

PILOT/SMF

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Preface

This publication contains information necessary for the operation of PILOT, a family of proprietary program products used for performance management and capacity planning. It provides data processing managers, system programmers, and capacity planners with information required to use this product.

This manual describes:

- ! The use of PILOT/SMF as an accounting data base extractor.
- ! The use of PILOT/SMF user exit with COBOL and Assembler language programs.
- ! The use of PILOT/SMF to manage SMF file migration utilizing the History and VSAM options.
- ! The JCL necessary to use PILOT/SMF.

Information in this publication is subject to significant change.

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This edition applies to Version 1.7 of the PILOT program products and to all subsequent versions and modifications until otherwise indicated in new editions or newsletters.

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Contents

Introduction	1
Functional Description	3
Completion Codes	5
Control Statement Format	7
Mandatory Keywords	9
READSMF	9
START	9
END	9
SELECT	10
Optional Keywords	11
ACCOUNT	11
DDNAME	11
EXCLUDE	12
ISMF	12
JOBNAME	12
NODUP	13
NS	13
PEAKTIME	13
PW1	14
PW2	14
SYSTEM	14
TIME	14
WEEKDAYS	14
NOWEEKENDS	14
NOWKNDS	14
User Exit	17
General Description	17

Linkage Conventions	17
Passing Parameters	18
Assembly Language	18
COBOL Program Example	19
History Option	21
Required JCL	23
NODUP JCL	25
Performance Considerations	27
Storage Requirements	27
Block Size and BUFNO	27
Additional Considerations	27
Statistics Log	29
Additional Modules	33
RDSMF4	35
RDSMF5	37
RDSMF6	39
RDSMF14	41
RDSMF17	44
RDSMF18	45
RDSMF26	46
RDSMF40	47
RDSMF57	48
RDSMF67	49
RDSMFVXT	51
TYP305	53
GENMONTH	53
CICSAVIL	54
Index	55

Introduction

PILOT/SMF allows users to selectively extract SMF records and, optionally, manage SMF migration and the archiving of SMF files.

PILOT/SMF has two input files:

SYSIN

This data set is used to supply the control cards that specify the PILOT/SMF processing you require.

SYSUT1

This data set specifies the file from which the SMF records will be extracted. This file can be dynamically allocated when used in conjunction with the History file. See the "History Option" on page 22 in this manual.

PILOT/SMF has five output files:

SYSPRINT

This data set provides statistical information about the processing performed, as well as informational, warning, and error messages.

SYSUT2

This is the output file produced by PILOT/SMF and contains the SMF records extracted from SYSUT1, based on the selection criteria you provided.

SYSUTn

These data sets define additional output files, where $n = 2$ through 9. Multiple output files containing records extracted from SYSUT1, and are based on the selection criteria you provided. These are the default names for the output files and are referred to as SYSUTn in this manual.

EXCEPT

This data set is an optional report of all invalid records found on SYSUT1.

SNAP

This data set is optional, and contains a copy of the invalid records that were found on SYSUT1.

HISTORY

This data set is optional, and contains the same information written to the SYSPRINT data set, stored as a member of a partitioned dataset.

Functional Description

Here is an overview of how PILOT/SMF works.

1. PILOT/SMF processes all control statements from the file SYSIN. The syntax is checked, the options are analyzed and the processing parameters are set. If SYSIN is specified as "//SYSIN DD DUMMY", all input records are extracted.
2. PILOT/SMF reads the input file (SYSUT1) which contains SMF records generated by the operating system. Each record is compared with the options requested to determine if it is to be written to an output file.
3. If PILOT/SMF is installed with an Installation Exit, each record that meets the criteria specified in SYSIN will be passed to the Installation Exit for processing.
4. If the user has specified a User Exit, each record that meets the criteria specified by SYSIN will be passed to the User Exit program for processing.
5. If the record meets the selection criteria, is not a duplicate of an earlier record (when the NODUP option is used) and the Installation or User Exit has not requested that the record be deleted (if exit(s) are active), the record will be written to the output data set(s) (SYSUTn).
6. If a HISTORY DD card is present, the Statistics Log is written as a member in a partitioned data set (if the HISTORY option is active).
7. The statistics log is always written to SYSPRINT.
8. An Exception log is written if bad input records are encountered.

Completion Codes

The completion codes PILOT/SMF returns at the end of a step inform the user as to whether or not the request was serviced. These completion codes refer to step termination and not the User Exit return codes.

Condition codes of step termination:

<u>Completion Codes</u>	<u>Meaning</u>
-------------------------	----------------

CC=0 PILOT/SMF completed successfully.

CC=4 If SYSUT1 is a VSAM data space, then the SYSUTn DCB parameters must be defined.

If SYUTU1 is a sequential data set PILOT/SMF completed successfully. The DCB parameters were not specified for SYSUTn and the DCB parameters from SYSUT1 were used.

CC=8 No records were extracted. Messages RSMF001E and RSMF003I are issued.

CC=16 Indicates that a control statement syntax error has occurred or Sort failed. No records are extracted. Refer to the error message(s) to determine the problem. Sort is used to identify and delete duplicate records when the NODUP option is specified.

Control Statement Format

The PILOT/SMF processing options are specified on free-form control statements. All keywords are separated by commas. Key-words may appear between columns two and seventy-one inclusive. The statement may be continued to the next card. No special continuation character is required. Multiple output file control card groups are separated by the word "READSMF" with at least one blank before and after the keyword "READ-SMF". The first group will direct the output to SYSUT2, the second to SYSUT3, the third to SYSUT4, etc. The "READSMF" keyword can be eliminated if SYSUT2 is the only output file.

Comments may be specified on any control card by placing an asterisk in column one, making the entire card a comment, or leaving at least one blank on any control card past column seventeen. If the asterisk is omitted or incorrectly specified, the step will be terminated with a completion code of 16.

Figure 1 on page 7 contains some examples of the control statements.

When the SYSIN data set is specified as DUMMY, all default options are used and only SYSUT2 is used.

```

      1         2         3         4         5         6
123456789012345678901234567890123456789012345678901234567890
  READSMF START=1/2/98,END=1/2/98,SELECT=(70-74)   GET RMF RECORDS

Notice the parameters start in column two and that "GET RMF RECORDS" is a comment.

      1         2         3         4         5         6
123456789012345678901234567890123456789012345678901234567890
*   GET RMF RECORDS
    START=1/2/98,END=1/2/98,SELECT=(70-74)

The control cards above show "GET RMF RECORDS" as a comment.

This example shows three output files with different selection criteria.

  READSMF  START=00000,END=99999,SELECT=ALL          * ALL TYPES TO SYSUT2
  READSMF  START=00000,END=99999,SELECT=(70-79)     * ONLY RMF TO SYSUT3
  READSMF  START=00000,END=99999,SELECT=(4,5,6)     * ACCOUNT TO SYSUT4

```

1 Sample Control Statements

Mandatory Keywords

There are three keywords that must be specified if a SYSIN data set is provided. They are “START”, “END”, and “SELECT”. If more than one output file is to be created, then the “READSMF” keyword is also required.

READSMF

Separates the control groups for each output file and is required when more than one output file is needed. This parameter can be omitted only when there is only one output file. This keyword is available to maintain compatibility with prior releases.

START= (ST=)

Specifies the starting date and optional time-of-day to begin to extract data. The format of the parameter is:

YYYYDDD.HH.MM.SS, or
MM/DD/YYYY.HH.MM.SS

where:

- ! YYYYDDD is the starting year and Julian day from which to extract data. It is required;
- ! MM/DD/YYYY is the date in month, day, and year format;
- ! HH.MM.SS is the starting time, and is optional.

The time-of-day parameter can be specified three ways:

1. YYYYDDD.HH or
MM/DD/YYYY.HH
the day and hour;
2. YYYYDDD.HH.MM or
MM/DD/YYYY.HH.MM
the day, hour and minute;
3. YYYYDDD.HH.MM.SS or
MM/DD/YYYY.HH.MM.SS
the day, hour, minute, and second.

When SYSIN is defined as DUMMY, the default value is START=0000000, meaning that records will not be selected by starting date. For compatibility with earlier releases, START=00000 is also accepted.

END= (E=)

Specifies the end date and optional time-of-day to stop extracting data. The format of the parameter is

YYYYDDD.HH.MM.SS or
MM/DD/YYYY.HH.MM.SS

where:

- ! YYYYDDD is the ending year and Julian day;
- ! MM/DD/YYYY is the date in month, day, year format;

- ! HH.MM.SS is the end time of the data on the date specified. This is optional.

The time-of-day parameter can be specified three ways:

1. YYYYDDD.HH or
MM/DD/YYYY.HH
the day and hour;
2. YYYYDDD.HH.MM or
MM/DD/YYYY.HH.MM
the day, hour and minute;
3. YYYYDDD.HH.MM.SS or
MM/DD/YYYY.HH.MM.SS
the day, hour, minute, and second.

When SYSIN is defined as DUMMY, the default value is END=9999999. This means that records will not be limited to an end date or time. For compatibility with earlier releases, END=99999 is also accepted.

SELECT=
(SEL=)

Specifies the SMF record type(s) to be selected. See the MVS Systems Management Facilities manual for the valid record types. The format of the keyword is:

SELECT=(t,t,r1-r2,...)

where:

- ! "t" is a valid SMF record type to be extracted;
- ! "r1-r2" is a range of valid SMF record types.

SELECT=ALL

where:

- ! ALL will cause all SMF records within the START/END periods to be extracted. "ALL" is the default when SYSIN is specified as DUMMY.

Examples:

READSMF START=1998001,
END=1998007,
SEL=(4,5,70-77)

Extract record types 4 and 5, and record types 70 through 77 for Jan. 1, 1998 through Jan 7, 1998.

READSMF START=02/07/1998,
END=02/07/1998,
SELECT=ALL

Extract all records for February 7, 1989.

READSMF START=01/21/1998.17,
END=01/22/1998.08,SEL=(4,5,
70-77)

Extract record types 4 and 5, and record types 70 through 77, for Jan. 21, 1998 at 5 P.M. through Jan. 22, 1998 at 8 A.M.

Optional Keywords

The following keywords are optional:

ACCOUNT= **(ACC=)**

This option can be used to find account numbers in the account section of a job related record (SMF types 4, 5, 30 34, and 35) or in the user identification field of SMF records. The storing of the account number is done by using an SMF exit to place the account number in SMF record types that contain a user identification field (refer to the MVS SMF Manual for further information). Records which do not contain a user identification field or an account field will not be processed if their record types are requested using the "SELECT" keyword. Account numbers must adhere to the following syntax:

- ! a maximum of 50 account numbers may be specified;
- ! the list must be enclosed in parenthesis regardless of the number of account numbers specified;
- ! the account numbers must be separated by commas;
- ! a mask may be used to select account numbers.

The Account number may be specified as:

1. A specific value (e.g. 9000);

2. A non-specific request, by inserting an "*" in place of each digit that is to have a variable value 0-9 (e.g. 9** - all account numbers 900-999)

Examples:

```
READSMF START=1/3/1998,
      END=1/3/1998,SELECT=ALL,
      ACCOUNT=(**34)
```

Extract all data for 1/3/1998 that has account numbers with 34 as third and fourth digits (e.g. 0034...9934);

```
READSMF START=1998001,
      END=1998365,SELECT=ALL,
      ACCOUNT=(SYS0034,PROD0059)
```

Extract all records for 1998 with account numbers SYS0034 or PROD0059.

DDNAME= **(DD=)**

This keyword specifies the output DD name for a control card group. This option will direct output to the DD name specified instead of the default output DD name "SYSUTn". All information in the log referring to that file will be associated with the default name.

EXCLUDE=
(EXL=)

This keyword specifies the SMF record type(s) to be excluded. (See the MVS Systems Management Facilities manual for valid record types). This option overrides the "SELECT" keyword. If the same record type is specified in both keywords, it will be excluded. The format of the keyword is:

EXCLUDE=(t,t,r1-r2,...)

where:

- ! "t" is a valid SMF record type;
- ! "r1-r2" is a range of valid SMF record types.

Example:

```
READSMF START=1/1/1998,
      END=1/31/1998,
      SELECT=(70-79),
      EXCLUDE=(76)
```

Extract record types 70 through 77 except type 76 for Jan. 1, 1998 through Jan 31, 1998.

ISMF

This keyword specifies that the system SMF data set read on SYSUT1 is to be initialized after it is processed. A Write To Operator is issued to verify that this option was chosen. The "HISTORY" option must also be used so that an audit trail is maintained. Users can browse the history data set to determine when the SMF data set was dumped, to what volumes, etc.

JOBNAME=
(JOB=)

Specifies that records containing job-related information (refer to the MVS SMF Manual for further information) can be selected by the JOBNAME specified on the job card. Records that do not contain a job name will not be extracted. For SMF type 110 records (CICS records), the VTAM APPLID is used to select the CICS region. The following syntax is required:

- ! Up to eight characters per name;
- ! If more than one is specified, then each name must be separated by commas and the entire list must be enclosed in parenthesis;
- ! If only one name is specified, the parenthesis are not needed;
- ! The name may be specified by inserting an asterisk to create a mask.

The format of the keyword is:

JOBNAME=(name1,name2,...).

where name1 and name2 are the jobs to be selected if all other criteria (START, END, etc.) are met. Name1 or name2 can have a mask specified. That is, JOBNAME=N* will extract all records with job names that start with the character 'N'. Job=(P***D123) will extract all records with job names that start with P and end with D123.

Examples:

```
READSMF ST=1998001,
      E=1998001,
```



```
SELECT=(4,5),
JOBNAME=(TEST1)
  Extract type 4 and 5 records for
  1998001 that have the job name
  "TEST1".
```

```
READSMF START=1/1/1998,
  END=12/31/1998,
  SELECT=(4,5),
  JOBNAME=(TEST1,TSU1,
  APP01J,SYS01)
  Extract SMF types 4 and 5 for
  1998 with the job names listed.
```

```
READSMF ST=1998001,
  E=1998365,SEL=ALL,
  JOB=(TSO*,CICS*,
  CICSNODE)
  Extract all records for 1998 with
  JOBNAME beginning with TSO
  or CICS and the CICS region
  with the VTAM APPLID of
  "CICSNODE".
```

NODUP

This keyword specifies that all duplicate records will be deleted. This is accomplished by a link to SORT. All records that are selected are given to SORT through an E15 exit. After the SORT, an E35 exit is used and each returned record is compared with the previous record. If the record is a duplicate, the duplicate will be deleted.

Records are sorted by SMF date, time, and type. The time used is the time the SMF record was moved to the SMF buffer, except types 4, 5, 30, 34, and 35. These types

contain the time of the JOB/STEP termination. Refer to the MVS SMF manual for further information. The user exit gets control after the sort so that accounting program exits are accurate. The only additional JCL required are DD cards for SORT work files and messages. Additional virtual storage is needed for this option. Please refer to the "Performance Considerations" discussion on page 27 for storage requirements and "NODUP JCL" on page 25 for additional information.

Example:

```
READSMF START=3/1/1998,
  END=3/31/1998,
  SELECT=ALL,
  NODUP
  Extract all records for 3/1/1998
  to 3/31/1998 and delete all
  duplicate records.
```

NS

This keyword specifies that PILOT/SMF should run as a non-swappable address space. This will improve performance in a heavily loaded system. Consult the Systems Programmer or Technical Support staff at your installation for information regarding the use of this option.

PEAKTIME=

This keyword specifies a time period to be extracted between the START and END parameters. This allows you to extract the same period across multiple days.

The format is:

PEAKTIME=(hh.mm, HH.MM)

where:

- ! hh.mm is the time of day beginning the period in hour and minute format (00.00 - 23.59);
- ! HH.MM is the time of day ending the period.
 - ! When the start time is greater than the end time, periods will cross multiple days and exclude the time between the end time and start time. This is useful for batch tuning.

Examples:

```
READSMF ST=1/4/1998,
E=1/7/1998,SEL=(70-75),
TIME=M,
PEAKTIME=(13.00,14.00)
  Select record types 70 through
  75 for the peak period of 1 PM
  to 2 PM for the week of January
  4 through 7, 1998, using the
  RMF interval time.
```

```
READSMF ST=10/1/1998,
E=10/31/1998,SEL=(70-75),
TIME=M,
PEAKTIME=(2000,0300)
  Select record types 70 though
  75 for the peak period 8PM to
  3AM for the month of October.
```

PW1=

Specifies the password for SYSUT1 for password protected VSAM data sets.

PW2=

Specifies the password for SYSUT2 for password protected VSAM data sets.

SYSTEM=

(SYSID=)

(SID=)

Specifies the SMF identification of the CPU from which the record was written.

Example:

```
READSMF ST=1999001.08,
E=1999001.17,SELECT=ALL,
SYSTEM=A032
```

Extract all data on 1999001 that ran on system A032 between 8 A.M. and 5 P.M.

TIME=

This keyword specifies the time field to use to extract data. Your options are:

- R** The system reader time. This is the time the job was read into the system.
- M** The RMF interval start time (types 70 - 79).
- W** The time the record was moved to the SMF buffer, as explained in the NODUP option. This is the default if TIME is omitted.

WEEKDAYS

(NOWEEKENDS)

(NOWKNDS)

This keyword specifies that the weekend data is not to be selected.

Example:

```
READSMF ST=10/1/1999,  
E=10/31/1999,SEL=(70-79),  
TIME=M,WEEKDAYS
```

Select record types 70-79 for the month of October using the RMF interval time without weekend data.

User Exit

General Description

PILOT/SMF provides an exit for a user-written program to analyze and modify each SMF record, to delete SMF records, and to add additional records. A sample assembler routine is provided with the distribution materials. Additional user exits are provided in object form and are described in the section "Additional Modules" on page 33 in this manual.

Linkage Conventions

The conventions to be followed when using this interface are:

Assembler programs -

Register 1 contains the address of a parameter list where:

- +0(R1) the address of the SMF record;
- +4(R1) the address of an output area for the exit to add records;
- +8(R1) the address of parameters to be passed to the exit.

COBOL programs -

A linkage section must be present in the user programs with 01 levels for input and output records. Furthermore, the procedure division must be defined using the records defined in the linkage section. By using the COBOL keyword RETURN-CODE, the

exit indicates the action to be taken with the record passed by PILOT/SMF.

The PARM= option of the EXEC statement in the JCL will specify the module name of the exit to be executed by READSMF. A STEPLIB DD card must be included or the exit must be a member in a LINKLIST data set so READSMF can load the exit into memory. If the exit is not in a LINKLIST or STEPLIB data set, then READSMF issues message RSMF0016E MODULE NOT FOUND and terminates with a completion code of 16.

Add or Delete Records

The following convention is used in READSMF for a user exit:

Upon return to READSMF, the exit must specify a return code in register 15 (COBOL programs must move one of the values to RETURN-CODE). The following are valid return codes:

- 0 Write the SMF record (the record may have been modified) to the output file;
- 4 Add a record to the output file using the second address passed to the exit. Also, write the SMF record to the output file;

- 8 Delete the input record. Do not write it to the output file.

Passing Parameters

Assembly language parameters are passed using the third argument in the parameter list (see Assembly language example). COBOL uses the third 01 linkage-section entry, as shown in the COBOL program example. In both cases, the user has the option of passing up to 92 characters of parameter data following the exit program name and a comma on the EXEC JCL statement.

Examples:

```
//COBEXIT EXEC PGM=READSMF,PARM=EXIT01
//STEPLIB DD DSN=MYLIB,DISP=SHR
```

In this example, PILOT/SMF will call a user exit named EXIT01. This routine was located through the STEPLIB DD card reference to data set MYLIB. There is no third parameter.

```
//STEP1 EXEC PGM=READSMF,
// PARM='EXIT01,ONLYPRODUCTION'
```

In this example, PILOT/SMF will call a user exit named EXIT01. The address of the parameter (ONLYPRODUCTION) will be passed via register 1 as the third parameter of the parameter list.

Assembly Language Example

Figure 2 on page 18 contains an example of a user exit in assembler language.

```
EXIT01      CSECT
            SAVE (R14,R12), , *
            .
            L   R2,0(R1)      - Address of Record
            L   R3,4(R1)      - Address of Output Area
            L   R4,8(R1)      - Address of Parm
            .
ADD         DS      0H
            LA   R15,4      - ADD THIS NEW RECORD
            RETURN (R14,R12),RC=R15
*
LEAVE      DS      0H
            LA   R15,0      - LEAVE THIS RECORD
            RETURN (R14,R12),RC=R15
*
DELETE     DS      0H
            LA   R15,8      - DELETE THIS RECORD
            RETURN (R14,R12),RC=R15
            END   EXIT01
```

2 Assembly Language Sample Exit

COBOL Program Example

A sample exit program in COBOL is provided in figure 3 on page 19.

```
IDENTIFICATION DIVISION.
PROGRAM-ID.      EXIT01.
AUTHOR.         JOHN DOE.
DATE WRITTEN.   JAN 1983.
DATE COMPILED.
REMARKS.
    THIS EXIT MODIFIES RECORDS PASSED FROM PILOT/SMF AND CREATES
    NEW RECORDS FOR OTHER COBOL PROGRAMS.
DATA DIVISION.
01 RECORD-4.
    02 4-FILLER      PIC 9(2)      COMP VALUE 0.
    02 4-TYPE        PIC X.
    02 FILLER        PIC X(10).
    02 MESSAGE       PIC X(8).
    02 FILLER        PIC X(57).
LINKAGE SECTION.
01 IN-REC.
    02 FILLER        PIC X.
    02 INREC-TYPE    PIC X.
    02 RECORD-TEXT   PIC X(15000).
01 OUT-REC.
    02 FILLER        PIC X(100).
01 PARMS.
    02 PARM-LENGTH   PIC 9(2) COMP.
    02 PARM-LIST     PIC X(100).
PROCEDURE DIVISION USING (IN-REC,OUT-REC,PARMS).
    IF INREC-TYPE = 4 THEN
        PERFORM NEWREC THROUGH NEWREC-EXIT
        MOVE 4 TO RETURN-CODE
        GOBACK
    ELSE
        MOVE 0 TO RETURN-CODE
        GOBACK.
NEWREC.
    .
    MOVE PARM-LIST TO MESSAGE.
    MOVE RECORD-4 TO OUT-REC.
    .
NEWREC-EXIT.
```

3 COBOL Language Exit Program Sample

History Option

The History option is used to accumulate a history of all PILOT/SMF runs, giving the statistical information about each run. This option is useful when tracking the migration or archiving of SMF data to a weekly, monthly, or yearly tape. The History option is required when the ISMF option is specified.

The History file can be used to dynamically allocate the input file for specific selection criteria. Please refer to the definition of the SYSUT1 data set in the “Required JCL” section on page 23.

This option is only active when a HISTORY DD card is present in the JCL.

The History data set must:

- ! be a PDS;
- ! have the DCB attributes LRECL= 80, and RECFM= FBA. The BLKSIZE may be any multiple of 80.

When using ISPF to browse the data set, ISPF will space the lines using the control characters specified in column one.

PILOT/SMF generates names for each run by using the Julian date of the time of execution. If PILOT/SMF is run more than once using the same History data set, PILOT/SMF will append a letter or number to the name (i.e., D098121, D098121A, ... etc). This option will create an image of the Statistics Log for each run. Note that the Julian date is in the form CYYDDD

where C=0 for 1900's dates and C=1 for 2000's dates.

An example of the History file directory and the contents of a member are shown in figure 4 on page 22.

Upgrading From Earlier Releases

If you are upgrading PILOT from a release prior to V1.7, please remember to run the History File Conversion Program. The instructions for doing this are in the PILOT V1.7 Conversion Guidelines document. This conversion program will rebuild the History file with the new member naming convention and will convert the 2-digit year dates to 4-digit notation.

```

Menu  Functions  Utilities  Help
-----
VIEW      PILOT.V1M7.TEST.HISTORY          Row 00001 of 00054
Command ==>>>                               Scroll ==>>> CSR
Name      VV MM  Created      Changed      Size  Init  Mod  ID
. D099158
. D099243
. D099243A
. D099244
. D099245
. D099250A
. D099250B

File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
-----
VIEW      PILOT.V1M7.TEST.HISTORY(D099243A) - 01.00      Columns 00001 00072
Command ==>>>                               Scroll ==>>> CSR
000001 1AXIOS PRODUCTS, INC. PILOT/SMF          READSMF V1.M7.0  XA6.0.7
000002                KLM TECHNICAL SPECIALTIES INC.
000003
000004 0RUN DATE -    TUESDAY      08/31/1999  1999.243  10.13.59
000005 0PILOT221I CONTROL CARD(S) FOR SYSUT2
000006
000007  START=0000000,END=9999999,SELECT=ALL,ISMF
000008 0
000009 0                F I L E  S T A T U S
000010 0SYSUT1 - VOLUME(S)  EXCPS  DSN - SYS1.MAN2
000011                SCPMV5          409  UNIT- DISK
000012 0PILOT007I ISMF OPTION ACTIVE. LINK TO IFASMFDP WAS SUCCESSFUL
000013 0SYSUT2 - VOLUME(S)  EXCPS  DSN - PILOT.V1M5.BACKUP.SMFTODAY.G0329V00
000014                API011          1,800  UNIT- DISK
000015 -D A T E  A N D  T I M E  R A N G E      F O R  R E C O R D S      O U T P U T  F I L E  -  S Y S U T 2
000016 0START= WEDNESDAY  08/25/1999  1999.237  17.09.54
000017  END=  FRIDAY      08/27/1999  1999.239  17.24.12
000018 -RECORDS READ-                14,811
000019 RECORDS EXTRACTED-          14,811
000020
000021                TYPE      4 RECORDS-          203
000022                TYPE      5 RECORDS-           86
000023                TYPE      6 RECORDS-            3
000024                TYPE     10 RECORDS-            1
000025                TYPE     14 RECORDS-          1,337
000026                TYPE     15 RECORDS-          1,169
000027                TYPE     17 RECORDS-           376
000028                TYPE     18 RECORDS-            7
000029                TYPE     19 RECORDS-            19
000030                TYPE     20 RECORDS-            84
000031                TYPE     21 RECORDS-             4
000032                TYPE     23 RECORDS-            48
000033                TYPE     26 RECORDS-            81
000034                TYPE     30 RECORDS-          2,811

```

4 Example of the History File in SPF

Required JCL

Figure 5 on page 24 illustrates the job control statements required for the running of PILOT/SMF.

STEPLIB

This statement defines the libraries containing the PILOT/SMF program and the user exit.

SYSPRINT

This statement is used to define the PILOT/SMF Statistics Log which includes information, error, and warning messages.

SYSUT1

This statement defines a physical sequential file or a VSAM ESDS in VBS format (SYS1.MAN(x) data sets). If this file is specified as DUMMY and the HISTORY DD card is present, then the selection criteria and the History file members will be used to determine the appropriate input file and the file will be dynamically allocated.

SYSUTn

These statements define one or more physical sequential or a VSAM ESDS data sets (only SYSUT2 may be VSAM) in VBS format. A total of 8 data sets may be define, with $n = 2 - 9$. If the DCB parameters are omitted when SYSUTn is a PS file, the SYSUT1 DCB attributes are used. DCB parameters must always be specified when SYSUT1 is a VSAM data set. If you choose to use the DDNAME parameter, replace SYSUTn

with the DDNAME value(s) you have coded on the READSMF control cards.

EXCEPT

This data set is used as an output file for exception records.

SNAP

This data set is only used if an S002 abend is intercepted. The record that caused the S002 abend is written to this file in dump format.

SYSIN

This data set is used to supply the input control cards. If dummied, defaults are used.

HISTORY

This data set is a PDS with RECFM FBA and LRECL 80. If present, and if SYSUT1 specifies a data set, a copy of the Statistics Log for this run will be written to a new member of this data set. If SYSTU1 is a dummy data set, this data set will be used to determine the input volumes to be used to satisfy the selection criteria provided on the READSMF control cards.

```
//SMFDMP      EXEC PGM=READSMF,PARM='EXIT01,DATA.....'  
//*          The parameter is optional, as explained in the  
//*          User Exit section of this guide.  
//STEPLIB    DD User exit library if READSMF not in Linklist.  
//SYSPRINT   DD SYSOUT=A  
//SYSUT1     DD Input data set.  
//SYSUTn     DD Output data set.  
//EXCEPT   DD SYSOUT=A  
//SNAP       DD SYSOUT=A  
//SYSIN      DD *  
//HISTORY    DD History library (PDS) optional.
```

5 Required JCL for PILOT/SMF

NODUP JCL

If the NODUP option is used, additional JCL is required for SORT. In some installations, sort files may be dynamically allocated. Consult your technical support group or Systems Programmer for additional information.

Figure 6 on page 25 illustrates the job control statements that must be added to the required job stream when you use the NODUP option.

SORTLIB

This data set is used to load sort modules if SORT is not in a linklist data set.

SYSOUT

This data set is used for SORT/MERGE messages.

SORTWK0n

These data sets are work files for SORT.

Dynamic Allocation Example

The example in figure 7 on page 25 illustrates the same function but assumes that the sort files are dynamically allocated. It will select all jobs run on July 5, 1999. PILOT will dynamically allocate the input file using the History file, as explained in the prior section. The SORT work data sets will also be dynamically allocated.

```
//SORTLIB DD DSN=SYS1.SORTLIB,DISP=SHR
//SYSOUT DD SYSOUT=A
//SORTWK0n where n = 1,2...n
```

6 NODUP JCL Example

```
//STEP1 EXEC PGM=READSMF,REGION=2M
//STEPLIB DD User Exit Library if required.
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DUMMY
//SYSUT2 DD Output data set
//EXCEPT DD SYSOUT=A
//HISTORY DD Audit library with members of prior executions
//SYSIN DD *
READSMF START=07/05/1999,END=07/05/1999,SELECT=(5),NODUP
/*
```

7 Sample of NODUP and Dynamic Allocation

Performance Considerations

Storage Requirements

PILOT/SMF requires a minimum of 2M, in the MVS/XA, ESA and OS/390 environments (due to the SMF data set 32K block size). This will be sufficient to execute all functions. In the case where a user exit is invoked, the exit's region size must be added to the minimum region requirements. Performance will improve as memory is added to reduce I/O. Optimum block size and buffers need to be specified. When running other PILOT programs as user exits up to 4M may be needed. If the NODUP option is used, the following items must also be considered:

- ! the SORT region size;
- ! the number of sort work files.

SORT will utilize whatever storage is available. This, however, does not necessarily mean better performance. Factors such as the number of records to be sorted will effect the selection of a region size. In general, a minimum value of 2M must be specified. If a large number of records are to be sorted, you should review the SORT reference manual for guidelines on region size specification. The statistics log contains information to help monitor resources used in daily runs. You can adjust the region size and the BUFNO parameter of the DCB (the PILOT/SMF default is 20) to conserve resources.

Block Size and BUFNO

PILOT/SMF uses QSAM as it's access method to perform it's I/O. The best performance is attained by having a combined specification of 240K of data in memory. This is the number at which QSAM will start to achieve the most CPU/IO overlap. Half track blocking will not only cause fewer EXCPS, but will better utilize DASD space. A 3380 device a 23K block size with 20 buffers will give 460K of data in memory. A 3390 device a 27K block size with 20 buffers will give 540K of data in memory. When running PILOT/SMF in a ESA environment with DFP 3.1 or higher use system determined block size by specifying block size = 0.

Additional Considerations

The "NS" parameter will provide better performance in a heavily loaded system

Users with multiple step jobs that utilize PILOT/SMF to pass data from one step to another should use a disk data set instead of tape for SYSUT2.

If a BLKSIZE parameter is not specified, the default BLKSIZE, taken from SYSUT1, will be used and a system 002 abend may occur. This occurs when the tape block size exceeds the disk track capacity (e.g., the 3350 maximum blksize is 19069).

Statistics Log

Figures **8** and **9** on pages 30 and 31 contain an example of the statistics log.

The first line provides the version and level number of PILOT/SMF and the date and time of the run. Message PILOT221I displays the SYSIN control card statements used for each output file.

The next section, marked "FILE STATUS", provides information on the SYSUT1 and SYSUTn files. The volumes, EXCPs (I/O) done to each file, the data set names and unit type (DISK or TAPE) are listed. Message PILOT007I indicates that the ISMF parameter was specified to initialize the MAN data set after dumping, and that this was successful.

The title "DATE AND TIME RANGE FOR RECORDS OUTPUT FILE" states that the "START" is the earliest record found within the requested range, and "END=" is the latest record found within the requested range.

Records read/extracted show the number of records read versus the number of records extracted.

If the NODUP option is specified with a user exit that adds records, the number of records extracted will be equal to the sum of the records extracted from the input file plus the records added by the user exit. The records extracted refers to the original SYSUT1 file. The records added do not show up in this field. A separate field "*****RECORDS ADDED -" provides this information.

```

AXIOS PRODUCTS, INC. PILOT/SMF          READSMF V1.M7.0  XA6.0.7
                KLM TECHNICAL SPECIALTIES INC.

```

```

RUN DATE -   TUESDAY       08/31/1999  1999.243  10.13.59
PILOT221I CONTROL CARD(S) FOR SYSUT2

```

```

START=0000000,END=9999999,SELECT=ALL,ISMF

```

```

      F I L E  S T A T U S

```

```

SYSUT1 - VOLUME(S)  EXCPS  DSN - SYS1.MAN2
          SCPMV5      409  UNIT- DISK
PILOT007I ISMF OPTION ACTIVE. LINK TO IFASMFDP WAS SUCCESSFUL
SYSUT2 - VOLUME(S)  EXCPS  DSN - PILOT.V1M5.BACKUP.SMFTODAY.G0329V00
          API011     1,800 UNIT- DISK
D A T E  A N D  T I M E  R A N G E   F O R  R E C O R D S   O U T P U T  F I L E  -  S Y S U T 2
START= WEDNESDAY  08/25/1999  1999.237  17.09.54
END=   FRIDAY    08/27/1999  1999.239  17.24.12
RECORDS READ-           14,811
RECORDS EXTRACTED-     14,811

```

TYPE	4 RECORDS-	203
TYPE	5 RECORDS-	86
TYPE	6 RECORDS-	3
TYPE	10 RECORDS-	1
TYPE	14 RECORDS-	1,337
TYPE	15 RECORDS-	1,169
TYPE	17 RECORDS-	376
TYPE	18 RECORDS-	7
TYPE	19 RECORDS-	19
TYPE	20 RECORDS-	84
TYPE	21 RECORDS-	4
TYPE	23 RECORDS-	48
TYPE	26 RECORDS-	81
TYPE	30 RECORDS-	2,811
TYPE	32 RECORDS-	48
TYPE	34 RECORDS-	14
TYPE	35 RECORDS-	14
TYPE	40 RECORDS-	1,313
TYPE	41 RECORDS-	295
TYPE	42 RECORDS-	2,514
TYPE	45 RECORDS-	1
TYPE	60 RECORDS-	298
TYPE	61 RECORDS-	131
TYPE	62 RECORDS-	149
TYPE	64 RECORDS-	281
TYPE	65 RECORDS-	210
TYPE	66 RECORDS-	17
TYPE	80 RECORDS-	65
TYPE	88 RECORDS-	44
TYPE	89 RECORDS-	97
TYPE	90 RECORDS-	4
TYPE	92 RECORDS-	2,470

8 Statistics Log (Part 1)

```
TYPE 100 RECORDS-      294
TYPE 101 RECORDS-       22
TYPE 102 RECORDS-       98
TYPE 110 RECORDS-     180
TYPE 118 RECORDS-       19
TYPE 200 RECORDS-        4
```

```
EXCEPTION RECORDS-      0
```

```
STATISTICS FOR JOB - DUMPMAN2  STEP - DUMP
CPU -      11.43S  VIRT USED -  416K SYS USED -  320K EXCPS -      5,334
```

```
PILOT/SMF (C) 1983-1999
```

9 Statistics Log (Part 2)

Additional Modules

The following additional programs are included to format SMF records.

RDSMF4

This program formats type 4 records (job and step related information).

RDSMF5

This program formats type 5 records (job related information).

RDSMF6

This program formats type 6 records (job printing information).

RDSMF14

This program formats types 14, 15, and 64 records (open/close data set access, and EXCPS for VSAM and non-VSAM).

RDSMF17

This program formats type 17 records (scratch data set).

RDSMF18

This program formats type 18 records (re-name data set).

RDSMF26

This program formats type 26 records (job printing information).

RDSMF40

This program formats type 40 records (EXCPs for dynamic allocation data sets).

RDSMF57

This program formats type 57 records (JES2 SYSOUT transmission records).

RDSMF67

This program formats type 67 records (VSAM and ICF catalog activity).

RDSMVFVXT

This program is a user exit to reduce type 14, 15, and 64 record types to be passed to RDSMF14.

TYP305

This program is a user exit provided to choose only the subtype 5 (Job end record) of the SMF type 30 records. It can be used to reduce the number of type 30 records not processed by SMFPC30.

GENMONTH

This program will manage a PILOT/SMF control card member in a PDS. Each time the member is processed through this program, the START= and END= settings will be advanced to the start and end date of the next month.

CICSAVIL

This program is a user exit to reduce type 4 and 30 (step) records to be passed to

RDSMF4, or SMFPC30 (PILOT/MVS).
This will produce an availability report.

RDSMF4

RDSMF4 is a resource usage report which is especially valuable for understanding virtual storage usage. It runs as an exit to READSMF. RDSMF4 produces a report with the following fields:

START DATE

The date JES began execution of the job.

START TIME

The time JES began execution of the job.

END DATE

The date JES terminated the job.

END TIME

The time JES terminated the job.

SID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the JOB card.

STEPNAME

The name of step on the EXEC card.

PGMNAME

The program name on the PGM= parameter on the EXEC card.

CC=

The completion code the job received at termination.

MAX VIRT

The maximum potential virtual storage for a private area.

VIRT

The maximum amount of private area virtual storage used.

SYST

The maximum amount of LSQA and SWA work area used within the private area.

TOTAL CPU SERVICE

The total number of CPU service units the job accumulated.

TOTAL MSO SERVICE

The total number of main storage service units the job accumulated.

TOTAL I/O SERVICE

The total number of I/O service units the job accumulated.

ELAPSED TIME

The elapsed time the job accumulated from start to end.

Required JCL:

Figure **10** on page 36 shows you the JCL required to run this report.

```
//VIRTSTAT  JOB
//TYPE4     EXEC  PGM=READSMF,PARM='RDSMF4',REGION=2M
//SYSUT1    DD    DSN=MYTYPE4.SMF,DISP=SHR          Input file
//SYSUT2    DD    DUMMY
//SMF4      DD    SYSOUT=*                          Report FILE
//SORTWK01  DD    SPACE=(CYL,(10,10),RLSE)         Sort work space
//SORTWK02  DD    SPACE=(CYL,(10,10),RLSE)         Sort work space
//SYSOUT    DD    SYSOUT=*                          Sort information
//SYSPRINT  DD    SYSOUT=*                          READSMF LOG
//SYSIN     DD    *
      READSMF ST=0000000,E=9999999,SEL=(4,34)  GET ALL TYPES INCLUDING TSO.
/*
```

10 Required JCL for RDSMF4

RDSMF5

RDSMF5 reports job-wide resource usages. It runs as a stand-alone program. This report can be generated in Job Name or Date/Time sequence. See the JCL example.

RDSMF5 produces a report with the following fields:

DATE STARTED

The date JES began execution of the job.

TIME STARTED

The time JES began execution of the job.

DATE ENDED

The date JES terminated the job.

TIME ENDED

The time JES terminated the job.

JOBNAME

The name of the job on the JOB card.

SYSID

The SMF system ID where the job executed.

CC=

The completion code the job received at termination.

PG

The performance group the job was assigned to for execution.

JOB CLASS

The job execution class.

TOTAL SERVICE

The total number of service units the job accumulated during execution.

CPU TIME

The total number of CPU service units the job accumulated.

TOTAL SRB TIME

The total SRB time the job accumulated.

TOTAL I/O

The total number of I/O's the job accumulated.

ELAPSED TIME

The elapsed time the job accumulated from start to end.

Required JCL:

Figure 11 on page 38 contains the JCL required to run this report.

```
//JOBSTATS  JOB
//TYPE5     EXEC  PGM=RDSMF5,REGION=2M
//SMFIN     DD    DSN=MYTYPE5.SMF,DISP=SHR      Input file
//SMF5      DD    SYSOUT=*                      Report by JOBNAME
//SMF5A     DD    SYSOUT=*                      Report by DATE/TIME
//SORTWK01  DD    SPACE=(CYL,(10,10),RLSE)     Sort work space
//SORTWK02  DD    SPACE=(CYL,(10,10),RLSE)     Sort work space
//SYSOUT    DD    SYSOUT=*                      Sort information
```

11 Required JCL for RDSMF5

RDSMF6

RDSMF6 reports job printing information. It runs as a stand-alone program. RDSMF6 produces two reports (one by Job Name and one by Date/Time) with the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the job card.

SYSOUT CLASS

Class of output data sets.

NUMBER DSNS

The number of data sets to be printed.

FORM

The FORM of the output data set to be printed.

FCB

The FCB (if any) used to print the job.

UCS

The UCS Print train (if any) used to print the job.

LOCATION

The Location of where the job is to be printed.

NUMBER LINES

The number of lines to be printed (spooled).

OPERATOR

Action taken by operator for the job (if any).

Required JCL:

Figure 12 on page 40 shows the JCL needed to run this program.

```
//JOBSTATS  JOB
//TYPE6     EXEC  PGM=RDSMF6,REGION=2M
//SMFIN     DD    DSN=MYTYPE6.SMF,DISP=SHR      Input file
//SMF6      DD    SYSOUT=*                      Report by JOBNAME
//SMF6A     DD    SYSOUT=*                      Report DATE/TIME
//SORTWK01  DD    SPACE=(CYL,(10,10),RLSE)     Sort work space
//SORTWK02  DD    SPACE=(CYL,(10,10),RLSE)     Sort work space
//SYSOUT    DD    SYSOUT=*                      Sort information
```

12 Required JCL for RDSMF6

RDSMF14

RDSMF14 formats record types 14, 15, and 64, which will produce detail and summary reports of data set activity. This report can be used as problem determination tool as well as a performance tool. For example, "Find the user who wrote to a dataset with the wrong block size, or the user who updated a particular dataset at 2:00 am last night." The fields of the detail report are:

DS NAME

The data set name that was closed by a user.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the job card.

DSORG

The type of data set opened, PS, PO, or VSAM.

OPENED

Describes if the data set was opened for input or output.

FMT

Record format

LRECL

The logical record length the dataset was opened/closed.

BLKSIZE

The block size of the dataset the time it was open/closed.

DEVICE/UNIT

The type of device (3330, 3350, 3375, 3380, etc.) on which the data set resides and the UCB address.

VOLSER

The volume on which the data set resides.

EXCPS

The number of blocks transferred to main memory from the device for this data set.

The fields of the summary report are:

DSN NAME

The data set name that was closed by a user.

STR DATE

The first date of a record found accessing this data set.

TIME

The time of day of the STR DATE.

END DATE

The last date of a record found accessing this data set.

TIME

The time of day of the END DATE.

SYSID

The SMF system ID where the job executed.

DSORG

The type of data set opened, PS, PO, or VSAM.

DEVICE/UNIT

The type of device (3330, 3350, 3375, 3380, etc.) on which the data set resides, and the UCB address.

VOLSER

The volume on which the data set resides.

ACCESSES

The number of times the data set was accessed.

EXCPS

The number of blocks transferred to main memory from the device for this data set.

Required JCL:

The PARM field can be used to reduce the number of data sets for reporting. A generic search is done on the value in the PARM field.

Examples:

```
//ONLYSYS1 EXEC PGM=RDSMF14,PARM=SYS1
```

This example will report on only dataset names that start with SYS1.

```
/ / E X A M P L 2           E X E C
PGM=RDSMF14,PARM='SYS1.LINKLIB'
```

The above example will report on data set names which start with SYS1.LINKLIB.

The SMFCTL DD card reduces the data by volume. If you wish all volumes found to be processed, then SMFCTL DD card must be defined as DUMMY.

Syntax rules:

1. Volume names begin in column one.
2. Volume names may be generic with an '*':
3. Volume control cards must be in alpha-numeric order.
4. Comments may be placed past column eight.

Required JCL:

Figure 13 on page 43 shows an example of the JCL and control cards used with this program.

```

      1           2           3           4           5           6
123456789012345678901234567890123456789012345678901234567890

      PROD01   GET DSN INFORMATION ON PROD01 AND PROD02
      PROD02
      TSO*     GET DATA SET INFORMATION ON ALL TSO PACKS.

//DSNSTATS   JOB
//TYPE14     EXEC      PGM=RDSMF14,REGION=2M
//SMFIN      DD        DSN=TYPE14.TYPE15.TYPE67.SMF,DISP=SHR   Input
//SMF14      DD        SYSOUT=*                                DETAIL Report
//SMF14S     DD        SYSOUT=*                                SUMMARY Report
//SMFLOG     DD        SYSOUT=*                                Information on run
//SORTWK0n   DD        SPACE=(CYL,(10,10),RLSE)                Sort work space
//SYSOUT     DD        SYSOUT=*                                Sort information
//SMFCTL     DD        *                                        Volume control card

```

13 Required JCL for RDSMF14

RDSMF17

RDSMF17 produces two reports. The SMF17 file is a report of the data sets scratched by date and time. SMF17A is a report sorted by data set name. Both reports have the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the JOB card.

VOLUME

The name of the pack on which the data set resides.

DSNAME

The data set name that was scratched.

Required JCL:

The PARM field can be used to reduce the number of data sets to report on. A generic search is done on the value in the PARM field.

Figure 14 shows examples of the EXEC statement and the required JCL for this program.

```
//ONLYSYS1 EXEC PGM=RDSMF17,PARM=SYS1
           This example will report on only dsnames that start with
           "SYS1"

//EXAMPL2 EXEC PGM=RDSMF17,PARM='SYS1.LINKLIB'
           This example will report on only dsnames that start with
           "SYS1.LINKLIB"

//JOBSTATS  JOB
//TYPE17   EXEC      PGM=RDSMF17,REGION=2M
//SMFIN     DD        DSN=MYTYPE17.SMF,DISP=SHR           Input file
//SMF17A    DD        SYSOUT=*                           Report by DSN
//SMF17     DD        SYSOUT=*                           Report DATE/TIME
//SORTWK01  DD        SPACE=(CYL,(10,10),RLSE)           Sort work space
//SORTWK02  DD        SPACE=(CYL,(10,10),RLSE)           Sort work space
//SYSOUT    DD        SYSOUT=*                           Sort information
```

14 Required JCL for RDSMF17

RDSMF18

This program produces a report of the data sets renamed by date and time. The report has the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the job card.

VOLUME

The name of the pack on which the data set resides.

OLD DSNAME

The original data set name.

NEW DSNAME

The current data set name.

Required JCL:

The PARM field can be used to reduce the number of data sets to report on. A generic search is done on the value in the PARM field.

Figure 15 contains an example of the EXEC statement and required JCL for this program.

```
//ONLYSYS1 EXEC PGM=RDSMF18,PARM=SYS1
      This example will report on only dsnames that start with "SYS1"

//EXAMPL2 EXEC PGM=RDSMF18,PARM='SYS1.LINKLIB'
      The above example will report on only dsnames that start with
      "SYS1.LINKLIB"

//JOBSTATS JOB
//TYPE18 EXEC PGM=RDSMF18,REGION=2M
//SMFIN DD DSN=MYTYPE18.SMF,DISP=SHR Input file
//SMF18 DD SYSOUT=* Report DSN/DATE/TIME
//SORTWK01 DD SPACE=(CYL,(10,10),RLSE) Sort work space
//SORTWK02 DD SPACE=(CYL,(10,10),RLSE) Sort work space
//SYSOUT DD SYSOUT=* Sort information
```

15 Required JCL for RDSMF18

RDSMF26

RDSMF26 reports job printing information. It runs as a stand-alone program.

RDSMF26 produces a report with the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the job card.

XMTDEV

Job transmitter device name.

FORM

The FORM of the output data set to be printed.

LINES

The number of lines to be printed (spooled).

BYTES

Actual number of bytes transferred.

Required JCL:

Figure 16 illustrates the JCL for this program.

```
//JOBSTATS  JOB
//TYPE26    EXEC      PGM=RDSMF26,REGION=720K
//SMFIN     DD        DSN=MYTYPE26.SMF,DISP=SHR      Input file
//SMF26     DD        SYSOUT=*                      Report by date/time
//SORTWK01  DD        SPACE=(CYL,(10,10),RLSE)      Sort work space
//SORTWK02  DD        SPACE=(CYL,(10,10),RLSE)      Sort work space
//SYSOUT    DD        SYSOUT=*                      Sort information
```

16 Required JCL for RDSMF26

RDSMF40

RDSMF40 produces a report of the data set EXCP activity by date and time. The report has the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the JOB card.

DEVTYPE

The type of device.

UNIT

The unit address of the pack.

EXCPS

The number of blocks transferred to storage.

Required JCL:

The PARM field can be used to reduce the number of jobs to report on. A generic search is done on the value in the PARM field. An example of the JCL to use this program is provided in figure 17.

```
//ONLYSYS1 EXEC PGM=RDSMF40,PARM=TSU
           This example will report on only jobs that start with "TSU"

//JOBSTATS JOB
//TYPE40   EXEC      PGM=RDSMF40,REGION=2M
//SMFIN    DD        DSN=MYTYPE40.SMF,DISP=SHR           Input file
//SMF40    DD        SYSOUT=*                           Report DATE/TIME
//SORTWK01 DD        SPACE=(CYL,(10,10),RLSE)           Sort work space
//SORTWK02 DD        SPACE=(CYL,(10,10),RLSE)           Sort work space
//SYSOUT   DD        SYSOUT=*                           Sort information
```

17 Required JCL for RDSMF40

RDSMF57

RDSMF57 reports job printing information. It runs as a stand-alone program.

ORGNODE
Original network node ID.

RDSMF57 produces a report with the following fields:

EXENODE
Execution network node ID.

DAY
The day of the week the job executed.

XMITID
SYSOUT transmitter system ID.

DATE
The date JES terminated the job.

XMITDEV
SYSOUT transmitter device name.

TIME
The time JES terminated the job.

RECORDS
Actual number of logical records transferred.

SYSID
The SMF system ID where the job executed.

Required JCL:

JOBNAME
The name of the job on the job card.

An example of the JCL required to run this program is found in figure **18**.

```
//JOBSTATS    JOB
//TYPE57     EXEC    PGM=RDSMF57,REGION=2M
//SMFIN      DD      DSN=MYTYPE57.SMF,DISP=SHR      Input file
//SMF57      DD      SYSOUT=*                      Report by date/time
//SORTWK01   DD      SPACE=(CYL,(10,10),RLSE)      Sort work space
//SORTWK02   DD      SPACE=(CYL,(10,10),RLSE)      Sort work space
//SYSOUT     DD      SYSOUT=*                      Sort information
```

18 Required JCL for RDSMF57

RDSMF67

RDSMF67 produces a report from record types 61, 65, 66, and 67. The SMF67 file is a report of the data sets cataloged to a VSAM or ICF catalog sorted by DSNNAME. This report is useful when catalog activity is needed to rebuild a catalog. The report has the following fields:

DAY

The day of the week the job executed.

DATE

The date JES terminated the job.

TIME

The time JES terminated the job.

SYSID

The SMF system ID where the job executed.

JOBNAME

The name of the job on the JOB card.

ACTION

What action was taken on the catalog entry (scratched, uncataloged, etc.).

For ICF catalogs:

IN VVR was inserted.

UP VVR was updated.

DE VVR was deleted.

TYPE

The type of catalog entry (cluster, data, index, or nonvsam).

VOLUME

Volume name where the data set resides.

DSNNAME

The cataloged data set name.

Required JCL:

The PARM field can be used to reduce the number of jobs to report on. A generic search is done on the value in the PARM field. An example of the JCL required to run this program is provided in figure 19.

```
//ONLYSYS1 EXEC PGM=RDSMF67,PARM=TSU
      This example will report on only data sets that start with "TSU"

//JOBSTATS  JOB
//TYPE67    EXEC  PGM=RDSMF67,REGION=2M
//SMFIN     DD    DSN=SMF61.SMF65.SMF66.SMF67,DISP=SHR Input file
//SMF67     DD    SYSOUT=*                               Report by DSNAME
//SORTWK01  DD    SPACE=(CYL,(10,10),RLSE)              Sort work space
//SORTWK02  DD    SPACE=(CYL,(10,10),RLSE)              Sort work space
//SYSOUT    DD    SYSOUT=*                               Sort information
```

19 Required JCL for RDSMF67

RDSMFVXT

RDSMFVXT is a user exit provided to reduce the amount of SMF type 14, 15, and 64 to process. This will save resources when these records are passed to other programs to be processed. This is very useful when a report of a particular data set or volume is needed for a large time period. This exit does not format the data, it acts as a filter by communicating to READSMF to write the current SMF record to the output file (refer to section "User Exit" on page 17 in this manual for more information).

Data Reduction Methods

1. Specify a full or partial data set name as a parameter. A parameter is passed to the user exit using standard conventions as described in the section User Exit Linkage Conventions to reduce the number of data sets for reporting. A generic search is performed on the value of the parameter passed.
2. Specify volume(s) using the SMFCTL file. The SMFCTL DD card reduces the data by volume.

If you wish not to limit volumes, then SMFCTL DD card must be defined as DUMMY.

Syntax rules:

- a. Volume names begin in column one.
 - b. Volume names may be generic with an '*':
 - c. Volume control cards must be in alpha-numeric order.
 - d. Comments may be placed past column eight.
3. If both a data set name (partial or full) and volumes are specified, a volume record will be written to the output file only if it satisfies both criteria.

Required JCL:

The example in figure **21** on page 52 demonstrates the technique to reduce SMF data for particular volumes. In this example volumes that start with PROD and PVSM will be written to the output file.

The example in figure **20** on page 52 will report on only data set names that start with SYS1 regardless of the volume on which it resides.

```

          1          2          3          4          5          6
123456789012345678901234567890123456789012345678901234567890

PROD01      GET DSN INFORMATION ON PROD01 AND PROD02
PROD02
TSO*        GET DATA SET INFORMATION ON ALL TSO PACKS.

```

20 Sample JCL for RDSMFVXT Limiting DSNAMES

```

//SMF      EXEC PGM=READSMF,PARM='RDSMFVXT',REGION=2M
//STEPLIB  DD      DSN=PILOT.LOADLIB,DISP=SHR
//*
//*      THE FOLLOWING DD STATEMENTS ARE FOR READSMF
//*
//SYSPRINT DD      SYSOUT=*
//EXCEPT DD      SYSOUT=*
//SYSUT1   DD      DSN=MONTHLY.SMF(0),UNIT=TAPE,DISP=OLD
//SYSUT2   DD      DSN=ONLY.MYPACK.SMF.T141564,UNIT=SYSDA,
//          SPACE=(CYL,(30,10),RLSE)
//SYSIN    DD      *
          READSMF START=01/01/1998,END=01/20/1998,SELECT=(14,15,64)
//*
//*      THE FOLLOWING DD STATEMENT ARE FOR RDSMFVXT
//*
//SMFLOG   DD      SYSOUT=*
//SMFCTL   DD      *
PROD*
PVSM*
//

```

21 Sample JCL for RDSMFVXT

TYP305

TYP305 is a user exit provided to reduce the amount of SMF type 30 records to process. It will ignore all other record types except for subtype 5. This will save resources when these records are passed to other programs to be processed. This is very useful when a report is produced by SMFPC30. This exit does not format the data, it acts as a filter by communicating to READSMF to write the current SMF record to the output file (refer to section "User Exit" on page 17 in this manual for more information). Data Reduction Methods.

GENMONTH

GENMONTH is a utility program to update a PDS member which contains PILOT/SMF control cards. The first card in the member must contain the READSMF keyword followed by the START= and END= keywords formatted in the mm/dd/yyyy format. Each time the program is run, the member is updated such that the Start and End dates are the first and last of the next month. This enables you to create a monthly accumulation job stream that can run every month without editing.

Your PILOT Source Library contains sample JCL for this facility, and a sample control card member.

CICSAVIL

CICSAVIL is a user exit provided to reduce the number of SMF type 4 and 30 records to process. This will save resources when these records are passed to other programs to be processed. This is very useful for creating a CICS availability report. The exit will only select type 4 records with the program DFH-SIP.

It acts as a filter by communicating to READSMF to write the current SMF record to the output file (refer to section User Exit on page 17 in this manual for more information).

Figure 22 contains an example of the JCL to produce an availability report.

```
//CICS4      EXEC PGM=READSMF,PARM='CICSAVIL',REGION=2M
//STEPLIB   DD   DSN=PILOT.LOADLIB,DISP=SHR
//*        THE FOLLOWING DD STATEMENTS ARE FOR READSMF
//SYSPRINT  DD   SYSOUT=*
//EXCEPT  DD   SYSOUT=*
//SYSUT1    DD   DSN=MONTHLY.SMF(0),UNIT=TAPE,DISP=OLD
//SYSUT2    DD   DSN=ONLY.CICSSMF.TYPE4,UNIT=SYSDA,
//           SPACE=(CYL,(30,10),RLSE),DISP=(,CATLG)
//SYSIN     DD   *
           READSMF START=01/01/1999,END=01/31/1999,SELECT=(4)
//*        PRODUCE REPORT USING RDSMF4
//TYPE4     EXEC PGM=READSMF,PARM='RDSMF4',COND=(4,LT)
//SYSUT1    DD   DSN=ONLY.CICSSMF.TYPE4.SMF,DISP=SHR
//SYSUT2    DD   DUMMY
//SMF4      DD   SYSOUT=*
//SORTWK01  DD   SPACE=(CYL,(10,10),RLSE)
//SORTWK02  DD   SPACE=(CYL,(10,10),RLSE)
//SYSOUT    DD   SYSOUT=*
//SYSPRINT  DD   SYSOUT=*
//SYSIN     DD   *
           READSMF ST=0000000,E=9999999,SEL=(4)
//
```

22 Sample JCL for CICSAVIL

Index

- accesses 42
- account 7, 11
- action 17, 39, 49
- additional considerations 27
- additional modules 33
- allocation 25, 33
- assembler 2, 17, 18
- assembly 18
- capacity planning 2
- cc 5, 35, 37
- cics 12, 13, 54
- cobol 2, 17-19
- comp 19
- completion codes 5
- control statement format 7
- cpu 14, 27, 31, 35, 37
- daily 27
- dasd 27
- date .. 9, 10, 13, 19, 21, 22, 29, 30, 33, 35,
37-42, 44-49
- date ended 37
- date started 37
- day 9, 10, 14, 39, 41, 42, 44-49
- dd . 3, 9-11, 13, 17, 18, 21, 23-25, 36, 38,
40, 42-48, 50-54
- ddname 11, 23
- default 1, 7, 9-11, 14, 27
- device/unit 41, 42
- dsname 44, 45, 49, 50
- dsorg 41, 42
- dynamic allocation 25, 33
- end . 5, 7, 9-14, 18, 22, 25, 30, 33, 35, 37,
41, 42, 52-54
- end date 9, 10, 33, 35, 41, 42
- except 1, 12, 13, 23-25, 52-54
- exclude 12, 14
- excps 22, 27, 29-31, 33, 41, 42, 47
- exit . 2, 3, 5, 11, 13, 17-19, 23-25, 27, 29,
33, 35, 51, 53, 54
- exl 12
- fcbl 39
- form 7, 17, 21, 39, 46
- general description 17
- group 7, 11, 25, 37
- history 2, 1, 3, 12, 21-25
- history option 1, 3, 21
- interval 14, 15
- ismf 12, 21, 22, 29, 30
- jcl . 2, 13, 17, 18, 21, 23-25, 35-40, 42-54
- jobname 12, 13, 35, 37-41, 44-49
- keywords 7, 9, 11, 12, 53
- linkage conventions 17, 51
- location 39
- mandatory keywords 9
- multiple output 1, 7
- new dsname 45
- nodup jcl 25
- number dsns 39
- number lines 39
- old dsname 45
- opened 41, 42
- operator 12, 39
- optional keywords 11
- output files 1, 7
- page .. 1, 7, 13, 17-19, 21, 23, 25, 35, 37,
39, 42, 51, 53, 54
- parameters 3, 5, 7, 13, 17, 18, 23
- parms 18, 19

passing parameters	18	summary	41, 43
peaktime	13, 14	syntax	3, 5, 11, 12, 42, 51
performance	2, 13, 27, 37, 41	sysid	14, 37, 39, 41, 42, 44-49
performance considerations	27	sysin .	1, 3, 7, 9, 10, 23-25, 29, 36, 52, 54
pgmname	35	sysprint	1, 3, 23-25, 36, 52, 54
pilot/mvs	33	syst	35
pilot/smf ...	1, 2, 1, 3, 5, 7, 13, 17-19, 21-24, 27, 29-31, 33, 53	system .	2, 3, 12-14, 27, 35, 37, 39, 41, 42, 44-49
print	39	sysut1 ..	1, 3, 5, 12, 14, 21, 23-25, 27, 29, 30, 36, 52, 54
pw1	14	sysut2 .	1, 7, 14, 22, 23, 25, 27, 30, 36, 52, 54
pw2	14	time .	9, 10, 13-15, 21, 29, 33, 35, 37-42, 44-49, 51, 53
rdsmf14	33, 41-43	time ended	37
rdsmf17	33, 44	time started	37
rdsmf18	33, 45	tso	13, 36, 43, 52
rdsmf4	33, 35, 36, 54	type .	10, 12, 13, 19, 22, 29-31, 33, 41, 42, 47, 49, 51, 53, 54
rdsmf40	33, 47	ucs	39
rdsmf5	33, 37, 38	unit	22, 29, 30, 41, 42, 47, 52, 54
rdsmf57	33, 48	user exit ...	2, 3, 5, 13, 17, 18, 23-25, 27, 29, 33, 51, 53, 54
rdsmf6	33, 39, 40	virt	31, 35
rdsmf67	33, 49, 50	volser	41, 42
readsmf	7, 9-15, 17, 18, 22-25, 30, 35, 36, 51-54	volume	22, 30, 41-45, 49, 51
required jcl	23, 24, 35-40, 42-51		
rmf	7, 14, 15		
run date	30		
select	7, 10-15, 22, 25, 30, 52, 54		
smf ..	1, 2, 1, 3, 5, 7, 10-14, 17-19, 21-24, 27, 29-31, 33, 35-49, 51-54		
smfctl	42, 43, 51, 52		
smfin	38, 40, 43-48, 50		
smflog	43, 52		
smfpc30	33, 53		
snap	1, 23, 24		
start ...	7, 9-14, 22, 25, 27, 30, 33, 35, 37, 42, 44, 45, 47, 50-54		
statistics log	3, 21, 23, 27, 29-31		
steplib	17, 18, 23-25, 52, 54		
storage requirements	13, 27		
str date	41		