted without first insuring the integrity of the TAB/= permanent data files.

This can be accomplished in two ways.

ABNORMAL EOI RESTART (SW8=1)

Reexecution of the entire unsuccessful run, reproducing all requested reports.

- a. If EDP-TABS has been executed with the SAVE option on, then a tape was made of the TAB/= permanent data files at the end of TABS' last successful execution. After these files replace those which are potentially corrupt, the initial execute statement may be reentered and the entire job is started again.

Steps:

1. "REMOVE TAB/=;" (or "REMOVE MYPACK/TAB/=;" if executing from a user pack)
2. "COPY =/= FROM TABSFILE;" (or "COPY =/= FROM TABSFILE TO MYPACK (KIND = DISK);" if executing from a user pack)
3. "EX TABS/LOGOUT;"

- b. If the unsuccessful run was the first TABS execution during a month and the days being processed were produced at the beginning of the month, TABS/UPDATE may be reexecuted with the CREATE option set. This will reinitialize the TAB/= permanent data files.

Steps:

1. "REMOVE TAB/=;" (or "REMOVE MYPACK/TAB/=;" if executing from a user pack)

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2. "EX TABS/UPDATE SW8=1;"
3. If executing from a user pack, move the TAB/= permanent data files to MYPACK.
4. "EX TABS/LOGOUT;"

Note: Both a) and b) require the rerun of the entire job, possibly reprocessing many days' information.

ABNORMAL EOJ RECOVERY (SW8=1)

Recovery from the unsuccessful execution, beginning at the day and program which was in process at the time of EDP-TAB's abnormal EOJ.

"EX TABS/LOGOUT; SW8=1;"

Some operator intervention may be required to determine which programs should be executed during the recovery pass. The displayed message takes the form:

```
% TABS/LOGOUT = <job #> DO YOU WANT TO EXECUTE TABS/<program>?
% TABS/LOGOUT = <job #> ENTER YES OR NO.
```

The operator should respond with:

```
<job #>AX YES (if the reports generated by that program have not yet
              been produced) or
<job #>AX NO (if those reports have already been produced)
```

In these situations, inadvertant duplication of reports is harmless.

Note: Recovery from a coldstart restart or recovery run which ended in an abnormal manner is also possible provided TABS/LOGOUT has completed its work before the abnormal EOJ. In other words, an unsuccessful coldstart restart or recovery run may be recovered by executing TABS/LOGOUT SW8=1 if in the unsuccessful run, TABS/REPORTGEN had gone to BOT.

EXPLANATION OF ABNORMAL EOJ RECOVERY IMPLEMENTATION

Of the seven permanent data files, only two (TAB/CUSTOMERS and TAB/PERIPH) contain month-to-date statistics. Of the nine daily programs, only four (TABS/LOGOUT, TABS/REPORTGEN, TABS/MIX, and TABS/HDWR) alter files and totals to such an extent that duplicate execution will produce erroneous information.

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- | | | |
|----|----------------|---------------|
| 1. | TABS/LOGOUT | data-altering |
| 2. | TABS/REPORTGEN | data-altering |
| 3. | TABS/ACCTS | |
| 4. | TABS/MIX | data-altering |
| 5. | TABS/SUM | |
| 6. | TABS/HDWR | data-altering |
| 7. | TABS/EXEC | |
| 8. | TABS/ERR | |
| 9. | TABS/DMS | |

Figure 15.1 Sequence of Daily Program Execution.

TABS/LOGOUT remains in the mix for the entire execution sequence but finishes its daily data alterations before calling the other programs.

If TABS/LOGOUT is executed with program switch 8=1, it will check the two permanent data files containing month-to-date statistics to determine which of the data-altering programs have already completed for the day. In no case will these be reexecuted. TABS/LOGOUT does not receive explicit information concerning the nondata-altering programs successful daily execution. However, it does get some information implicitly because of the sequence of daily program execution. For instance, if the data-altering program, TABS/MIX has completed, then the nondata-altering program, TABS/SUM has also completed. But, if TABS/MIX has not completed, the operator will be asked to decide whether or not TABS/SUM should be executed. The method of response was described previously.

Because TABS/LOGOUT and TABS/REPORTGEN do such a large amount of file manipulation on both permanent and temporary data files, if either of them fails to complete successfully, the day in process is completely restarted. Otherwise, processing continues with the report-generating programs.

After recovery is complete, EDP-TABS continues to process log information for subsequent days in the usual fashion.

COLDSTART RESTART AND RECOVERY (SW8=2)

If a system fails, a coldstart of the system disk pack may be necessary. In this case, all MCP options, including LOG, are reinitialized. Logs created after a coldstart are sequenced beginning with number 1. Any logs created before a coldstart, but unprocessed by EDP-TABS, will not be processed unless a coldstart restart-recovery is requested.

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Several situations are described below, along with the appropriate coldstart restart-recovery procedures.

COLDSTART RESTART

- a. Logs created before coldstart but not yet completely processed are unavailable (destroyed during coldstart and not backed up).

Information will be lost. Monthly totals will not reflect this lost data.

Steps:

1. Run TABS/BILLING if desired to obtain precoldstart billing reports and statistics. If the TAB/= permanent data files are not available, TABS/BILLING cannot be executed.

EX TABS/BILLING;

2. Execute TABS/UPDATE with the CREATE option set to reinitialize the TAB/= permanent data files.

EX TABS/UPDATE; SW8=1;

3. Execute TABS/LOGOUT which will begin processing logs created after coldstart.

EX TABS/LOGOUT;

- b) Precoldstart logs are available, but the TAB/= permanent data files are not. This would be the case if the SAVE option was not specified, but logs had been backed up.

Monthly totals will not reflect information not reprocessed for the month.

Steps:

1. Execute TABS/UPDATE with the CREATE option set to reinitialize the TAB/= permanent data files.

EX TABS/UPDATE; SW8=1;

2. Put the precoldstart logs on disk. If complete

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month-to-date statistics are important, be sure to include all logs containing information for the month, even if those logs have already been processed.

3. Invoke restart after coldstart by executing TABS/LOGOUT with the coldstart restart-recovery option set.

EX TABS/LOGOUT; SW8=2;

EDP-TABS will display:

```
%TABS/LOGOUT = <job #>COLDSTART RESTART REQUESTED.
PLEASE SPECIFY LOG NUMBERS CREATED BEFORE COLDSTART TO
BE PROCESSED BY EDP-TABS.
%TABS/LOGOUT = <job #>ENTER <#> THRU <#> OR BLANKS
IF COLDSTART RESTART IS NOT DESIRED.
```

The operator should enter the smallest and largest log numbers to be processed by TABS during coldstart restart. Missing logs, other than the first, will not affect the restart, but will later require operator intervention in order to skip.

Examples:

```
<job #>AX 5 THRU 10
<job #>AX 5 THRU 5
```

EDP-TABS will then display:

```
%TABS/LOGOUT = <job #> PLEASE SPECIFY STARTING DATE TO PROCESS.
%TABS/LOGOUT = <job #> ENTER <MM/DD/YY> OR BLANKS IF ALL DAYS
IN LOG ARE TO BE PROCESSED.
```

The operator should enter the date in process at the time of EDP-TABS' abnormal EOJ. This is included because a log may contain several days worth of information, and reprocessing a day may be undesirable.

If the day entered is not found in the previously specified log, an appropriate error message will be displayed.

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COLDSTART RECOVERY

- a. Precoldstart logs are available as well as the TAB/= permanent data files from the last successful EDP-TABS run. This would be the case if the SAVE option was set and log files were backed up.

All monthly information will remain intact. However, if the saved TAB/= files are not the most recent, or if the coldstart occurred during an EDP-TABS run, duplicate reports may be produced.

Steps:

1. Put all unprocessed precoldstart logs on disk. EDP-TABS will know which log to begin processing.
2. Put the saved TAB/= permanent data files on disk.
3. Specify coldstart restart-recovery option when executing TABS/LOGOUT.

EX TABS/LOGOUT; SWB=2;

EDP-TABS will look for all consecutive precoldstart logs and then display the message:

```
%TABS/LOGOUT = <job #> CONSECUTIVE LOGS NUMBERED <#a> THRU
                <#b> ON DISK. PLEASE VERIFY THAT THESE ARE THE ONLY LOGS
                TO BE PROCESSED DURING COLDSTART RECOVERY.
%TABS/LOGOUT = <job #> ENTER YES TO VERIFY OR <#> TO OVERRIDE
                IF <#b> IS NOT TO BE THE LAST LOG PROCESSED DURING RECOVERY
```

The operator should verify with:

```
<job#> AX YES
or
<job#> AX <#c>
```

<job#> AX <#c> is used to override if another log number exists which is to be the last log processed during coldstart recovery.

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- b. Precoldstart logs are available as well as the TAB/= permanent and temporary data files in the same condition as they were immediately prior to the coldstart. This would be the case if EDP-TABS was executing from a userpack, and the logs were backed up.

The steps involved are identical to those of a) in COLDSTART RECOVERY. The only difference is that EDP-TABS will recover from abnormal EOJ as well as from the coldstart.

After EDP-TABS has completely finished its coldstart restart or recovery, and before it begins processing post coldstart logs and days, it will display:

```
      XTABS/LOGOUT = <job #> PROCESSING OF LOGS CREATED BEFORE COLDSTA  
                   COMPLETE. EDP-TABS WILL NOT REMOVE THEM FROM DISK
```

The operator may remove these logs. EDP-TABS will not remove them regardless of the REMOVE option.

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CONDITIONS REQUIRING OPERATOR ACTION

MISSING PROGRAM

If one of the required programs cannot be found, TABS/LOGOUT will display the following message on the SPO:

```
PROGRAM TABS/<name> NOT ON DISK--  
PLEASE LOAD AND ACCEPT WITH "OK"
```

The operator should load the program and then enter:

```
<job number>AXOK
```

TABS/LOGOUT will then continue in a normal manner.

MISSING LOG

If TABS/LOGOUT cannot find an MCP log file, it will display the message:

```
X TABS/LOGOUT = <job #>  
FILE LOG/#<number> NOT ON DISK--  
LOAD FILE AND ENTER "OK"  
OR ENTER "SKIP" TO SKIP THE FILE
```

The operator has two possible courses of action. If another copy of the log is available, the operator should load the log and then respond with:

```
<job number> AX OK
```

If the log file cannot be located, the operator should respond with:

```
<job number> AX SKIP
```

TABS/LOGOUT will then display:

```
X TABS/LOGOUT = <job #>  
LOG/#<number> WILL BE SKIPPED
```

Whenever possible, however, the operator should try to find a copy of the missing log.

Once the operator decides to skip a missing log file, TABS/LOGOUT will look for the next log file (LOG/#<number+1>). It will ignore all log records until it comes to a Clear/Start entry.

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This insures that the TABS option is set and that the program statistics are accurate. Information on machine usage for the time lost will not be accurate.

BAD FILES

In most cases, TABS will attempt to recover from bad input files. However, since TAB/CUSTOMERS contains essential information, the EDP-TABS programs cannot execute if this file is completely destroyed. In this case the program that discovers the problem will display the following message and go to EOJ.

BAD TAB/CUSTOMERS FILE--PROGRAM ABORTED

The operator should reload the TAB/= files, if another copy is available. If no alternate copies are available, the operator should execute TABS/UPDATE with the CREATE option set to recreate the files. Note that this second method destroys monthly totals.

INCORRECT TIME SEQUENCE

TABS assumes that the date and time set by the operator are correct. Whenever it finds a log record that is not in correct chronological order, it will ignore it. Out-of-sequence Clear/Starts will be included in the "Clear/Start Summary", but they will be flagged as being incorrectly sequenced. TABS does not use this out-of-sequence information for building its reports. Consequently, setting the time backwards means that all statistics gathered during that time period will be lost.

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RECORD FORMATS

The three programs TABS/UPDATE, TABS/BILLING and TABS/ACCTS expect an input card deck labelled TCARDS. The user can file equate the programs so they will expect a disk file instead. For example,

```
?EX TABS/UPDATE FI TCARDS NAME UPDATE/TCARDS DISK;
```

would force TABS/UPDATE to use a disk file named UPDATE/TCARDS for its input file. If the programs will always use a disk file instead of a card file, the user can modify them permanently, for example,

```
?MO TABS/BILLING FI TCARDS NAME BILL/CARDS DISK;
```

The input record formats for TABS/BILLING and TABS/UPDATE are summarized below:

TABS/UPDATE

A. MASTER insertion/change

columns	1-7	charge number
columns	8	program status
columns	9-29	program name
columns	30-33	blank
columns	34-63	description
columns	64-78	programmer

B. CUSTOMERS insertion/change

1.	columns	1-7	charge number
	columns	8	1
	columns	9-58	account name
2.	columns	1-7	charge number
	columns	8	2
	columns	9-33	address 1
	columns	34-58	address 2

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3.	columns	1-7	charge number
	columns	8	3
	columns	9-33	address 3
	columns	34-58	address 4

C. DELETION

columns	1-7	charge number
columns	8	blank
columns	9-29	program name or blanks
columns	30-32	"DEL"

D. YIDCHGS

columns	1-7	charge number
---------	-----	---------------

E. CONTROL

columns	1	"\$"
columns	2-79	options, free format, separated by commas or blanks.

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TABS/BILLING

A. CONTROL

columns	1	"1"
columns	2-7	option

B. REPORTS

columns	1-7	"REPORTS"
columns	8-19	free format, separated by commas or blanks.

C. MASK

columns	1-7	charge number
columns	8-11	"MASK"

D. DISTRIBUTED CHARGE

columns	1-7	charge number
columns	8-11	"DIST"

E. SPECIAL CHARGE

columns	1-7	charge number
columns	8-11	"SPEC"
columns	12-19	cost
columns	20-69	description

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E. UNIT CHARGE

columns	1-6	name
columns	7	blank
columns	8-15	cost
columns	16-19	hours
columns	20-69	description

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