

SUPER
SAS / SMF
REPORT

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SAS/SMF JOB REPORT

Since the dawn of recorded SMF, man has had the desire to get the information from the Step Record (TYPE 4) combined with the data set statistics (TYPE 14-15). The problem is complicated by variable fields in SMF 4 records, real time order of SMF records, EXCP counts not reset on reopened data sets, and missing records.

Using the Data Management and Report Writing Capabilities of SAS 75.2, these problems have been overcome and an easy to read, comprehensive report is produced.

Additional enhancements include selection by job information (in both record types) as well as selection by data in the Step Record only.

P R O B L E M S W I I H S M E D A I A

- . RANDOM CHRONOLOGICAL ORDER.
- . DATA SET RECORDS DO NOT CONTAIN INFO FROM STEP THAT CREATED THEM.
- . VARIABLE LENGTH FIELDS WITHIN RECORDS.
- . EXCP COUNTS NOT RESET ON REOPEN.
- . MISSING RECORDS.
- . DATA IN HEXIDECIMAL REPRESENTATION.
- . VOLUME OF DATA.

SAS MACRO FACILITY

```
MACRO MACRNAME
```

```
SAS STATEMENTS; %
```

```
MACRO MACR01
```

```
DATA; INFILE IN; INPUT;
```

```
@ 2 RTYP PIB1. ; %
```

```
MACRO MACR02
```

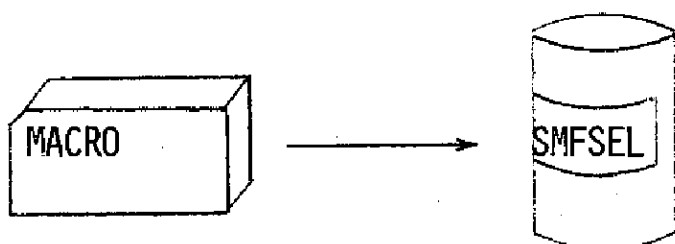
```
OUTPUT; %
```

```
{ MACR01 MACR02
```

```
MACR01 IF RTYP=4 THEN GOTO SAVE; DELETE; }
```

```
SAVE: MACR02
```

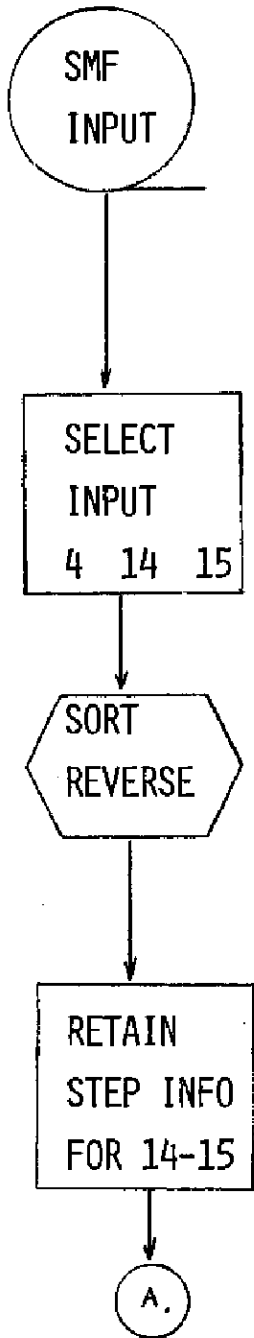
SAS CONCATENATED SYSIN



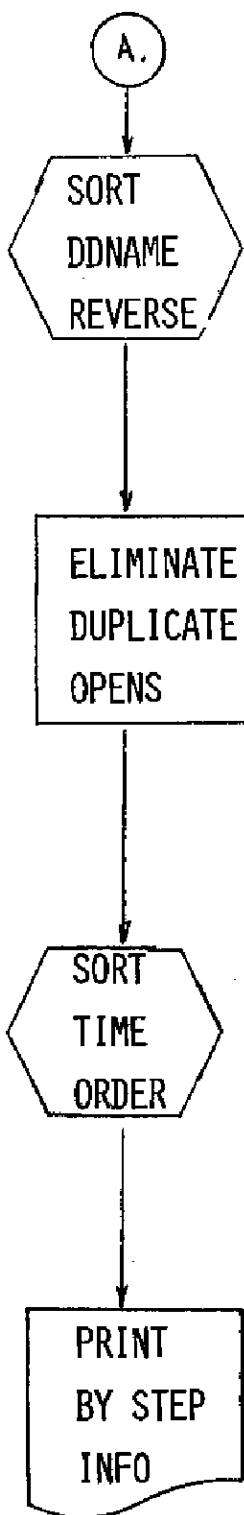
DSN=SP.SASLIB

```
//SAS EXEC SAS
//SMFIN DD DSN=SMF TAPE,DISP=SHR
//SYSIN DD DSN=SP.SASLIB(SMFSEL),DISP=SHR
// DD *
```

```
MACRO1 MACRO2
  IF RPROG='SORT' THEN GOTO SAVE2;
  RETURN;
SAVE2: SELECT=4; MACRO3
```



JOB INFO	STEP INFO	DATA SET INFO
15		DD1
14		DD2
15		DD1
4	STEP1	
4	STEP1	
15		DD1
14		DD2
15		DD1
15	STEP1	DD1
14	STEP1	DD2
15	STEP1	DD1



15	STEP1	DD2
15	STEP1	DD2
14	STEP1	DD1



15	STEP1	DD2
14	STEP1	DD1

JOB	STEP1
DD1	
DD2	

MACRO MACR01
DATA;

INFILE SHFIN;

COMMENT SYNC SORT EVAL ;
COMMENT SAMPLE
/SAS EXEC SAS75
/SHFIN DD
/SYSIN DD DSN=SP.SASLIB(SYNC78),DISP=SHR
/SYSIN DD *
MACR1 MACR2
IF RPROG=1 SORT AND CTH GT 0 THEN GOTO KEEP1 INP RET KEEP1
MAC3 PRINT MAC4 PRINT
END OF SAMPLE *

INPUT

*2 RTYP PIB1. *;

IF RTYP=4 OR RTYP=14 OR RTYP=15
THEN GOTO CONTINUE;

INPUT; RETURN;

CONTINUE;

INPUT

*15 SEL1 \$1, *15 SEL2 \$2, *15 SEL3 \$3, *15 SEL4 \$4,
*15 SEL5 \$5, *15 SEL6 \$6, *15 SEL7 \$7, *15 SEL8 \$8.

*3 RTIME PIB4, *7 RDATE PD4, *12 RSYS \$1,
*15 RJOB \$8, *23 RROST PIB4, *27 RROSD PD4, *1

DROP SEL1 SEL2 SEL3 SEL4 SEL5 SEL6 SEL7 SEL8;

*

MACRO MACR02

SORTDT=-RDATE;

SORTIM=-RTIME;

IF RTYP=4 THEN GOTO TYPE4;

INPUT

*42 RNUCB PIB1, *53 DDNAME \$8, *65 DSNAME \$44, *163 RORG PIB1,
*167 BLKS PIB2, *169 RECL PIB2, *250 ROPTYP PIB1, *265 *

EXCPS=0;

EXLOOP;

INPUT

CUU PIB2, +14 REXCP PIB4, +4 *;

EXCPS=EXCPS+REXCP;
 RNUCB=RNUCB-1;
 IF RNUCB GT 0 THEN GOTO EXLOOP;

INPUT;

CUU=MOD(CUU,4096);
 OUTPUT;
 RETURN;

DROP RNUCB REXCP;

TYPE41

INPUT

*39 RSTEPN PIB1, *40 RSTIME PIB4, *44 RSDATE PD4, *52 RCCODE PIB2,
 *55 RPROG SB, *63 RSTEP SB, *71 RREG1 PIB2, *73 RREG2 PIB2,
 *75 RCOR1 PIB2, *77 RCOR2 PIB2, *103 RULTH PIB2, *;

%

MACRO MACR03

RULTH=RULTH+104;

INPUT

*RULTH RCPU PIB3, ;

RELAPS=((RDATE-RSDATE)*8640000+(RTIME-RSTIME))/6000;
 IF RELAPS LT 0 THEN RELAPS=RELAPS+1440;
 RCOR=RCOR1+RCOR2;
 RREG=RREG1+RREG2;
 OUTPUT;
 RETURN;

DROP RULTH RCOR1 RCOR2 RREG1 RREG2;

PROC SORT;

BY RSYS RJOB RRDSO HRDST SORTDT SORTIM;

COMMENT PUT STEP INFORMATION IN 14-15 RECORDS ;

DATA;

RETAIN;

SET;

IF FIRSTSW*1 THEN GOTO NOTFIRST;
 HJOB*1
 FIRSTSW=1;

NOTFIRST;

IF (HJOB NE RJOB OR HRDST NE RRDSO OR HRDSD NE RRDSO)


```

AND RTYP NE 4 THEN GOTO MISSTEP;
IF HJOB=RJOB AND HRDST=RRDST AND HRDSD=RRDSD AND RTIME LT HSTIME
THEN GOTO MISSTEP;
IF RTYP NE 4 THEN GOTO PUT1415;

```

```

MSGSN=0;
HJOB=RJOB;
HRDST=RRDST;
HRDSD=RRDSD;
HSTIME=RSTIME;

```

```

ETM=RELAPS;
DATE=RRDSD;
TIME=RRDST/360000;
STP=RSTEP;
PGM=RPROG;
COR=RCORE;
REG=RREG;
CTM=RCPU/100;
S=RSYS;
JOB=RJOB;
STEPN=RSTEPN;
CC=RCCODE;
SDT=RSDATE;
STM=INT(RSTIME/360000)*10000
      +INT((MOD(RSTIME,360000))/6000)*100
      +INT((MOD(RSTIME,6000))/100);

```

```

IF RTYP=HTYP THEN GOTO MISS1415;
HTYP=RTYP;
DELETE;

```

```
MISS1415;
```

```

DDNAME='99999999';
DSNAME='';
CUU=0;
EXCPS=0;
TIMESTAMP=RTIME/360000;
ROPTYP=0;
HTYP=RTYP;
OUTPUT;
RETURN;

```

```
MISSTEP;
```

```
DELETE;
```

```
PUT1415;
```

```

HTYP=RTYP;
OUTPUT;
RETURN;

```

```

DROP RSTEPN HTYP RTYP RPROG RDATE RSTEP RCPU RSDATE RSTIME
      RCCODE RELAPS RCORE HJOB HRDST HRDSD MSGSN FIRSTSN RREG;
DROP HSTIME;

```

```

PROC SDRT;
BY RSYS RJOB RRDSD RRDST STEPN DDNAME SORTDT SORTIM;

```

DATA;

RETAIN;

SET;

IF FIRSTSW=1 THEN GOTO SKIP1ST;

HDDNAME=' ';

HJOB=' ';

HSTEP=' ';

OPTYPE=' ';

FIRSTSW=1;

SKIP1ST:

COMMENT SORTED REVERSE TAKE THE LATEST OF THE DUP 14-15;

IF RJOB=HJOB AND RRDST=HRDST AND RRDSO=HRDSO AND STP=HSTEP
AND HDDNAME=DDNAME AND DDNAME NE ' ' THEN DELETE;

IF RJOB=HJOB AND RRDST=HRDST AND RRDSO=HRDSO AND STP=HSTEP
AND DDNAME='99999999' THEN DELETE;

IF DDNAME='99999999' THEN DDNAME=' ';

HJOB=RJOB;

HRDST=RRDST;

HRDSO=RRDSO;

HSTEP=STP;

HDDNAME=DDNAME;

TIMESTAMP=RTIME/360000;

ROPTYP=MOD(ROPTYP,16);

IF ROPTYP=0 THEN GOTO RTYP0 ;

IF ROPTYP=15 THEN GOTO RTYP15;

IF ROPTYP=3 THEN GOTO RTYP3 ;

IF ROPTYP=7 THEN GOTO RTYP7 ;

IF ROPTYP=1 THEN GOTO RTYP1 ;

IF ROPTYP=4 THEN GOTO RTYP4 ;

OPTYPE=' ';

GOTO OUTONE;

RTYP0 : OPTYPE='INPUT ' ; GOTO OUTONE;

RTYP15: OPTYPE='OUTPUT' ; GOTO OUTONE;

RTYP3 : OPTYPE='INDUT ' ; GOTO OUTONE;

RTYP7 : OPTYPE='OUTIN ' ; GOTO OUTONE;

RTYP1 : OPTYPE='RDBACK' ; GOTO OUTONE;

RTYP4 : OPTYPE='UPDAT ' ; GOTO OUTONE;

OUTONE:

IF RORG=128 THEN GOTO ORG80;

IF RORG=64 THEN GOTO ORG40;

IF RORG=32 THEN GOTO ORG20;

IF RORG=2 THEN GOTO ORG2;

ORG=' ';

GOTO OUTWO;

ORG80: ORG='IS' ; GOTO OUTWO;

ORG40: ORG='PS' ; GOTO OUTWO;

ORG20: ORG='DA' ; GOTO OUTWO;

ORG2: ORG='PO' ; GOTO OUTWO;

```
OUTWO;
```

```
OUTPUT;  
RETURN;
```

```
DROP  RSYS RJOB HRDST HRDSD RTIME ROPTYP  
      HRDSD HRDST HJOB HDDNAME HSTEP  
      SORTDT SORTIM FIRSTSN STEPN RORG;
```

```
PROC SORT;  
  BY SDT STM TIMSTAMP;
```

```
PROC PRINT;  
  BY JOB STP PGM SDT STM ETM CTM REG CDR CC S NOTSORTED;  
  ID DDNAME;  
  FORMAT CUU HEX3. CC HEX4.  
         ETM 8.3 CTM 7.2 TIMSTAMP 7.4;  
  TITLE 'SAS/SMP JOB REPORT BY TIME' ;  
  DROP TIME DATE;
```

```
;
```

JOB REPORT BY TIME

8 07 MONDAY, JANUARY 5, 1976 16

----- JOB#BA007A STP#BA733P PGM#SORT SPT#75351 STM#63639 ETM#6.019 CTH#2.79 REG#86 COR#86 CC#0000 SW2 -----

DDNAME	DSNAME	BLKS	RECL	EXCPS	CUU	TIMESTAMP	OPTYPE	ORG
SYSIN	CP.SORTCRDS	80	80	2	25F	6.6140	INPUT	PD
SORTIN	BA.BASE1E.RP200	300	30	7	258	6.6162	INPUT	PS
	BA.BASE1E.MU301	300	30	5761	258	6.6564	INPUT	PS
SORTOUT	BA.BASE1E.ONLINE	300	30	5764	258	6.7093	OUTPUT	PS
SORTWK02	SYS75351.T052800.RV000.BA007A.SORTWK02	0	0	128	356	6.7093	INPUT	PS
SORTWK03	SYS75351.T052800.RV000.BA007A.SORTWK03	0	0	281	355	6.7094	INPUT	PS
SORTLIB	SYS1.SORTLIB	13030	0	0	155	6.7096	INPUT	PD

----- JOB#CC230A STP#CC312PS PGM#SORT SPT#75351 STM#63917 ETM#3.236 CTH#5.49 REG#86 COR#86 CC#0000 SW2 -----

DDNAME	DSNAME	BLKS	RECL	EXCPS	CUU	TIMESTAMP	OPTYPE	ORG
SYSIN	CP.SORTCRDS	80	80	2	25F	6.6585	INPUT	PD
SORTIN	CC.EXCEPTS.G0029V00	3400	34	69	481	6.6650	INPUT	PS
	CC.STOPPAY.G0040V00	3400	34	6	491	6.7003	INPUT	PS
SORTWK02	SYS75351.T062837.RV000.CC230A.SORTWK02	0	0	0	355	6.7017	OUTPUT	PS
SORTOUT	CC.VCYCLDD.G0029V00	3400	34	68	482	6.7071	OUTPUT	PS
SORTWK03	SYS75351.T062837.RV000.CC230A.SORTWK03	0	0	154	356	6.7072	INPUT	PS
SORTLIB	SYS1.SORTLIB	13030	0	0	155	6.7074	INPUT	PD

----- JOB#CB015A STP#CB015PS PGM#SORT SPT#75351 STM#64045 ETM#2.489 CTH#1.81 REG#86 COR#86 CC#0000 SW1 -----

DDNAME	DSNAME	BLKS	RECL	EXCPS	CUU	TIMESTAMP	OPTYPE	ORG
SYSIN	CP.SORTCRDS	80	80	2	25F	6.6907	INPUT	PD
SORTIN	CB.ODNASUP	3156	179	8	15A	6.6957	INPUT	PS
SORTWK03	SYS75351.T064010.RV000.CB015A.SORTWK03	0	0	0	356	6.6968	OUTPUT	PS
SORTOUT	CB.NADAYSP.G1065V00	3520	179	6	480	6.7186	OUTPUT	PS
SORTWK02	SYS75351.T064010.RV000.CB015A.SORTWK02	0	0	8	355	6.7188	INPUT	PS
SORTLIB	SYS1.SORTLIB	13030	0	0	155	6.7191	INPUT	PD

----- JOB#SNYGBRPT STP#CC348PS PGM#SORT SPT#75351 STM#65328 ETM#9.303 CTH#3.06 REG#86 COR#86 CC#0000 SW2 -----

DDNAME	DSNAME	BLKS	RECL	EXCPS	CUU	TIMESTAMP	OPTYPE	ORG
SORTIN	TEST.TRACREF	12950	259	627	480	6.9329	INPUT	PS
SORTWK01	SYS75351.T054637.RV000.SNYGBRPT.SORTWK01	0	0	959	355	6.9865	INPUT	PS
SORTOUT	TEST.TRACAMP	12950	259	625	484	7.0448	OUTPUT	PS
SORTWK02	SYS75351.T054637.RV000.SNYGBRPT.SORTWK02	0	0	3638	356	7.0449	INPUT	PS
SORTWK03	SYS75351.T054637.RV000.SNYGBRPT.SORTWK03	0	0	3397	355	7.0449	INPUT	PS
SORTLIB	SYS1.SORTLIB	13030	0	0	155	7.0452	INPUT	PD

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- J O B R E P O R T F R O M S M F D A T A -

The SAS/SMF program uses the step-end (type 4) and dataset-activity (types 14/15) SMF records to produce a report which summarizes execution and I/O activity for any definable subset of jobs. Execution information reported on includes timings, programs, system used, core and completion code; I/O activity reported on includes dataset and DD names, physical dataset characteristics, I/O activity and processing type.

SAS/SMF consists of several steps of data manipulation followed by a print of the generated data.

- P R O G R A M F L O W -

The first SAS/SMF step selects types 4, 14, and 15 records and some subset of job names (supplied by the user of SAS/SMF). Also, in this step is the processing of variable-positioned data on the SMF records -- UCB data and user CPU time. At the completion of this step, processing of the SMF tape is completed.

The second step sorts the information collected in the first step such that the type 4 (step-end) records precede the dataset-activity records.

The third step combines the information on the type 4 records into the type 14/15 records and deletes the type 4 records. Also in this step is the processing to detect missing type 4 records and to process steps which have no type 14/15 records.

The fourth step sorts the data collected in the third step into reverse chronological order.

The fifth step performs several functions. First, it removes duplicate type 14/15 records so that the only such records are the "latest" dataset-activity records. This is done because the EXCP counts (UCBs) accumulate over multiple CLOSEs of the same dataset. Second, it undoes the processing which created dummy type 14/15 records (for those steps which didn't have any). Third, this step converts some binary data into symbolic representation (e.g. record format, dataset organization).

The sixth step sorts the data from the fifth step back into normal chronological sequence, so that the report appears by job by time.

The seventh step is merely a print of the data from the sixth step.

- S A M P L E J C L -

```
//JOB CARD JOB
//SAS EXEC SAS
//SMFIN DD DSN=SP.WKLYMAN(0),DISP=SHR
//SYSIN DD DSN=SP.SASLIB(SMF41593),DISP=SHR
MACRO1
IF SEL3='BA0' OR SEL4='BACA' OR
SEL4='BACS' OR SEL6='BADISK' OR
SEL6='BATAPE' OR SEL6='BAPOST' OR
SEL6='BASAVE' OR SEL6='BAKUPB'
THEN GO TO PROCESS;
MACRO2 MACRO3
```

/*

- F I E L D D E F I N I T I O N S -

The definitions and sources of the fields appearing on the report produced by the SAS SMF program are as follows:

JOB	The job name, taken from the type 4 record for the step.
STP	The step name, taken from the type 4 record for the step.
PGM	The name of the program executed by the step, taken from the type 4 record for the step.
SDT	The date the step was initiated, taken from the type 4 record for the step. This field is "YYDDD".
STM	The time the step was initiated, taken from the type 4 record for the step. This field is 24-hour time in the form "HHMMSS".
ETM	The elapsed time for the step, calculated from the timestamp of the type 4 record for the step and the step initiation time. This field is in minutes.
CTM	The CPU time used by the step, taken from the type 4 record for the step. This field is in minutes.
REG	The region size requested by the step, taken from the two region fields in the type 4 record for the step. This field is in K-bytes.
COR	The region size actually used by the step, taken from the two core-used fields in the type 4 record for the step. This field is in K-bytes.
CC	The completion code for the step, taken from the type 4 record for the step. This field is four hexadecimal digits.
S	The system on which the step was executed, taken from the header area of the type 4 record for the step. This field is one digit -- "1" indicates system 551, "2" indicates system 552 and "3" indicates system 553.

The remaining fields are printed in columnar format, one line per dataset used by the step.

DDNAME	The ddname of this dataset, taken from the TIOT segment of the type 14-15 record.
DSNAME	The dsname of the dataset, taken from the JFCB in the type 14-15 record.
BLKS	The physical blocksize of the dataset, taken from the JFCB in the type 14-15 record.
RECL	The logical record length of the dataset, taken from the JFCB in the type 14-15 record.

- F I E L D D E F I N I T I O N S - (cont'd)

The remaining fields are printed in columnar format, one line per dataset used by the step.

EXCPS	The count of EXCPs against this dataset, taken from the UCB segment(s) in the type 14-15 record.
CUU	The physical device address for the dataset, taken from the UCB segment(s) in the type 14-15 record. The channel-unit address is three hexadecimal digits.
TIMSTAMP	The time at which the dataset was closed, taken from the header area of the type 14-15 record. This field is in hours and fractions thereof, 24-hour time.
OPTYPE	The processing type for the dataset, taken from the DEB segment in the type 14-15 record. This field is the same as OPEN option field.
ORG	The organization of the dataset, taken from the JFCB segment in the type 14-15 record.
DISP	The disposition of the dataset, taken from the JFCB segment in the type 14-15 record. This field is the operand of the DISP= field in the DD statement.
RCFM	The record format of the dataset, taken from the DCB segment in the type 14-15 record. This field is some combination of the four characters "F", "V", "S", and "T", where "F" indicates fixed-format, "V" indicates variable-format, "S" indicates spanned or standard-format and "T" indicates track overflow-format.