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PRODUCT SPECIFICATION

| REV LTR | REVISION ISSUE DATE | APPROVED BY | REVISIONS |
|---------|---------------------|-------------|--|
| B | 1/25/79 | <i>Hale</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. |
| C | 11/21/79 | <i>Hale</i> | <p>Changes for MARK 9.0 Release</p> <ul style="list-style-type: none"> 2-1 Rewrote "The 9.0 release of EDP.TABS" paragraph. 3-1 Added Switch Setting 4. Updated "operator must run" paragraph. Added "The UPDATE option" paragraph. 3-2 Added CHANGE section. 3-3 Updated "Control options" paragraph. Updated "Of the AUTO BILL" paragraph. Deleted "If Switch 5" paragraph. 3-7 Added PERIOD section. 4-1 Added "If TAB/CUSTOMERS was created" paragraph and message. 4-3 Added "TABS/LOGOUT file equates" paragraph and message. |
| D | 2/23/81 | <i>Hale</i> | <p>Changes for MARK 10.0 Release</p> <ul style="list-style-type: none"> 2-1 Updated "The 9.0 and 10.0 release" paragraph. 3-1 Added number "5" Switch Setting. 4-2 Added "In the 10.0 release of EDP.TABS" paragraph. 9-1 Added "In addition to providing statistics" paragraph. 13-2 Updated "Physical I/O's are not available" paragraph. 13-4 Updated "Overall statistics are given" paragraph. Updated "Services Rendered Billing Reports" section. 13-5 Added "Billing Table Based on HDWR option". 13-14 Replace 13.5.1 and 13.5.2 diagram with a new diagram. 15-7 Added "C" Coldstart Recovery. |

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 B1800/B1700 EDP-TABS
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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 (LOG/#<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 ensure 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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TABS 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/DAILYPRCG
TAB/ERRINFO
TAB/DMS

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

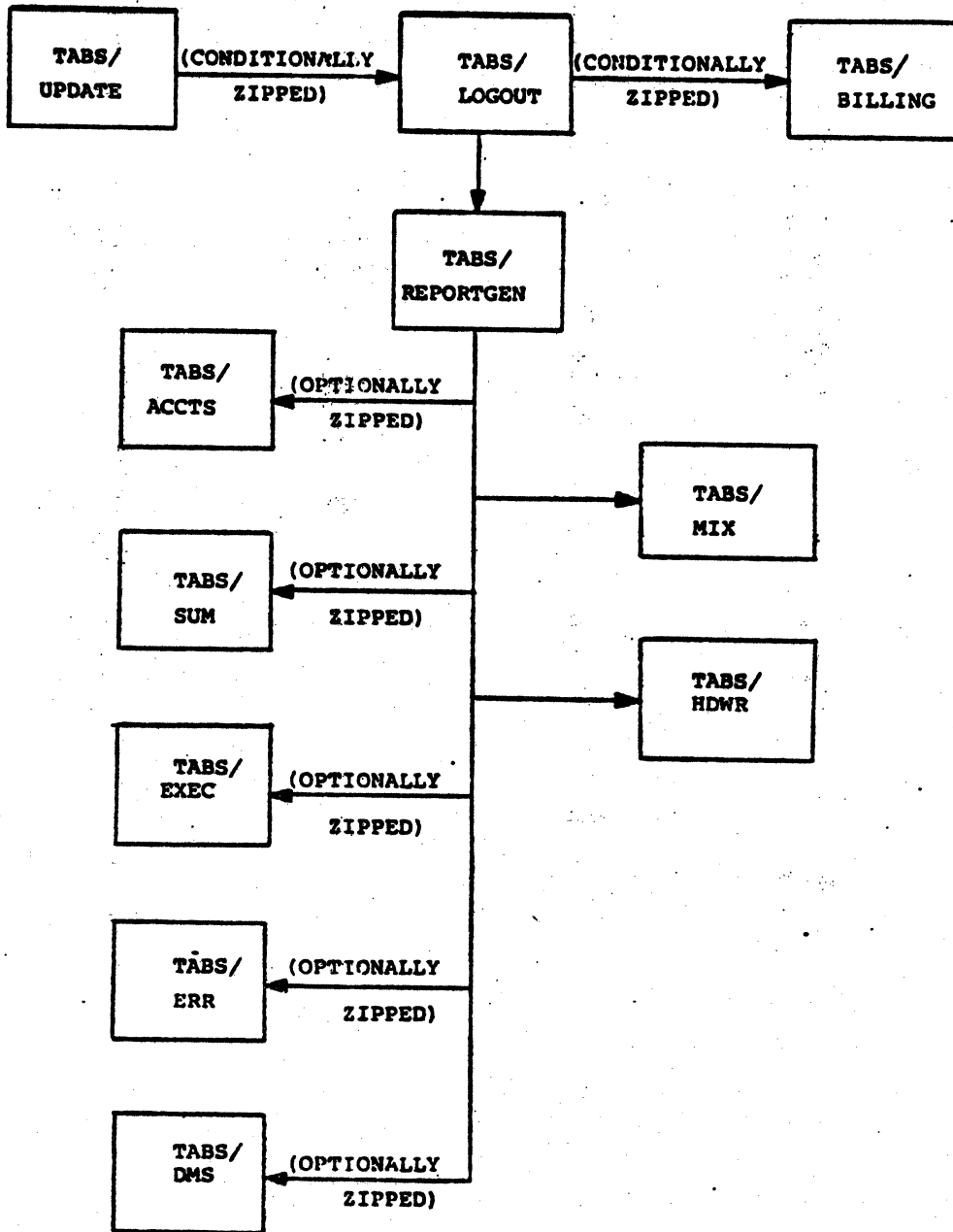


Figure 1.1 TABS programs

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OPERATING INSTRUCTIONS

SETTING UP THE SYSTEM FOR TABS

The 9.0 and 10.0 release of EDP.TABS will not run with files created prior to the 8.0 release. Before files created with the 8.0 release can be used, TABS/UPDATE must be run with SW8=0 or SW8=3.

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.

Prior to the 10.0 release of EDP.TABS, the LOG 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.

In the 10.0 System release, the date and time may be reset at any time. The time/date for all activity between the last clearstart and time/date reset, will be adjusted relative to the time/date reset. No adjustment in times will be made if a time/date reset is not encountered after 500 log entries since clearstart.

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 TABS 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/LOGOUT, 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 |
| 4 | Change charge number information |
| 5 | Update files after Coldstart |

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, with the UPDATE option, or change other information, with the CHANGE option.

The coldstart update option (SW8=5) should only be used when all TAB/= files are present and the logfiles are not present after colostart. (see section C under COLDSTART/RECOVERY).

The UPDATE option will automatically convert an 8.0 TAB/CUSTOMERS file to be compatible with the 9.0 released TABS software.

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.

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MASTER

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

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

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: CDDDXXX; 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.

CHANGE

Columns 1-7 contain the 7-digit charge number that is to be charged. Column 8 must be blank. Columns 9-11 must contain "CHG". Columns 12-18 contain the correct 7-digit charge number.

Note: Both charge numbers must be present in the permanent data files TAB/MASTER and TAB/CUSTOMERS for the change to occur. Otherwise, ADD or DELETE should be used.

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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 and PERIOD options, 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 final entry in the statement.

Of the AUTO BILL, BILL, and NO BILL options, only one may be specified. The SW 5 and ORDER options are also mutually exclusive.

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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```

      |-----| , <-----|
      |     v     |     |
--> $ -----/1\ REPORT --- <report name> ----- ; ---#
    |
    | /1\ PERIOD --- <month> --- <up to five dates> ---|
    |-----| , <-----|
    | /1\-----> SAVE ----->|
    |     I_ NO _I|
    | /1\-----> LGST ----->|
    |     I_ NO _I|
    | /1\-----> REMOVE ----->|
    |     I_ NO _I|
    | /1\-----> MASK <7 mask digits> ----->|
    | /1\-----> SYSCHG <7 digits> ----->|
    | /1\-----> PAGE <2-digit number> ----->|
    | /1\-----> HCWR <hardware type> ----->|
    | /1\-----> SW <switch number><switch value>-->|
    | /1\-----> ORDER <order type> ----->|
    | /1\-----> BILL ----->|
    |           I__ AUTO BILL__I|
    |           I__ NO BILL ___I|

```

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 ON.</p> |
| REMOVE | <p>Log files no longer needed are removed after TABS/LOGOUT has extracted the necessary information. The default is ON.</p> |

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MASK <7 digits>

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

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 C.

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.

PERIOD

The PERIOD option allows the user to specify accumulation periods for billing and reports.

By default, the first day of each month is regarded as the beginning of the accumulation period for billing and reports. The option is used by specifying the month (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, or DEC) and up to five dates in that month. The following examples show valid uses of this option.

Examples:

\$PERIOD MAY 6;

\$PERIOD FEB 5 JAN 3 6 9, MAR 2,
 SEP 5 6 7 9 15;

\$PERIOD JUN 22, 24, 29, 30, MAY 1,
 SEP 01

Each date is verified; for example, FEB 30 is invalid and flagged as such.

The entire string of dates must be specified each time additions or changes are made to any period. For example, if JAN 20 21 is the specified period, and the user wishes to add January 22nd to that period, the string JAN 20 21 22 must be entered. The user cannot update the string with the command \$PERIOD JAN 22.

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SUMMARY REPORTS

TAES/UPDATE will produce two reports, depending on what functions have been performed. The "Update Summary" provides a record of all updates made by TAES/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 C, T, 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.

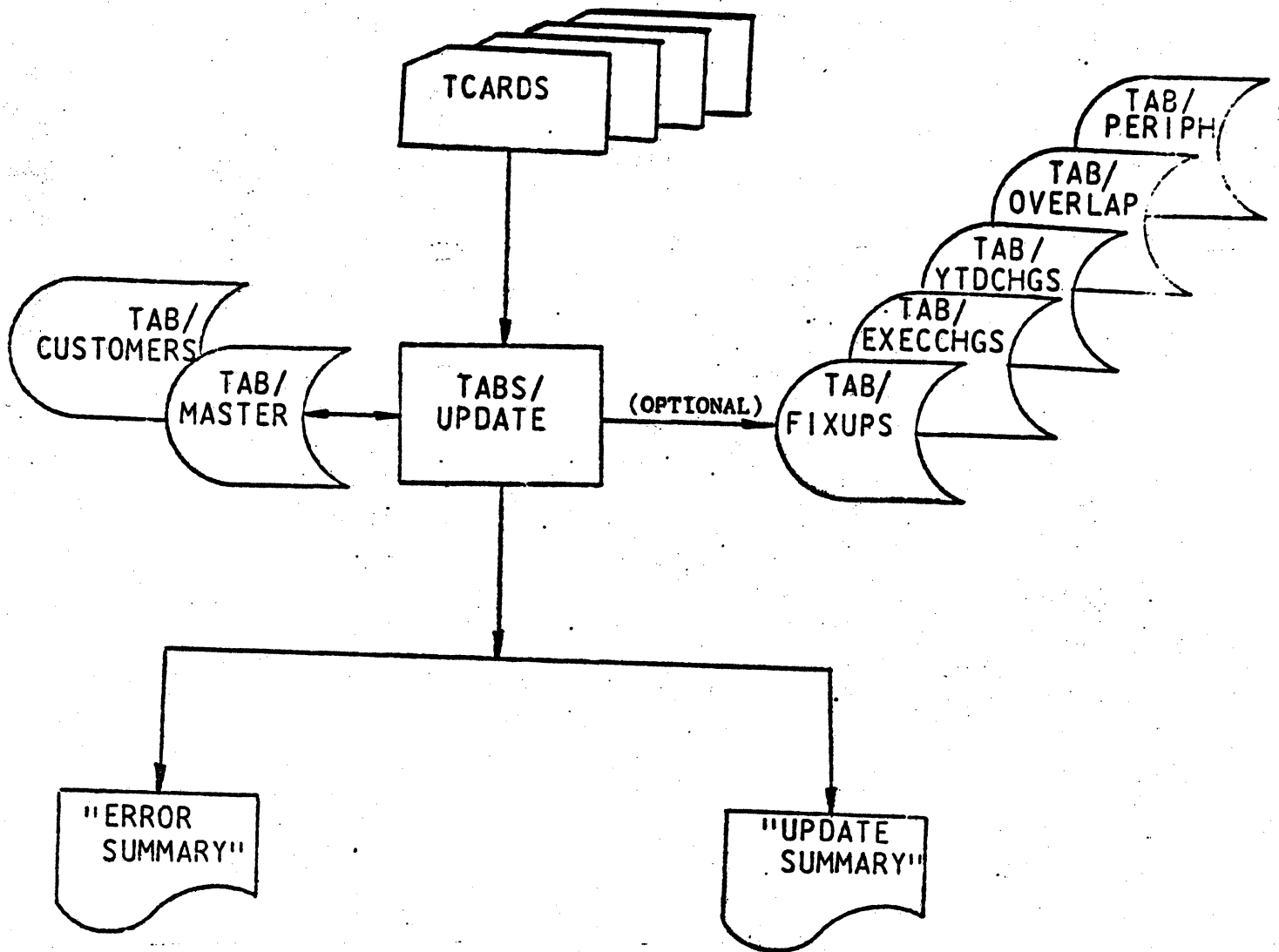


Figure 3.2 TABS/UPDATE Flowchart.

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MAY 31, 1977

UPDATE SUMMARY

| | | | | |
|---------------|--------------|------------------|----------|------------|
| LOST = ON | REMOVE = OFF | BILL = OFF | HOWR = P | SAVE = OFF |
| MASK = 000000 | | SYSCHG = 9999999 | | PAGE = 60 |
| SM1 = 3 | SM2 = 3 | SM3 = 3 | SM4 = 3 | SM5 = 3 |
| | | | | SM6 = 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 | M. SHYTHE |
| 0001956 | PR/LGN75 | MONTHLY PAYROLL | ACCOUNTING |

Figure 3.3 Update Summary

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TABS/LOGGOUT

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/LOGGOUT 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/LOGGOUT searches for all the log files present, and creates 24-hour files for further use by TAES/REPORTGEN.

TABS/LOGGOUT will call TAES/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/LOGGOUT will print one short report as follows instead of the individual reports.

```
TABS/LOGGOUT...
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 ECJ.

If TAB/CUSTOMERS was created prior to the 9.0 release, the TABS/LOGGOUT execution will terminate with the message:

```
"INCORRECT VERSION OF TAB/CUSTOMERS FILE. PLEASE RUN
TABS/UPDATE TO CORRECT THIS"
```

The program then goes to ECJ.

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>
```

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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:

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

TABS/LOGOUT handles only complete days which may be reached in mic-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.

In the 10.0 release of EDP.TABS, the time/date of all activity, from CLEARSTART to time/date reset, will be adjusted (in the logfiles) to reflect more accurate times on the reports. If several CLEARSTARTS occur before the time/date reset is encountered, only the times of activities since the last

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CLEARSTART will be adjusted. If a time/date reset is not encountered after 500 log entries since clearstart, no adjustments will be made.

| 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 EOL. 2 = Restart or recover TABS package following COLDCSTART. |
| 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)

So that backup print files of all the report-generating programs may be distinguished more easily, TABS/LOGOUT file equates each programs line file with <program name>/<report date> as it calls each one. In order to utilize this feature, and thereby generate unique, meaningful report labels, the user may modify each programs LINE file to be a user-named file (U.N).

EXAMPLE: ?NO TABS/MIX; FI LINE U.N;

will produce an output file named MIX/MMDDYY.

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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 | 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)

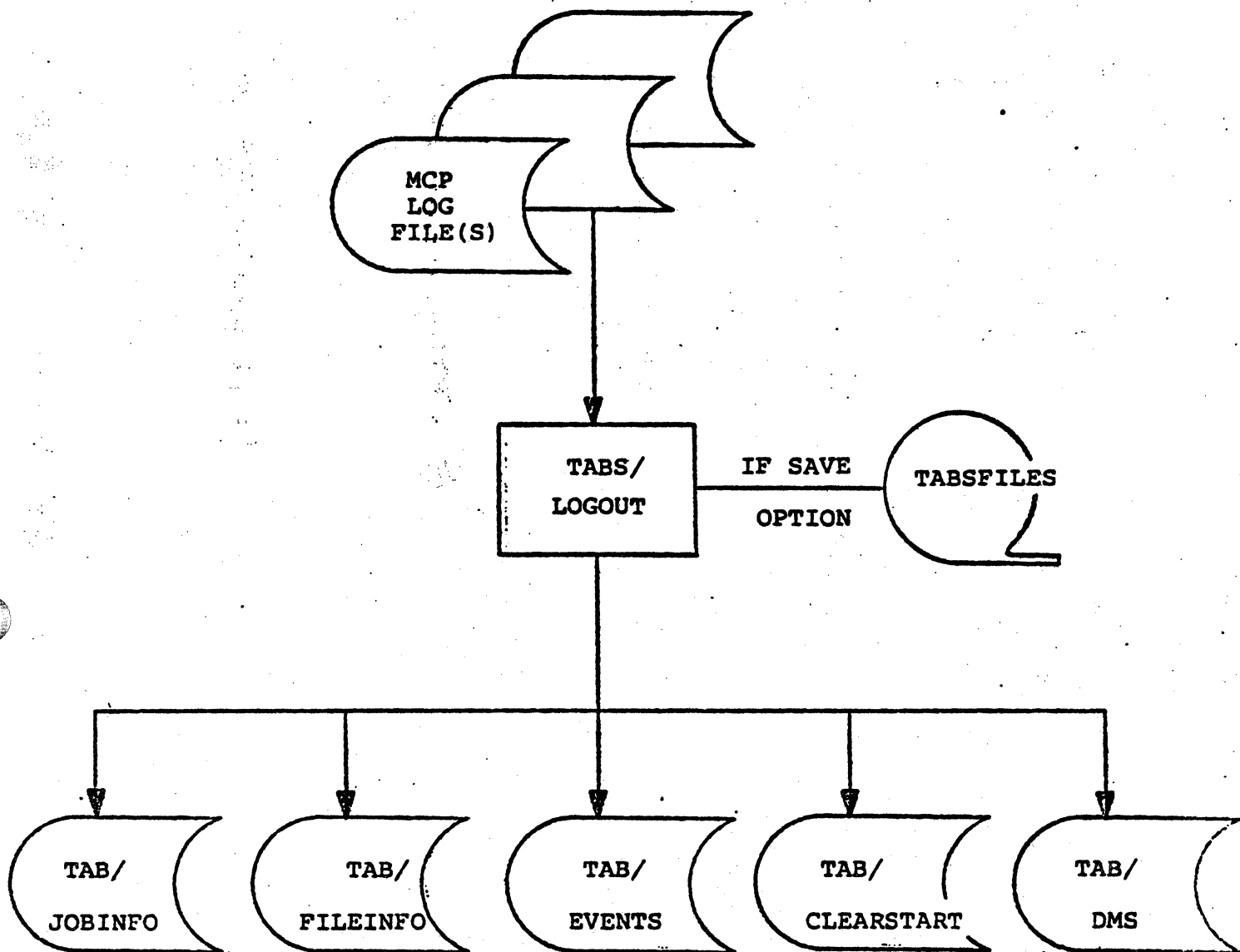


Figure 4.3 TABS/LOGOUT Flowchart

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TABS/REPCRIGEN

This program takes the information extracted from the log by TABS/LOGOUT, and sets up the files needed by the seven report programs. TABS/REPCRIGEN 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.

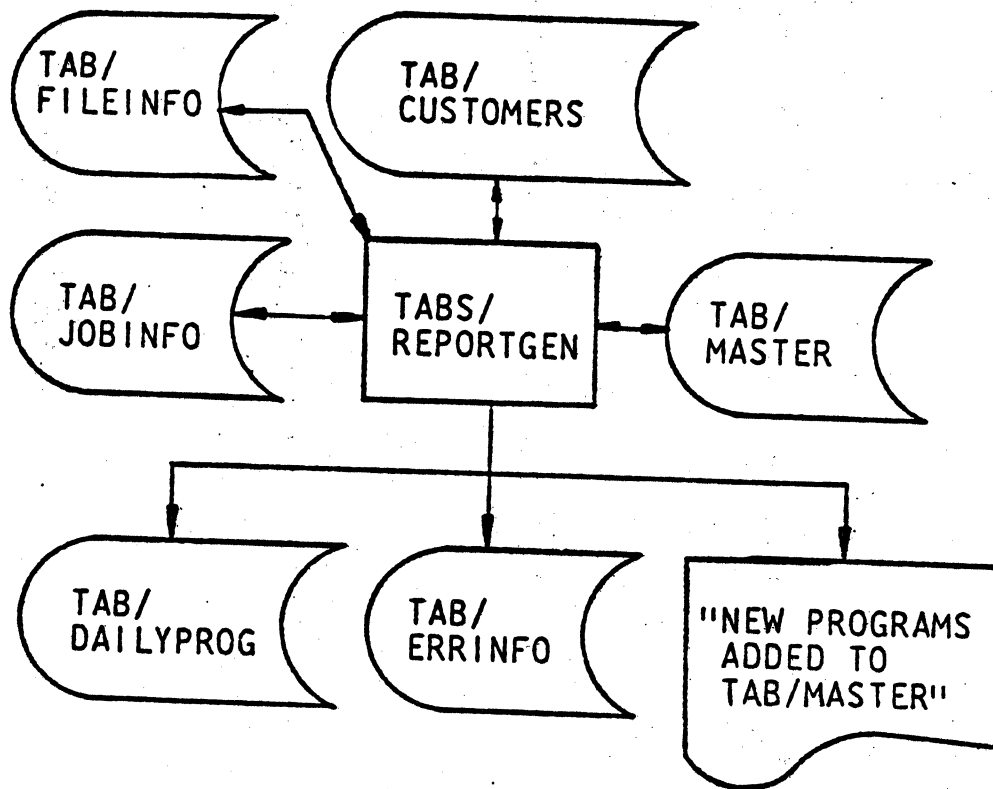


Figure 5.1 Flowchart of TABS/REPORTGEN

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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)/MANSRCD | *** NEW CHARGE NUMBER *** |
| 9999999 | (MEYERS)/POGL0 | |
| 9999999 | (MEYERS)/SCHEDSRCD | |
| 9999999 | COBGL | |
| 9999999 | DISKHAP/UTILITY | |
| 9999999 | NCS16V | |
| 9999999 | NOL | |
| 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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SANTA BARBARA PLANT

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P.S. 2219 0094 (C)

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)/MANSRC0 | *** NEW CHARGE NUMBER *** |
| 9999999 | (MEYERS)/POGL0 | |
| 9999999 | (MEYERS)/SCHEDSRC0 | |
| 9999999 | COBGL | |
| 9999999 | DISKMAP/UTILITY | |
| 9999999 | NCS16V | |
| 9999999 | NOL | |
| 9999999 | RENGTE/LISTER | |
| 9999999 | SORT/VSORT | |
| 9999999 | SYSTEM/DISK.INIT | |
| 9999999 | SYSTEM/LOGOUT | |
| 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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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 COMBINED. 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.

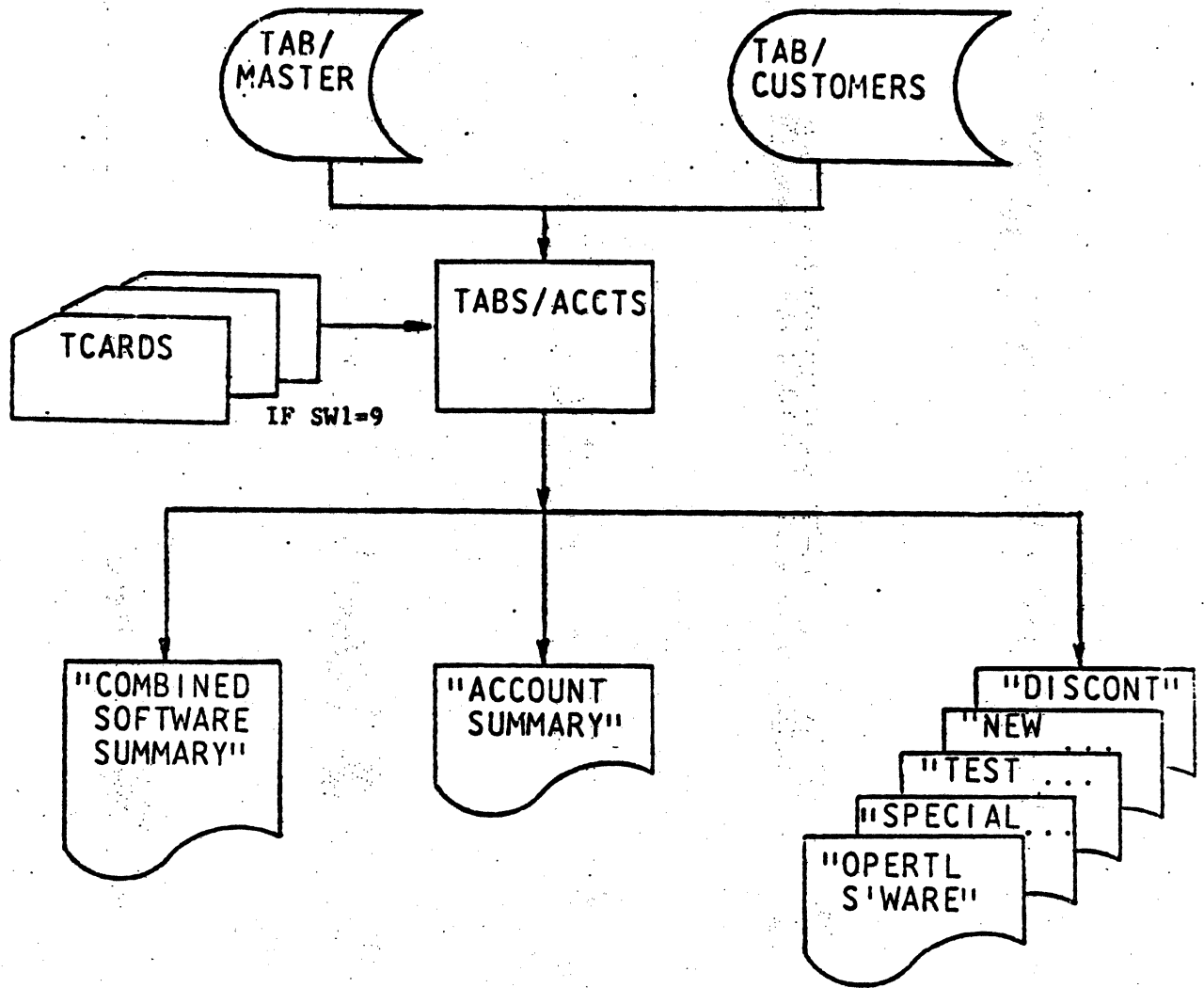


Figure 6.2 TABS/ACCTS Flowchart

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P.S. 2215 0094 (C)

MAY 26, 1977

ACCOUNT SUMMARY

| CHARGE # | OPERATIONAL | TEST | SPECIAL | NEW | DISCONTINUED | TOTAL |
|----------|-------------|------|---------|-----|--------------|-------|
| 0000035 | 3 | 0 | 0 | | | |
| 0000123 | 1 | 0 | 0 | 1 | 0 | 1 |
| 0001956 | 1 | 0 | 0 | 0 | 0 | 1 |
| 0654123 | 0 | 0 | 1 | 0 | 0 | 2 |
| 0999999 | 0 | 0 | 0 | 2 | 0 | 2 |
| 9999999 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | | | 13 | 0 | 13 |
| <hr/> | | | | | | |
| TOTALS | 2 | 0 | 1 | 25 | 0 | 28 |

Figure 6.3 Account Summary

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

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

JUNE 20, 1977

COMBINED SOFTWARE SUMMARY

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

| | | | |
|-----------------------|-------------------|-----------------------------|------------|
| OPERATIONAL SOFTWARE: | PROGRAM | DESCRIPTION | PROGRAMMER |
| | BUILDING/SCHEDULE | SCHEDULES COMPLETIONS DATES | P. ACKER |

CHARGE # 0001954

| | | | |
|---------------|--|-------------|------------|
| NEW SOFTWARE: | PROGRAM | DESCRIPTION | PROGRAMMER |
| | 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 | PROGRAMMER |
| | PR/LGN75 | MONTHLY PAYROLL | ACCOUNTING |

| | | | |
|-------------------|------------|----------------------|------------|
| SPECIAL SOFTWARE: | PROGRAM | DESCRIPTION | PROGRAMMER |
| | COMH/RATES | COMPUTES COMMISSIONS | H. SMYTHE |

CHARGE # 9999999

| | | | |
|---------------|---|-------------|------------|
| NEW SOFTWARE: | PROGRAM | DESCRIPTION | PROGRAMMER |
| | DISK/COPY DISKMAP/UTILITY DMPALL SYSTEM/BUILDTRAIN SYSTEM/LOAD-DUMP SYSTEM/LOGOUT TABS/LOGOUT | | |

Figure 6.4 Combined Software Summary

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TABS/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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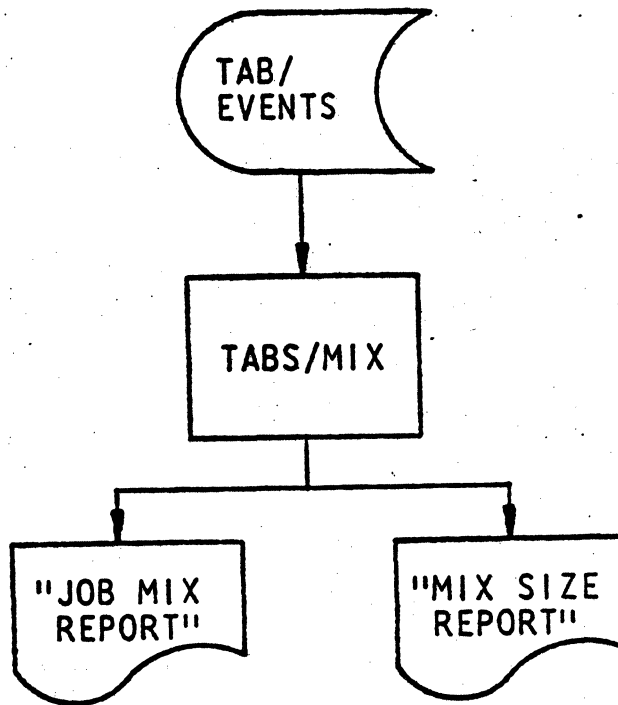


Figure 7.1 TABS/MIX Flowchart

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 P.S. 2219 0094 (C)

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 |
|-------|---------------------------|-----------------|---------------------|-----------------|
| 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 | 9 | 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 | 3 | |
| :30 | 0 | 0 | 3 | |
| :45 | 1 | 1 | 4 | 0:00:00.0 .0 X |

Figure 7.2.1 Job Mix Report

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 SANTA BARBARA PLANT

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

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 | 3 | 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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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 | 2:26:41.8 | 10.2 % | 3:33:34.6 | 4.9 % |
| 7 | 1:41:05.1 | 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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COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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

IAES/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
- GISMC Name
- Micro-MCP Name

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

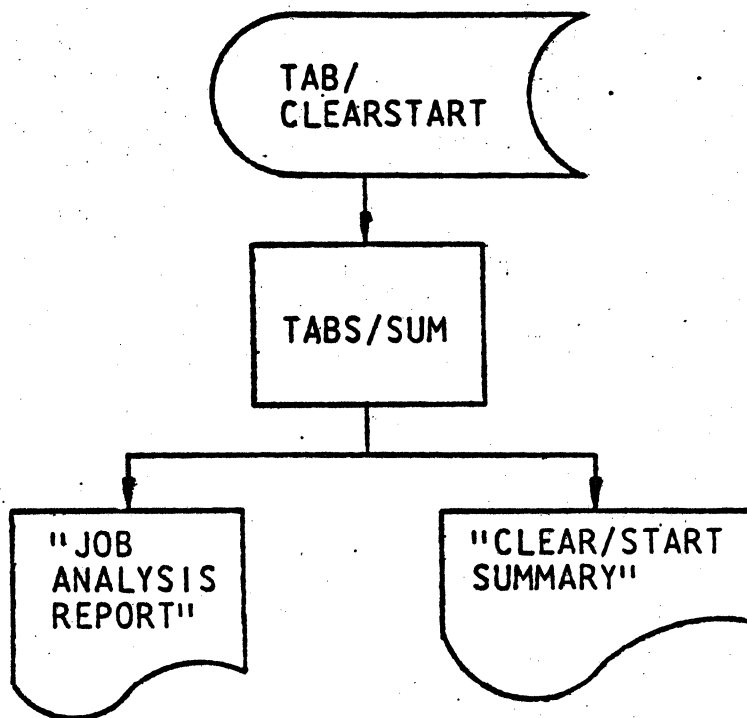


Figure 8.1 TABS/SUM Flowchart

EURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B1800/B1700 EDP-TAES
 P.S. 2219 0094 (D)

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

SEP. 13. 1970

| JOB TYPE | # JOBS | DAILY | | ELAPSED TIME | | # JOBS | MONTH-TO-DATE | | ELAPSED TIME | |
|------------|--------|----------------|--------------|----------------|--------------|--------|---------------|--------|--------------|--------|
| | | PROCESSOR TIME | ELAPSED TIME | PROCESSOR TIME | ELAPSED TIME | | | | | |
| PRODUCTION | 95 | 0:30:56.7 | 21.2X | 22:51:26.5 | 39.8X | 202 | 0:49:52.5 | 10.0X | 7:59:41:36.0 | 49.5X |
| TESTING | 20 | 0:05:14.9 | 3.6X | 0:15:35.5 | 14.4X | 36 | 0:09:42.5 | 3.5X | 3:74:15:05.2 | 24.4X |
| COMPILES | 21 | 0:55:15.2 | 37.8X | 3:32:01.8 | 6.1X | 79 | 2:21:35.8 | 51.2X | 0:36:49.7 | 0.6X |
| UTILITIES | 62 | 0:54:47.2 | 37.5X | 22:49:00.2 | 39.7X | 123 | 1:15:30.7 | 27.3X | 3:91:56:07.2 | 25.5X |
| TOTALS | 198 | 2:26:14.0 | 100.0X | 57:28:04.0 | 100.0X | 440 | 4:36:49.5 | 100.0X | 534:29:36.1 | 100.0X |

DAILY IDLE TIME = 3:53:36.2 16.2X
 MONTH-TO-DATE IDLE TIME = 14:30:10.1 20.1X

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

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 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 10:54:45.5 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 16:06:07.2 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 16:20:02.6 | MCP119.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 16:32:42.3 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 17:17:22.6 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 17:02:25.7 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| ***** | OUT OF SEQUENCE | | | | | |
| 17:38:04.2 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 17:34:35.0 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| ***** | OUT OF SEQUENCE | | | | | |
| 17:52:37.3 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 18:10:34.7 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 18:33:11.8 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 19:25:09.1 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 19:56:27.8 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 19:57:20.7 | MCP118.0/0911 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 20:13:43.9 | MCP118.0/0911 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 22:32:33.3 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |
| 23:42:32.8 | MCP118.0/0904 | VIII.0.0 | SDL/INTERPIM | GISMO/DEBUG | MCP11/MICRO.MCP | 524288 |

18 CLEAR/STARTS TOTAL

Figure 8.3 Clear/Start Summary

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P.S. 2219 0094 (C)

TABS/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/LOGOUT, 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.

In addition to providing statistics on peripheral usage for each hardware device, statistics on memory usage are also given in this report. Static memory and dynamic memory refer respectively to the total static and dynamic memory used for all jobs. Total memory includes the sum of the static and dynamic memory, data dictionary, and FIB memory.

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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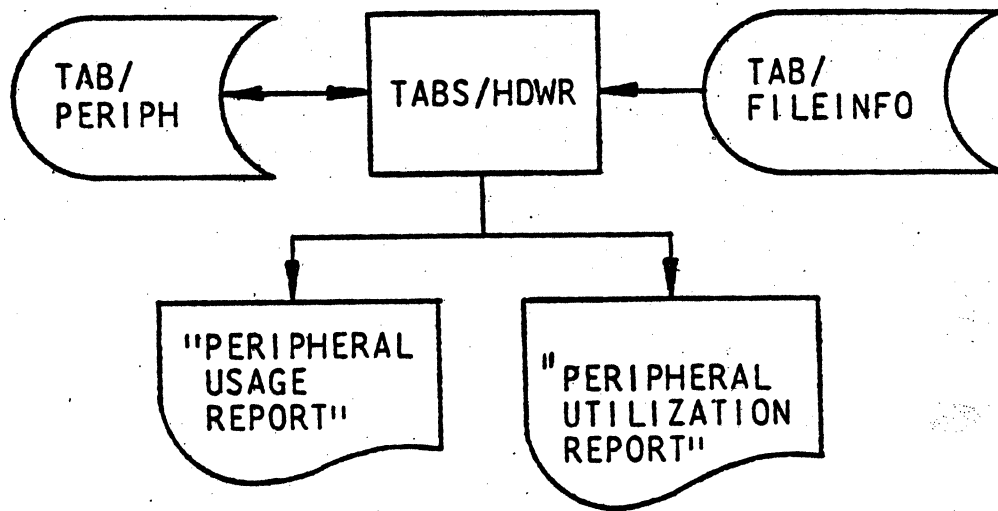


Figure 9.1 TABS/HDWR Flowchart

EURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

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

PERIPHERAL USAGE REPORT

SEP. 13, 1970

| 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 | 1:30:43:58.6 | 152:43:09.3 | 3:33:00:14.5 | 4:36:59:29.9 |
| DPB | 27477 | 3239 | 0 | 1:22:00.6 | 1:22:00.6 | 2:47:49.2 | 2:47:49.2 |
| OPB | 55806 | 21578 | 1 | 11:26:53.4 | 11:59:57.4 | 29:53:54.6 | 31:39:33.3 |
| OPD | 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 | 100906 | 100904 | 0 | 2:45:17.7 | 2:45:17.7 | 4:28:17.0 | 4:28:17.0 |
| MTA | 47120 | 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 | 0:35:50.6 |
| QUEUE | 3386 | -- | 0 | 153:29:19.8 | 153:29:33.5 | 441:08:04.0 | 441:09:18.8 |
| REMOTE | 23419130 | -- | 0 | 39:04:27.8 | 39:05:08.1 | 123:15:57.9 | 123:16:39.8 |

STATIC MEMORY = 1513 K
 DYNAMIC MEMORY = 363 K
 TOTAL MEMORY = 1903 K

Figure 9.2 Peripheral Usage Report

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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

SEP. 13 1978 PERIPHERAL UTILIZATION REPORT

HOURS 0 THRU 6

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

Figure 9.3.1 Peripheral Utilization Report

SEP. 13, 1978 PERIPHERAL UTILIZATION REPORT

HOURS 12 THRU 18

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

HOURS 18 THRU 24

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

Figure 9.3.2 Peripheral Utilization Report (cont.)

EURROUGHS CORPORATION
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 SANTA BARBARA PLANT

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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 Setting | 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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- 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, purch 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
 CNCL - 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.

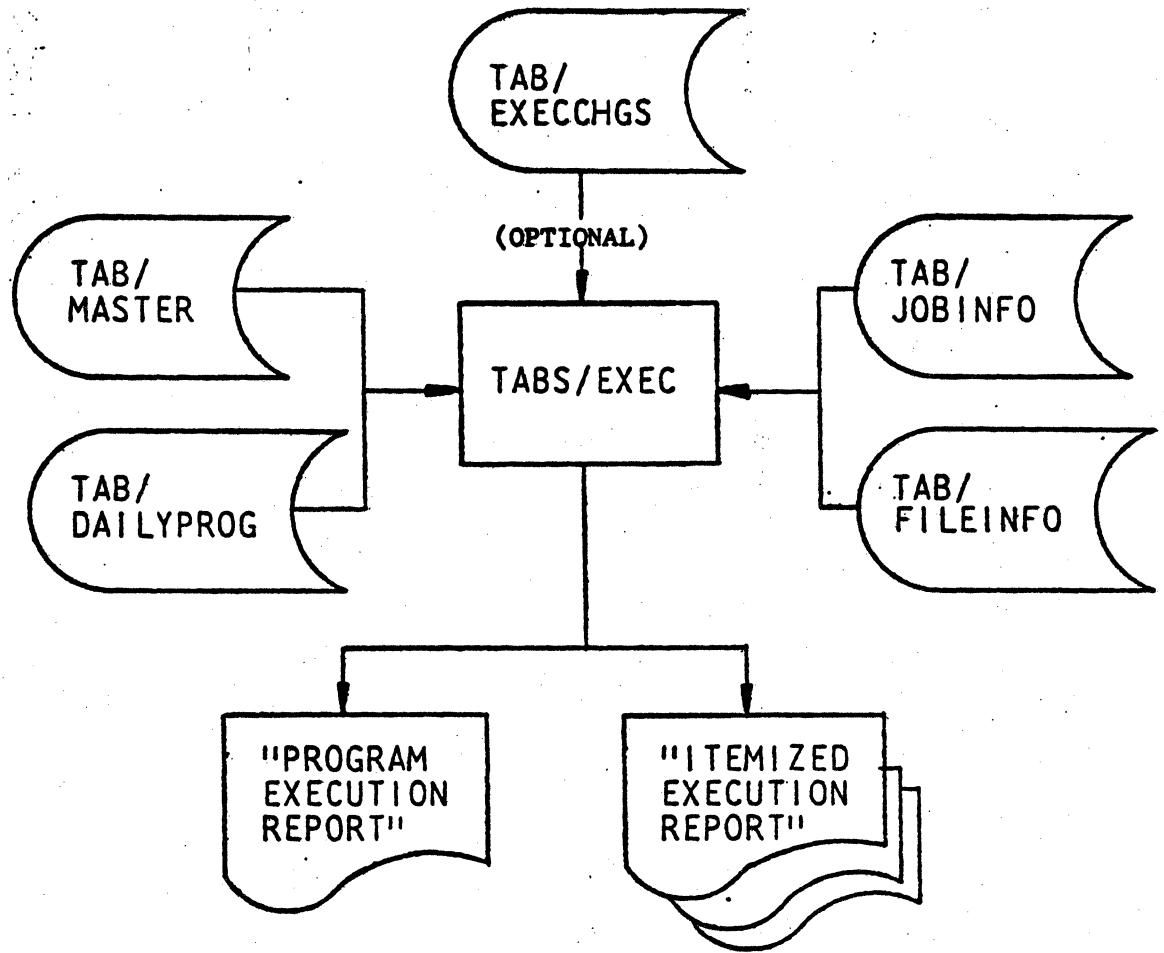


Figure 10.2 TABS/EXEC Flowchart

EURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
B1800/E1700 EDP-TAES
P.S. 2219 0094 (D)

| CHARGE # | PROGRAM | EXECUTES | DAILY PROCESSOR TIME | ELAPSED TIME | EXECUTES | MONTH-TO-DATE PROCESSOR TIME | ELAPSED TIME |
|----------|-------------------|----------|-------------------------|--------------|----------|---------------------------------|--------------|
| 0911000 | SNCS | 20 | 0804:22.0 | 01:35:37.0 | 25 | 0:05:31.3 | 373:25:49.7 |
| 0912000 | CANDE | 8 | 0615:23.4 | 7:37:39.5 | 9 | 0:24:58.6 | 371:53:53.4 |
| 0913000 | BAHBI | 5 | 0600:54.0 | 4:16:09.2 | 6 | 0:01:58.2 | 368:32:23.1 |
| 9999999 | ICS16V | 4 | 0415:08.7 | 3:02:19.0 | 8 | 0:29:26.9 | 367:40:27.1 |
| 0923000 | SYSTEM/BACKUP | 30 | 0607:47.9 | 4:38:08.0 | 83 | 0:11:34.2 | 11:14:03.0 |
| 9999999 | SNCS/MCSL6.0913 | 12 | 0819:20.6 | 5:23:14.2 | 12 | 0:19:20.6 | 5:23:14.2 |
| 9999999 | SNCS | 7 | 0:00:15.8 | 3:28:08.8 | 7 | 0:09:15.8 | 3:28:08.8 |
| 9999999 | SNCS/NCSL6.0914 | 7 | 0802:07.4 | 3:26:45.5 | 7 | 4:02:07.4 | 3:26:45.5 |
| 0929000 | TAPE/ARCHIVE | 4 | 0600:06.3 | 2:10:03.3 | 6 | 0:00:09.0 | 2:50:16.9 |
| 9999999 | MEDIC | 3 | 0600:19.1 | 2:43:02.1 | 3 | 0:00:19.1 | 2:43:02.1 |
| 9969999 | COBOL | 4 | 0815:54.6 | 1:11:33.6 | 20 | 0:50:12.3 | 2:39:53.7 |
| 9999999 | SQUASH/USER-DISK | 0 | 0:00:00.0 | 0:00:00.0 | 1 | 0:04:28.7 | 2:29:47.8 |
| 9999999 | MEMARCH1 | 6 | 0800:09.0 | 1:18:30.6 | 14 | 0:00:16.6 | 2:16:25.4 |
| 0932100 | SOL7.0 | 2 | 0:04:48.7 | 0:15:03.6 | 11 | 0:32:36.3 | 2:06:17.6 |
| 0933000 | MCPII/ANALYZER | 4 | 0614:33.1 | 1:41:18.5 | 4 | 0:14:33.1 | 1:41:18.5 |
| 0933000 | NOL | 9 | 0612:05.7 | 0:49:05.0 | 17 | 0:17:35.9 | 1:21:56.8 |
| 0922000 | DMPALL | 10 | 0600:04.2 | 0:47:18.1 | 25 | 0:00:14.6 | 1:10:24.8 |
| 0929000 | SYSTEM/LOAD-DUMP | 5 | 0602:01.3 | 1:01:53.0 | 5 | 0:02:31.0 | 1:00:54.0 |
| 0929000 | CHECK/LOAD-DUMP | 3 | 0802:05.1 | 0:43:55.9 | 8 | 0:02:49.2 | 1:02:14.5 |
| 0921000 | DISK/COPY | 9 | 0:01:36.0 | 0:44:07.0 | 20 | 0:02:41.7 | 0:59:07.1 |
| 0931000 | COBOL | 2 | 0:07:34.7 | 0:26:59.6 | 7 | 0:18:49.9 | 0:52:12.6 |
| 0932000 | SOL | 3 | 0609:58.9 | 0:34:22.3 | 5 | 0:11:14.8 | 0:38:40.8 |
| 0212124 | SYSTEM/DISK-INIT | 0 | 0:00:00.0 | 0:00:00.0 | 2 | 0:00:48.1 | 0:36:28.3 |
| 9999999 | CHECK/LOAD-DUMP | 1 | 0800:11.9 | 0:36:18.3 | 1 | 0:00:11.9 | 0:36:18.3 |
| 0924000 | SYSTEM/LOAD-DUMP | 40 | 0:00:41.8 | 0:14:45.9 | 23 | 0:01:28.7 | 0:34:22.0 |
| 9999999 | (MEVER)/SCHEDSRCQ | 0 | 0:00:00.0 | 0:00:00.0 | 11 | 0:00:08.9 | 0:26:42.4 |
| 0934000 | DASOL | 0 | 0:00:00.0 | 0:00:00.0 | 6 | 0:00:57.0 | 0:18:43.8 |
| 9999999 | SYSTEM/MAKEUSER | 3 | 0800:13.7 | 0:14:40.0 | 4 | 0:00:48.1 | 0:18:14.1 |
| 9999999 | SORT/VSORT | 4 | 0800:45.1 | 0:14:30.4 | 9 | 0:00:48.6 | 0:18:26.6 |
| 9999999 | NOL | 1 | 0:04:52.6 | 0:14:57.7 | 1 | 0:04:52.6 | 0:14:57.7 |
| 9999999 | DASOL | 0 | 0:00:00.0 | 0:00:00.0 | 6 | 0:04:33.4 | 0:12:48.3 |
| 9999999 | SYSTEM/LOGOUT | 1 | 0600:45.6 | 0:10:38.0 | 1 | 0:00:45.6 | 0:11:16.4 |
| 9999999 | DISK/COPY | 3 | 0:00:11.0 | 0:10:02.8 | 3 | 0:00:11.0 | 0:10:38.0 |
| 9999999 | SYSTEM/LOGOUT | 1 | 0:00:12.2 | 0:08:50.2 | 1 | 0:00:42.2 | 0:08:50.2 |
| 0941000 | DDCTOR | 1 | 0600:01.0 | 0:01:29.9 | 6 | 0:01:54.4 | 0:07:16.3 |
| 9999999 | (MEVER)/POOL0 | 0 | 0600:00.0 | 0:00:00.0 | 3 | 0:00:08.6 | 0:08:54.3 |
| 0926000 | DUMP/ANALYZER | 3 | 0600:21.1 | 0:03:18.9 | 6 | 0:00:51.8 | 0:06:39.1 |
| 0925000 | DISMAP/UTILITY | 2 | 0:06:30.8 | 0:06:31.6 | 2 | 0:00:30.8 | 0:06:31.6 |
| 9999999 | SNCS/MCSL6.0912 | 1 | 0:00:00.2 | 0:04:44.1 | 1 | 0:00:00.2 | 0:04:44.1 |
| 9999999 | (MEVER)/MANSRCQ | 0 | 0600:00.0 | 0:00:00.0 | 3 | 0:00:02.5 | 0:04:32.1 |
| 9999999 | SDRY/CCLLATE | 0 | 0:00:00.0 | 0:00:00.0 | 8 | 0:00:02.7 | 0:03:48.5 |
| 0915000 | SYCON | 1 | 0:00:00.2 | 0:03:00.1 | 1 | 0:00:00.2 | 0:03:00.1 |
| 0964000 | REORGCMOL | 0 | 0:00:00.0 | 0:00:00.0 | 5 | 0:01:24.6 | 0:02:43.9 |
| 9999999 | (MEVER)/SCHEDULES | 0 | 0600:00.0 | 0:00:00.0 | 2 | 0:00:00.6 | 0:02:39.8 |
| 9999999 | DMPALL | 1 | 0:00:00.5 | 0:02:23.1 | 1 | 0:00:00.5 | 0:02:23.1 |
| 9999999 | SYSTEM/ELGGOUT | 2 | 0:00:02.9 | 0:01:08.8 | 4 | 0:00:05.1 | 0:02:18.2 |
| 9999999 | BIGMEDIC | 1 | 0:00:00.4 | 0:02:17.0 | 1 | 0:00:00.4 | 0:02:17.0 |
| 9999999 | DISMAP/UTILITY | 0 | 0:00:00.0 | 0:00:00.0 | 1 | 0:00:03.2 | 0:02:12.7 |
| 0914100 | MEDIC | 1 | 0:00:03.2 | 0:02:16.9 | 1 | 0:00:03.2 | 0:02:10.9 |
| 9999999 | (MEVER)/MANPOWER | 0 | 0600:00.0 | 0:00:00.0 | 1 | 0:00:00.1 | 0:02:07.0 |
| 9999999 | SOL/SA | 0 | 0:00:00.0 | 0:00:00.0 | 1 | 0:00:00.0 | 0:01:24.5 |
| 9919999 | CREATE/JOB CARDS | 0 | 0:00:00.0 | 0:00:00.0 | 1 | 0:00:00.1 | 0:01:23.2 |
| 0932200 | SDL/SSC | 0 | 0:00:00.0 | 0:00:00.0 | 1 | 0:00:00.1 | 0:01:05.4 |

Figure 10.3.1 Program Execution Report

SEP. 13. 1970

PROGRAM EXECUTION REPORT

PAGE 7

| PROGRAM | CHANGE # | -----DAILY----- | | | -----MONTH-TO-DATE----- | | |
|-------------------|----------|-----------------|----------------|--------------|-------------------------|----------------|--------------|
| | | EXECUTES | PROCESSOR TIME | ELAPSED TIME | EXECUTES | PROCESSOR TIME | ELAPSED TIME |
| TEST/LOOPTF | 9999999 | 0 | 0000:00.0 | 0:00:00.0 | 4 | 0:00:04.3 | 0:01:04.8 |
| REORGCCDL | 9999999 | 0 | 0000:00.0 | 0:00:00.0 | 2 | 0:00:33.6 | 0:01:01.1 |
| SYSTEM/BUILDTRAIN | 0920000 | 0 | 0000:00.0 | 0:00:00.0 | 1 | 0:00:15.0 | 0:00:38.4 |
| PROCSPEC/TERM | 9999999 | 0 | 0000:00.0 | 0:00:00.0 | 2 | 0:00:03.7 | 0:00:36.9 |
| SCRIPT/VSDRT | 0925000 | 2 | 0000:07.2 | 0:00:34.0 | 2 | 0:00:07.2 | 0:00:34.0 |
| SYSTEM/SPCLSGOUT | 0928000 | 1 | 0000:03.7 | 0:00:18.9 | 1 | 0:00:03.7 | 0:00:18.9 |
| SYSTEM/DISK-INIT | 9999999 | 0 | 0000:00.0 | 0:00:00.0 | 1 | 0:00:00.0 | 0:00:09.3 |
| SSLOAD/MANCAS | 9999999 | 1 | 0000:00.0 | 0:00:08.8 | 1 | 0:00:00.0 | 0:00:08.8 |
| ----- | | | | | | | |
| TOTALS | | 198 | 2:26:14.0 | 57:20:04.0 | 440 | 4:36:49.5 | 534:29:36.1 |

Figure 10.3.2 Program Execution Report (cont.)

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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

SEP. 13 1978

ITEMIZED EXECUTION REPORT

CHARGE # 0922000

1 DMPALL

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

| | | | |
|----------|--------------------------|-----------------------------|-----|
| 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

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

| | | | |
|----------|-------------------------|------------------------------|-----|
| 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.PRNT/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

| | | |
|------------------------------------|----------------------------|----------------------|
| SOJ DATE = 09/13/78 12:28:01.2 | PROGRAM TYPE = EXECUTE | JOB # = 345 |
| EOJ DATE = 09/13/78 12:28:41.8 | EOJ TYPE = NORMAL | STATIC MEMORY = 9189 |
| COMPILE DATE = 08/01/78 16:22:17.1 | PROCESSOR TIME = 0:00:00.2 | DYNAMIC MEMORY = C |
| PROC. PRIORITY = 4 | ELAPSED TIME = 0:00:39.9 | TOTAL MEMORY = 9684 |
| MEM. PRIORITY = 9 | # FILES = 7 | # CODE OVERLAYS = 5 |
| | | # DATA OVERLAYS = C |

Figure 10.4 Itemized Execution Report

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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

SEP- 13- 1978

ITEMIZED EXECUTION REPORT

CHARGE # 0923000

1 SYSTEM/BACKUP

BOJ DATE = 09/13/78 1:08:26.8
EOJ DATE = 09/13/78 1:14:45.1
COMPILE DATE = 02/27/78 11:14:07.4
PROC. PRIORITY = 12
MEM. PRIORITY = 12

PROGRAM TYPE = EXECUTE
EOJ TYPE = NORMAL
PROCESSOR TIME = 0:00:00.4
ELAPSED TIME = 0:05:18.3
FILES = 4

JOB # = 253
STATIC MEMORY = 3393
DYNAMIC MEMORY = 0
TOTAL MEMORY = 3858
CODE OVERLAYS = 12
DATA OVERLAYS = 0

BACKFILE FILE ID = (SPO)/#98
UNIT = DPA (DISK PACK)
BUFFERS = 2
RECORDS = 28
BLOCKS = 4
ERRORS = 0

OPENED AT 1:09:34.9 IN
CLOSED AT 1:09:42.4 PG
FILE SPACE = 14902
REC LENGTH/BLK FACTOR = 121/7
OPEN TIME = 0:00:07.5
PRINTER BACKUP FILE

LINE FILE ID = LINE
UNIT = LPA (LINE PRINTER)
BUFFERS = 2
RECORDS = 26
BLOCKS = 26
ERRORS = 0

OPENED AT 1:09:37.3 OUT NEW
CLOSED AT 1:09:43.6 RLS
FILE SPACE = 3224
REC LENGTH/BLK FACTOR = 132/1
OPEN TIME = 0:00:06.3

AUTOPRINT FILE ID = AUTOPRINT
UNIT = QUEUE
BUFFERS = 2
RECORDS = 0
ERRORS = 0

OPENED AT 1:09:30.1 IN
CLOSED AT 1:14:44.3 RLS
FILE SPACE = 633
REC LENGTH/BLK FACTOR = 31/1
OPEN TIME = 0:05:14.2

2 SYSTEM/BACKUP

BOJ DATE = 09/13/78 1:53:12.3
EOJ DATE = 09/13/78 1:58:36.8
COMPILE DATE = 02/27/78 11:14:07.4
PROC. PRIORITY = 12
MEM. PRIORITY = 12

PROGRAM TYPE = EXECUTE
EOJ TYPE = NORMAL
PROCESSOR TIME = 0:00:00.0
ELAPSED TIME = 0:05:24.3
FILES = 4

JOB # = 257
STATIC MEMORY = 3393
DYNAMIC MEMORY = 0
TOTAL MEMORY = 3858
CODE OVERLAYS = 9
DATA OVERLAYS = 0

BACKFILE FILE ID = (SPO)/#99
UNIT = DPA (DISK PACK)
BUFFERS = 2
RECORDS = 30
BLOCKS = 5
ERRORS = 0

OPENED AT 1:53:27.1 IN
CLOSED AT 1:53:34.0 PG
FILE SPACE = 14902
REC LENGTH/BLK FACTOR = 121/7
OPEN TIME = 0:00:06.9
PRINTER BACKUP FILE

LINE FILE ID = LINE
UNIT = LPA (LINE PRINTER)
BUFFERS = 2
RECORDS = 28
BLOCKS = 28
ERRORS = 0

OPENED AT 1:53:28.7 OUT NEW
CLOSED AT 1:53:35.4 RLS
FILE SPACE = 3224
REC LENGTH/BLK FACTOR = 132/1
OPEN TIME = 0:00:06.2

AUTOPRINT FILE ID = AUTOPRINT
UNIT = QUEUE
BUFFERS = 2
RECORDS = 0
ERRORS = 0

OPENED AT 1:53:25.4 IN
CLOSED AT 1:58:36.0 RLS
FILE SPACE = 633
REC LENGTH/BLK FACTOR = 31/1
OPEN TIME = 0:05:10.6

Figure 10.4.1 Itemized Execution Report (cont.)

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

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

TABS/ERR

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.

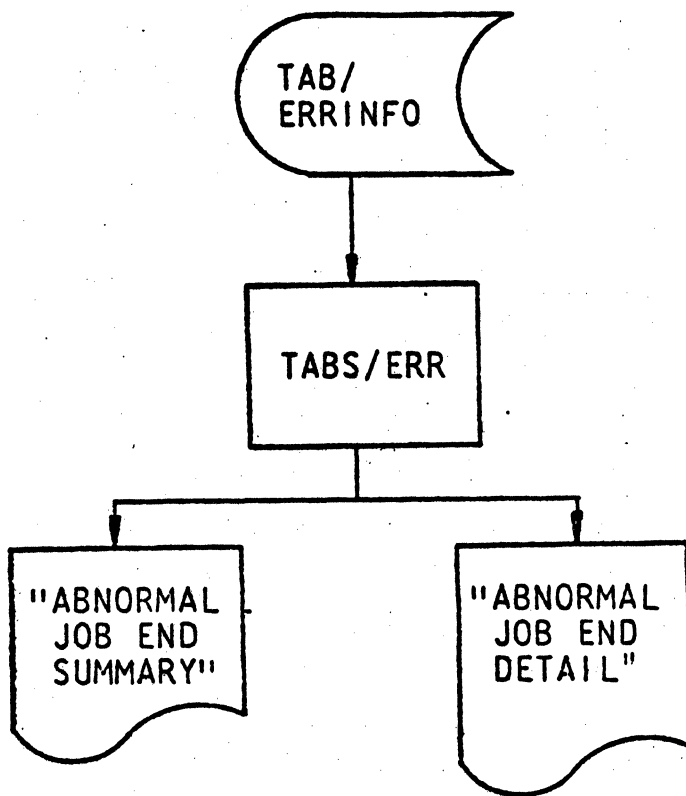


Figure 11.1 TABS/ERR Flowchart

BURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

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

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 DP-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 |
| <hr/> | | | | |
| 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
 B1800/B1700 EDP-TABS
 P.S. 2219 0094 (C)

SEP. 13, 1978 ABNORMAL JOB END DETAIL

| CHARGE # | PROGRAM NAME | TIME LOST |
|-----------------------|----------------|-----------|
| ***PROGRAM ERRORS | | |
| 0931000 | COBOL | 0:16:33.7 |
| TOTAL THIS CHARGE # : | 1 JOB | 0:16:33.7 |
| 0933000 | NOL | 0:01:50.6 |
| 0933000 | NOL | 0:06:19.5 |
| 0933000 | NOL | 0:02:28.7 |
| 0933000 | NOL | 0:05:21.3 |
| 0933000 | NOL | 0:04:13.3 |
| 0933000 | NOL | 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 | CANOE | 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 | SYCON | 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 | 0:52:09.1 |
| 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

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
R1800/B1700 EDP-TAES
P.S. 2219 0094 (C)

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 charges
- 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 TAES' billing schemes. DMS information which can be assigned to a charge number is recorded in the "Itemized Execution Report" produced by TABS/EXEC.

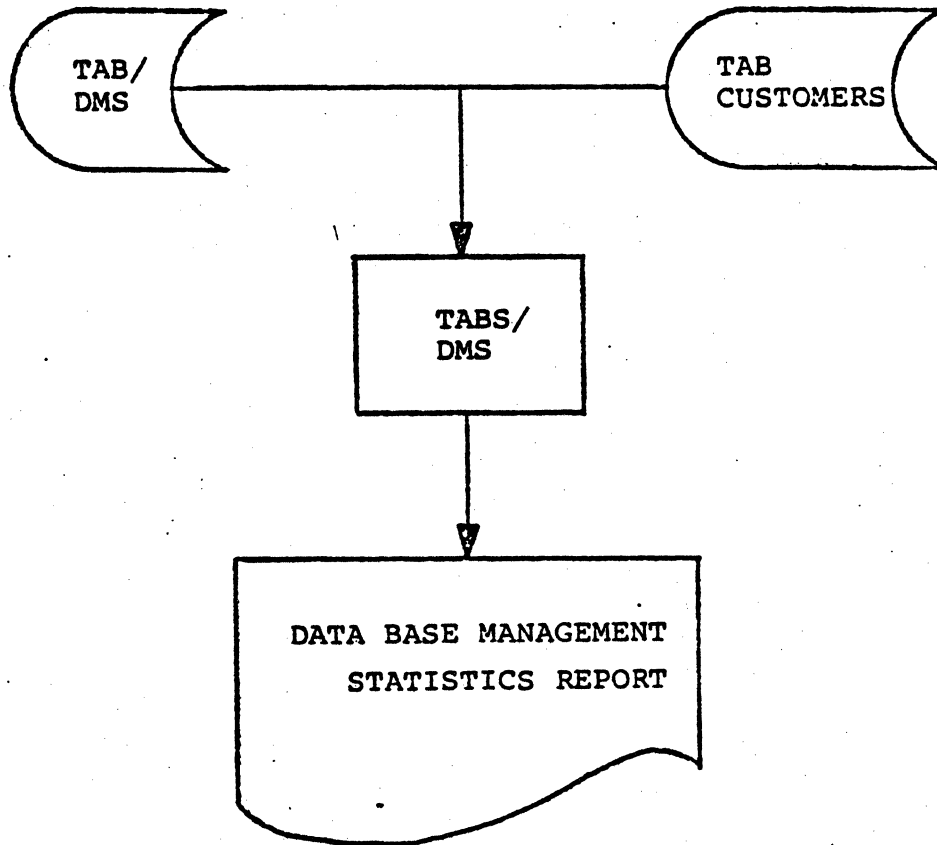


Figure 12.1.1 TABS/DMS Flowchart

BURROUGHS CORPORATION
COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

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

NOV. 2. 1978

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 |
| AEMBOS | INVOKED AT 0:34:32.9 DATA BASE = TEST FILE = TEST/AEMBOS # FINDS = 0 # UPDATES = 0 # SYSTEM CHANGES = 0 # READS = 0 | CLOSED AT 0:34:42.3 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

EURROUGHS CORPORATION
 COMPUTER SYSTEMS GROUP
 SANTA BARBARA PLANT

COMPANY CONFIDENTIAL
 B18G0/B17CC EDP-TAES
 P.S. 2219 0094 (C)

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 DDDCXXX. 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 DDDCXXX would charge individual instructors; and mask of DDXXDCX would charge individual classes within each department, even though they had different instructors.

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

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

CHARGE UNITS

All components are billed by charge units, where charge units measure the usage of the device: PFC 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, Remote, Initializer I/O, and DMS files. If HDWR=P, then logical I/O's will be used to calculate charge units for these file types. Disk usage will always be billed by physical I/O's (see Billing Table Based on HDWR option).

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

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to sacrifice consistency in order to charge for actual usage and 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

PRCC
 MEM
 SPEC

HDWR=L
 HDWR=P

VARYING

ELAP
 REMOTE
 QUEUE
 DIST

HDWR=C
 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 TCAFDS. 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.

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Rates (cost per charge unit) are given for all machine and 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 processor time in tenths of seconds minus processor time in tenths of seconds for 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 first 30 characters of the 50 character unit charge description (entered from input file TCARDS) will be also printed with each charge type. The report will be flagged as either a "Preliminary Audit" or a "Final Bill".

Overhead (OVHD) is calculated as the elapsed time charges plus the distributed charges (based on processor time) for each customer. The number of charge units entered under overhead is the total elapsed time in tenths of seconds for that account.

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.

Billing Table Based on HDWR option

| | LOGICAL (L) | PHYSICAL (P) | CONTROL* (C) | OPEN** (O) | DEFAULT |
|-------------------|--|--------------|-----------------------------|--------------------------|---------|
| LPX CRX MTX | record count | block count | control time in 1/10 sec | open time in 1/10 sec | L |
| DPX | N.A. | block count | N.A. | N.A. | P |
| QUEUE | record count logical I/O's | N.A. | control time in 1/10 sec | open time in 1/10 sec | L |
| REMOTE | input count + output count | N.A. | control time in 1/10 sec | open time in 1/10 sec | L |
| DMS | # of update ops + # of non-update ops | N.A. | control time in 1/10 sec | open time in 1/10 sec | L |
| INITIALIZER IO | N.A. | N.A. | control time in 1/10 sec | N.A. | C |

*control time: from open time until file is released.

*open time: from open time until file is closed.

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CONTROL

This record must have a "S" 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 Rendered" 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 CPA, 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 YIDCHGS. |
| 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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CANNOT 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, OVHC, and PROC). If more than 105 names are specified, then the message "THE FOLLOWING HDWR 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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NOV 15 1978 OPERATING COST REPORT FROM SEP. 11 1978 THRU DEC.

| 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 | |
| DE | 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 | |
| NTA | 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 |
|------------------|----------|-------|-------------|
| MT9 | 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)

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NOV. 15, 1978 CHARGE DISTRIBUTION REPORT FROM SEP. 11, 1978 THRU SEP. 14, 1978

| TYPE | CHARGE UNITS | ASSIGNED COST AMOUNT | ASSIGNED COST PERCENT | UNASSIGNED COST AMOUNT | UNASSIGNED COST PERCENT | ACTUAL COST | RATE |
|-----------------------------|--------------|----------------------|-----------------------|------------------------|-------------------------|-------------|------------|
| MACHINE COSTS ** | | | | | | | |
| MEM | 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 |
| PROC | 99,486 | 2,007.00 | 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 | 1.17408799 |
| DPA | 139,485 | 1,630.00 | 100.0 | 0.00 | 0.0 | 1,630.00 | 0.01160584 |
| DP3 | 24,235 | 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 |
| DPB | 5,597 | 500.00 | 100.0 | 0.00 | 0.0 | 500.00 | 0.00733357 |
| GPE | 11,894 | 500.00 | 100.0 | 0.00 | 0.0 | 500.00 | 0.04203800 |
| DPF | 104,477 | 500.00 | 100.0 | 0.00 | 0.0 | 500.00 | 0.00470574 |
| LPA | 11,800 | 14.00 | 1.1 | 1,259.00 | 98.9 | 1,273.00 | 0.00117370 |
| MTA | 6,533 | 520.00 | 100.0 | 0.00 | 0.0 | 520.00 | 0.06093989 |
| XTB | 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 |
| REMUFE | 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 | | | | | | 0.00500376 |
| SYSCG | | | | | | | |
| 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 | |

Figure 13.4 Charge Distribution Report

FEB. 6, 1981
PRELIMINARY AUDIT

CHARGE # 9999000

SERVICES RENDERED
FROM JAN. 26, 1981 THRU JAN. 28, 1981

| 142 EXECUTES | | | | | |
|--------------------------------|--------------|-----------|---------|-------------------------------|--|
| TYPE | CHARGE UNITS | COST | PERCENT | DESCRIPTION | |
| ** MACHINE COSTS ** | | | | | |
| MEM | 1,379,937 | 1,557.38 | 19.9 | MEMORY CHARGES | |
| OVHD | 3,239,261 | 1,165.19 | 14.9 | COMPUTER SUPPLIES & EQUIPMENT | |
| PROC | 176,106 | 1,765.23 | 22.6 | COMPUTER PROCESSOR CHARGES | |
| | | ----- | | | |
| TOTAL | | 4,487.80 | 57.4 | | |
| ** HARDWARE COSTS ** | | | | | |
| DPA | 42,686 | 271.43 | 3.5 | DISK PACK-A STORAGE FEES | |
| DPB | 4,638 | 10.72 | 0.1 | DISK PACK-B STORAGE FEES | |
| DPC | 82,979 | 393.99 | 5.0 | DISK PACK-C STORAGE FEES | |
| DPD | 857 | 27.66 | 0.4 | DISK PACK-D STORAGE FEES | |
| DPE | 4,932 | 26.87 | 0.3 | DISK PACK-E STORAGE FEES | |
| LPA | 63,831 | 1,109.39 | 14.2 | LINE PRINTER-A FEES | |
| LPB | 8,605 | 335.72 | 4.3 | LINE PRINTER-B FEES | |
| MTA | 3,903 | 129.22 | 1.7 | MAGNETIC TAPE-A STORAGE FEES | |
| MTB | 1,958 | 24.04 | 0.3 | MAG. TAPE-B STORAGE FEES | |
| MTC | 34,073 | 260.56 | 3.3 | MAG. TAPE-C STORAGE FEES | |
| QUEUE | 14,571 | 531.09 | 6.8 | QUEUE FILES | |
| REMOTE | 2,963 | 207.68 | 2.7 | DATA COMMUNICATIONS FEES | |
| | | ----- | | | |
| TOTAL | | 3,328.37 | 42.6 | | |
| TOTAL CHARGES ** AUDIT ONLY ** | | 87,816.17 | | | |

Figure 13.5.1 Preliminary Audit

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| MAY 31, 1977 | | ACCOUNT CHARGE SUMMARY | | FROM MAY 1, 1977 THRU | |
|--------------|--------------------------------|------------------------|---------|-----------------------|--|
| 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" SPC command.

The permanent TAB/= 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 TAES/= programs are on the system disk.
2. File equate TABS/LOGOUT so the file CUSTOMERS has the appropriate pack-id.

```
2MC TABS/LOGOUT FI CUSTOMERS PID MYPACK;
```

3. Make sure all TAB/= 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 removable, 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:

```
?MC 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 EQJ

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 EQJ 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:

Z TABS/LOGOUT = <job #> DO YOU WANT TO EXECUTE TABS/<program>?
 Z 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 these reports have already been produced)

In these situations, inadvertent 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:

ZTABS/LOGOUT = <job #>COLDSTART RESTART REQUESTED.
 PLEASE SPECIFY LOG NUMBERS CREATED BEFORE COLDSTART TO
 BE PROCESSED BY EDP-TABS.
 ZTABS/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:

ZTABS/LOGOUT = <job #> PLEASE SPECIFY STARTING DATE TO PROCESS.
 ZTABS/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 EOL. 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; SW8=2;

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

ZTABS/LOGOUT = <job #> CONSECUTIVE LOGS NUMBERED <#a> THRU
 <#b> ON DISK. PLEASE VERIFY THAT THESE ARE THE ONLY LOGS
 TO BE PROCESSED DURING COLDSTART RECOVERY.
 ZTABS/LOGOUT = <job #> ENTER YES TO VERIFY OR <#> TO OVERRIDE
 IF <#t> 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 EOW as well as from the coldstart.

- c. Precoldstart logs are not available, but TAB/= permanent and temporary data files are available in same condition as they were immediately prior to coldstart. This would be the case if EDP-TABS was executing from a userpack, and the logs were not backed up.

All monthly information will remain intact. After updating the TAB/= files and transferring the logs, processing will begin with first log transfered after coldstart. No additional COLDSTART/RECOVERY in TABS/LOGOUT is required.

Coldstart Recovery Procedure:

1. Set log option.
2. When logs are transferred, put the saved TAB/= permanent and temporary data files on disk.
3. Specify the coldstart option when executing TABS/UPDATE.
 EX TABS/UPDATE; SW8=5
4. Execute TABS/LOGOUT normally. (Note: COLDSTART option not required here).

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

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

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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 SPC:

```
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:

```
XTABS/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:

```
XTABS/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,

```
?MC 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 |

E. 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 | "g" |
| columns | 2-79 | options, free format, separated by commas or blanks. |

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IABS/BILLING

A. CONTROL

| | | |
|---------|-----|--------|
| columns | 1 | "f" |
| columns | 2-7 | optics |

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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F. 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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