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CENTRAL FLOW CONTROL DATA REDUCTION AND ANALYSIS (RA) COMPONENT--ETC(U)
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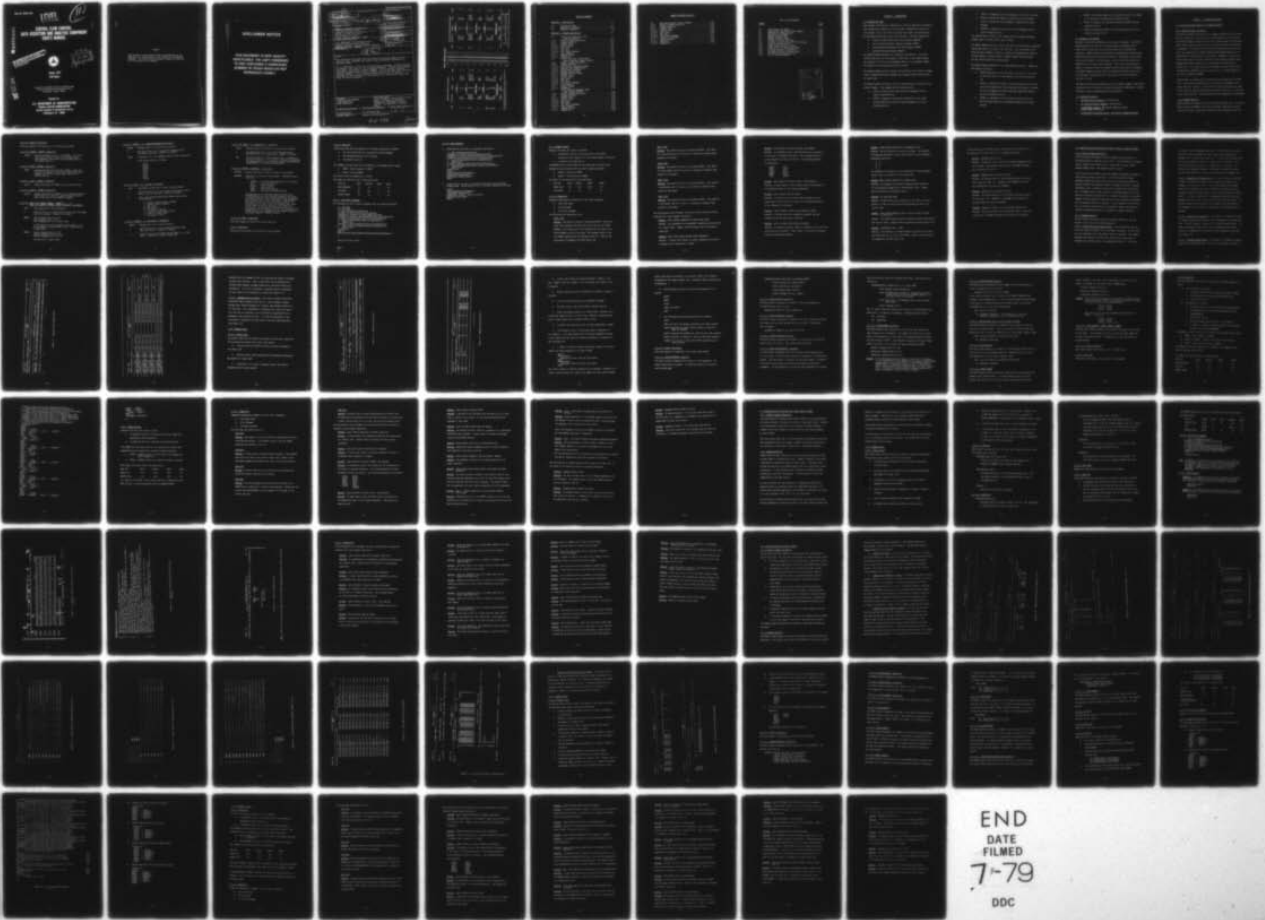
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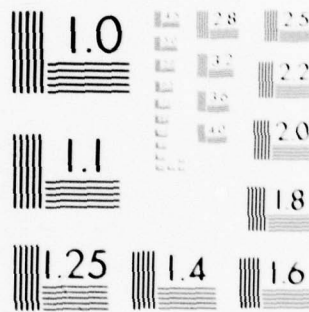
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CENTRAL FLOW CONTROL DATA REDUCTION AND ANALYSIS COMPONENT USER'S MANUAL

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**U.S. DEPARTMENT OF TRANSPORTATION
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16. Abstract This document describes the functions of the Data Reduction and Analysis (RA) programs and details the procedures required to exercise them. RA is comprised of four off-line analysis programs: 1) the Archive Log Queue (ALQ) Tape Filter Program (ALQFLTR), 2) the ALQ Filtered Data Report Generator Program (ALQRPT), 3) the System Analysis Recording (SAR) Dump Program (SARDMP), and 4) the Data Base Analysis Program (DBANAL). The programs enable evaluation of system-performance and system-load characteristics, and provide important aids for error analysis.			
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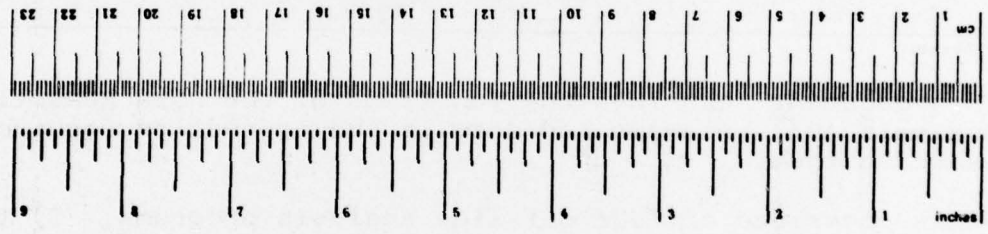
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
in ft yd mi	inches feet yards miles	LENGTH		
		2.5	centimeters	cm
		30	centimeters	cm
		0.9	meters	m
1.6	kilometers	km		
in ² ft ² yd ² mi ²	square inches square feet square yards square miles acres	AREA		
		6.5	square centimeters	cm ²
		0.09	square meters	m ²
		0.8	square meters	m ²
		2.6	square kilometers	km ²
0.4	hectares	ha		
oz lb	ounces pounds short tons (2000 lb)	MASS (weight)		
		28	grams	g
		0.45	kilograms	kg
0.9	tonnes	t		
tsp Tbsp fl oz c pt qt gal ft ³ yd ³	teaspoons tablespoons fluid ounces cups pints quarts gallons cubic feet cubic yards	VOLUME		
		5	milliliters	ml
		15	milliliters	ml
		30	milliliters	ml
		0.24	liters	l
		0.47	liters	l
		0.95	liters	l
		3.8	liters	l
0.03	cubic meters	m ³		
0.76	cubic meters	m ³		
°F	Fahrenheit temperature	TEMPERATURE (exact)		
		5/9 (after subtracting 32)	Celsius temperature	°C

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
mm cm m km	millimeters centimeters meters kilometers	LENGTH		
		0.04	inches	in
		0.4	inches	in
		3.3	feet	ft
		1.1	yards	yd
0.6	miles	mi		
cm ² m ² km ² ha	square centimeters square meters square kilometers hectares	AREA		
		0.16	square inches	in ²
		1.2	square yards	yd ²
		0.4	square miles	mi ²
		2.5	acres	ac
g kg t	grams kilograms tonnes (1000 kg)	MASS (weight)		
		0.035	ounces	oz
		2.2	pounds	lb
		1.1	short tons	st
ml l m ³ m ³	milliliters liters cubic meters cubic meters	VOLUME		
		0.03	fluid ounces	fl oz
		2.1	pints	pt
		1.06	quarts	qt
		0.26	gallons	gal
35	cubic feet	ft ³		
1.3	cubic yards	yd ³		
°C	Celsius temperature	TEMPERATURE (exact)		
		9/5 (then add 32)	Fahrenheit temperature	°F



*1 in. = 2.54 exactly. For other exact conversions and more data and tables, see NBS Special Publication 339, Units of Weights and Measures, Price \$1.45, SD Catalog No. C-310-286.

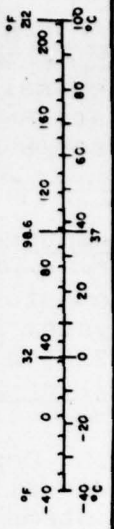


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SECTION 1 - INTRODUCTION

1.1 Purpose and Scope

This document provides user information for the Data Reduction and Analysis (RA) System, which consists of four executable programs that perform off-line analysis of the CFC Archive Log Queue (ALQ) Tapes, the System Analysis Recording (SAR) Tapes, and the CFC Data Base. The four programs are:

- Archive Log Queue (ALQ) Tape Filter Program (ALQFLTR)
- ALQ Filtered Data Report Generator Program (ALQRPT)
- System Analysis Recording (SAR) Dump Program (SARDMP)
- Data Base Analysis Program (DBANAL)

The ALQFLTR Program performs all filtering of the ALQ set. The output filtered data set from this program is then input to the ALQRPT Program for analysis of the CFC on-line message traffic or to the DBANAL Program for analysis of the data base statistics records.

The ALQFLTR Program allows filtering the ALQ data by time interval, message source, message destination, message type, airport/center identification, or record type.

The ALQRPT Program receives as input the filtered data set output from the ALQFLTR Program. This program has five report options:

- IOLOG--A listing of all input and output messages from the input filtered data set.
- IOSTAT--A summary of statistical information on the volume and distribution of input and output messages on the input filtered data set.

- IOSUM--A histogram of selected messages in equal time intervals.
- RTSUM--A statistical summary of the amount of time required by CFC to produce an output message in response to an input message.
- LOGCOMP--A comparison of input and output messages from two input filtered data sets.

All reports may be sorted by time, message source, message destination, message type, or airport/center identification.

The SARDMP Program receives as input a SAR data set and produces a formatted hexadecimal dump of the data on the input set. All the records on the input set may be dumped or specific records to be dumped may be selected by time interval, recording codes or program element identifications (PE IDs) within specified recording codes.

The DBANAL Program performs the data base analysis functions. DBANAL has four modes of operation:

- DBSTUP--Recreation of the data base to any point in time using an off-line copy of the data base and the data base recovery set.
- FRSTAT--A statistical summary of data contained in both the OAG and Non-OAG Flight Record Sets including total number of records as well as summaries by arrival terminal, departure terminal, and arrival/departure pairs.
- FRCOMP--A comparison of two OAG Flight Record Sets and two Non-OAG Flight Record Sets identifying mismatch and no-match records.

- DBSUM--A statistical summary of the data base activity as logged on the ALQ set in the data base statistics records.
- DBLOG--A listing of the data base statistics records from the filtered ALQ file.
- DBLOCK--A statistical summary of the data base locks by table accessed and type of lock.

1.2 Background Information

ALQ data is recorded continuously by the on-line CFC System. The ALQFLTR Program provides the user with a flexible means of extracting from a large volume of data only that data which the user is interested in analyzing. ALQRPT provides the mechanism for analyzing the selected data. ALQFLTR filters the ALQ file and sets fields in the header of each record to be used by ALQRPT. For this reason, the ALQ file to be processed by ALQRPT must be an output file of ALQFLTR. The on-line CFC data base is subject to constant queries and changes resulting from input CFC messages. The DBANAL Program provides a means of analyzing data base activity and when necessary creating off-line a duplicate of the on-line system at any point in time.

SAR tapes contain data transferred from core storage to magnetic tape during operation of the CFC Monitor or during the operation of NAS Model 3 systems. The data is used in systems analysis and evaluation.

1.3 Reference Documents

1. CFC System Design Document, CSC/SD-78/6172
2. CFC Executive Monitor Handbook, CSC/SD-78/6170
3. OS SORT/MERGE Program, IBM Systems Reference Library, Program Number 3605-SM-023
4. IBM System/360 Operating System: Job Control Language Reference

SECTION 2 - PROGRAM DESCRIPTIONS

2.1 Archive Log Queue Tape Filter Program (ALQFLTR)

2.1.1 General Program Description

The Archive Log Queue (ALQ) Tape Filter Program (ALQFLTR) selects records from the input ALQ set and writes the selected records to an output set.

The ALQFLTR Program provides the user with a flexible means of extracting from a large volume of data only that data which the user is interested in analyzing. The output set containing the selected ALQ records is the input set required by the ALQRPT Program and the DBANAL Program (if the DBSUM, DBLOG, or DBLOCK option is requested). Records to be written to the filtered output set may be selected by time interval, message source, message destination, message type, airport/center identification or record type. If no record selection is required, the ALQ set must still be processed by ALQFLTR in order to output a set in a format compatible for input to ALQRPT and DBANAL.

ALQFLTR begins by reading the user-supplied control cards from the SYSIN file. The control cards provide input and output file DDNAMEs and the record selection criteria. Records from the input ALQ set are then read; if the record is accepted based upon the selection criteria, it is written to the output data set. Where appropriate, error diagnostics are generated.

2.1.2 Program Operation

ALQFLTR reads user-supplied control cards from the SYSIN file. The control cards contain the DDNAMEs of the input and output files and the record selection criteria. Input files include the error message file and the

ALQ set. Output files include the file for listing control cards and error diagnostics and the file for the output filtered data.

The control cards are read, the selection criteria is established, and the card images are printed with appropriate diagnostics. If no errors are encountered on the control cards, records are read from the input ALQ set. The record is compared to the selection criteria and if accepted, it is written to the output data set. The record must meet all filter criteria specified in order to be accepted. Records may be selected by time interval, message source, message destination, message type, airport/center identification or any combination of the above. The specific function of selecting Data Base statistics records by record type is an additional option available for users of the Test Case Generator (TR) who require an output set containing only the enhanced record type. If the user chooses selection by record type, no other selection criteria may be specified.

The data set output by ALQFLTR may contain:

- Input CFC messages and resulting output messages to be input to ALQRPT
- Data Base statistics records for input to DBANAL
- Enhanced message records for input to TR

2.1.3 Program Inputs

2.1.3.1 Control Cards

The control cards are free format; any number of cards may be specified.

The following rules govern the control card format:

- A dollar sign (\$) indicates the end of control information on a given card.

- Multiple control card keywords with the associated parameters may appear on a single card.
- A semicolon (;) is used to separate control card keyword parameters from the next keyword.
- Control cards should be bracketed between a 'START \$' card and a 'TERM \$' card; the 'START \$' card is optional; the 'TERM \$' card is required.
- Control cards may contain information in columns 1 through 72 inclusive.
- Lists of keyword parameters are separated by commas.
- No keyword may be duplicated within a control card set.
- Blanks may appear anywhere on a control card. However, since a blank may signal the end of a field (e.g., keyword or keyword parameter), a blank should not be embedded within a field.
- A control card field may be one to eight characters in length.
- A continuation sign (+) may follow either a semicolon (;) or a comma (,). This sign signals that no further information follows on the current card but that the stream of information is continued on the following card.
- The following control card keywords are required:

CNTLST
ERRIN
ALQIN
ALQOUT
TERM

- The following control card keywords are optional:

START
TIME
SOURCE
DEST
MSGTYP
PLACE
RECTYPE

No additional keywords will be accepted.

2.1.3.1.1 START \$ (Optional)

This card signals the beginning of the control card stream.

2.1.3.1.2 CNTLST = DDNAME \$ (Required)

CNTLST - Keyword preceding the print file DDNAME. Since this file must be opened prior to the printing of any error messages, this keyword should appear early in the control card set.

2.1.3.1.3 ERRIN = DDNAME \$ (Required)

ERRIN - Keyword preceding the error file DDNAME. Since this file must be opened for reading the appropriate error message, this keyword should appear early in the control card set.

2.1.3.1.4 ALQIN = DDNAME \$ (Required)

ALQIN - Keyword preceding the DDNAME for the input ALQ file.

2.1.3.1.5 ALQOUT = DDNAME \$ (Required)

ALQOUT - Keyword preceding the DDNAME for the resulting filtered ALQ data set. The data set associated with this DD card is the input set for ALQRPT or DBANAL.

2.1.3.1.6 TIME = [X,] MMDDYY (HHMMSS - HHMMSS) \$ or
TIME = [X,] MMDDYY (HHMMSS) - MMDDYY (HHMMSS) \$ (Optional)

TIME - Time range filter criteria keyword.

X - Specifies that all records falling within this time range are to be excluded. Default is 'include'.

MMDDYY - Month (ranging from 01 to 12)
Day (ranging from 01 to 31)
Year (ranging from 77 to present year)

If the range is within the same 24-hour period, it is not necessary to specify MMDDYY twice. This must be a 6-digit field.

HHMMSS - Hours (ranging from 00 to 23)
Minutes (ranging from 00 to 59)
Seconds (ranging from 00 to 59)

This must be a 6-digit field.

2.1.3.1.7 SOURCE = X, AAAAA,AAAAA,AAAAA \$ (Optional)

- SOURCE - Message source ID filter criteria keyword.
- X - Any record with one of the specified message source IDs shall be excluded. Default is include.
- AAAAA - A maximum of 10 valid message source IDs may be specified.

Valid source IDs are as follows:

CFCCSI
TAEXEC
TATRAN
CFCCRD
CIOT1
CIOT2
CIOT3
CIOT4
CCCIOT

2.1.3.1.8 DEST = X, A,A,A,A \$ (Optional)

- DEST - Destination output device filter criteria keyword.
- X - Any record with one of the specified destination output devices shall be excluded. Default is include.
- A - Any of the following destination output device codes are acceptable:

G = Computer Readout Device (ATCSCC)
I = Console Printer (ATCSCC)
H = HSP (CFCF)
M = MSP (ATCSCC)
U = TTY Reperf. (ATCSCC)
J = Computer Readout Device (CFCF)
K = Console Printer (CFCF)
T = TTY Reperf. (CFCF)

2.1.3.1.9 MSGTYP = X, AA,AAAA,AA \$ (Optional)

- MSGTYP - Message code filter criteria keyword.
- X - Any record with one of the specified message codes shall be excluded. Default is include.
- AAAA - Any of the 26 valid message external codes (i.e., LISA, DEMA). A maximum of 13 may be specified.

2.1.3.1.10 PLACE = X, AAA,AAA,AAA \$ (Optional)

- PLACE - Airport/center identification filter criteria keyword.
- X - Any record with one of the specified airport/center identifications shall be excluded. Default is include.
- AAA - Any valid airport or center external code. A maximum of 10 may be specified. If this filter criteria is specified, any message which does not contain a unique airport/center identification is automatically excluded.

2.1.3.1.11 RECTYPE = AAAAAAAA \$ (Optional)

- RECTYPE - Keyword preceding the type of record to be selected.
- AAAAAAA - Specifies the requested record types. Acceptable record types are:
- ENHANCED - just enhanced records are to be selected
 - INIT - initiation records
 - OUTPUT - output records
 - REPORT - report records
 - TERM - termination records
 - DBSTAT - data base statistics records

Although any of these records types are valid, only RECTYPE=ENHANCED or RECTYPE=DBSTAT should be used since no support programs exist to process data sets containing only records of any of the other types. This parameter when used excludes all other selection criteria. If specified, all records of the type requested that exist on the input set will be written to the output set. An output set containing only enhanced records may be processed by the TR Program; an output set containing only DBSTAT records may be processed by the DBANAL Program if the report request is DBSUM or DBLOCK.

2.1.3.1.12 TERM \$ (Required)

This card signals the end of the control card set.

2.1.3.2 Data Cards

There are no data cards to be supplied to this program.

2.1.3.3 Data Sets

Three input data sets are required for successful operation of ALQFLTR:

- The partitioned data set containing the error messages
- The sequential ALQ set to be filtered
- The control card set

The DDNAMEs for these data sets are defined on the program control cards:

- ERRIN = error message set DDNAME
- ALQIN = ALQ set DDNAME

The control card set DDNAME must be SYSIN.

The format of these data sets is described below.

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
ERROR MESSAGES	80	80	F	PO
ALQ INPUT	512	512	F	PS
CONTROL CARDS	80	80	F	PS

2.1.3.4 Job Control Language

The following is the Job Control Language (JCL) for executing ALQFLTR.

```
// JOB CARD
/*SETUP TAPE(2)
// EXEC PGM=ALQFLTR,REGION=200K
//STEPLIB DD DSN=RA.LIB.PROD.LOAD,DISP=SHR
//RAERROR DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//SYSPRINT DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//RAALQIN DD DSN=ALQ.INPUT,UNIT=2400,VOL=SER=TAPE ID,
// DISP=OLD,DCB=(RECFM=F,LRECL=512,BLKSIZE=512),
// LABEL=(1,NL)
//RALQOUT DD DSN=ALQ.OUTPUT,UNIT=2400,VOL=SER=TAPE ID,
// DISP=(,KEEP),DCB=(RECFM=F,LRECL=512,BLKSIZE=512),
// LABEL=(1,NL)
//SYSIN DD *
START $
CNTLST=SYSPRINT;ERRIN=RAERROR;ALQIN=RAALQIN;ALQOUT=RALQOUT $
.
.
.
selection criteria cards
.
.
.
TERM $
/*
//
```

2.1.3.5 Input Examples

1. Filter ALQ Set for data in a specified time period.

```
// EXEC PGM=ALQFLTR,REGION=200K
//RAERROR DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//SYSPRINT DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//INPUT DD DSN=ALQ.INPUT,UNIT=2400,VOL=SER=CF0000,
// DISP=OLD,DCB=(RECFM=F,LRECL=512,BLKSIZE=512),
// LABEL=(1,NL)
//OUTPUT DD DSN=ALQ.OUTPUT,UNIT=2400,VOL=SER=CF1111,
// DISP=(NEW,KEEP),DCB=(RECFM=F,LRECL=512,BLKSIZE=512),
// LABEL=(1,NL)
//SYSIN DD **
START $
CNTLST=SYSPRINT;ERRIN=RAERROR, $
ALQIN=INPUT;ALQOUT=OUTPUT $
TIME=010178 (013000-053000) $
TERM $
```

2. Filter ALQ Set for data in a specified time period and specified message types. Using the above JCL, the control cards are as follows:

```
START $
CNTLST=SYSPRINT;ERRIN=RAERROR $
ALQIN=INOUT;ALQOUT=OUTEUT $
TIME=060979 (010000) - 061079 (010000) $
MSGTYP=LIFP,LISA,DEMA $
TERM $
```

2.1.4 Program Outputs

There are two data sets output by ALQFLTR:

- A sequential data set containing control card images, appropriate error diagnostics, and program summary information
- A sequential filtered ALQ set

The DDNAMES for the output data sets are specified as control card parameters and are required for successful program operation:

- CNTLST = print file DDNAME
- ALQOUT = filtered ALQ set DDNAME

The format of the data sets is described below:

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
PRINT FILE	133	1330	FBA	PS
ALQ OUTPUT	512	512	F	PS

2.1.4.1 Diagnostics

Diagnostics generated by ALQFLTR fall into three categories:

- User abend codes
- Error messages
- I/O module messages

The following user abends may occur:

USER = 0001

Meaning: This abend is output by the module RAFLTR. Either the input error message file (specified by the control card ERRIN=DDNAME) or the output print file (specified by the control card CNTLST=DDNAME) could not be opened. The probable cause is that the DDNAME specified was not provided in the JCL. Refer to the associated I/O message on the HASP output log.

USER = 0002

Meaning: This abend is output by the module RAFFPAR. This abend is a code default and if it occurs, it indicates a software logic problem in the module.

USER = 0003

Meaning: This abend is output by the module RAFFPAR. This abend is a code default and if it occurs, it indicates a software logic problem in the module.

USER = 0004

Meaning: This abend is output by the module RAFLDV. This abend is a code default and if it occurs, it indicates a software logic problem in the module.

USER = 0005

Meaning: This abend is output by the module RACFIL. This abend is a code default and if it occurs, it indicates a software logic problem in the module.

The following are error messages that may be printed and the condition indicated will cause program termination.

MESSAGE: RA001 INVALID CHARACTER IN CONTROL CARD FIELD

Meaning: An unacceptable non-alphanumeric character was encountered on a control card. Compool table BH contains the valid special characters.

MESSAGE: RA002 FIELD LENGTH EXCEEDS EIGHT CHARACTERS

Meaning: A control card keyword or keyword parameter was found to be greater than 8 characters in length.

MESSAGE: RA003 MISSING OR INVALID CONTROL CARD KEYWORD

Meaning: An acceptable control card keyword was not encountered at the onset of a keyword expression. The intended keyword is either misspelled or has been omitted. The following keywords are acceptable:

CNTLST	TIME
ERRIN	SOURCE
ALQIN	DEST
ALQOUT	MSGTYP
START	PLACE
TERM	RECTYPE

MESSAGE: RA004 MISSING OR INVALID VALUE - XXXX EXPECTED

Meaning: An equal sign or other delimiter was not encountered at the appropriate point in the keyword expression.

MESSAGE: RA005 INVALID TIME/DATE ENTRY

Meaning: A portion of the time/date field includes an out of range value, a field is not six digits, or the time/date entries do not represent a time range.

MESSAGE: RA006 DUPLICATE CONTROL CARD KEYWORD OR DDNAME

Meaning: A keyword preceding a DDNAME or parameter has been repeated within the same control card set.

MESSAGE: RA007 TOO MANY IDENTIFIERS FOR KEYWORD

Meaning: The maximum allowable number of parameters for a particular keyword has been exceeded. Compool table I5 contains the maximum values and associated keywords.

MESSAGE: RA008 INVALID IDENTIFIER IN DESTINATION FIELD

Meaning: One of two possible errors has occurred. The parameter following the destination output device keyword is not acceptable.

Acceptable values are:

G	U
I	J
H	K
M	T

The parameter following the record type keyword is not acceptable. Compool table LO contains the valid selections.

MESSAGE: RA014 INVALID IDENTIFIER IN SOURCE FIELD

Meaning: The parameter following the message source keyword is not an acceptable message source identification code. Compool table KX contains the acceptable values.

MESSAGE: NO TERM CARD FOUND

Meaning: An end-of-file was encountered on the control card set; however, no TERM card was encountered signifying the end of the control cards.

MESSAGE: RA015 HEADER MESSAGE SOURCE ID XXX NOT FOUND IN TABLE OF VALID ID's

Meaning: The record being processed contained a source identification that was not valid. Compool table KX contains the valid source ID's.

MESSAGE: UNSUCCESSFUL RUN - IOERR

Meaning: This message is a summary message indicating an I/O error was encountered by one of the I/O modules. Refer to the associated I/O message on the HASP output log.

The following are I/O module messages which appear on the HASP log. In all cases, an I/O error will result in program termination.

MESSAGE: AAAAAAAA ERROR ON OPEN

Meaning: The data set associated with the DDNAME (AAAAAAA) could not be opened. The probable cause is that the DDNAME indicated was not provided in the JCL.

MESSAGE: AAAAAAAA GIVES TOO MANY PDS FILES

Meaning: The maximum number of partitioned data sets that may be open at any one time is 5. AAAAAAAA is the DDNAME of the file to be opened when the limit was exceeded.

MESSAGE: AAAAAAAA GIVES TOO MANY I/O FILES

Meaning: The maximum number of I/O data sets that may be open at any one time is 20. AAAAAAAA is the DDNAME of the data set to be opened when the limit was exceeded.

MESSAGE: AAAAAAAA IS UNABLE TO GET SUFFICIENT CORE FOR DCB

Meaning: There was insufficient core available when the data set specified by the DDNAME (AAAAAAA) indicated was to be opened.

2.2 Archive Log Queue Filtered Data Report Generator Program (ALQRPT)

2.2.1 General Program Description

The ALQ Filtered Data Report Generator Program provides analysis of selected ALQ data in specified report form: the input/output log compare report, response time summary report, input/output log list report, message summary report, and message statistic report.

The ALQ Filtered Data Report Generator Program can generate any number of these reports during one execution. The ALQ Filtered Data Report Generator Program processes a filtered ALQ file (output by ALQFLTR) to produce response time statistics based on message initiation to message termination time; a formatted listing of the records on a filtered ALQ file; a summary report of the frequency of messages depicted in a histogram and a statistic information line; a report consisting of a one-line summary of rate, number of occurrences, and other statistical information for user-selected fields in a message. It also compares a filtered ALQ file to another filtered ALQ file and produces a report consisting of a listing of mismatched records and a summary of compare statistics.

2.2.2 Program Operation

The ALQ Filtered Data Report Generator Program produces, at the user request, any or all of the following reports.

2.2.2.1 Input/Output Log Compare Report. Two filtered ALQ files are sorted by criteria internal to the log compare processor. The two files are then compared and the log compare report is generated. The compare program first compares the fields that the data sets were sorted on (message type, message source, and message destination). If they are

not equal, the lesser message is printed. If the fields that the data sets were sorted on compare but other fields do not compare, both messages will be printed (see Figure 2-1). If the input messages match, the output messages for each input message are then compared. After both files have been processed, a summary report is generated containing total messages, messages that matched, messages with output errors, and messages with no match on each data set (see Figure 2-2).

2.2.2.2 Response Time Summary Report. If no sort field is specified, a report is generated to represent the response time range for all messages on a filtered ALQ file. This report contains a histogram depicting the response times and a statistics line containing total messages processed, average response time, and other statistical information. If a sort is specified, a histogram and statistics line are generated for each value of the specified sort fields (see Figure 2-3). Message response time is defined as the elapsed time from receipt of the message in the CFC System to termination of CFC processing of the message.

2.2.2.3 Input/Output Log Report. This report is a formatted listing of enhanced messages and associated output messages for a filtered ALQ file. For each message, a heading line is formatted and printed. The enhanced messages and associated output messages are then printed. Finally, the heading line is printed with the termination time added (see Figure 2-4).

2.2.2.4 Message Summary Report. This report is a summary of message rates for a filtered ALQ file. If no sort is specified, a report is

ID	DM SOURCE	TYPE	ATSCG	DEST	ENTRY TIME	DATE
9431808700000	CR 44316	CRN 1852 CRD			507890	986777
9431808700000	CR 44316	CRN 1852 CRD			507890	986777

ID	DM SOURCE	TYPE	ATSCG	DEST	ENTRY TIME	DATE
9431805700000	CR 44316	CRN 1852 CRD			507890	986777
9431805700000	CR 44316	CRN 1852 CRD			507890	986777

Figure 2-1. Input/Output Log Compare Report

LOG COMPARE SUMMARY

TOTAL RECORDS ALQ1	19
TOTAL RECORDS ALQ2	10
TOTAL MATCHED RECORDS WITHOUT ERROR	4
TOTAL MATCHED RECORDS WITH OUTPUT ERROR	0
TOTAL RECORDS ALQ1 NO MATCH	4
TOTAL RECORDS ALQ2 NO MATCH	6

Figure 2-2. Input/Output Log Compare Report Summary

```

VERSION - 000
--S021--BSEIPELAL DESIAL IIRINI - 000100
PSEIPL - EN DESL - H
CENTRAL FLOW CONTROL O. A. & A.
RTSUM
PAGE 1

FREQUENCY DISTRIBUTION PERCENT OF TOTAL
RESPONSE TIME CCUNT 0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100
00000 - 000059 .....
TOTAL CCUNT 1 AVE RESPONSE TIME = .3000E 01 MIN = 000003 MAX = 000003 STD DEVS = 0000E 00 SUM OF TIMES 000000

```

Figure 2-3, Response Time Summary Report

generated for all messages on the file depicting the number of messages in given time intervals. Also, a statistics line is formatted containing total messages, average message rate, and other statistical information. If a sort is specified, a separate report is generated for each value of the specified sort fields (see Figure 2-5).

2.2.2.5 Message Statistic Report. This report contains statistical information about message rates such as: total messages, average message rate, maximum messages per interval, and standard deviation of the intervals. This information is formatted into a one-line report. If a sort was not specified, a one-line report is generated for all messages on the filtered ALQ file. If a sort was specified, a one-line report is generated for each value of the sort fields specified (see Figure 2-6).

2.2.3 Program Inputs

2.2.3.1 Control Cards

The control cards are free format; any number of cards may be specified.

The following rules govern the control card format:

- A dollar sign (\$) indicates the end of control information on a given card

- Multiple control card keywords with the associated parameters may appear on a single card

- A semicolon (;) is used to separate control card keyword parameters from the next keyword

MSGTYPE	DEST	COUNT	MIN/LIMIT	MAX/LIMIT	STAND. DEV.	RATE/LIMIT
CM	M	3	3	3	.000E 00	.303E 01
ABD	G,I,M,R,U,J,K,T	3	3	3	.000E 00	.300E 01
CPA	I,M	6	0	3	.4221E 00	.600E-01
GAEL	I,M,J,T	3	3	3	.000E 00	.303E 01
1A+B	LM	6	0	3	.000E 00	.300E 01
	M	6	0	3	.4221E 00	.600E-01

Figure 2-6. Message Statistic Report

- Control cards should be bracketed between a 'START \$' card and a 'TERM \$' card; the 'START \$' card is optional; the 'TERM \$' card is required

- Control cards may contain information in columns 1 through 72 inclusive

- Lists of keyword parameters are separated by commas

- No keyword may be duplicated within a control card set

- Blanks may appear anywhere on a control card. However, since a blank may signal the end of a field (e.g., keyword or keyword parameter), a blank should not be embedded within a field

- A control card field may be one to eight characters in length

- A continuation sign (+) may follow either a semicolon (;) or a comma (,). This sign signals that no further information follows on the current card but that the stream of information is continued on the following card

- A 'TERM \$' card must separate each report request if multiple reports are being requested in one input stream:

```
START $  
REPORT=IOLOG $  
    additional control cards for this report  
TERM $  
REPORT=RTSUM $  
    additional control cards for this report  
TERM $
```

Each report request is treated separately by the program. Therefore, all control cards required for a report must appear with that report request.

Control card errors encountered in one report request will terminate processing of that report request only. Subsequent report requests will be processed.

- The following are required control card keywords for all reports:

REPORT
ERRIN
CNTLST
ALQIN (or ALQIN1)
TERM

- The following are optional keywords for all reports:

START
SORT (not valid for Logcomp; optional on all other reports)
TIMINT (required for IOSUM, IOSTAT, RTSUM; not valid for IOLOG or LOGCOMP)
ALQIN2 (required for LOGCOMP; not valid for any other reports)
RPTINT (optional for RTSUM; not valid for any other reports)
TIMSPAN (not valid for IOLOG and LOGCOMP; optional for all other reports)

2.2.3.1.1 START \$ (optional)

This card signals the beginning of the control card stream.

2.2.3.1.2 REPORT=AAAAAAA required)

The report keyword designates which report is to be generated. The report keyword must be present. The possible reports are listed on the following page.

AAAAAAAA=LOGCOMP (Input/Output Log Compare Report)

=RTSUM (Response Time Summary Report)

=IOLOG (Input/Output Log Report)

=IOSUM (Message Summary Report)

=IOSTAT (Message Statistic Report)

2.2.3.1.3 ERRIN=AAAAAAAA (required)

The ERRIN keyword designates the DDNAME of the error message file.

The ERRIN keyword must be present.

AAAAAAAA=The DDNAME of error message file

2.2.3.1.4 CNTLST=AAAAAAAA (required)

The CNTLST keyword designates the DDNAME of the file to which the control card images and any error messages are to be written. This keyword must be present.

AAAAAAAA=The DDNAME of the control list file

2.2.3.1.5 RPTLST=AAAAAAAA (required)

The RPTLST keyword designates the DDNAME of an output file to which the reports are to be written. This keyword must be present.

2.2.3.1.6 SORT=AAAAAAAA [,X] (optional)

The SORT keyword designates the fields on which the filtered ALQ file is to be sorted. The SORT keyword may not be included in a LOGCOMP report request. The SORT keyword is optional for all other reports. A maximum of two sort criteria may be specified by including two SORT=VALUE statements. If two statements are used, the first represents the primary

sort field and the second the secondary sort field. The possible sort fields are:

AAAAAAA=MSGTYPE (Message type, i.e., LISA, DEMO)

=DEST (Message output destination)

=PLACE (Message airport/center ID; messages with multiple airport/center IDs will be grouped together, i.e., the place field will be blank)

=TIME (Entry time of the message; this is only valid for IOLOG report)

=SOURCE (Message source)

The ',X' symbol represents optional type of sort to be performed on the given field. The default is ascending. Possible values for X are:

X=A Ascending

X=D Descending

2.2.3.1.7 TIMINT=HHMMSS (optional)

The TIMINT keyword value specifies the size of the time interval for which statistics are accumulated. The number of intervals for a given report is determined by the time spans of the data processed divided by the time interval (TIMINT). This keyword is required for reports IOSUM, IOSTAT, and RTSUM. It is invalid for reports IOLOG and LOGCOMP.

HH=Hours (ranging from 00 to 23)

MM=Minutes (ranging from 00 to 59)

SS=Seconds (ranging from 00 to 59)

Example: If the data being processed ranges in time from 1:00 (010000) to 2:00 (020000) and a time interval of 10 minutes (TIMINT=001000) is specified for the reports IOSUM or IOSTAT (REPORT=IOSUM or REPORT=IOSTAT), an average message rate will be computed for each 10 minute interval (i.e., 010000-011000, for 011000-012000, etc.). Similarly, if REPORT=RTSUM, an average response time would be calculated for each 10 minute interval.

2.2.3.1.8 ALQIN=AAAAAAAA (Optional)

The ALQIN keyword specifies the input DDNAME for the filtered ALQ file.

It must be specified for all reports.

AAAAAAAA=Filtered ALQ file input DDNAME

If the report requires a sort to be done, the DDNAME (AAAAAAAA) must conform to the standards below. A sort is done whenever the SORT keyword is specified or if REPORT=RTSUM and the RPTINT keyword is specified.

The DDNAME must be in the format AAAAIN where

AAAA = any four characters

IN = mandatory characters. This constraint is due to the formats of DDNAMEs for the OS sort/merge utility.

2.2.3.1.9 ALQIN1=AAAAAA (may be used in place of ALQIN)

The ALQIN1 keyword designates the DDNAME for the primary filtered ALQ file for the LOGCOMP report. This card is used for LOGCOMP report only.

Because the sort is used, the DDNAME must be in the format 'AAAAIN', where

AAAA = any four characters (different from ALQIN)

IN = mandatory characters

2.2.3.1.10 ALQIN2=AAAAAA

The ALQIN2 card designates the DDNAME for the secondary filtered ALQ file.

This card is used for LOGCOMP report only. Because the sort is used,

the DDNAME must be in the format 'AAAAIN', where

AAAA = any four characters (different from ALQIN1)

IN = mandatory characters

2.2.3.1.11 RPTINT=HHMMSS

The RPTINT (report interval) keyword is valid only for the response time summary report (REPORT=RTSUM). The RPTINT option allows the user to indicate the start time of the report rather than allowing the start

time to default to the first time encountered in the data being processed. The format for the RPTINT value is HHMMSS where

HH=Hours (ranging from 00-23)

MM=Minutes (ranging from 00-59)

SS=Seconds (ranging from 00-59)

Example: If the first time encountered for the data is 012316 and the user has specified TIMINT of 10 minutes, the default intervals for which statistics are generated would be

012316 - 013315

013316 - 014315

014316 - 015315

The user may wish to provide RPTINT=012300 such that the default intervals are

012300 - 013359

013300 - 014359

014300 - 015359 etc.

2.2.3.1.12 TIMSPAN=MMDDYY, HHMMSS, MMDDYY, HHMMSS

The Time span (TIMSPAN) keyword specifies the time period to be covered by the report. Only messages that fall into the time span range will be used to produce the report. Timespan is not valid for IOLOG and LOGCOMP reports.

2.2.3.1.13 TERM \$ (required)

Each report request must terminate with a 'TERM \$' card.

2.2.3.2 Data Cards

There are no data cards to be supplied to this program.

2.2.3.3 Data Sets

The following input data sets are required for successful operation of ALQRPT:

- If no sorting is to be done
 - a. The partitioned data set containing the error messages
 - b. The sequential set containing filtered ALQ data
 - c. The control card set
- If sorting is to be done
 - a. The partitioned data set containing the error messages
 - b. The sequential set containing the filtered ALQ data
(DDNAME=AAAAIN)
 - c. The control card set
 - d. The sort program library data set - SYS1.SORTLIB
 - e. If report is LOGCOMP, a second sequential set containing filtered ALQ data (DDNAME=BBBBIN)

The DDNAMES for these data sets are defined on the program control cards:

- ERRIN = error message set DDNAME
- ALQIN (or ALQIN1) = AAAAIN (for sort) filtered ALQ set
- ALQIN2 = second filtered ALQ set (BBBBIN)

The DDNAME for the sort library must be SORTLIB. The DDNAME for the control card set must be SYSIN.

The format of these data sets is described below:

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
ERROR MESSAGES	80	80	F	PO
ALQ INPUT	512	512	F	PS
CONTROL CARDS	80	80	F	PS

2.2.3.4 Job Control Language

The following is the Job Control Language (JCL) for executing ALQRPT.

```
// JOB CARD
// EXEC PGM=ALQRPT,REGION=300K
//STEPLIB DD DSN=RA.LIB.PROD.LOAD,DISP=SHR
//RAERROR DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//REPOUT DD SYSOUT=A,DCB=(LRECL=133,BLKSIZE=1330,RECFM=FBA)
//RAUT1 DD DSN=SCRATCH,UNIT=SYSDA,DISP=(,DELETE)
// SPACE=(TRK,5),DCB=(BLKSIZE=512,RECFM=F,DSORG=DA)

//SORTLIB DD DSN=SYS1.SORTLIB,DISP=SHR
//SORTIN DD DSN=ALQ1.INPUT,UNIT=2400,VOL=SER=tape ID,
// DISP=OLD,DCB=(RECFM=F,LRECL=512,BLKSIZE=512),LABEL=(1,NL)
//SORTWK01 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8SYSUT1
//SORTWK02 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8SYSUT2
//SORTWK03 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8SYSUT3
//SORTOUT DD DSN=8SORTOUT,UNIT=SYSDA,DISP=(,PASS),
// SPACE=(TRK,50),DCB=(RECL=512,BLKSIZE=512,RECFM=F)
//ALQBIN DD DSN=ALQ2.INPUT,UNIT=2400,VOL=SER=tape ID,
// DISP=OLD,DCB=(RECFM=F,LRECL=512,BLKSIZE=512)
//ALQBWK01 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8ALQB1
//ALQBWK02 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8ALQB2
//ALQBWK03 DD UNIT=SYSDA,SPACE=(TRK,(25,10),,CONTIG),DSN=8ALQB3
//ALQBOUT DD DSN=8ALQBOUT,UNIT=SYSDA,DISP=(,PASS),
// SPACE=(TRK,50),DCB=(LRECL=512,BLKSIZE=512,RECFM=F)
//SYSOUT DD SYSOUT=A
//SYSIN DD
START $
  input control cards
TERM $
/*
//
```

This is the full set of JCL that may be used to generate any of the reports.

The following criteria may be used to reduce the number of JCL cards for specific report requests:

- RAUT1 is a required DD card only if REPORT=LOGCOMP. If REPORT=LOGCOMP, then RAUT1 must specify a work data set with direct access organization.
- The SORTLIB through SYSOUT DD cards are required only if a sort is to be done on two input files. That is, all cards are required only if REPORT=LOGCOMP.

- Any report, other than LOGCOMP, requires at most only one file to be sorted. If the report is not LOGCOMP, the DD cards ALQBIN through ALQBOUT may be eliminated.
- All sort related DD cards (SORTLIB through SYSOUT) may be eliminated if the user is not requesting a sort (via the control card SORT=) and if REPORT is not LOGCOMP and if REPORT is not RTSUM with the RPTINT keyword specified.

2.2.3.5 Input Examples

1. Generate a listing of the input and output messages from a filtered ALQ tape.

```
// EXEC PGM=ALQRPT,REGION=250K
//STEPLIB DD DSN=RA.LIB.PROD.LOAD,DISP=SHR
//RAERROR DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//SYSPRINT DD SYSOUT=A,DCB=BLKSIZE=1330
//REPOUT DD SYSOUT=A,DCB=(LRECL=133,BLKSIZE=1330,RECFM=FBA)
//ALQIN1 dd DSN=&ALQIN,UNIT=2400,VOL=SER=tape ID,
// DISP=OLD,DCB=(RECFM=FB,LRECL=512,BLKSIZE=512),
// LABEL=(,NL)
//SYSIN DD *
START $
REPORT=IOLOG;ALQIN=ALQIN1 $
ERRIN=RAERROR;CNTLST=SYSPRINT;RPTLST=REPOUT$$
TERM $
```

2. The following shows the mechanism for generating all reports from the same input ALQ file. The reports generated are shown in Figures 2-1 through 2-6.

```
//GO EXEC PGM=ALQRPT,REGION=250K
//STEPLIB DD DSN=RA.LIB.PROD.LOAD,DISP=SHR
//SYSERROR DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//SYSPRINT DD SYSOUT=A,DCB=BLKSIZE=1330
//REPOUT DD SYSOUT=A,DCB=(LRECL=133,BLKSIZE=1330,RECFM=FBA)
//RAUT1 DD DSN=&SCRATCH,UNIT=SYSDA,DISP=(,DELETE)
// SPACE=(TRK,5),DCB=(BLKSIZE=512,RECFM=F,DSORG=DA)
//SORTIN DD DSN=RA.ALQ.DATA.OUT,DISP=SHR,UNIT=2400,VOL=SER=CFXXXX,
// LABEL=(,NL),DCB=(RECFM=FB,LRECL=512,BLKSIZE=512)
//SORTWK01 DD UNIT=SYSDA,SPACE=(TRK,75,1),,CONTIG),DSN=&SYSUT1
//SORTWK02 DD UNIT=SYSDA,SPACE=(TRK,75,1),,CONTIG),DSN=&SYSUT2
//SORTWK03 DD UNIT=SYSDA,SPACE=(TRK,75,1),,CONTIG),DSN=&SYSUT3
//SORTLIB DD DSN=SYS1.SORTLIB,DISP=SHR
```

```

//SORTOUT DD DSN=&SORTOUT,UNIT=SYSDA,DISP=(,PASS),
// SPACE=(TRK,400),DCB=(LRECL=512,BLKSIZE=512,RECFM=FB)
//TESTIN DD DSN=RA.ALQ.DATA.TWO,DISP=SHR,UNIT=2400,VOL=SER=CFAAAA,
// LABEL=(,NL),DCB=(RECFM=FB,LRECL=512,BLKSIZE=512)
//TESTWK01 DD UNIT=SYSDA,SPACE=(TRK,75,1),,CONTIG),DSN=&TSTUT1
//TESTWK02 DD UNIT=SYSDA,SPACE=(TRK,(75,1),,CONTIG),DSN=&TSTUT2
//TESTWK03 DD UNIT=SYSDA,SPACE=(TRK,(75,1),,CONTIG),DSN=&TSTUT3
//TESTOUT DD DSN=&TESTOUT,UNIT=SYSDA,DISP=(,PASS),
// SPACE=(TRK,400),DCB=(LRECL=512,BLKSIZE=512,RECFM=FB)
//SYSOUT DD SYSOUT=A
//SYSIN DD *
START ;
REPORT = RTSUM ;
ERRIN = SYSERROR ; CNTLST = SYSPRINT ;
SORT = MSGTYPE ;
SORT = DEST ;
RPTLST = REPOUT ;
TIMINT = 000100 ;
ALQIN = SORTIN ;
TERM $
START ;
REPORT = IOLOG ;
ERRIN = SYSERROR ; CNTLST = SYSPRINT ;
SORT = MSGTYPE ;
SORT = DEST ;
RPTLST = REPOUT ;
ALQIN = SORTIN ;
TERM $
START ;
REPORT = IOSUM ;
ERRIN = SYSERROR ; CNTLST = SYSPRINT ;
SORT = MSGTYPE ;
SORT = DEST ;
RPTLST = REPOUT ;
TIMINT = 000100 ;
ALQIN = SORTIN ;
TERM $
START ;
REPORT = IOSTAT ;
ERRIN = SYSERROR ; CNTLST = SYSPRINT ;
SORT = MSGTYPE ;
SORT = DEST ;
RPTLST = REPOUT ;
TIMINT = 000100 ;
ALQIN = SORTIN ;
TERM $
START ;
REPORT = LOGCOMP ;
ERRIN = SYSERROR ; CNTLST = SYSPRINT ;

```

```
RPTLST = REPOUT ;
ALQIN1 = SORTIN ;
  ALQIN2 = TESTIN ;
TERM $
//SYSUDUMP DD SYSOUT=A

//
```

2.2.4 Program Outputs

There are two data sets output by ALQRPT:

- A sequential data set containing control card images and appropriate error diagnostics.
- A sequential data set containing the requested report

The DDNAMEs for the output data sets are specified as control card parameters and are required for successful program operation:

- CNTLST = DDNAME of print file for control card images and error diagnostics
- RPTLST = DDNAME of data set to which the report is written

The format of the data sets is described below:

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
PRINT file	133	1330	FBA	PS
REPORT file	133	1330	FBA	PS

If a sort is to be done, a third output data set is required for the SORT utility. It must be specified with the DDNAME SYSOUT.

2.2.4.1 Diagnostics

Diagnostics generated by ALQRPT fall into three categories:

- User abend codes
- Error messages
- I/O module messages

The following user abends may occur:

USER 0001

Meaning: The attempt to open the SYSIN file containing the control cards was unsuccessful. The probable cause is that the DDNAME SYSIN was not provided in the JCL.

USER 0002

Meaning: A serious error occurred during processing. The probable cause is an I/O error on an input or output file. Refer to the associated message on the HASP output log or in the sort printout.

USER 0003

Meaning: No valid control card set was found on the SYSIN file. Verify the control card input for accuracy.

USER 0004

Meaning: The error message data set could not be opened or its DDNAME was not supplied as a control card parameter. Verify that the control card ERRIN=DDNAME of error message set is present in the control card set.

USER 0005

Meaning: A serious error occurred while parsing the control cards.

An end-of-file was encountered on the SYSIN file prior to encountering a TERM \$ control card or an I/O error occurred while scanning SYSIN.

The following are error messages which may be printed and the condition indicated caused program termination.

MESSAGE: RA001 INVALID CHARACTER IN CONTROL CARD FIELD

Meaning: An unacceptable non-alphanumeric character was encountered on a control card. Compool table BH contains the valid special characters.

MESSAGE: RA002 FIELD LENGTH EXCEEDS EIGHT CHARACTERS

Meaning: A control card keyword or keyword parameter was found to be greater than 8 character in length.

MESSAGE: RA003 MISSING OR INVALID CONTROL CARD KEYWORD

Meaning: An acceptable control card keyword was not encountered at the onset of a keyword expression. The intended keyword is either misspelled or has been omitted. The following keywords are acceptable:

ALQIN	ERRIN
CNTLST	REPORT
DBIN1	RPTLST
DBIN2	START
ENDTIM	TERM
ENDDAT	TIMINT
	TIMSPAN

MESSAGE: RA004 MISSING OR INVALID VALUE - XXXX EXPECTED

Meaning: An equal sign or other delimiter was not encountered at the appropriate point in the keyword expression. XXXX equals the expected value.

MESSAGE: RA005 INVALID TIME/DATE ENTRY

Meaning: A portion of the time/date field includes an out of range value, a field is not 6 digits, or the time/date entries do not represent a time range.

MESSAGE: RA007 TOO MANY IDENTIFIERS FOR KEYWORD

Meaning: The maximum allowable number of parameters for a particular keyword has been exceeded. Compool table I5 contains the maximum values for associated keywords.

MESSAGE: RA008 INVALID IDENTIFIER IN DESTINATION FIELD

Meaning: Appropriate keyword parameters were not found following a valid keyword in the control card set.

MESSAGE: RA009 INVALID PARAMETER FOR THIS REPORT - XXXXXX

Meaning: The parameter indicated is an invalid keyword for the report requested.

MESSAGE: RA010 CNTLST AND/OR ERRIN FILE(S) NOT OPENED FOR PRIOR REPORT(S)

Meaning: For multiple report requests in one control card set, the indicated keywords designating the print file and error message file were not found with the prior report requests. The current report will be generated; the prior reports requested will not be generated.

MESSAGE: RA011 - DURING LOGCOMP EOF ON ALQn WITHOUT MATCHING EOF ON ALQn

Meaning: During execution of a LOG COMPARE request, end of file was reached on one filtered ALQ file without a matching end of file on the other filtered ALQ file.

MESSAGE: RA013 - MORE THAN 10 RECORDS READ ON ALQn AFTER EOF
ON ALQn

Meaning: During execution of a LOG COMPARE request, an end of file was reached on one of the two filtered ALQ files. After printing ten messages, end of file had not been reached.

After this message is printed, LOG COMPARE statistics are printed and LOG COMPARE processing is terminated.

MESSAGE: RA012 - FOR REPORT XXXXXXXX TOO MANY ACCUMULATORS REQUIRED

Meaning: During processing of IOSTAT, IOSUM, or RTSUM, an entry time (IOSUM, IOSTAT) or a response time (RTSUM) fell out of the range of the accumulators.

The last accumulator will be incremented and processing will continue.

This may be corrected by specifying a larger time interval.

The following are I/O module messages which appear on the HASP log. In all cases, an I/O error will result in program termination.

MESSAGE: AAAAAAAA ERROR ON OPEN

Meaning: The data set associated with the DDNAME (AAAAAAA) could not be opened. The probable cause is that the DDNAME indicated was not provided in the JCL.

MESSAGE: AAAAAAAA GIVES TOO MANY PDS FILES

Meaning: The maximum number of partitioned data sets that may be open at any one time is 5. AAAAAAAA is the DDNAME of the file to be opened when the limit was exceeded.

MESSAGE: AAAAAAAA GIVES TOO MANY I/O FILES

Meaning: The maximum number of I/O data sets that may be open at any one time is 20. AAAAAAAA is the DDNAME of the data set to be opened when the limit was exceeded.

MESSAGE: AAAAAAAA IS UNABLE TO GET SUFFICIENT CORE FOR DCB

Meaning: There was insufficient core available when the data set specified by the DDNAME (AAAAAAA) indicated was to be opened.

2.3 System Analysis Recording (SAR) Dump Program (SARDMP)

2.3.1 General Program Description

The System Analysis Recording Dump Program (SARDMP) selects records from SAR tapes and prints the selected records in hexadecimal format. Records to be printed may be selected by time interval and record category. A summary of the total number of records found for each record category is also printed.

SAR tapes contain data used in systems analysis and evaluation, which has been transferred from core storage to magnetic tape during operation of the CFC Monitor or NAS Model 3 Systems (ref: NAS Monitor Handbook).

2.3.2 Program Operation

SARDMP reads the input SAR data set and writes selected records in hexadecimal format to an output print file. SARDMP is capable of processing a SAR data set contained in multiple tape volumes. If multiple tape volumes are specified, the program expects that the volumes were created contiguously. If the volumes are not contiguous, individual program processing of each tape is necessary. This constraint is due to the segmentation of SAR tape records.

The user specifies the time interval as: beginning and ending time, beginning time only (causing records with beginning time equal to or greater than specified beginning to be selected), or indicates that there is no time constraint (ref: Sec. 2.3.3.1.1 Time Card).

All data loss or startover records encountered on the input SAR set are printed regardless of time they occurred. All other types of records are

subject to selection by time interval, if specified, and to selection by record category. Selection by record category allows selection by recording code or selection of Timing Analysis (TAR) records.

The user may filter SAR records by recording codes and further by program ID (within recording code) if desired.

If user filters on TAR records, no other type of record may be specified, i.e., no recording codes may be specified. TAR records may be filtered further only by time interval.

2.3.3 Program Inputs

2.3.3.1 Control Cards

The control cards are free format; any number of cards may be specified.

The following rules govern the control card format:

- A dollar sign (\$) indicates the end of control information on a given card
- Multiple control card keywords with the associated parameters may appear on a single card
- A semicolon (;) is used to separate control card keyword parameters from the next keyword
- Control cards may contain information in columns 1 through 72 inclusive
- Lists of keyword parameters are separated by commas
- No keyword may be duplicated within a control card set

- Blanks may appear anywhere on a control card. However, since a blank may signal the end of a field (e.g., keyword or keyword parameter), a blank should not be embedded within a field.
- A control card field may be one to eight characters in length
- A continuation sign (+) may follow either a semicolon (;) or a comma (,). This sign signals that no further information follows on the current card but that the stream of information is continued on the following card.

2.3.3.1.1 TIME Card

There must be one and only one time card, and it must be the first card.

The formats are as follows:

TIME=beginning time, ending time \$

Times are six digits specifying the time elapsed since midnight as HHMMSS (hours, minutes, seconds).

TIME=beginning time \$

The beginning time is in the format described above. This time frame consists of all times greater than or equal to the beginning time.

TIME=ALL \$

There are to be no time constraints.

2.3.3.1.2 RCODE Card

RCODE=recording code \$

Recording codes are integers between 0 and 255. Any combination of these cards may be used in a given run.

RCODE=recording code, PEID1, PEID2...PEID10 \$

Up to ten program elements (PEs) may further qualify a recording code. PE IDs are integers between 0 and 255. Records with this recording code will not be printed unless they were created by one of the PE IDs specified. Up to 50 of these cards may be included in a given run.

RCODE=TAR \$

Only TAR records are to be printed. If this card is used, it must be the only recording code card.

RCODE=ALL \$

All records other than TAR records are to be printed. If this card is used, it must be the only recording code card.

2.3.3.2 Data Cards

There are no data cards to be supplied to this program.

2.3.3.3 Data Sets

Three input data sets are required for successful operation of SARDMP:

- A sequential set containing the control card information.
- The SAR data input as a sequential data set; the medium expected is magnetic tape; a data set on multiple tape volumes may be processed by specifying a list of volume serial numbers on the same DD card in the JCL.
- The partitioned data set containing the error messages.

The DDNAMEs required for the input files and the data set attributes are given below.

DATA SET	DDNAME	RECFM	LRECL	BLKSIZE	DSORG
CONTROL CARDS	SYSIN	F	80	80	PS
SAR	DATAIN	VB		10000	PS
ERROR MESSAGES	ERRIN	F	80	80	PO

2.3.3.4 Job Control Language

```
// EXEC PGM=SARDMP,REGION=64K
//STEPLIB DD DSN=RA.LIB.PROD.LOAD,DISP=SHR
//CNTLST DD SYSOUT=A,
// DCB=(RECFM=FBA,LRECL=133,BLKSIZE=3458)
//DATAIN DD DCB=(DEN=2,RECFM=U,BLKSIZE=10000,EROPT=ACC),
// UNIT=(TAPE,,DEFER),VOL=SER=CF1601,LABEL=(,BLP)
//ERRIN DD DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
//SYSIN DD *
```

Control Card Set

NOTE: If EROPT=ACC is specified in the DCB parameter of the DATAIN DD statement, and an I/O error occurs while reading this file, the SAR DUMP program will terminate with an error message (no dump). A dump and other system information will be provided if this subparameter is excluded or if it is EROPT=ABE.

2.3.3.5 Input Examples

Example 1: The example below will cause printing of all non-TAR input recorded between two minutes, ten seconds after midnight and two minutes, fifteen seconds after midnight (inclusive).

```
TIME=000210,000215 $
RCODE=ALL $
```

Example 2: The example below will cause printing of all input TAR records created on or after the twenty second hour past midnight.

```
TIME=220000 $
RCODE=TAR $
```

Example 3: The example below will cause printing of all input records having a recording code of 50, as well as those with a recording code of 23 created by Program Elements 1 through 5.

```
TIME=ALL $  
RCODE=50 $  
RCODE=23,1,2,3,4,5 $
```

2.3.4 Program Outputs

The only output file from SARDMP is the report file. This file contains the control card images, any error diagnostics, the dump of the requested data, and totals by record type of records printed. This file must be specified by the DDNAME CNTLST with RECFM=FBA, LRECL=133, BLKSIZE=3458. Samples of the output on this file are illustrated in Figures 2-7, 2-8, and 2-9.

PAGE

VERSION - 000
CENTRAL FLGM CONTROL D. R. E. A.
SYSTEMS ANALYSIS RECCDING TAPE DUMP - CONTROL CARDS

TYPE = CCC119 \$	00000120
RCCCE = 63 \$	00000130
RCCDE = 41, 6, 13 \$	00000140
RCCEE = 4C \$	00000142

Figure 2-7. A Listing of Control Card Input

Explanation of Circled Letters

- A Identifies which version of the SARDMP program produced this report.
- B Identification of simulation tape input (if any).
- C Date input tape was created in this format: DDMMYY (day, month, year).
- D Reel number of SAR tape input (of those created on the date shown).
- E The time this reel was created. This is the time elapsed since midnight in the form HHMMSS + X (hours, minutes, seconds plus half seconds).
- F Identifies the site at which the tape was created.
- G Identifies the active SAR category (not recording code) at the time this reel was opened.
- H Displacement of the first byte in this line from the beginning of the record (in decimal).
Note: The first 28 bytes of each record contain SAR data header information.
- I The record is printed in groups of three lines. Each byte of the record is represented in a vertical manner: the top line is the EBCDIC equivalent of the two hexadecimal half bytes immediately below. In the example, the character "3" in the first line is the EBCDIC equivalent of the "F3" immediately below the "3".
- J Recording code of the record printed. TAR records will have "TAR" in this field.
- K Length of the record plus SAR data header (28 bytes).
- L Identification of the program element. TAR records have blanks in this field.
- M Time at which the record was generated (elapsed time since midnight). The format of this field is explained in (E) above.

Figure 2-8. Listings of Records Selected From SAR Input
(2 of 2)

VERSION - 333
 CENTRAL FLOW CONTROL D. R. E. A.
 SYSTEMS ANALYSIS RECORDING TAPE DUMP - TAPE PRINT
 SIM. TAPE ID. = 125805 DATE 250678 REEL NUMBER 1 TIME 22012 + 1 HALF SECOND ARICC IN CEC SAR CATEGORY 7
 PAGE 10

RECORDING CODE	RECORDS PRINTED
40	0
61	9
63	1

TOTAL OF RECORDS PRINTED 10
 NORMAL END OF JOB

Figure 2-9. Totals of Records Printed

NOTE: There is an entry on this report for each recording category specified on control card input.

2.3.4.1 Diagnostics

The following are error messages that may be printed and the condition indicated will cause program termination.

MESSAGE: RA001 INVALID CHARACTER IN CONTROL CARD FIELD

Meaning: An unacceptable non-alphanumeric character was encountered on a control card. Compool table BH contains the valid special characters.

MESSAGE: RA002 FIELD LENGTH EXCEEDS EIGHT CHARACTERS

Meaning: A control card keyword or keyword parameter was found to be greater than eight characters in length.

MESSAGE: RA003 MISSING OR INVALID CONTROL CARD KEYWORD

Meaning: An acceptable control card keyword was not encountered at the onset of a keyword expression. The intended keyword is either misspelled or has been omitted.

MESSAGE: RA004 MISSING OR INVALID VALUE - XXXX EXPECTED

Meaning: XXXX represents a control card parameter that was not found.

MESSAGE: RA005 INVALID TIME/DATE ENTRY

Meaning: A portion of the time field includes an out of range value, a field is not six digits, or the entries do not represent a valid time interval.

MESSAGE: RA016 RUN TERMINATED DUE TO READ/WRITE ERROR ON FILE XXXX
IN MODULE YYYY

Meaning: An uncorrectable I/O error has caused the program to
terminate.

MESSAGE: RA017 RUN TERMINATED DUE TO PRESENCE OF ERROR(S) ON
CONTROL CARDS

Meaning: Any error found in the control card set causes termination
of run after all cards have been parsed.

MESSAGE: RA018 RUN TERMINATED DUE TO I/O ERROR AFTER CALL TO
RAEMSG FROM MODULE XXXX

Meaning: RAEMSG is the module which is called to write diagnostics.
RAEMSG encountered an I/O error while attempting to write the
diagnostic.

MESSAGE: RA019 RUN TERMINATED DUE TO I/O ERROR AFTER CALL TO
RALSTC FROM MODULE XXXX

Meaning: RALSTC is the module which is called to print control
card images.

MESSAGE: RA020 RUN TERMINATED DUE TO ILLOGICAL LENGTH DESCRIPTOR
ON SAR RECORD BELOW

Meaning: A SAR input record not in NOSS variable length format
(other than tape header) has been encountered. This message is
preceded by RA032 and a dump of the first 80 bytes of the record.

MESSAGE: RA021 RUN TERMINATED: THE CURRENT TAPE BEGINS LATER THAN
THE ENDING TIME PARAMETER

Meaning: The ending time parameter referred to came from control
card input.

MESSAGE: RA022 NO CONTROL CARDS FOUND IN INPUT STREAM

Meaning: TIME and RCODE are required control cards.

MESSAGE: RA023 THE FIRST SEGMENT BELOW IS NEITHER A COMPLETE OR INITIAL SEGMENT

Meaning: A middle or terminal SAR input record segment has been encountered without the preceding initial segment.

MESSAGE: RA024 DATA LOSS RECORD ENCOUNTERED (PRINTED BELOW)

Meaning: A SAR data loss input record has been encountered.

MESSAGE: RA025 STARTOVER RECORD ENCOUNTERED (PRINTED BELOW)

Meaning: A SAR startover input record has been encountered.

MESSAGE: RA026 PE ID INVALID; TOO MANY PE IDS OR INVALID NUMBER

Meaning: More than 10 PE IDs per recording code was specified or an invalid PE ID was specified.

MESSAGE: RA027 TAR SPECIFIED ON OTHER THAN SECOND CARD

Meaning: The keyword parameter "TAR" is valid only on the second control card.

MESSAGE: RA028 RECORDING CODE ERROR. DUPLICATE OR TABLE OVERFLOW

Meaning: A duplicate recording code was specified or more than 50 recording codes were specified.

MESSAGE: RA029 INVALID CARD. PRIOR CARD INDICATED NO MORE CARDS

Meaning: An extra control card was encountered. Either TIME=ALL or RCODE=ALL was found followed by another TIME or RCODE request or RCODE=TAR was specified followed by additional RCODE requests.

MESSAGE: RA030 THE RECORD ABOVE IS INCOMPLETE; ITS TERMINAL
SEGMENT WAS NOT IN SEQUENCE

Meaning: This refers to SAR input; an incomplete record was found.

MESSAGE: RA031 ALL SPECIFIED ON OTHER THAN FIRST OR SECOND CARD

Meaning: The keyword parameter "ALL" is valid only on the first
and second control cards.

MESSAGE: RA032 THE FIRST 80 BYTES OF A BAD RECORD ARE PRINTED
BELOW: BLOCK XXX RECORD YYY

Meaning: A SAR input record is not in the NOSS variable length
format. The block and record numbers are inserted; however, they
cannot be guaranteed to be exact due to the fact that VGETR, a
JOVIAL library routine, is used to read and deblock the input.
The block number is either correct or one less than the correct
number.

MESSAGE: NO RECORDING CODES FOUND IN INPUT STREAM

Meaning: RCODE is a required control card.

2.4 Data Base Analysis Program (DBANAL)

2.4.1 General Program Description

The Data Base Analysis (DBANAL) Program performs off-line analysis of the CFC Data Base. The functions performed by the DBANAL program include:

- Off-line re-creation of the CFC Data Base to any point in time using a data base backup tape and its associated recovery tapes.
- Calculation of flight record statistics for both the OAG and Non-OAG Flight Record Sets, including total number of records by arrival terminal, departure terminal, arrival/departure pair, and calculations of percent of physical block usage.
- Comparison of two OAG Flight Record Sets and two Non-OAG Flight Record Sets showing total number of matched records, number of mis-matched records, and number of no-match records.
- A listing of Data Base statistic records from a filtered ALQ set showing the statistics records generated for each input CFC message.
- A summary of data base statistics on table usage by retrieval method and access type.
- A statistical summary of data base lock usage giving the number of locks and length of locks for a specified time interval.

The DBANAL program can generate any number of these reports during one execution.

2.4.2 Program Operation

The DBANAL program begins by reading user-supplied control cards from the SYSIN file. The control cards contain the DDNAMES of the input and output

files and the report request information. The required modules are then invoked to produce the requested report. The Data Base Analysis Program produces the following:

a. Start-Up Data Base. The Data Base Backup tape set is read and an off-line copy of all data base sets is created. The associated recovery tapes are then read and the updates are applied to the off-line sets. The user may specify a time parameter which is applied to the update process. Only those recovery records that contain a time less than the user-specified time are applied.

b. Flight Record Statistics Report. The Start-Up Data Base function described above is first invoked to create off-line the Flight Record Sets (OAG and Non-OAG) to be analyzed. The OAG Flight Record Set is first opened and each physical block is read. The arrival terminal, departure terminal, and number of active slots is retrieved from each block header and stored. The stored information is then sorted to produce statistics by arrival terminal, departure terminal, and arrival departure pairs. The Non-OAG Flight Record Set is then processed in the same manner and the report is generated. Figure 2-10 is a sample output for this report.

c. Flight Record Set Comparison Report. The Start-Up Data Base function described above is first invoked to create the Flight Record Sets (OAG and Non-OAG). The OAG Flight Record Set is opened and each logical flight record is read and written to a work data set. The Non-OAG set is then opened and each logical flight record is read and written to a second work data set. The Start-Up Data Base function is then invoked a second time to create off-line the second copy of the Flight Record Sets (OAG and Non-OAG). A third and fourth work data set are then

VERSION - 030

CENTRAL FLOW CONTROL N. O. C. A.
FBSTAT

PAGE 1

DAG TOTAL FLIGHT RECORDS - 556

DAG FLIGHT RECORD TOTALS BY DEPARTURE TERMINAL

JFK 51 LGA 23 PHL 140 ZNY 342

VERSION - 030

CENTRAL FLOW CONTROL N. O. C. A.
FBSTAT

PAGE 2

DAG FLIGHT RECORD TOTALS BY ARRIVAL TERMINAL

ATL 34 JFK 42 LGA 24 PHL 174 ZNY 333

VERSION - 030

CENTRAL FLOW CONTROL N. O. C. A.
FBSTAT

PAGE 3

DAG FLIGHT RECORD TOTALS BY ARRIVAL/DEPARTURE PAIR

ARR/DEP	TOTAL BLOCK USAGE	PERCENT	ARR/DEP	TOTAL BLOCK USAGE	PERCENT
ATL/PHL	22	16%	ATL/ZNY	14	10%
JFK/ZNY	30	14%	LGA/ZNY	24	17%
PHL/ZNY	86	69%	ZNY/JFK	23	17%
ZNY/PHL	96	59%	ZNY/ZNY	139	100%
			ARR/DEP	TOTAL BLOCK USAGE	PERCENT
			JFK/PHL	22	16%
			PHL/JFK	28	20%
			ZNY/LGA	23	17%
			ZNY/ZNY	49	35%

Figure 2-10. Flight Record Statistics Report (1 of 4)

NON-CAG TOTAL FLIGHT RECORDS - 31*

NON-CAG FLIGHT RECORD TABLE BY DEPARTURE TERMINAL

ATE	151	JFK	13	LAX	13	MIA	13	PIT	7	ZNY	11	ZTL	9
-----	-----	-----	----	-----	----	-----	----	-----	---	-----	----	-----	---

VERSION - 000

NON-CAG FLIGHT RECORD TOTALS BY ARRIVAL

ATE	151	JFK	151	LAX	17	MIA	7	PIT	7	ZNY	7	ZTL	7
-----	-----	-----	-----	-----	----	-----	---	-----	---	-----	---	-----	---

VERSION - 000

NON-CAG FLIGHT RECORD TOTALS BY ARRIVAL/DEPARTURE PAIR

ARRIVAL	TOTAL	PERCENT	ARRIVAL	TOTAL	PERCENT	ARRIVAL	TOTAL	PERCENT
ATL/ATL	5	7%	ATL/JFK	3	4%	ATL/CLX	4	6%
ATL/MIA	2	3%	ATL/PIT	1	1%	ATL/ZNY	2	3%
ATL/ZTL	1	1%	JFK/ATL	5	7%	JFK/ATL	1	1%
JFK/JFK	1	1%	JFK/LAX	2	3%	JFK/MIA	2	3%
JFK/PIT	2	3%	JFK/ZNY	2	3%	JFK/ZTL	2	3%
LAX/ATL	2	3%	LAX/JFK	2	3%	LAX/LAX	3	4%
LAX/MIA	2	3%	LAX/PIT	3	4%	LAX/ZNY	3	4%
LAX/ZTL	2	3%	MIA/ATL	1	1%	MIA/JFK	1	1%
MIA/LAX	1	1%	MIA/MIA	1	1%	MIA/PIT	1	1%
MIA/ZNY	1	1%	MIA/ZTL	1	1%	PIT/ATL	1	1%
PIT/JFK	1	1%	PIT/LAX	1	1%	PIT/MIA	1	1%
PIT/PIT	1	1%	PIT/ZNY	1	1%	PIT/ZTL	1	1%
ZNY/ATL	1	1%	ZNY/JFK	1	1%	ZNY/LAX	1	1%
ZNY/MIA	1	1%	ZNY/PIT	1	1%	ZNY/ZNY	1	1%
ZNY/ZTL	1	1%	ZTL/ATL	1	1%	ZTL/JFK	1	1%
ZTL/LAX	1	1%	ZTL/MIA	1	1%	ZTL/PIT	1	1%
ZTL/ZNY	1	1%	ZTL/ZTL	1	1%			

* OVERFLOW BLOCK

Figure 2-10. Flight Record Statistics Report (3 of 4)

TOTAL WEEKS AT-A-GAS FLIGHT RECORDS- 51
 TOTAL PAID BLOCKS- 47 TOTAL OVERFLY BLOCKS- 1

CELL	ACTIVE RECORDS/BLOCK	FREQUENCY
1	9	40
2	10	0
3	19	0
4	29	0
5	30	0
6	40	0
7	50	0
8	50	0

FREQUENCY DISTRIBUTION PERCENT OF TOTAL

CELL	FREQUENCY	PERCENT OF TOTAL
1	40	33
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0

FLIGHT RECORDS/BLOCK AVG. = .6779097E 01

MIN. = 1

MAX. = 139

STD. DEV. = .194611E 02

Figure 2-10. Flight Record Statistics Report (4 of 4)

created containing the flight records from second copy. The four work data sets are then sorted by arrival terminal, departure terminal, aircraft identification, and departure time. The two OAG sets are then compared followed by a comparison of the two Non-OAG sets. A report on the total number of matched records, mis-matched, and no-match records is generated for both the OAG comparison and the Non-OAG comparison. Mis-matched and no-match records are printed. A match results if all fields in the two records are identical. A mis-match occurs if the two records contain the same arrival terminal, departure terminal, aircraft identification, and departure time, but differ in any other field. A no-match occurs if no record exists containing the same arrival terminal, departure terminal, aircraft identification, and departure time. Figure 2-11 is a sample output for this report.

d. Data Base Statistics Log Report. This report provides a listing of Data Base statistics records from a filtered ALQ set (ref: Section 2.1). Data Base statistics records are extracted from the filtered ALQ set, formatted, and written to the output set. Figure 2-12 is sample output for this report.

e. Data Base Statistics Summary Report. The input filtered ALQ set is read. Each Data Base statistic record encountered is deblocked into logical components identified by type of data base access (flight record retrieval, get next flight record retrieval, or table retrieval). These component records are written to a work data set for sorting by table accessed, type of access, and retrieval method. Statistics are generated for each table accessed and the report is written. Figure 2-13 is sample output for this report.

ID- 5512358 0002 TYPE= FP SOURCE= CFCRD DEST=M ENTRY TIME 0005 DATE 011078

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = PT
 START TIME = 011203 END TIME = 011203

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = NO
 START TIME = 001203 END TIME = 001203

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 1
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = OK
 START TIME = 011203 END TIME = 011204

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = PY
 START TIME = 001204 END TIME = 001204

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = PK
 START TIME = 001204 END TIME = 001204

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 1
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = AJ
 START TIME = 001204 END TIME = 001205

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 3
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = CP
 START TIME = 011205 END TIME = 011206

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = AJ
 START TIME = 001206 END TIME = 001206

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = MM
 START TIME = 001206 END TIME = 001206

ACCESS METHOD = LOCK RECORD
 RELATIVE BLOCK ADDRESS = 0
 TYPE OF CALL = LOCK
 LOCK TYPE = SET LOCK
 DATA SET ACCESSED = MM
 START TIME = 001206 END TIME = 001206

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 2
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = NF
 START TIME = 001206 END TIME = 001206

ACCESS METHOD = TABLE RETRIEVAL
 RELATIVE BLOCK ADDRESS = 2
 TYPE OF CALL = TABT
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = XY
 START TIME = 001206 END TIME = 001207

ACCESS METHOD = AIRCRAFT ID
 RELATIVE BLOCK ADDRESS = 1
 TYPE OF CALL = GETP
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = XT
 START TIME = 011207 END TIME = 011207

ACCESS METHOD = AIRCRAFT ID
 RELATIVE BLOCK ADDRESS = 1
 TYPE OF CALL = GETF
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = NF
 START TIME = 001206 END TIME = 001207

ACCESS METHOD = AIRCRAFT ID
 RELATIVE BLOCK ADDRESS = 1
 TYPE OF CALL = GETF
 LOCK TYPE = NOT LOCK REC
 DATA SET ACCESSED = NF
 START TIME = 001207 END TIME = 001207

Figure 2-12. Data Base Statistics Log Report

IIHINI - 000020

TABLE MM

RETRIEVAL METHOD TABLE RETRIEVAL ACCESS TYPE TABT

TOTAL COUNT 20

AVE. RESPONSE TIME = .150000 MIN = 000000 MAX = 000001 STD. DEV = .3663E 00 SUM OF TIMES 000003

VERSION - 000

CENTRAL FLOW CONTROL D. R. & A.
OBSUM

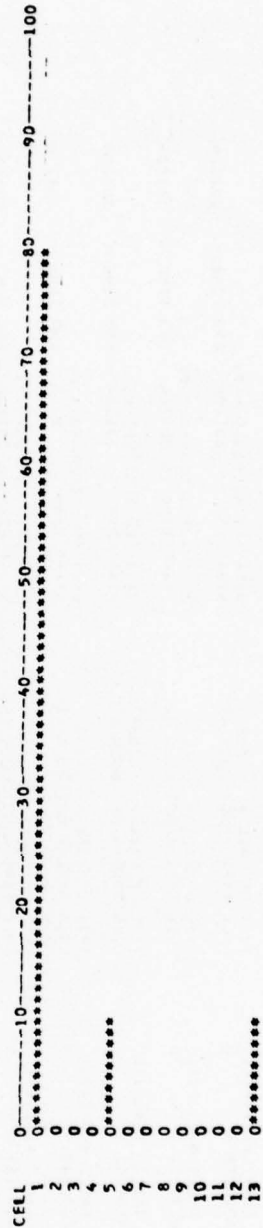
IIHINI - 000020

TABLE MM

RETRIEVAL METHOD TABLE RETRIEVAL ACCESS TYPE TABT

CELL	EPOCH TIME	LOCAL	TIME	FREQUENCY
1	60136905	11/28/78	004145	16
2	60136925	11/28/78	004205	0
3	60136945	11/28/78	004225	0
4	60136965	11/28/78	004245	0
5	60136985	11/28/78	004305	2
6	60137005	11/28/78	004325	0
7	60137025	11/28/78	004345	0
8	60137045	11/28/78	004405	0
9	60137065	11/28/78	004425	0
10	60137085	11/28/78	004445	0
11	60137105	11/28/78	004505	0
12	60137125	11/28/78	004525	0
13	60137145	11/28/78	004545	2

FREQUENCY DISTRIBUTION



TOTAL MESSAGES = 20

AVE. MESSAGE RATE/TIMINT = .1538E 01 MIN/TIMINT = 0 MAX/TIMINT = 16 STD. DEV. = .4409E 01

FIGURE 2-13 Data Base Statistics Summary Report

f. Data Base Lock Queue Statistics Report. The input filtered ALQ set is read and each Data Base statistic record encountered is de-blocked into logical components. The lock queue components are written to a work data set for sorting by time. A histogram indicating the number and type of data base lock for specified time intervals is generated. Figure 2-14 is sample output for this report.

2.4.3 Program Inputs

2.4.3.1 Control Cards

The control cards are free format; any number of cards may be specified.

The following rules govern the control card format:

- A dollar sign (\$) indicates the end of control information on a given card.
- Multiple control card keywords with the associated parameters may appear on a single card.
- A semicolon (;) is used to separate control card keyword parameters from the next keyword.
- Control cards should be included between a 'START \$' card and a 'TERM \$' card; the 'START \$' card is optional; the TERM \$ card is required.
- Control cards may contain information in columns 1 through 72 inclusive.
- Lists of keyword parameters are separated by commas.
- No keyword may be duplicated within a control card set.
- Blanks may appear anywhere on a control card. However, since a blank may signal the end of a field (e.g., keyword or keyword parameter), a blank should not be embedded within a field.

CENTRAL FLOW CONTROL D. S. C. A.
DBLOCK

VERSION - 000

TABLE OF

EPOCH	TIME	LOCAL	TIME	ACCESSES LOCKS INITIATED	LOCKS RELEASED	LOCKS ON AT 1/2 TIMINT
001400	001409	01/01/77	002140	1	0	0
001410	001419	01/01/77	002150	0	0	0
001420	001429	01/01/77	002200	0	0	1
001430	001439	01/01/77	002210	1	0	2
001440	001449	01/01/77	002220	1	1	1
001450	001459	01/01/77	002230	0	1	1

CENTRAL FLOW CONTROL D. S. C. A.
DBLOCK

VERSION - 000

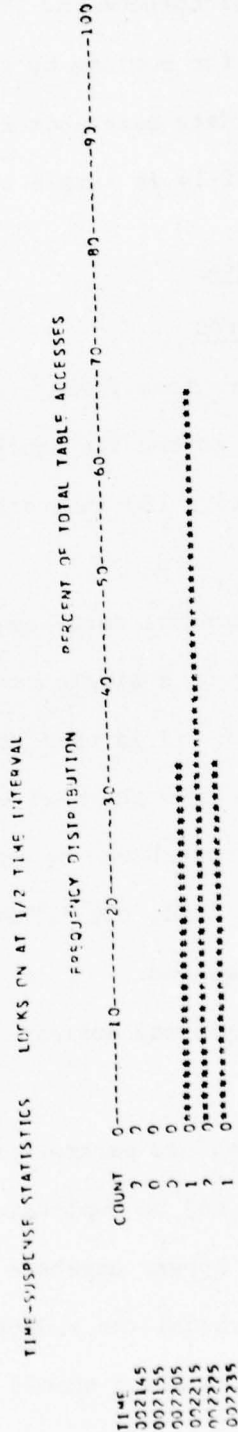


Figure 2-14. Data Base Lock Queue Statistics Report

- A control card field may be one to eight characters in length.
- A continuation sign (+) may follow either a semicolon (;) or a comma (,). This sign signals that no further information follows on the current card but that the stream of information is continued on the following card.
- The following control card keywords are required for all reports:

CNTLST
ERRIN
REPORT
RPTLST
TERM

- The following control card keywords are optional or are report dependent:

START TIMINT
DBIN1 TIMSPAN
DBIN2
ENDTIM
ENDDAT
ALQIN

No additional keywords will be accepted.

2.4.3.1.1 START \$ (Optional)

This card signals the beginning of the control card stream.

2.4.3.1.2 REPORT=AAAAAAAA \$ (Required)

The report keyword designates which function is to be performed. The possible functions are:

AAAAAAAA = DBSTUP (Data Base Start-Up Function)
 = FRSTAT (Flight Record Statistics)
 = FRCOMP (Flight Record Comparison)
 = DBLOG (Data Base Statistics Log)
 = DBSUM (Data Base Statistics Summary)
 = DBLOCK (Data Base Lock Queue Statistics)

2.4.3.1.3 ERRIN=DDNAME \$ (Required)

The ERRIN keyword designates the DDNAME of the error message file.

2.4.3.1.4 CNTLST=DDNAME \$ (Required)

The CNTLST keyword designates the DDNAME of the file to which the control card images and any error messages are to be written.

2.4.3.1.5 RPTLST=DDNAME \$ (Required)

The RPTLST keyword designates the DDNAME of an output file to which the report is to be written.

2.4.3.1.6 DBIN1=DDNAME \$

The DBIN1 keyword designates the DDNAME of the input file containing the data base backup and recovery tapes. This keyword is required for the following reports: DBSTUP, FRSTAT, and FRCOMP. It is invalid for all other reports.

2.4.3.1.7 DBIN2=DDNAME \$

The DBIN2 keyword designates the DDNAME of a second input file containing data base backup and recovery tapes. This keyword is required for the report FRCOMP. FRCOMP will compare the flight record sets unloaded from the data base supplied by DBIN1 to the flight record sets unloaded from the data base supplied by DBIN2. This control keyword is invalid for all other reports.

2.4.3.1.8 ENDDAT=YMMDD \$

The ENDDAT keyword, in conjunction with the ENDTIM keyword, specifies stop date and time to be applied to the data base startup function (applicable

to reports DBSTUP, FRSTAT, and FRCOMP). It is optional for the reports DBSTUP, FRSTAT, and FRCOMP; it is invalid for all other report requests. The format of the control keyword is:

ENDAT=YMMDD

where YY = ending year (i.e., 78, 79)
MM = ending month (i.e., 01...12)
DD = ending day (i.e., 01...31)

2.4.3.1.9 ENDTIM=HHMM

The ENDTIM keyword in conjunction with the ENDDAT keyword specifies the stop date and time to be applied to the data base startup function. It is optional for the reports DBSTUP, FRSTAT, and FRCOMP; it is invalid for all other report requests. The format of the control keyword is:

ENDTIM=HHMM

where HH = ending hour (i.e., 00...23)
MM = ending minute (i.e., 00...59)

2.4.3.1.10 ALQIN=DDNAME \$

The ALQIN keyword specifies the DDNAME of the input ALQ file to be processed when the report request is DBLOG, DBSUM, or DBLOCK. For the DBLOG report, the input file must be a filtered ALQ file generated by the ALQFLTR program. For reports DBSUM and DBLOCK, either a filtered or unfiltered ALQ file may be input. This keyword is required when the report request is DBLOG, DBSUM, or DBLOCK; it is invalid for all other reports.

2.4.3.1.11 TIMSPAN=MMDDYY,HHMMSS,MMDDYY,HHMMSS \$

The TIMSPAN keyword specifies the time span to be covered by the report. All records found outside the specified time period are not processed.

This keyword is optional for the reports DBSUM and DBLOCK. It is invalid for all other reports. The format is:

```
TIMSPAN=MMDDYY, HHMMSS,MMDDYY,HHMMSS
      =beginning date, beginning time,
      ending date, ending time
```

2.4.3.1.12 TIMINT=HHMMSS \$

The TIMINT keyword specifies the size of the time interval for which statistics are accumulated (i.e., the histogram bin size). This keyword is required for reports DBSUM and DBLOCK; it is invalid for all other reports.

2.4.3.1.13 TERM \$

The TERM keyword signals the end of the report request cards. It is required for all reports.

2.4.3.2 Data Cards

There are no data cards to be input to this program.

2.4.3.3 Data Sets

Input data sets to the DBANAL program include:

- The control card set as sequential input
- The partitioned data set containing the error messages
(ERRIN=DDNAME)
- The sequential set containing the data base backup and recovery tapes
(for REPORT=DBSTUP; DBIN1=DDNAME)
(for REPORT=FRSTAT; DBIN1=DDNAME)
(for REPORT=FRCOMP; DBIN1=DDNAME)
- The sequential set containing a second set of data base backup and recovery tapes (for REPORT=FRCOMP; DBIN2=DDNAME)

- The sequential set containing ALQ data
 (for REPORT=DBLOG; ALQIN=DDNAME)
 (for REPORT=DBSUM; ALQIN=DDNAME)
 (for REPORT=DBLOCK; ALQIN=DDNAME)

The format of these data sets is described below:

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
CONTROL CARDS	80	80	F	PS
ERROR MESSAGES	80	80	F	PO
DATA BASE INPUT (DBIN1 AND DBIN2)	-		U	PS
ALQ INPUT	512	512	F	PS

2.4.3.4 Job Control Language

Figure 2-15 is the Job Control Language for executing DBANAL.

2.4.3.5 Sample Illustrations

The following are sample control card sets to be used with the JCL described in Section 2.4.3.4.

- Request Flight Record Statistics Report

```
//SYSIN DD *
START $
REPORT = FRSTAT $
ERRIN = RAERROR $
CNTLST = ERRPRINT $
RPTLST = REPRINT $
DBIN1 = DBASE1 $
TERM $
```

- Request Flight Record Sets Comparison Report

```
//SYSIN DD *
START $
REPORT = FRCOMP $
ERRIN = RAERROR $
CNTLST = ERRPRINT $
RPTLST = REPRINT $
DBIN1 = DBASE1 $
DBIN2 = DBASE2 $
TERM $
```

```

// JOB CARD
// EXEC PGM= DBANAL, REGION=60K
//SYSLIB DD DSN=RA.CTP.PEOD.LPAR, DISP=SHR
//***THE FOLLOWING DATA SETS ARE REQUIRED FOR ALL
//***REPORT REQUESTS. DDNAMES MUST MATCH THOSE
//***SUPPLIED ON THE CONTROL CARDS
//***
//RAERPR DD DSN=SPCX.IB.ERPRR.CURRENT, DISP=SHR
//REPRINT DD SYSOUT=A, DCB=(RECFM=FBA, LRECL=133, BLKSIZE=1330)
//ERRPRINT DD SYSOUT=A, DCB=(RECFM=FPA, LRECL=133, BLKSIZE=1330)
//***
//***THE FOLLOWING DATA SETS ARE REQUIRED IF
//***REPORT= DBSTIP, ERSTAT OR ERCOMP
//***
//DBASE1 DD DSN=INPUT.DATABASE, DISP=OLD,
//      UNIT=(TAPE,,DEFER), DCB=(RECFM=U, BLKSIZE=7296)
//      VOL=SER=(TAPE1, ..., TAPEM), LABEL=(,NL)
//I7D DD DSN=RA.I7.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=324, BLKSIZE=324)
//AJD DD DSN=RA.AJ.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(3,1)), DCB=(RECFM=F, LRECL=7284, BLKSIZE=7284)
//CPD DD DSN=RA.CP.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(6,1)), DCB=(RECFM=F, LRECL=7298, BLKSIZE=7298)
//NYD DD DSN=RA.NY.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=2104, BLKSIZE=2104)
//UYD DD DSN=RA.UY.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=2080, BLKSIZE=2080)
//NJD DD DSN=RA.NJ.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=4360, BLKSIZE=4360)
//UJD DD DSN=RA.UJ.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=4360, BLKSIZE=4360)
//TDD DD DSN=RA.TD.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=272, BLKSIZE=272)
//PTD DD DSN=RA.PT.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=1496, BLKSIZE=1496)
//CDD DD DSN=RA.CD.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(5,1)), DCB=(RECFM=F, LRECL=6792, BLKSIZE=6792)
//AFD DD DSN=RA.AF.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=3832, BLKSIZE=3832)
//AVD DD DSN=RA.AV.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(24,1)), DCB=(RECFM=F, LRECL=7264, BLKSIZE=7264)
//PKD DD DSN=RA.PK.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(2,1)), DCB=(RECFM=F, LRECL=6680, BLKSIZE=6680)
//PYD DD DSN=RA.PY.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(11,1)), DCB=(RECFM=F, LRECL=7288, BLKSIZE=7288)
//ADD DD DSN=RA.AD.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(2,1)), DCB=(RECFM=F, LRECL=7289, BLKSIZE=7289)
//AND DD DSN=RA.AN.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=352, BLKSIZE=352)
//OKD DD DSN=RA.OK.DATA, DISP=(NEW,PASS), UNIT=SYSDA,
//      SPACE=(TRK,(1,1)), DCB=(RECFM=F, LRECL=432, BLKSIZE=432)

```

Figure 2-15. JCL for Executing DBANAL
(1 of 3)

```

//OXD DD DSN=PA.OX.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1)),DCB=(RECFM=F,LRECL=720,BLKSIZE=720)
//HSD DD DSN=PA.HS.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1)),DCB=(RECFM=F,LRECL=324,BLKSIZE=324)
//MSD DD DSN=PA.MS.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(2,1)),DCB=(RECFM=F,LRECL=7196,BLKSIZE=7196)
//USD DD DSN=PA.US.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(2,1)),DCB=(RECFM=F,LRECL=7196,BLKSIZE=7196)
//NFD DD DSN=PA.NF.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(17),1)),DCB=(RECFM=F,LRECL=7252,BLKSIZE=7252)
//NFD DD DSN=PA.NF.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(350,1)),DCB=(RECFM=F,LRECL=3508,BLKSIZE=3508)
//ZDD DD DSN=PA.ZD.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(59,1)),DCB=(RECFM=F,LRECL=6624,BLKSIZE=6624)
//IXD DD DSN=PA.IX.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(100),1)),DCB=(RECFM=F,LRECL=2280,BLKSIZE=2280)
//XID DD DSN=PA.XI.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(184,1)),DCB=(RECFM=F,LRECL=2280,BLKSIZE=2280)
//XYD DD DSN=PA.XY.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(3,1)),DCB=(RECFM=F,LRECL=3484,BLKSIZE=3484)
//YXD DD DSN=PA.YX.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(120,1)),DCB=(RECFM=F,LRECL=3484,BLKSIZE=3484)
//MDD DD DSN=PA.MD.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(4,1)),DCB=(RECFM=F,LRECL=7240,BLKSIZE=7240)
//HKD DD DSN=PA.HK.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1)),DCB=(RECFM=F,LRECL=324,BLKSIZE=324)
//PDD DD DSN=PA.PD.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1)),DCB=(RECFM=F,LRECL=7288,BLKSIZE=7288)
//VDD DD DSN=PA.VD.DATA,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1)),DCB=(RECFM=F,LRECL=7284,BLKSIZE=7284)
//***
//***THE FOLLOWING DATA SETS ARE REQUIRED IF REPORT=
//***ERSTAT,ERCOMP,OBSUM OR DBLCK
//***
//SORTLIB DD DSN=SYS1.SORTLIB,DISP=SHR
//SYSOUT DD SYSOUT=A
//***
//***THE FOLLOWING SORT DATA SETS ARE REQUIRED
//***IF REPORT=ERSTAT
//***
//SORTIN DD DSN=TOTALS.DATA,DISP=(NEW,PASS),
// UNIT=SYSDA,SPACE=(TRK,(10,5)),
// DCB=(RECFM=FB,LRECL=20,BLKSIZE=900)
//SORTOUT DD DSN=&SORTOUT,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(TRK,(10,5)),DCB=(RECFM=FB,LRECL=20,BLKSIZE=900)
//SORTWK01 DD UNIT=SYSDA,SPACE=(TRK,(15,1),,CONTIG)
//SORTWK02 DD UNIT=SYSDA,SPACE=(TRK,(15,1),,CONTIG)
//SORTWK03 DD UNIT=SYSDA,SPACE=(TRK,(15,1),,CONTIG)
//***
//***THE FOLLOWING SORT DATA SETS ARE REQUIRED
//***IF REPORT=ERCOMP
//***
//CAGPIN DD DSN=&CAGI,DISP=(NEW,PASS),UNIT=SYSDA,
// SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=728)

```

Figure 2-15. JCL for Executing DBANAL
(2 of 3)

```

//NAGP0UT DD DSN=&NAG1OUT,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=85,BLKSIZE=7280)
//NAGPWK01 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGPWK02 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGPWK03 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSIN DD DSN=&NAG2,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGSOUT DD DSN=&NAG2OUT,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGSWK01 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSWK02 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSWK03 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGRIA DD DSN=&NAG1,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGP0UT DD DSN=&NAG1OUT,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGPWK01 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGPWK02 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGPWK03 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSIN DD DSN=&NAG2,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGSOUT DD DSN=&NAG2OUT,DISP=(NEW,PASS),UNIT=SYSDA,
//      SPACE=(CYL,(11,1)),DCB=(RECFM=FB,LRECL=52,BLKSIZE=7280)
//NAGSWK01 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSWK02 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//NAGSWK03 DD UNIT=SYSDA,SPACE=(CYL,(6,1),,CONTIG)
//DBASE2 DD DSN=&DATABASE2,UNIT=(TAPE,DEFER),DISP=OLD,
//      LABEL=(,NL),VOL=SER=(TAPE1,...,TAPEN),
//      DCB=(RECFM=U,BLKSIZE=7296)
//***
//***THE FOLLOWING ALQ DATA SET IS REQUIRED IF
//***REPORT=PBLOG,DBSUM,OR DBLOCK. THE DDNAME
//***MUST MATCH THE ONE SPECIFIED BY THE CONTROL
//***CARD ALQIN=DDNAME
//***
//ALQINP DD DSN=&ALQIN,DISP=OLD,UNIT=(TAPE,,DEFER),
//      LABEL=(,NL),VOL=SER=ALQNUM
//***
//***ALL REPORTS REQUIRE CONTROL CARDS ON THE
//***SYSIN FILE
//***
//SYSIN DD *
      CONTROL CARD INPUT
//
//

```

Figure 2-15. JCL for Executing DBANAL
(3 of 3)

- Request Data Base Statistics Log Report

```
//SYSIN DD *  
START $  
REPORT = DBLOG $  
ERRIN = RAERROR $  
CNTLST = ERRPRINT $  
RPTLST = REPRINT $  
ALQIN = ALQINP $  
TERM $
```

- Request Data Base Startup Function

```
//SYSIN DD *  
START $  
REPORT = DBSTUP $  
ERRIN = RAERROR $  
CNTLST = ERRPRINT $  
RPTLST = REPRINT $  
DBIN1 = DBASE1 $  
TERM $
```

- Request Data Base Statistics Summary Report

```
//SYSIN DD *  
START $  
REPORT = DBSUM $  
ERRIN = RARERROR $  
CNTLST = ERRPRINT $  
RPTLST = REPRINT $  
ALQIN = ALQINP $  
TIMINT = 001000 $  
TERM $
```

- Request Data Base Lock Queue Statistics Report

```
//SYSIN DD *  
START $  
REPORT = DBLOCK $  
ERRIN = RAERROR $  
CNTLST = ERRPRINT $  
RPTLST = REPRINT $  
ALQIN = ALQINP $  
TIMINT = 001000 $  
TERM $
```

2.4.4 Program Outputs

2.4.4.1 Data Sets

There are two data sets always output by DBANAL:

- A sequential data set containing control card images and appropriate error diagnostics.
- A sequential data set containing the requested report.

The DDNAMES for these output data sets are specified as control card parameters and are required for successful program operation:

- CNTLST=DDNAME of print file for control card images and error diagnostics.
- RPTLST=DDNAME of data set to which the report is written

The formats of the data sets are described below:

DATA SET	LRECL	BLKSIZE	RECFM	DSORG
PRINT FILE	133	1330	FBA	PS
REPORT FILE	133	1330	FBA	PS

For reports FRSTAT, FRCOMP, DBSUM, and DBLOCK, a sort is always performed which requires an additional output data set with the DDNAME of SYSOUT.

For REPORT=DBSTUP, FRSTAT or FRCOMP, the data base startup function is invoked. For this function, all data base sets are loaded to disk from the backup tape.

2.4.4.2 Diagnostics

Diagnostics generated by DBANAL fall into three categories:

- User abend codes
- Error messages
- I/O module messages

The following user abends may occur:

USER 0001

Meaning: The attempt to open the SYSIN file containing the control cards was unsuccessful. The probable cause is that the DDNAME SYSIN was not provided in the JCL.

USER 0002

Meaning: A serious error occurred during processing. The probable cause is an I/O error on an input or output file. Refer to the associated message on the HASP output log.

USER 0003

Meaning: No valid control card set was found on the SYSIN file. Verify the control card input for accuracy.

USER 0004

Meaning: The error message data set could not be opened or its DDNAME was not supplied as a control card parameter. Verify that the control card ERRIN=DDNAME of error message set is present in the control card set.

USER 0005

Meaning: A serious error occurred while parsing the control cards. Either an end-of-file was encountered on the SYSIN file prior to encountering a TERM \$ control card or an I/O error occurred while scanning SYSIN.

The following are error messages which may be printed and the condition indicated caused program termination.

MESSAGE: RA0001 INVALID CHARACTER IN CONTROL CARD FIELD

Meaning: An unacceptable non-alphanumeric character was encountered on a control card. Compool table BH contains the valid special characters.

MESSAGE: RA0002 FIELD LENGTH EXCEEDS EIGHT CHARACTERS

Meaning: A control card keyword or keyword parameter was found to be greater than 8 characters in length.

MESSAGE: RA0003 MISSING OR INVALID CONTROL CARD KEYWORD

Meaning: An acceptable control card keyword was not encountered at the onset of a keyword expression. The intended keyword is either misspelled or has been omitted. The following keywords are acceptable:

ALQIN	ERRIN
CNTLST	REPORT
DBIN1	RPTLST
DBIN2	START
ENDTIM	TERM
ENDDAT	TIMINT
	TIMSPAN

MESSAGE: RA0004 MISSING OR INVALID VALUE - XXXX EXPECTED

Meaning: An equal sign or other delimiter was not encountered at the appropriate point in the keyword expression. XXXX equals the expected value.

MESSAGE: RA0005 INVALID TIME/DATE ENTRY

Meaning: A portion of the time/date field includes an out of range value, a field is not six digits, or the time/date entries do not represent a time range.

MESSAGE: RA0007 TOO MANY IDENTIFIERS FOR KEYWORD

Meaning: The maximum allowable number of parameters for a particular keyword has been exceeded. Compool table I5 contains the maximum values for associated keywords.

MESSAGE: RA0008 INVALID IDENTIFIER IN DESTINATION FIELD

Meaning: Appropriate keyword parameters were not found following a valid keyword in the control card set.

MESSAGE: RA0009 INVALID PARAMETER FOR THIS REPORT - XXXXXXXX

Meaning: The parameter indicated is an invalid keyword for the report generated.

MESSAGE: RA010 CNTLST AND/OR ERRIN FILE(S) NOT OPENED FOR PRIOR REPORT(S)

Meaning: For multiple report requests in one control card set, the indicated keywords designating the print file and error message file were not found with the prior report requests. The current report will be generated; the prior reports requested will not be generated.

MESSAGE: RA033 OPEN ERROR FOR FLIGHT RECORD SET #1 IN RACNNR MODULE

Meaning: An open error occurred on the work data set specified by the DDNAME OAGPIN or NAGPIN. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA035 READ ERROR ON 1ST READ FOR FLIGHT RECORD SET #1 IN RACNNR

Meaning: An error occurred on the first read of the work data set specified by the DDNAME OAGPIN or NAGPIN. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA036 READ ERROR ON FIRST READ FOR FLIGHT RECORD
SET #2 IN RACNNR

Meaning: An error occurred on the first read of the work data set specified by the DDNAME OAGSIN or NAGSIN. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA037 WRITE ERROR IN RADBSR MODULE

Meaning: An error occurred while attempting to write the flight record compare (FRCOMP) report summary lines. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA038 READ ERROR ON 2ND OR SUBSEQUENT READ FOR SET #1
IN RACNNR

Meaning: An error occurred while attempting to read from the work data set specified by the DDNAME OAGPIN or NAGPIN. Refer to the associated I/O messages in the HASP output log.

MESSAGE: RA039 READ ERROR ON 2ND OR SUBSEQUENT READ FOR FLIGHT
RECORD SET #2

Meaning: An error occurred while attempting to read from the work data set specified by the DDNAME OAGSIN or NAGSIN. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA040 WRITE ERROR IN RAFDBR MODULE

Meaning: An error occurred while attempting to write the flight record compare (FRCOMP) report. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA041 DATA BASE ERROR IN RACCDB MODULE

Meaning: The Compool table A2 was being searched for a specific keyword that was not found. The module RACCDB contains a list of keywords that are expected to be defined in A2. This is a serious error that will require program DR Compool modifications.

MESSAGE: RA042 OPEN ERROR FOR FLIGHT RECORD SET #2 IN RACNNR

Meaning: An open error occurred on the work data set specified by the DDNAME OAGSIN or NAGSIN. Refer to the associated I/O message in the HASP Output Log.

MESSAGE: RA043 SORT ERROR IN RACMP MODULE

Meaning: An error occurred during the sort processing. Refer to the sort messages on the SYSOUT data set.

MESSAGE: RA045 ERROR STATUS RETURNED FROM XXXXX

Meaning: The I/O module indicated returned an error status. The I/O module was unable to process the data set. Either the data set could not be opened (XXXXX=DAOPN) or an I/O error occurred while attempting to read (if XXXXX=DARED) or while attempting to write (if XXXXX=DAWRIT). If the data set could not be opened, the most probable cause is that the DDNAME was not specified in the JCL. Refer to the associated I/O message in the HASP output log.

MESSAGE: RA047 NO DATA BASE STATISTICS RECORDS FOUND ON INPUT
DATA SET

Meaning: The report requested was DBSUM, DBLOCK, or DBLOG which process data base statistics records from an input ALQ set. The DDNAME of the ALQ Input Set is specified by the control card ALQIN=DDNAME. No data base statistics records were found on this input set.

The following are I/O module messages that may appear on the HASP output log. In all cases, an I/O error will cause program termination.

MESSAGE: AAAAAAAAA ERROR ON OPEN

Meaning: The data set associated with the DDNAME (AAAAAAAA) could not be opened. The probable cause is that the DDNAME indicated was not provided in the JCL.

MESSAGE: AAAAAAAAA GIVES TOO MANY PDS FILES

Meaning: The maximum number of partitioned data sets that may be open at any one time is 5. AAAAAAAAA is the DDNAME of the file to be opened when the limit was exceeded.

MESSAGE: AAAAAAAAA GIVES TOO MANY I/O FILES

Meaning: The maximum number of input/output data sets that may be open at any one time is 20. AAAAAAAAA is the DDNAME of the data set to be opened when the limit was exceeded.

MESSAGE: AAAAAAAAA IS UNABLE TO GET SUFFICIENT CORE FOR DCB

Meaning: There was insufficient core available when the data set specified by the DDNAME (AAAAAAAA) indicated was to be opened.