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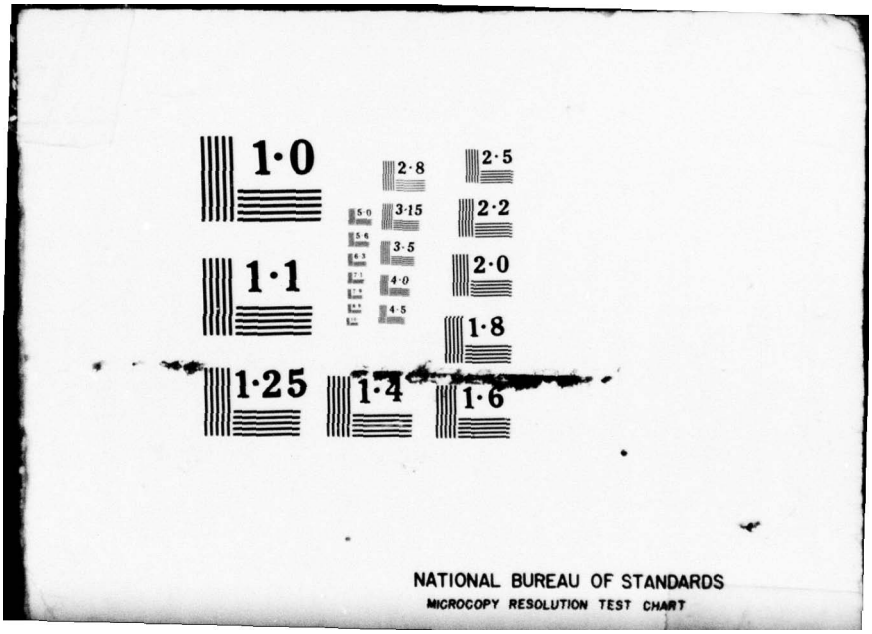
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

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16. Abstract

This document describes the functions of the System Data Assembler (DA) and details the procedures required to exercise them.

The purpose of DA is to create, update, merge, or list the Central Flow Control (CFC) data base. DA is an off-line program, and operates on air-carrier flight schedules, airport data, airline codes, aircraft data, ARTCC data, zone date, and general-aviation data.

The primary inputs to DA are Official Airline Guide (OAG) data. Processing is controlled by user option specification and DA validates all input data and provides its own internal housekeeping facilities.

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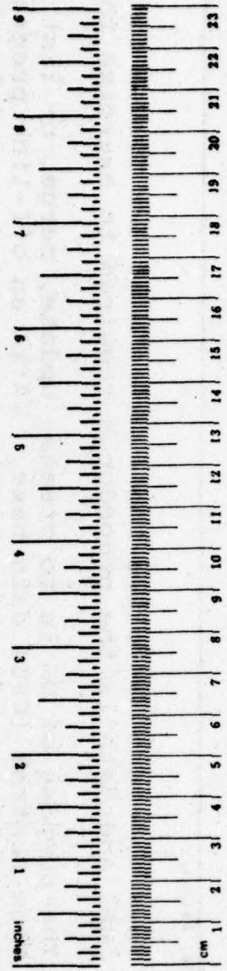
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

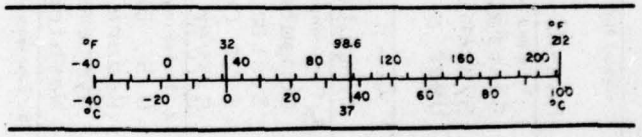


TABLE OF CONTENTS

Section 1 Introduction 1-1

1.1 Purpose and Scope 1-1
1.2 Background Information 1-2
1.3 References 1-3

Section 2 Program Operation 2-1

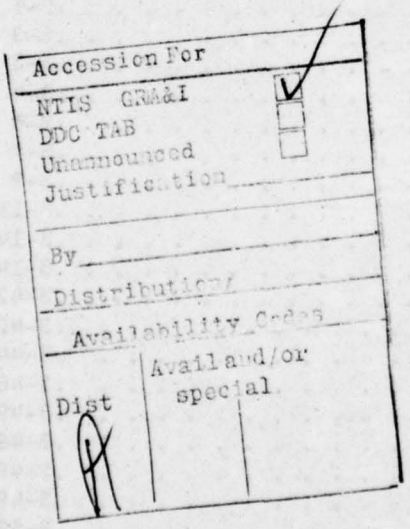
2.1 Overview 2-1
2.1.1 Data Base Creation 2-1
2.1.1.1 General Tables 2-1
2.1.1.2 Flight Record Set 2-1
2.1.1.3 Data Base Dependencies 2-2
2.1.2 Data Base Updating 2-7
2.1.2.1 Capabilities and Limitations 2-7
2.1.3 Flight Record Merge 2-8
2.1.3.1 Merge Processing 2-10
2.1.3.2 Clean Processing 2-10
2.1.4 Data Base Assembler Output Reports 2-10
2.1.5 Failure Recovery During OF/NF Processing 2-11
Section 3 Program Inputs 3-1

3.1 Control Cards 3-1
3.1.1 General Control Card 3-3
3.1.2 Output List Specification Card 3-3
3.1.3 Create Specification Control Card 3-4
3.1.4 Update Specification Control Card 3-6
3.1.5 Merge Specification Control Card 3-7
3.1.6 List Specification Control Card 3-8
3.1.7 Control Card Examples 3-11
3.2 Data Cards 3-14a
3.2.1 Data Card Format in CREATE Mode 3-14a
3.2.2 Data Card Format in UPDATE Mode 3-42
3.2.2.1 ADD Type 3-42
3.2.2.2 CHG Type 3-44
3.2.2.3 DEL Type 3-46
3.3 Data Sets 3-49
3.3.1 CFC Data Base Sets 3-49
3.3.2 DA Control Card Data Set 3-49
3.3.3 DA Input Raw Data Set 3-49
3.3.4 DA Control Card List Data Set 3-52
3.3.5 DA Input Raw Data List Data Set 3-53
3.3.6 Formatted Data Base Record List Data Set 3-53
3.3.7 DA Error Diagnostic Message Data Set 3-54
3.3.8 Flight Record Header Set 3-55
3.3.9 Sort Data Sets 3-55

TABLE OF CONTENTS (Continued)

Section 4 Program Outputs 4-1

Section 5 Diagnostics 5-1



LIST OF TABLES

TABLE		PAGE
2-1	Automatically Created Data Sets.	2-3
3-1	Retrieval Keywords	3-9
3-2	Keyword Definitions for the AO Set	3-14b
3-3	Keyword Definitions for the AV Set	3-15
3-4	Keyword Definitions for the AF Set	3-16
3-5	Keyword Definitions for the AJ Set	3-17
3-6	Keyword Definitions for the CP Set	3-18
3-7	Keyword Definitions for the CO Set	3-19
3-8	Keyword Definitions for the HS/HK Sets	3-21
3-9	Keyword Definitions for the IX/XI Sets	3-22
3-10	Keyword Definitions for the MM Set	3-23
3-11	Keyword Definitions for the NJ/UJ Sets	3-24
3-12	Keyword Definitions for the NO Set	3-25
3-13	Keyword Definitions for the NY/UY Sets	3-26
3-14	Keyword Definitions for the OD Set	3-27
3-15	Keyword Definitions for the OF/NF Sets	3-28
3-16	Keyword Definitions for the OK Set	3-30
3-17	Keyword Definitions for the OS/NS Sets	3-31
3-18	Keyword Definitions for the OX Set	3-32
3-19	Keyword Definitions for the PY Set	3-33
3-20	Keyword Definitions for the PK Set	3-34
3-21	Keyword Definitions for the PT Set	3-35
3-22	Keyword Definitions for the PW Set	3-38
3-23	Keyword Definitions for the VW Set	3-39
3-24	Keyword Definitions for the XY/YX Sets	3-40
3-25	Keyword Definitions for the ZO Set	3-41
3-26	Data Base Set Attributes	3-50

LIST OF FIGURES

FIGURE		
2-1	Data Set Predecessors.	2-4
2-2	Automatically Created Data Sets.	2-5
2-3	Data Base Creation Sequence.	2-6
2-4	Data Set Updated Dependencies.	2-9
2-5	Restart Capabilities	2-12
4-1	DA Control Card Listing.	4-2
4-2	DA Input Raw Data Listing.	4-3
4-3	Formatted Data Set Record Listing.	4-4
4-4	Error Diagnostic Listing	4-5

SECTION 1 - INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of the System Data Assembler (DA) is to create, update, merge, or list the Central Flow Control (CFC) data base. Within the DA, the Create mode generates an entirely new data base set while the Update mode adds, changes, or deletes specified existing data base records. For the flight record set only, Merge mode is used to combine the existing Operational Airline Guide (OAG) data base set with an OAG tape. List mode will print all or a user-specified part of a data base set.

The sets comprising the data base are:

- OAG Flight Record Set (OFRS-OF)
- Non-OAG Flight Record Set (NFRS-NF)
- OAG Flight Index Table Set (OFIT-IX)
- Non-OAG Flight Index Table Set (NFIT-XI)
- Normal General Aviation Table Set (NGTS-NJ)
- User-Supplied General Aviation Table Set (UGTS-UJ)
- Normal Capacity Table Set (UCTS-NY)
- User-Supplied Capacity Table Set (UCTS-UY)
- OAG Arrival/Departure Table Set (OADT-OS)
- Non-OAG Arrival/Departure Table Set (NADT-NS)
- OAG Flight Accession Table Set (NFAT-XY)
- Zone Table Set (ZOTS-ZO)
- Continue Table Set (CONT-CO)

- Arrival Fix Table Set (FXTS-AV)
- Airport Fix Table Set (AFTS-AF)
- Center Table Set (CETS-CP)
- Parameter Table Set (PATS-PT)
- Table Mapping Table Set (TMTS-TZ)
- Airline Operator Table Set (AOTS-AO)
- Airline Operator Conversion Table Set (AOCS-VW)
- Non-OAG Name Table Set (NOTS-NO)
- Aircraft Type Table Set (ATTS-PY)
- Aircraft Type Conversion Table Set (ATCS-PW)
- Aircraft Class Table Set (ACTS-PK)
- Airport Table Set (APTS-AJ)
- Operational Category Table Set (OCTS-OK)
- Output Format Table Set (OFTS-OX)
- Output Device Table Set (ODTS-OD)
- OAG Housekeeping Table Set (OHOT-HS)
- Non-OAG Housekeeping Table Set (NHOT-HK)
- Error Message Table Set (TEMS-MM)

1.2 BACKGROUND INFORMATION

The Data Assembler is an off-line program which generates, updates, and lists the various CFC data base files accessed during on-line operations. The kinds of data handled by DA include:

- Air-carrier flight schedules
- Airport data

- Airline codes
- Aircraft types
- ARTCC data
- Zone data
- General aviation data

The primary inputs to DA are data cards and OAG data tapes. Processing is determined through user control cards specifying the function and identifying the run parameters. DA validates all input data and ensures the integrity of the output data base files by supplying all necessary linkages, cross-references, and pointer fields in a form ready to be used by the CFC operational computer program.

A complete description of the CFC data base is contained in the Subprogram Design Data (SDD) documentation.

1.3 REFERENCES

The following documents may assist the Data Assembler user:

a. IBM System/360 Operating System: Job Control Language Reference, IBM Systems Reference Library, GC28-6704.

b. IBM System/360 Operating System: OS Utilities, IBM Systems Reference Library, GC28-6586.

c. Central Flow Control Program Design Specifications, Volume 2, CSC/SD-77-6093.

d. IBM System/360 Operating System: OS Sort/Merge Program, IBM Systems Reference Library, GC28-6543-8.

SECTION 2 - PROGRAM OPERATION

2.1 OVERVIEW

DA has four basic operational capabilities: data base set creation and update, specialized OAG and Non-OAG Flight Record Sets (OF, NF) processing, and output of printed reports. The following paragraphs describe these in more detail.

2.1.1 Data Base Creation

The data base consists of a number of sets which can be general tables and flight record sets. The flight record sets are OF, NF and their related index and pointer sets. All other sets are called general tables.

2.1.1.1 General Tables

In create mode, DA will generate a new version of a specified set. The data values to appear in the set are specified by the user on input raw data cards. The format and specification of these cards are given in Section 3. Not all fields of an output data base record are necessarily user-provided. DA uses other available information, such as other sets of the data base to create or convert a new value consistent with user inputs. However, whenever a user input is requested, it is mandatory to provide such an input; there are no optional user data parameters.

2.1.1.2 Flight Record Sect

The OF set is created in two separate user-controlled steps. These steps may be performed as separate DA program executions or as two processing requests within the same program execution, the former

approach being recommended. During the first step the OAG tape is input by the user and is preprocessed. OAG tape data records are validated and formatted data records are written to an intermediate data set. During the second step, the user provides the intermediate data set as an input and formatted data records from it are inserted into the OF set. Related index and pointer sets (OS, IX, YX) are created automatically during the second step.

At the NF set creation time, input raw data records are not provided by the user. The NF set along with its related index sets NS, XI, and XY are initialized only. No data records are placed in the NF set, but are inserted during online operation.

2.1.1.3 Data Base Set Dependencies During Creation

The sets of the CFC are created one at a time but they must be considered as parts of an integrated whole. Thus, creation of a specific set may have repercussions in other sets. There are two interrelationships of which the user must be aware.

The first of these is called table precedence. It requires that certain data base sets be created prior to the creation of others. This is due to the use by DA of some sets in order to validate or convert input raw data values for other sets. A complete list of predecessor relationships is given in Figure 2-1. In this figure, for example, the AF set cannot be created until the AJ and AV sets have been created. Predecessor sets may be created by prior DA program executions or as multiple processing requests within a single program execution.

The second data base set interrelationship is automatic set creation. This refers to the fact that not all CFC data base sets can be explicitly created at user request. Certain sets are created automatically by DA when other sets are requested. For example, as shown in Figure 2-2, the CP table is created automatically when AJ is created. For automatically created sets, no user raw data cards are required; all necessary input comes from the data provided for the primary set. For example, the data for CP comes from the user-provided raw data for AJ. One automatically created set is particularly noteworthy. This is the TZ table which is the Table Mapping Table. It is automatically created when the first set of a new data base is created. Once created, the TZ table is input to DA so that it can be updated as other sets in a new data base are created.

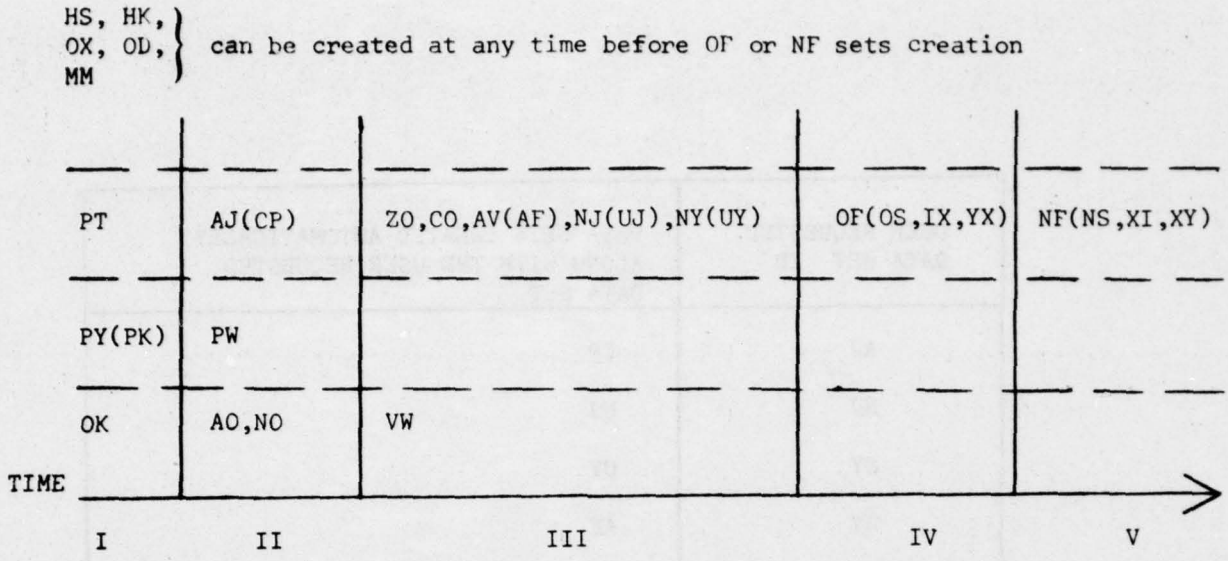
Combining these two dependencies, the data base can be created in a time ordered sequence as shown in Figure 2-3.

DATA SET	PREDECESSOR
AF	AJ, AV
AJ	PT
AO	OK
AV	AJ
CO	AJ, CP
CP	PT, AJ
IX	AO, AJ, CP
NF	AJ, CP, PY, PK, OK, NO, HK, OF
NJ	AJ, CP
NO	OK
NS	AJ, CP
NY	AJ
OF	AJ, CP, PW, PK, OK, VW, PY, AO, HS
OS	AJ, CP
PK	PY
PW	PY
UJ	AJ, CP
UY	AJ
XI	NO, AJ, CP
XY	NO
YX	AO
ZO	AJ, CP
VW	AO

Figure 2-1. Data Set Predecessors

USER REQUESTED DATA SET ID	DATA SETS CREATED AUTOMATICALLY ALONG WITH THE USER REQUESTED DATA SET
AJ	CP
NJ	UJ
NY	UY
AV	AF
PY	PK
OF	OS, IX, YX
NF	NS, XI, XY

Figure 2-2. Automatically Created Data Sets



NOTES

A set may be created when all sets in all previous time intervals have been created. Within a time interval, the order of creation is not fixed.

Set identifiers within parentheses represent automatically created sets.

Figure 2-3. Data Base Creation Sequence

2.1.2 Data Base Updating

Updating the data base consists of adding, changing, and deleting the various elements comprising the CFC data base. General tables and flight record sets are handled in the same way.

2.1.2.1 Capabilities and Limitations

In update mode, there are three types of processing available: add, change, and delete. The table below indicates the operation possible. Note that adding to or deleting from a fixed length vector, and adding or deleting a simple data item are not allowed.

Operation	Data Type
Add	record
	value to variable length vector
	repeating group
Change	item value
	retrieval key
	vector value
	repeating group value
Delete	record
	set
	value in a variable length vector
	repeating group (assumes that repeating group always have first data element as simple item)

To assist the user in determining the structures represented within the CFC data base, the SDD contains data hierarchies for all sets.

2.1.2.2 Data Base Set Dependencies During Update

Because of the logical data interrelationships present within the data base, care must be taken by the user when updating certain sets as the changes in one set may cause other sets to be incomplete or in error. For example, if the Airport Table is changed by deleting an airport, then the Center Table should also have that airport deleted from its owner center. A complete list of table dependencies is shown in Figure 2-4. DA cannot automatically diagnose the changes made and update the dependent tables but will print a diagnostic message identifying the affected sets. User analysis is then required to evaluate what additional updates, if any, are required.

The TZ data set cannot be updated by the user through DA because it contains data base set attribute information. Changing data set attributes (i.e., record length, block size, and maximum number of data records) requires that the user change the values in the DA COMPOOL, delete the data set from the TZ set, allocate a new data set, change values in the OPCX Subsystem, and then recreate the specified data base set.

2.1.3 Flight Record Merge

Merge mode processing pertains only to the Flight Record Sets, OF and NF. There are two types of merge processing: merge, which deals only with the OF set; and clean processing which is performed on either OF or NF.

DATA SET	DATA SET AFFECTED
AJ	CP, NY, UY, NJ, UJ, CO, AF, AV, OF, NF, IX, XI, OS, NS, ZO
CP	AJ, NJ, UJ, CO, ZO, OS, NS, IX, XI, OF, NF
PT	OF, NF
AF	AV
AV	AF
PK	OF, NF, PY
PY	OF, NF, PK, PW
AO	OF, IX, YX
NO	NF, XI, XY
OK	OF, NF, AO, NO
HS	OF, IX
HK	NF, XI
PW	PY, OF
VW	AO, OF

Figure 2-4. Data Set Updated Dependencies

2.1.3.1 Merge Processing

Merge refers to combining an OAG tape with the existing OF set. Records from both are compared with respect to their arrival/departure airports, aircraft identification, ETE, departure time, aircraft type and class, and operational category. Based upon these comparison results, OAG tape records are inserted into OF or OF records are updated.

The OF set is merged in two separate steps. During the first step, the OAG tape is input by the user and is preprocessed. OAG tape data records are validated, formatted, and written to an intermediate data set and then sorted. During the second step, the sorted data is input by the user. Existing OF data records are sorted by the aircraft identification and then are compared with the new data records. Valid and updated data records are inserted into the OF set.

2.1.3.2 Clean Processing

The clean type of merge processing reorganizes either the OF or NF set by physically deleting records which have been logically deleted during OPCX operation. The input set, OF or NF, is updated using the same physical disk space in an operation analagous to a compression in place.

2.1.4 Data Base Assembler Output Reports

The last major mode or function of DA is the preparation of printed reports. These reports consist of listing of control cards, created data base data set records, error diagnostics, and optional listing of raw data records and updated data base records. The user may also

request that a specific data base set be listed in its entirety or that specific records be listed as selected by a value of the set's retrieval key.

2.1.5 Failure Recovery During OF/NF Processing

Due to the lengthy run times associated with OF and NF set processing, a capability is available to restart DA if a system failure occurs during OF/NF processing. The mechanism by which a restart is performed is the OAG header file. During OF/NF processing, the header file is updated with information descriptive of the data being processed and the conditions and status of the run. When a restart occurs, the header file is read and the information used to reposition the input and output files and to restore main memory. In general, processing does not restart with the instruction executing at the time of failure; rather, processing resumes at the beginning of the "activity" which was executing at the time of failure. For example, in merge mode, merge type, the OF file is read and an intermediate file created containing current flight records to be retained. Once this intermediate file is created, it is sorted. Then the sorted records are merged with the new OAG data. Such a run is restartable between intermediate file creation and sorting or sorting and merging. Figure 2.5 provides a complete description of restart.

The remaining sections of this document describe the program inputs necessary to perform these activities and show examples of inputs and outputs.

DATA SET	MODE	TYPE	STEP	RESTART CAPABILITIES
OF	CREATE	-	1	If OAG TAPE was being processed when failure occured, restart begins with last aircraft ID written to intermediate Data File. Step can also be restarted prior to sort if failure occured in IBM sort.
OF	MERGE	MRG	1	Capabilities same as create step one.
OF	MERGE	MRG	2	Restart capabilities are for phases of Merge step two processing. Step two can be re-started after following phases have been completed. 1) After processing of old data base records i.e.(Departure date mask shifted and DELETED records discarded) 2) Records kept from old data base have been sorted.
OF	MERGE	CLN	-	Capabilities same as OF MERGE MRG step two
NF	MERGE	CLN	-	Capabilities same as of MERGE MRG step two.

Figure 2.5. Restart Capabilities

SECTION 3 - PROGRAM INPUTS

3.1 CONTROL CARDS

Six types of control cards are used to specify a different operation to be performed by DA. The control cards are always read from the SYSIN file. All control cards and data cards observe the following set of conventions regarding their format and structure:

1. Control cards are contained between START and TERM cards:

```
START
  .
  .
  .
control cards
  .
  .
  .
TERM
```

   Data cards may optionally follow the TERM card.

2. Control cards may contain information only in columns 1 through 72, inclusive.

3. The "$" delimiter is optional on each card. If present, the remaining card columns are ignored. Comments may follow the "$" delimiter:

```
MODE=CREATE
    or
MODE=CREATE $ INITIALIZE DATA BASE
```

4. All input data is specified in the form keyword/equal sign/value and all such expressions are delimited by a semicolon:

```
MODE=CREATE;HDRID=CFCSIM;...
```

5. Multi-valued keywords (lists of values) are specified without parentheses with each value separated by a comma:

```
SITE=A,B,C,D;
```

6. Keywords may not be specified using multiple lists:

```
SITE=((A,B,C),(D,E,F),(G,H,I))
```

Instead, the keyword is to be repeated as follows:

```
SITE=A,B,C;SITE=D,E,F;SITE=G,H,I
```

7. A control card will be considered as continued on the next card if a plus sign (+) delimiter appears on the card. If a plus sign appears on a card, the remainder of the card is ignored.

```
NUMKEY=2; APTID=JAX; + NEXT KEY ON NEXT CARD
          APTID=LAX; $ NO MORE CONTINUATIONS
```

8. (a) The following keywords are standardized:

MODE = self explanatory

DATAIN = for the ddname of input data file

ERRIN = for the ddname of SPCX PDS error message file

CNTLST = for the ddname of file for printing control card

(b) Keywords used for ddname specification will adhere to the following convention regarding the last letters of their spelling:

LST - for ddnames for output listing files

IN - for ddnames of input files

OUT - for ddnames of output files other than listings

3.1.1 General Control Card

The General Control Card allows the user to specify the mode of operation, user identification and password, and DDNAME of an existing data base to be updated. The MODE keyword must appear first on the card. User identification and password are validated against the list of valid users to prevent unauthorized updates to the CFC data base sets. The General Control Card format is shown below. This card immediately follows the START card and is followed by any sequence of create, update, merge, or list specification control cards for multiple modes of operation.

```
MODE = XXXXXX;USER=YYYYYYY;PASSWORD=ZZZZ;DBIN=CCCCCCC$
```

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
MODE	XXXXXX	6	CREATE MERGE UPDATE LIST	R	MODE OF OPERATION
USER	YYYYYYYY	8		R	USER ID
PASSWORD	ZZZZ	4		R	PASSWORD
DBIN	CCC	8		O	'YES' IF THE TABLE MAPPING TABLE (TZ) ALREADY EXISTS. OTHERWISE, MUST BE OMITTED.

3.1.2 Output List Specification Card

The Output List Specification Card allows the user to specify the DDNAMEs of various output listing files and the error message file. The CNTLST keyword must appear first on the card. The output list specification card must appear only once in control card stream and it always follows the first General Control card. The format of this card is as follows:

CNTLST=CCCCCCC;INPLST=CCCCCCCC;DBLST=CCCCCCCC;ERRIN=CCCCCCCC$

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
CNTLST	CCCCCCCC	8		R	DDNAME OF FILE FOR PRINTING CONTROL CARDS
INPLST	CCCCCCCC	8		R	DDNAME OF FILE FOR PRINTING INPUT RAW DATA CARDS
DBLST	CCCCCCCC	8		R	DDNAME OF FILE FOR PRINTING DATA BASE RECORDS
ERRIN	CCCCCCCC	8		R	DDNAME OF SPCX ERROR MESSAGE FILE

3.1.3 Create Specification Control Card

This card identifies the data base table to be created, the DDNAME of the raw input data, whether the input data and created records are to be listed, and for the OF data base set, whether to use the input OAG tape

or a previously pre-processed OAG tape. The TABLE keyword must appear first on the card. More than one Create Specification Control Card may appear in the input. The format of this card is as follows:

```
TABLE=BBB;DATALST=AAA;DATAIN=CCCCCCCC; STEP=D;RESTART=AAA$
```

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
TABLE	BBB	3	2 CHAR TABLE ID	R	DATA SET SYMBOLIC NAME
DATALST	AAA	3	YES NO	R	LIST INPUT RAW DATA
DATAIN	CCCCCCCC	8		R	DDNAME OF INPUT RAW DATA (FOR THE OF/OFRS DATA BASE SET, WHEN STEP=2, DATAIN=OAGTOUT)
RESTART	AAA	3	YES NO	O	USED ONLY FOR 'OF' PROCESSING IN STEP=1 OF CREATE MODES. IF 'NO' OR OMITTED, THE OAG TAPE IS PROCESSED FROM THE BEGINNING. IF YES, RECOVERY/RESTART IS IMPLIED AND OAG TAPE IS PROCESSED FROM THE POINT OF LAST STEP 1 PROCESSING.
STEP	D	1	1 or 2	O	OAG TAPE PROCESSING STEP IDENTIFIER. REQUIRED FOR 'OF' SET ONLY. 1=PROCESS OAG TAPE 2=INSERT DATA RECORDS IN DATA BASE.

3.1.4 Update Specification Control Card

This card identifies the update type (ADD, CHG, DEL), the input DDNAME of a file containing the update raw data, whether updated records are to be printed, and other associated data concerned with updating the data base. The TABLE keyword must appear first on the card. The Update Specification Control card is given as follows:

```
TABLE=BBB;TYPE=EEE;DELTAB=AAA;DATALST=AAA;TABLELST=AAA; +
DATAIN=CCCCCCCC$
```

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
TABLE	BBB	3	2 CHAR TABLE ID	R	DATA SET SYMBOLIC NAME
TYPE	EEE	3	ADD	R	UPDATE TYPE:ADD= ADD NEW RECORD
			CHG		CHG=CHANGE EXISTING RECORD
			DEL		DEL=DELETE EXISTING RECORD
DELTAB	AAA	3	YES NO	O*	DELETE SPECIFIED DATA SET FROM THE DATA BASE. *REQUIRED IF USER WANTS TO DELETE DATA SET. OTHERWISE ASSUMED TO BE 'NO' VALUE. IF DELTAB= YES IS PROVIDED, THEN FOLLOWING KEYWORDS AND VALUES ARE NOT REQUIRED
DATALST	AAA	3	YES NO	R	LIST INPUT RAW DATA FLAG
TABLELST	AAA	3	YES NO	R	LIST UPDATED DATA BASE RECORD
DATAIN	CCCCCCCC	8		R	DDNAME OF INPUT RAW DATA

3.1.5 Merge Specification Control Card

This control card is valid only for the OF/OFRS and NF/NFRS data base sets and is used to request that an OAG tape be merged with an existing OF/OFRS or that either NF/NFRS or OF/OFRS be cleaned, i.e., records marked as logically deleted are to be physically deleted. The TABLE keyword must appear first on the card. The Merge Specification Control card is specified as follows:

```
TABLE=BBB;TYPE=GGG;DATALST=AAA;TABLELST=AAA;DATAIN=CCCCCCCC;STEP=D;+
RESTART=AAA$
```

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
TABLE	BBB	2	2 CHAR	R	DATA SET SYMBOLIC NAME (OF or NF)
TYPE	GGG	3	MRG CLN	R	MERGE TYPE MRG-MERGE OAG TAPE WITH EXISTING OF SETS CLN-CLEAN OF, NF SETS
DATALST	AAA	3	YES NO	R	LIST INPUT RAW DATA. NOT REQUIRED IN CLEAN OPERATION
TABLELST	AAA	3	YES NO	R	LIST MERGED FLIGHT RECORDS
DATAIN	CCCCCCCC	8		R	DDNAME OF INPUT OAG TAPE. NOT REQUIRED IN CLEAN OPERATION. (FOR THE OF/OFRS DATA BASE SET, WHEN TYPE=MRG AND STEP=2, DATAIN=OAGTOUT)
RESTART	AAA	3	YES	O	RECOVER/RESTART INDICATOR. FOR TYPE=MRG IN STEP=1: IF NO OR OMITTED, OAG TAPE IS PROCESSED FROM BEGINNING. IF YES, RECOVERY/ RESTART IS IMPLIED AND OAG

					TAPE IS PROCESSED FROM THE POINT OF LAST STEP 1 PROCESSING. IN STEP=2: IF NO OR OMITTED, MERGE TAKES PLACE FROM BEGINNING. IF YES, RECOVERY/RESTART IS IMPLIED AND MERGE PROCESSING RECOVERS FROM LAST STEP 2 PROCESSING (SORTIN AND SORTOUT DATA SETS MUST BE RETAINED FROM LAST STEP). FOR TYPE=CLN IF NO OR OMITTED, CLEAN OPERATION TAKES PLACE FROM BEGINNING. IF YES, RECOVERY/RESTART IS IMPLIED AND CLEAN PROCESSING RECOVERS FROM LAST STEP PROCESSING (SORTIN AND SORTOUT DATA SETS MUST BE RETAINED FROM LAST STEP).
STEP	D	1	1 or 2	0	OAG TAPE PROCESSING STEP INDICATOR. REQUIRED FOR 'OF' SET WHEN TYPE=NRG. 1=PROCESS OAG TAPE 2=MERGE DATA RECORDS

3.1.6 List Specification Control Card

Any record of any data base set can be listed with this card. If the retrieval keyword is omitted, the entire set is listed but, specific records can be selected with a retrieval keyword. These keywords are listed in Table 3-1. The TABLE keyword must appear first on the card, as shown below:

FOR ALL SETS EXCEPT OF AND NF SETS

```
TABLE=BBB;JJJJJJ=KKKKKKKK,...,KKKKKKKK$
```

FOR OF AND NF SETS

```
TABLE=BBB;(JJJJJJ=KKKKKKKK;...;JJJJJJ=KKKKKKKK);...;
(JJJJJJ=KKKKKKKK;....;JJJJJJ=KKKKKKKK)$
```

where

KEYWORD FIELD	VALUE FIELD	LENGTH BYTE	VALUES	REQUIRED/ OPTIONAL	DESCRIPTION
TABLE	BBB	3	2 CHAR TABLE ID OR ALL*	R	DATA SET SYMBOLIC NAME. *SPECIFY ALL TO LIST THE ENTIRE DATA BASE
JJJJJJ		6		O	RETRIEVAL KEYWORD
KKKKKKKK		8		O	RETRIEVAL KEY VALUE. FOR SETS OTHER THAN OF AND NF, SEVERAL KEYWORD VALUES MAY FOLLOW THE KEYWORD. FOR OF AND NF, ONLY ONE KEYWORD VALUE MAY FOLLOW THE KEYWORD

TABLE-SET	RETRIEVAL KEY KEYWORD	LENGTH BYTES	*TYPE	VALUES	DESCRIPTION
PT, OD, OX, HS, HK	INTERN	1	N	0	RELATIVE RECORD NUMBER
AJ	AIRPOT	3	A		AIRPORT IDENTIFICATION
CP	CENTER	3	A		CENTER IDENTIFICATION
NJ, UJ	AIRPOT	3	A		PACING AIRPORT OR CENTER IDENTIFICATION
NY, UY, CO	AIRPOT	3	A		PACING AIRPORT IDENTIFICATION
AF	ARRAPT	3	A		PACING ARRIVAL AIRPORT IDENTIFICATION
AV	ARRFIX	6	AN		ARRIVAL FIX EXTERNAL IDENTIFIER
PY	ARTYPE	4	AN		AIRCRAFT TYPE IDENTIFIER
PW	OAGTYP	4	AN		OAG AIRCRAFT TYPE IDENTIFIER
PK	ARCLAS	1	A		AIRCRAFT CLASS IDENTIFIER
AO, YX	OPRCOD	3	A		OAG AIRLINE OPERATOR IDENTIFIER
NO, XY	OPRCOD	2	A		NON-OAG CALL SIGN
OK	OPRCAT	1	A		OPERATIONAL CATEGORY IDENTIFIER
OS, NS	ARRAPT	3	A		ARRIVAL CENTER OR PACING AIRPORT IDENTIFIER

Table 3-1. Retrieval Keywords (1 of 2)

*A = Alphabetic
AN = Alphanumeric
N = Numeric

Note: Where retrieval key values are shown, one of them must be used, or if only one value is indicated, it is the only value and must be specified. Where no retrieval key values are shown, one is selected by the user using his knowledge of the contents of the set(s) to be accessed.

TABLE-SET	RETRIEVAL KEY KEYWORD	LENGTH BYTES	*TYPE	VALUES	DESCRIPTION
ZO	ZONEKY	5	AN		ZONE KEY. FORMAT IS PPPNN WHERE PPP IS PACING AIRPORT EXTERNAL ID AND NN IS ZONE NUMBER (00 TO 99)
MM	ERRCOD	3	N		TRANSACTION ERROR MESSAGE CODE NUMBER
OF, NF	RELREC	6	N	0 TO 236, 300	RELATIVE RECORD NUMBER
	ARRAPT	3	A		ARRIVAL AIRPORT IDENTIFIER
	DEPAPT	3	A		DEPARTURE AIRPORT IDENTIFIER
	ACIDNT	8	AN		AIRCRAFT ID. FORMAT IS OOONNNNN WHERE OOO IS AIRLINE OPERATOR CODE AND NNNNN IS FLIGHT NUMBER
	OPRCOD	3	A		AIRLINE OPERATOR CODE
IX, XI	RECNMB	4	N		OAG OR NON-OAG FLIGHT INDEX TABLE DATA RECORD NUMBER
VW	OAGCOD	3	A		OAG AIRLINE OPERATOR CODE
TZ	TABLID	2	A	Valid 2 Character CFC set ID.	CFC DATA BASE DATA SET IDENTIFICATION

Table 3-1. Retrieval Keywords (2 of 2)

*A = Alphabetic
AN = Alphanumeric
N = Numeric

3.1.7 Control Card Examples

Creating a Data Set

```
START$
MODE=CREATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=ZO;DATALST=YES;DATAIN=ZOINP$
TERM$
```

ZO data set will be created and added to the existing CFC data base. Raw data records are contained in the ZOINP data set. Control cards, input raw data records, and ZO data set records will be printed.

Updating a Data Set

```
START$
MODE=UPDATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=ZO;TYPE=ADD;DATALST=YES;TABLELST=YES;DATAIN=ZOADD$
TABLE=ZO;TYPE=CHG;DATALST=YES;TABLELST=YES;DATAIN=ZOCHG$
TABLE=ZO;TYPE=DEL;DATALST=YES;TABLELST=NO;DATAIN=ZODEL$
TERM$
```

ZO data set will be updated on the existing CFC data base with new added records, changed existing records, and logically deleted data records. Control cards, input raw data records, and updated ZO table records are listed except for those deleted.

Merging OF Data Set

```
START$
MODE=MERGE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=OF;TYPE=MRG;DATALST=YES;TABLELST=NO;DATAIN=OAGINP;STEP=1;RESTART=NO$
TABLE=OF;TYPE=MRG;DATALST=NO;TABLELST=YES;DATAIN=OAGTOUT;STEP=2;RESTART=NO$
TERM$
```

Step 1 (first TABLE=OF card) is run to preprocess the new OAG tape. Step 2 (second TABLE=OF card) is run to merge the existing OF set with the preprocessed OAG tape records. In both steps, control cards are printed. In

step 1, the input OAG data is listed. In step 2, the merged OF table is listed. The above control cards can appear within one DA program execution or two DA executions with the first TABLE=OF card in the first job execution and the second TABLE=OF card in the second job execution. All other control cards would appear in both jobs.

Cleaning OF/NF Data Sets

```
START$
MODE=MERGE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=OF(or NF); TYPE=CLN;DATALST=NO;TABLELST=YES$
TERM$
```

Logically deleted OF or NF records will be physically deleted as a result of the clean operation. The cleaned version of the OF or NF table will be listed as will the control cards.

Listing Data Sets

```
START$
MODE=LIST;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=AJ$
TABLE=CP;CENTER=ZAU,ZTL$
TABLE=OF;(RELREC=50);(ARRAPT=JFK;DEPART=ATL)$
TABLE=ALL$
TERM$
```

Listing will consist of the AJ data set, two data records from CP data set, relative record number 50, and all flight leg data records between JFK and ATL airports from the OF data set, and all data sets from the CFC data base.

Multi-Mode Operation

```
START$
MODE=CREATE;USER=RMS;PASSWORD=ARTO$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
        .
        .
        .
    Create Specification Cards (1 or more)
        .
        .
        .
MODE=UPDATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
        .
        .
        .
    Update Specification Cards (1 or more)
        .
        .
        .
MODE=LIST;USER=RMS;PASSWORD=ARTO;DBIN=YES$
        .
        .
        .
    List Specification Cards (1 or more)
        .
        .
        .
TERM$
```

The specified data sets will be created, updated, and then listed in the order in which the control cards are given in the deck.

Deleting a Data Set

```
START$
MODE=UPDATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=PT;TYPE=DEL;DELTAB=YES$
TERMS$
```

PT data set entry will be logically deleted from the TZ data set.

Creating OF Set: (with error recovery)

Step 1 of OF CREATE may be restarted. The only difference is on the table card restart should be equal to yes.

TABLE=OF:DATALST=$\begin{Bmatrix}\text{yes}\\\text{no}\end{Bmatrix}$; DATAIN=OAGINP;STEP=1:RESTART=YES$

MERGING OF Set: (with error recovery)

Both steps of MERGE may be restarted. The only difference is that on the table card restart should be equal to yes.

TABLE=OF; TYPE=MRG;DATALST=$\begin{Bmatrix}\text{yes}\\\text{no}\end{Bmatrix}$; TABLELST=$\begin{Bmatrix}\text{yes}\\\text{no}\end{Bmatrix}$; +

DATAIN =$\begin{Bmatrix}\text{OAGINP}\\\text{OAGTOUT}\end{Bmatrix}$; STEP =$\begin{Bmatrix}1\\2\end{Bmatrix}$; RESTART=YES$

CLEANING OF/NF Data Sets (with error recovery)

CLEAN may be restarted for both OF and NF Data Sets, by changing the restart parameter on the table card to yes.

TABLE=$\begin{Bmatrix}\text{OF}\\\text{NF}\end{Bmatrix}$; TYPE=CLN; DATALST=$\begin{Bmatrix}\text{yes}\\\text{no}\end{Bmatrix}$; TABLELST=$\begin{Bmatrix}\text{yes}\\\text{no}\end{Bmatrix}$; RESTART=YES$

3.2 DATA CARDS

CFC data base sets are created or updated from information provided on input raw data cards. All raw data (except OAG tape) are input by card, tape, or disk and are read from the data definition name (DDNAME) provided on either the create, update, or merge specification control card. All raw data (except OAG tape) follow a general set of conventions regarding their format and structure. These rules are described in Section 3.1, Items 2 through 7.

For creating or merging the OAG flight record set, the standard OAG tape is used.

3.2.1 Data Card Format in CREATE Mode

Tables 3-2 through 3-25 give input raw data card formats and keyword and value descriptions for all (except OF/NF) CFC data base sets. The required sequence of keywords for each of the input raw data cards is shown in Tables 3-2 through 3-25. Dependent data sets CP, AF, PK, UJ, and UY are created in parallel to the AJ, AV, PY, NJ, and NY sets, respectively; therefore, input raw data cards are not required for these sets.

The OF data set is created from the standard OAG tape. OF-related data sets OS, IX, and YX are created automatically at the time of set creation; therefore input raw data cards are not required.

Table 3-2. Keyword Definitions for the AO Set

For Creating and Adding a New Data Record to the AO Set:

OPRCOD=XXX;OPRCAT=Y$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OPRCOD	3	A		R	OAG AIRLINE OPERATOR EXTERNAL IDENTIFIER
OPRCAT	1	A		R	OPERATIONAL CATEGORY FOR THIS OPERATOR

Table 3-3, Keyword Definitions for the AV Set

For Creating the AV/AF Sets and for Adding New Data Record to the AV Set:

ARRAPT=XXX;ARRFIX=YYYYYY;(DEPAPT=XXX,....,XXX;PERETE=PPP,....PPP)$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARRAPT	3	A		R	ARRIVAL PACING AIRPORT IDENTIFIER
ARRFIX	6	AN		R	ARRIVAL FIX IDENTIFIER
DEPAPT	3	A		R	DEPARTURE AIRPORT IDENTIFIER; MAX OF 178 VALUES
PERETE	3	N		R	PERCENTAGE OF ESTIMATED TIME ENROUTE AT THIS FIX. MAXIMUM OF 178 VALUES. VALUES PROVIDED FOR PERETE SHOULD CORRESPOND WITH DEPAPT VALUES. OTHERWISE INPUT RAW DATA WILL BE DISCARDED

Table 3-4. Keyword Definitions for the AF Set

For Adding a New Data Record (Update Mode Only) to the AF Set:

ARRAPT=AAA;ARRFIX=FFFFFF,...,FFFFFF$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARRAPT	3	A		R	ARRIVAL PACING AIRPORT EXTERNAL IDENTIFIER
ARRFIX	6	AN		R	ARRIVAL FIX IDENTIFER (MAXIMUM of 12 VALUES ARE ALLOWED)

NOTE: The AF set is created along with the AV set so data card format for creating the AF set is same as the AV set.

Table 3-5. Keyword Definitions for the AJ Set

For Creating the AJ/CP Sets and for Adding New Records to the AJ Set:

AIRPOT=XXX;PACNON=Y;GATETM=ZZ;CENTER=BBB$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
AIRPOT	3	A		R	3-CHARACTER AIRPORT IDENTIFIER
PACNON	1	A	P or N	R	PACING/NON-PACING INDICATOR
GATETM	2	N	0 to 99	R	GATE TIME/DEPARTURE TIME DIFFERENCE IN MINUTES
CENTER	3	A		R	3-CHARACTER CENTER IDENTIFIER CONTAINING THE AIRPORT
NOTE: First 35 entries in AJ set are reserved for pacing airports only. At create time user must input 35 actual and/or dummy pacing airports. The value 35 is documented in the OPCX COMPOOL. Also see PT table keyword definition.					
NOTE: For Maintenance and Certification processing, QPA must be specified as a pacing airport, QNA and QNB as non-pacing airports, and QCA and QCB as centers.					

Table 3-6. Keyword Definitions for the CP Set

For Adding New Records (Update Mode) to the CP Set:

CENTER=XXX;PACAPT=AAA,...,AAA;NONAPT=AAA,...,AAA$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
CENTER	3	A		R	CENTER EXTERNAL IDENTIFIER
PACAPT	3	A		O	PACING AIRPORT EXTERNAL IDENTIFIER (MAXIMUM OF 8 VALUES ARE ALLOWED)
NONAPT	3	A		O	NON-PACING AIRPORT EXTERNAL IDENTIFIER (MAXIMUM OF 440 VALUES ARE ALLOWED)

NOTE: The CP Set is created along with the AJ Set, so data card format for creating the CP Set is same as for the AJ Set.

Table 3-7. Keyword Definitions for the CO Set (1 of 2)

For Creating and Adding New Data Records:

AIRPOT=XXX$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
AIRPOT	3	A		R	3-CHARACTER PACING AIRPORT IDENTIFIER
FOR UPDATE MODE ONLY:					
STMTYP	2	N		O	SIMULATION TAPE
SIMSTM	12	N		O	SIMULATION START TIME IN MMDDYY, HHMMSS FORMAT
SIMSTP	12	N		O	SIMULATION STOP TIME IN MMDDYY, HHMMSS FORMAT
REPSTM	12	N		O	REPORT START TIME IN MMDDYY, HHMMSS FORMAT
REPSTP	12	N		O	REPORT STOP TIME IN MMDDYY, HHMMSS FORMAT
HOLDTM	12	N		O	HOLD TIME IN MMDDYY, HHMMSS FORMAT
HOLDVL	6	N		O	HOLD TIME VALUE IN HHMMSS
STKTIM	12	N		O	PREVIOUS STACK TIME IN MMDDYY, HHMMSS FORMAT
STKSIZ	4	N		O	STACK SIZE
ZONEKY	5	AN		O	ZONE KEY IN FORMAT OF PPPNN, WHERE PPP=PACING AIRPORT EXT. IDENTIFIER AND NN=ZONE NUMBER (00 TO 99) CONCATENATED WITH PPP TO FORM ZONE KEY

Table 3-7. Keyword Definitions for the CO Set (2 of 2)

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ZONENT	12	N		O	ZONE ENTRY TIME IN MMDDYY, HHMMSS FORMAT
ZONEXT	12	N		O	ZONE EXIT TIME IN MMDDYY, HHMMSS FORMAT
DELVAL	6	N		O	DELAY VALUE IN HHMMSS

Table 3-8. Keyword Definitions for the HS/HK Sets

For Creating and Adding a New Data Record to the HS/HK Sets:

(TABLID=XX,XX;FALARM=YY,YY)$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
TABLID	2	A	OF, NF, IX, XI	R	2-CHARACTER DATA SET IDENTIFIER
FALARM	2	N	70 to 99	R	FREE CHAIN ALARM POINT EXPRESSED IN PERCENTAGE
FOR UPDATE MODE ONLY:					
INTERN	1	N	0	R	RELATIVE RECORD NUMBER
PTRFST	6	N		O	POINTER TO FIRST BLOCK IN FREE CHAIN
NMBBLK	4	N		O	NUMBER OF BLOCKS
NMBFRE	4	N		O	NUMBER OF FREE BLOCKS
NMBOVR	4	N		O	NUMBER OF OVERFLOW BLOCKS
FITNMB	4	N		O	FITS NEXT RECORD NUMBER

Table 3-9. Keyword Definitions for the IX/XI Sets

For Updating IX/XI Sets:

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OVERFL	1	N	0 or 1	O	OVERFLOW FLAG FOR THIS RANGE OF FLIGHT RECORD INDICES
RECNMB	4	N		R	OF/NF FLIGHT INDEX TABLE DATA RECORD NUMBER
OPRCOD	3	A		O	AIRLINE OPERATOR CODE EXTERNAL IDENTIFIER
DELFLG	1	N	0, 1, 2	O	DELETE FLAG FOR FLIGHT LEG ENTRY 0=UNUSED 1=ACTIVE 2=DELETED
BLKNMB	6	N		O	RELATIVE RECORD NUMBER IN OF/NF SET FOR THIS FLIGHT LEG
ARRAPT	3	A		O	ARRIVAL CENTER OR PACING AIRPORT EXTERNAL IDENTIFIER
DEPAPT	3	A		O	DEPARTURE CENTER OR PACING AIRPORT EXTERNAL IDENTIFIER
ACIDNT	7	AN		O	AIRCRAFT IDENTIFICATION IN THE FORM OF OOONNNN, WHERE OOO=AIRLINE OPERATOR CODE NNNN=FLIGHT ACCESSION NUMBER
NOTE: IX/XI sets are created automatically at the time of the OF/NF creation. When new records are added or deleted from the OF/NF sets, IX/XI, OS/NS, YX/XY sets are updated automatically.					

Table 3-10. Keyword Definitions for the MM Set

For Creating and Adding a New Data Record to the MM Set:

```
ERRCOD=XXX;LENONE=YY;LENTWO=YY;MSGTXT=AAA.....AA+
AA....A$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ERRCOD	3	N	0 to 99	R	TRANSACTION ERROR MESSAGE CODE (NUMBER)
LENONE	2	N	0 to 80	R	LENGTH OF FIRST PART OF ERROR MESSAGE IN BYTES
LENTWO	2	N	0 to 80	R	LENGTH OF SECOND PART OF ERROR MESSAGE IN BYTES
MSGTXT	80	AN		R	ERROR MESSAGE TEXT. IF IT EXCEEDS 33 CHARACTERS, CONTINUE ON NEXT CARD; EMBEDDED BLANKS ARE ALLOWED

Table 3-11. Keyword Definitions for the NJ/UJ Sets

For Creating and Adding New Data Records to the NJ/UJ Sets:

```
AIRPOT=XX;CAPCTY=YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,+
YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
AIRPOT	3	A		R	3-CHARACTER PACING AIRPORT OR CENTER IDENTIFIER
CAPCTY	3	N	0 to 999	R	NORMAL GENERAL AVIATION ESTIMATE FOR AN HOUR. THIS ITEM REPEATS 24 TIMES ONE FOR EACH HOUR OF THE DAY USER MUST PROVIDE ALL 24 VALUES, OTHERWISE RAW INPUT DATA RECORD WILL BE DISCARDED.

Table 3-12. Keyword Definitions for the NO Set

For Creating and Adding a New Data Record to the NO Set:

OPRCAT=Y;OPRCOD=XX$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OPRCAT	1	A		R	OPERATIONAL CATEGORY FOR NON--OAG OPERATOR
OPRCOD	2	A		R	FIRST CHARACTER OF THE NON-OAG CALL SIGN

Table 3-13. Keyword Definitions for the NY/UY Sets

For Creating and Adding New Data Records to the NY/UY Sets:

```
AIRPOT=XXX;ZERSTK=ZZ;CAPCTY=YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,+
YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY,YYY$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
AIRPOT	3	A		R	3-CHARACTER PACING AIRPORT IDENTIFIER
ZERSTK	2	N	0 to 24	R	ZERO STACK HOUR (TIME WHEN AIRPORT BECOMES OPERATIONAL)
CAPCTY	3	N	0 to 999	R	NORMAL CAPACITY FOR AN HOUR FOR THIS PACING AIRPORT. THIS ITEM REPEATS 24 TIMES, ONE FOR EACH HOUR OF THE DAY. USER MUST PROVIDE ALL 24 VALUES, OTHERWISE RAW INPUT DATA RECORD WILL BE DISCARDED.

Table 3-14. Keyword Definitions for the OD Set

For Creating and Adding New Data Records to the OD Set:

(OUTDVC=D,D,...,D;DVCINT=YY,...,YY)$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OUTDVC	1	A	G, I, H, M, U, J, K, T	R	OUTPUT DEVICE IDENTIFIER; MAXIMUM NUMBER OF 25 VALUES G=COMPUTER READOUT DEVICE (ATCSCC) I=CONSOLE PRINTER (ATCSCC) H=HIGH SPEED PRINTER (CFCF) M=MEDIUM SPEED PRINTER (ATCSCC) U=TTY REPERF. (ATCSCC) J=COMPUTER READOUT DEVICE (CFCF) K=CONSOLE PRINTER (CFCF) T=TTY REPERF. (CFCF)
DVCINT	2	N	0, 1, 2, 3, 4, 5, 6, 7	R	OUTPUT DEVICE INTERNAL CODE INTERNAL CODE FOR G = 0 I = 1 H = 2 M = 3 U = 4 J = 5 K = 6 T = 7

Table 3-15. Keyword Definitions for the OF/NF Sets (1 of 2)

For Adding a New Data Record to the OF/NF Sets (Update Mode):

```
ARRAPT=AAA;DEPAPT=AAA;ACIDNT=OOONNNN;ARTYPE=TTTT;ARCLAS=L;OPRCAT=C;+
FRQNCY=XXXXXXX;EFFDAT=MMDDYY;DISDAT=MMDDYY;DEPTIM=HHMMSS;ENROUT=HHMMSS$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARRAPT	3	A		R	ARRIVAL AIRPORT IDENTIFIER
DEPAPT	3	A		R	DEPARTURE AIRPORT IDENTIFIER
ACIDNT	7	AN		R	AIRCRAFT IDENTIFICATION IN THE FORMAT OOONNNN, WHERE OOO IS AIRLINE OPERATOR CODE AND NNNN IS FLIGHT ACCESSION CODE
ARTYPE	4	AN		R	OAG AIRCRAFT TYPE
ARCLAS	1	A	J, T, P, H, S, A	R	AIRCRAFT CLASS J=JET, T=TURBO, P=PROP, H=HELICOPTER, S=SEA PLANE, A=AMPHIBIOUS
OPRCAT	1	A		R	OPERATIONAL CATEGORY
FRQNCY	7	N	0000000 to 1111111	R	FREQUENCY (DAYS OF OPERATION); FIRST DIGIT REPRESENTS SUNDAY
EFFDAT	6	N		O	EFFECTIVE DATE IN THE FORM MMDDYY; ID OMITTED, THE OF OR NF EFFECTIVE DATE IS USED
DISDAT	6	N		O	DISCONTINUE DATE OF THE FORM MMDDYY. IF OMITTED, THE FREQUENCY FIELD IS PROPOGATED FOR 31 BITS

Table 3-15. Keyword Definitions for the OF/NF Sets (2 of 2)

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
DEPTIM	6	N	000100 to 235959	R	SCHEDULED DEPARTURE TIME IN GMT IN THE FORM HHMMSS
ENROUT	6	N	000100 to 235959	R	ENROUTE FLIGHT TIME IN THE FORM HHMMSS
RELREC	5	N		R	RELATIVE RECORD NUMBER; USED ONLY IN UPDATE CHANGE OR UPDATE DELETE MODES
DEPMSK	8	AN	00000000 to7FFFFFFF	O	DEPARTURE DATE MASK IN HEXADECIMAL; USED IN UPDATE CHANGE MODE ONLY
ACTMSK	8	AN	00000000 to7FFFFFFF	O	ACTIVATION/DEACTIVATION MASK IN HEXADECIMAL;USED IN UPDATE CHANGE MODE ONLY
ADEPTM	12	N		O	ACTUAL DEPARTURE TIME IN FORM OF MMDDYY, HHMMSS; UPDATE CHANGE MODE ONLY
CARRTM	12	N		O	CONTROLLED ARRIVAL TIME IN THE FORM OF MMDDYY, HHMMSS; UPDATE CHANGE MODE ONLY
CDEPTM	12	N		O	CONTROLLED DEPARTURE TIME IN THE FORM OF MMDDYY, HHMMSS; UPDATE CHANGE MODE ONLY

NOTE: In creating or merging the OF set, the OAG tape is used for input raw data. For creating the NF set, input raw data records are not required.

Table 3-16. Keyword Definitions For the OK Set

For Creating and Adding New Data Records to the OK Set:

OPRCAT=X;NMBVAL=YY;OUTPID=A,A,...,A$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OPRCAT	1	A		R	OPERATIONAL CATEGORY EXTERNAL IDENTIFIER
NMBVAL	2	N	1 to 16	R	LENGTH OF OUTPUT IDENTIFIER IN BYTES
OUTPID	1	A		R	OPERATIONAL CATEGORY MNEMONIC USED DURING PRINTING OF OPCX REPORTS. MAXIMUM OF 16 CHARACTERS, EACH SEPARATED BY A COMMA. A BLANK SHOULD BE GIVEN AS A PERIOD (.)

Table 3-17. Keyword Definitions for the OS/NS Sets

For adding New Data Records (Update Mode Only) to the OS/NS Sets:

ARRAPT=AAA;BLKNMB;-1,-1,-1,...,-1$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARRAPT	3	A		R	ARRIVAL CENTER OR PACING AIRPORTS EXTERNAL IDENTIFIER
BLKNMB	4	N	-1	R	OFRS BLOCK NUMBER FOR THIS ARRIVAL/DEPARTURE PAIR. THERE ARE 82 DEPARTURE SLOTS PER ARRIVAL CENTER/ PACING AIRPORT. EACH SLOT MUST BE INITIALIZED TO -1. THE USER MUST SPECIFY VALUE OF -1 FOR ALL 82.
NOTE: OS/NS sets are created automatically at the time of OF/NF creation.					

Table 3-18. Keyword Definitions for the OX Set

For Creating and Adding a New Data Record to the OX Set:

```
(DEFULT=X,...,X;LENGTH=YY,...,YY;FRMIDN=ZZZZZZZZ,...,ZZZZZZZZ;+
FRMTLE=AAAAAAAA,...,AAAAAAAA)$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
DEFULT	1	N	0, 1	R	DEFAULT CODE 0 = NO DEFAULT 1 = DEFAULT MAXIMUM NUMBER OF TIMES IT CAN REPEAT IS 25
LENGTH	2	N	1 to 16	R	LENGTH OF FORMAT TITLE EXPRESSED IN BYTES
FRMIDN	8	A		R	OUTPUT FORMAT IDENTIFIER; IMBEDDED BLANKS ARE SPECIFIED AS "." CHARACTERS
FRMTLE	8	A		R	OUTPUT TITLE OF THE IDENTIFIER; IMBEDDED BLANKS ARE SPECIFIED AS "." CHARACTERS. USED AS HEADING IN OPCS MESSAGE REPLIES.

Table 3-19. Keyword Definitions for the PY Set

For Creating the PY/PK Sets and for Adding New Records to the PY Set:

ARCLAS=X;ARTYPE=YYYY$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARCLAS	1	A	J, T, P, H, S, A	R	AIRCRAFT CLASS IDENTIFIER
ARTYPE	4	AN		R	AIRCRAFT TYPE IDENTIFIER

Table 3-20. Keyword Definitions for the PK Set

For Adding New Records to the PK Set (Update Mode Only):

```
ARCLAS=C;LENGTH=L;CTITLE=TTTTTTTT;+
ARTYPE=AAAA,...,AAAA$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ARCLAS	1	A	J, T, P, H, S, A	R	AIRCRAFT CLASS IDENTIFIER
LENGTH	1	N	1 to 8	R	LENGTH OF OUTPUT FORMAT TITLE IN BYTES
CTITLE	8	AN		R	AIRCRAFT CLASS OUTPUT FORMAT TITLE
ARTYPE	4	AN		R	AIRCRAFT TYPE IDENTIFIER (MAXIMUM OF 400 VALUES ARE ALLOWED)

NOTE: The PK set is created along with the PY set; therefore, data card format for creating the PK set is same as the PY set.

Table 3-21. Keyword Definitions for the PT Set (1 of 3)

For Creating or Adding a New Record to the PT Set:

```
STPTIM=H;STPDAT=DD;DELMIN=MM;DELMAX=PPP;ENROTM=MM;ENROTX=PPP;STKMIN=H;+
STKMAX=H;HOLDMN=MM;HOLDMX=PPP;CAPMIN=X;CAPMAX=YYY;NMBAPT=ZZ;NMBCET=ZZ;+
MXIOTM=BBB;MINSTK=X;MAXSTK=YYY;ACTFLD=SSSSS;JULIAN=JJJJJJJ;MNCTGA=C;+
MXCTGA=AAA;MNAPGA=C;MXAPGA=AAA;ENRTDF=DDDD;DEPTOF=DDDD;TIMDEF=DDDD;+
CDAYP1=XX;CDAYP2=XX;CDAYP3=XX;SIMEXT=YY;MERGDF=XXXXXXX;CLENDF=XXXXXXX$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
STPTIM	1	N	6	R	STOP TIME IN HOURS
STPDAT	2	N	14	R	STOP DATE IN DAYS
DELMIN	2	N	0	R	MINIMUM DELAY FACTOR IN MINUTES
DELMAX	3	N	240	R	MAXIMUM DELAY FACTOR IN MINUTES
ENROTM	2	N	0	R	MINIMUM ESTIMATED TIME ENROUTE IN MINUTES
ENROTX	3	N	180	R	MAXIMUM ESTIMATED TIME ENROUTE IN MINUTES
STKMIN	1	N	4	R	MINIMUM STACK TIME LIMITS IN HOURS
STKMAX	1	N	2	R	MAXIMUM STACK TIME LIMITS IN HOURS
HOLDMN	2	N	0	R	MINIMUM HOLD TIME IN MINUTES
HOLDMX	3	N	180	R	MAXIMUM HOLD TIME IN MINUTES
CAPMIN	1	N	0	R	MINIMUM CAPACITY LIMIT
CAPMAX	3	N	200	R	MAXIMUM CAPACITY LIMIT
NMBAPT	2	N	35	R	MAXIMUM NUMBER OF PACING AIRPORTS
NMBCET	2	N	47	R	MAXIMUM NUMBER OF CENTERS

Table 3-21. Keyword Definitions for the PT Set (2 of 3)

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
MXIOTM	2	N	0	R	MAXIMUM I/O TIME
MINSTK	1	N	0	R	MINIMUM STACK SIZE
MAXSTK	3	N	200	R	MAXIMUM STACK SIZE
ACTFLD	5	N	14400	R	ACTIVE FLIGHT TIME DIFFEPENCE IN SECONDS
JULIAN	7	N	2443145	R	JULIAN DATE OF REFERENCE EXPRESSED IN EPOCH SECONDS
MNCTGA	1	N	0	R	MINIMUM CENTER GA ESTIMATE
MXCTGA	3	N	500	R	MAXIMUM CENTER GA ESTIMATE
MNAPGA	1	N	0	R	MINIMUM PACING AIRPORT GA ESTIMATE
MXAPGA	3	N	50	R	MAXIMUM PACING AIRPORT GA ESTIMATE
ENRTDF	4	N	1200	R	DELTA TIME FOR ENROUTE TIME CHECK IN SECONDS; USED IN DETERMINING DUPLICATE FLIGHT LEGS
DEPTDF	4	N	1200	R	DELTA TIME FOR DEPARTURE TIME CHECK IN SECONDS; USED IN DETERMINING DUPLICATE FLIGHT LEGS
TIMDEF	4	N	3600	R	DEPARTURE TIME TEST IN SECONDS
CDAYP1	2	N	0 to 24	R	CURRENT DAY PARAMETER P1 IN HOURS WHERE P1+P2 <OR=24
CDAYP2	2	N	0 to 24	R	CURRENT DAY PARAMETER P2 IN HOURS WHERE P1+P2 <OR=24
CDAYP3	2	N	0 to 24	R	CURRENT DAY PARAMETER P3 IN HOURS WHERE P3 <OR=24

Table 3-21. Keyword Definitions for the PT Set (3 of 3)

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
SIMEXT	2	N	0 to 24	R	SIMULATION EXTENSION LIMIT IN HOURS
MERGDF	7	N	1209600	R	DELTA TIME IN SECONDS; USED TO DETERMINE PROPER MERGE TIME
CLENDF	6	N	108000	R	DELTA TIME IN SECONDS

Table 3-22. Keyword Definitions for the PW Set

For Creating and Adding a New Data Record to the PW Set:

OAGTYP=XXXX;ARTYPE=YYYY$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OAGTYP	4	AN		R	OAG AIRCRAFT TYPE EXTERNAL IDENTIFIER
ARTYPE	4	AN		R	CFC (NAS) AIRCRAFT TYPE EXTERNAL IDENTIFIER

Table 3-23. Keyword Definitions for the VW Set

For Creating and Adding a New Data Record to the VW Set:

OAGCOD=AAA;OPRCOD=000$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OAGCOD	3	A		R	OAG AIRLINE OPERATOR EXTERNAL IDENTIFIER
OPRCOD	3	A		R	CFC (NAS) AIRLINE OPERATOR EXTERNAL IDENTIFIER

Table 3-24. Keyword Definitions for the XY/YX Sets

For Adding New Data Records (Update Mode Only) to the YX/XY Sets:

OPRCOD=OOO;(UPRLMT=NNNNNNNN,...,NNNNNNNN;BLKNMB=BBBB,...,BBB)$

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
OPRCOD	3	A		R	AIRLINE OPERATOR CODE EXTERNAL IDENTIFIER
UPRLMT	8	N	99999999	R	UPPER LIMIT OF AIRCRAFT IDENTIFICATION RANGE (MAXIMUM OF 57 VALUES)
BLKNMB	4	N	-1	R	LOCATION OF FLIGHT INDEX TABLE SET DATA RECORD FOR THIS FLIGHT NUMBER RANGE

NOTE: YX/XY Sets are created automatically at the time of the OF/NF creation.

Table 3-25. Keyword Definitions for the ZO Set

For Creating and Adding a New Data Record to the ZO Set:

```
ZONEKY=PPPNN; FLIGHT=HHMMSS;(TIERCP=CCC,...,CCC;BFLIGT=HHMMSS,+
...,HHMMSS;NMBVAL=VV,...,CENTER=CCC,...,CCC)$
```

KEYWORD	LENGTH BYTES	TYPE	VALUES	REQD/ OPT	DESCRIPTION
ZONEKY	5	AN		R	ZONE KEY (PPPNN WHERE PPP=PACING AIRPORT EXTERNAL IDENTIFIER AND NN=ZONE NUMBER (00 TO 99) CONCATENATED WITH PPP TO FORM ZONE KEY)
FLIGHT	6	N		R	NOMINAL FLIGHT TIME FOR DUMMY GA TRAFFIC IN HHMMSS FORMAT
TIERCP	3	A		R	TIER CENTER EXTERNAL IDENTIFIER; MAXIMUM OF 10 VALUES
BFLIGT	6	N		R	BOUNDARY FLIGHT TIME IN HHMMSS FORMAT
NMBVAL	2	N	1 to 48	R	NUMBER OF VALUES IN A VECTOR PER REPEATING GROUP
CENTER	3	A		R	ORIGIN CENTER EXTERNAL IDENTIFIER VALUES IN A VECTOR; MAXIMUM OF 48 VALUES PER REPEATING GROUP

At create time, the NF data set is initialized only therefore; so input raw data cards are not required. Because NF-related data sets NS, XI, and XY are created automatically at the time of NF set creation, input raw data cards are not required.

3.2.2 Data Card Format in UPDATE Mode

In update mode, the user can add, change, and delete from the existing CFC data base sets. To activate these functions, the user must provide the retrieval keyword and corresponding retrieval key value. The retrieval key uniquely identifies the record in the data set to be changed. Table 3-1 contains retrieval keyword and value description for all CFC data base sets. The following subsections describe update mode data card formats for the add, change, and delete cases.

3.2.2.1 ADD Type

The update ADD type specifies the addition of a record, a value to a variable length vector, a repeating group, or a value to a variable length vector within a repeating group. Addition of simple items or addition of items to a fixed length vector is not allowed. An ADD update required that the retrieval keyword and corresponding retrieval key value be provided. The retrieval key uniquely identifies the record in the data set to be changed.

3.2.2.1.1 ADD Entire Record

The data card format for the addition of a new record is the same as that for the CREATE mode. Keyword and value must be provided for all required data items as specified in the appropriate table (Tables 3-2 through 3-25).

3.2.2.1.2 ADD Value to Variable Length Vector

Addition of a value(s) to a variable length vector requires the retrieval keyword and value for the specified record to be added to, followed by the vector keyword and value(s) to be added.

Example:

```
CENTER=ZSE;NONAPT=AAA,BBB $
```

where CENTER is the retrieval keyword
NONAPT is the vector keyword for this data set record

3.2.2.1.3 ADD Repeating Group

Addition of a repeating group requires the retrieval keyword and value for the specified record to be added to, followed by the repeating group keywords and values enclosed in parentheses.

Example:

```
ZONEKY=STL01;(TIERCP=ZAU;BFLIGT=001000;+
NMBVAL=1;CENTER=AQU)$
```

where ZONEKY is the retrieval keyword
TIERCP is the keyword for the first simple data item in the repeating group
BFLIGT is the keyword for a second simple data item
NMBVAL specifies the number of vector items provided for a variable length vector
CENTER is the keyword for a variable length vector

3.2.2.1.4 ADD Value to a Variable Length Vector Within a Repeating Group

Addition to a variable length vector within a repeating group requires the retrieval keyword and value for the record to be changed, the number of the repeating group, and the vector keyword and value(s) to be added. Numbering of repeating groups begins with 1.

Example:

```
ZONEKY=ATL01;NMBRPT=3;CENTER=ZLA $
```

where ZONEKY is the retrieval keyword
NMBRPT is the number of the repeating group
CENTER is the variable length vector keyword within the repeating group

In this example, the value ZLA is added to the center vector in the third occurrence of this repeating group.

3.2.2.2 CHG Type

The update type CHG specifies the change of a simple item value, retrieval key value, vector value, or repeating group item value. In all cases, the retrieval keyword and value must be specified in order to uniquely identify the record to be changed. All items with an associated keyword defined in Tables 3-2 through 3-25 can be changed.

3.2.2.2.1 Change Simple Item Value

Change of a simple item value requires the retrieval keyword and value for the specified record to be changed, followed by the item keyword and new value.

Example:

```
OPRCOD=SB;OPRCAT=T $
```

where OPRCOD is the retrieval keyword
OPRCAT is the keyword for the simple item to be changed

For the OF and NF data sets, simple item value change requires the retrieval keyword RELREC and relative record number value for the specified record to be changed, followed by the item keyword and old and new values.

Example:

```
RELREC=50;DEPMSK=7FFFFFFF,7FFF0000$
```

where RELREC is the relative record retrieval keyword
DEPMSK is the departure date mask keyword for the simple item to be changed (followed by old and new values)

3.2.2.2.2 Change Retrieval Key Value

Change of a retrieval key value requires that the retrieval keyword be provided, followed by the old and new values.

Example:

```
OPRCOD=SB,XX $
```

where OPRCOD is the retrieval keyword

3.2.2.2.3 Change Vector Value

Change of vector value(s) requires the retrieval keyword and value for the record to be changed followed by the vector keyword with old and new values. If more than one value in a vector is to be changed, each old and new value follows the vector keyword and is separated by a comma.

Example:

```
AIRPOT=ZNY;CAPCTY=27,35,68,80 $
```

where AIRPOT is the retrieval keyword
CAPCTY is the vector keyword

In this example, 27 is replaced by 35, and 68 is replaced by 80 in the same vector.

3.2.2.2.4 Change of Value(s) in a Repeating Group

Change of value(s) in a repeating group requires the retrieval keyword and value for the record to be changed, the number of the repeating group, and the keyword and value of the first simple item in the repeating group to be changed. Change of a simple item or a vector value within the repeating group is specified as above.

Example:

```
ZONEKY=CLE01;NMBRPT=4;TIERCP=ZID;CENTER=ZHU,ZNY $
```

where ZONEKY is the retrieval keyword
NMBRPT is the number of the repeating group
TIERCP is a simple item keyword
CENTER is a vector keyword

In this example, a vector value ZHU is changed to ZNY in the data set record with retrieval key CLE01. The specific repeating group to be changed is identified by the number 4, indicating the fourth repeating group occurrence, and the first simple item keyword and value ZID indicating the repeating group type. Specification of the first simple item uniquely identifies the type of repeating group since multiple types of repeating groups may occur in a data set record.

3.2.2.3 DEL Type

Update type DEL specifies the deletion of a record, a value(s) in a variable length vector, a repeating group or a value(s) in a variable length vector within a repeating group. Deletion of a simple item or an item in a fixed length vector is not allowed.

3.2.2.3.1 Delete Entire Record

Deletion of an entire record requires the retrieval keyword and value for the specified data set record.

Example:

OPRCOD=SB $

where OPRCOD is the retrieval keyword

For OF and NF Data Sets:

Example	Comments
RELREC=XXXXXX$	DELETE SPECIFIED RELATIVE RECORD
ACIDNT=OOONNNN	DELETE ALL FLIGHT RECORDS FOR THIS AIRCRAFT IDENTIFICATION

ARRAPT=AAA$	DELETE ALL FLIGHT RECORDS ARRIVING AT THIS AIRPORT
DEPAPT=AAA$	DELETE ALL FLIGHT RECORDS DEPARTING FROM THIS AIRPORT
ARRAPT=AAA;DEPAPT=AAA$	DELETE ALL FLIGHT RECORDS ARRIVING AT AND DEPARTING FROM THE SPECIFIED AIRPORTS
OPRCOD=AAA$	DELETE ALL FLIGHT RECORDS FOR SPECIFIED AIRLINE OPERATOR
ARRAPT=AAA;DEPAPT=AAA;ACIDNT=OOONNNN$	DELETE ALL FLIGHT RECORDS FOR THIS AIRCRAFT IDENTIFICATION DEPARTING FROM AND ARRIVING AT THE SPECIFIED AIRPORTS

3.2.2.3.2 Delete Variable Length Vector Value

Deletion of a value(s) from a variable length vector requires the retrieval keyword and value, followed by the vector keyword and the value(s) to be deleted.

Example:

```
CENTER=ZSE;NONAPT=PDX,SEA  $
```

where CENTER is the retrieval keyword
NONAPT is the vector keyword

3.2.2.3.3 Delete a Repeating Group

Deletion of a repeating group requires the retrieval keyword and value, followed by the number of the repeating group, and the keyword and value of the first simple item in the repeating group to be deleted. As in the case of changing values in a repeating group, the number of the repeating group and the first simple item uniquely identify the specific group to be deleted.

Example:

```
ZONEKY=STL01;NMBRPT=2;TIERCP=ZAU $
```

where ZONEKY is the retrieval keyword
NMBRPT is the number of the repeating group
TIERCP is the keyword of the first simple item of this repeating group

3.2.2.3.4 Delete Value(s) in a Variable Length Vector Within A Repeating Group

Deletion of a value(s) in a variable length vector within a repeating group requires the retrieval keyword and value, followed by the number of the repeating group and the vector keyword with value(s) to be deleted.

Example:

```
ZONEKY=LGA01;NMBRPT=3;CENTER=ZJX $
```

where ZONEKY is the retrieval keyword
NMBRPT is number of the repeating group
CENTER is the vector keyword

In this example, the value ZJX is deleted from the vector in the third repeating group. Specification of the first simple item is not required because the vector keyword uniquely identifies the repeating group type.

3.3 DATA SETS

DA uses the following data sets:

- CFC data base sets
- DA control card data set
- DA input raw data set
- DA control card list data set
- DA input raw data list data set
- Formatted data base record list data set
- DA error diagnostic message data set
- Flight record header data set
- Sort data sets

3.3.1 CFC Data Base Sets

DA either creates, updates, or lists the specified CFC data base data set. The user is required to allocate enough space for each of the CFC data sets. Their attributes are defined in Table 3-26 and structural definition is described in the OPCX COMPOOL.

3.3.2 DA Control Card Data Set

DA control cards are always input through the file defined by the SYSIN DD card. Logical data records are 80 bytes long and can be blocked by the user. They are input in the form of either card, tape, or disk.

3.3.3 DA Input Raw Data Set

The DDNAME of the proper input raw data set is provided on the create, update, or merge specification control card. The logical data record length for all CFC data base sets (except OAG tape) is 80 bytes and can be blocked by the user. Data records on the OAG tape are 106 bytes in

Table 3-26. Data Base Set Attributes (1 of 2)

SET ID	RECORD LENGTH	BLOCK SIZE	TRACKS ALLOCATED	MAX NUM RECORDS
TZ	48	3096	1	50
AJ	12	7284	3	1801
CP	908	7288	6	47
NY	56	2104	1	35
UY	56	2080	1	35
NJ	52	4360	1	82
UJ	52	4360	1	82
OD	104	272	1	1
PT	200	1496	1	1
CO	1128	6792	6	35
AF	104	3832	1	35
AV	724	7264	26	256
PK	1616	6680	2	8
PY	8	7288	1	896
AO	8	7288	2	1801
NO	8	352	1	26
OK	24	432	1	10
OX	504	720	1	1
HS	36	324	1	1
NS	172	7196	2	82
OS	172	7196	2	82
OF	52	7252	1700	236300
NF	52	3508	850	113900
ZO	1100	6624	59	350

Table 3-26. Data Base Set Attributes (2 of 2)

SET ID	RECORD LENGTH	BLOCK SIZE	TRACKS ALLOCATED	MAX NUM RECORDS
PW	16	7288	1	445
IX	1128	2280	1000	5999
XI	1128	2280	184	1099
XY	692	3484	3	29
YX	692	3484	120	1199
MM	88	7240	4	326
HK	36	324	1	1
VW	12	7284	1	593

length and are blocked 10 records per physical block. Raw data (except OAG tape) can be input in the form of either card, tape, or disk.

Creation and merge operations of the OAG flight record set are accomplished in two user-controlled steps. In the first step, the OAG tape DDNAME is input on either create or merge control specification cards. In the second step, 'OAGTOUT' is input on the create or merge specification control card. 'OAGTIN' and 'OAGTOUT' data sets contain formatted OAG flight records which are created in step 1 of the create or the merge mode of operation. The user must retain the 'OAGTOUT' data set in step 1 of the create or merge mode. Data records in these two data sets are 60 bytes in length and are blocked 121 logical records per physical block. Section 3.1.7 shows an example Control Card deck for creating the OF set.

The following example shows how to specify the input raw data for the OAG Housekeeping Set (HS). Input raw data set DDNAME is defined as HSINP on the create specification control card and data records are provided on cards.

```
//SYSIN    DD  *
START$
MODE=CREATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=HS;DATALST=YES;DATAIN=HSINP$
TERM$
//HSINP    DD  *
(TABLEID=OF,IX;FALARM=92,80)$
/*
```

3.3.4 DA Control Card List Data Set

The user-provided control cards are listed on the control card list data set. The DDNAME for the control card list data set is provided on the

output list specification control card with the CNTLST keyword. Data records are 132 bytes in length. For proper pagination, the record format should be RECFM=FBA.

Example

```
//SYSIN  DD  *
  START$
  MODE=LIST;...
  CNTLST=DACNTL;...
  TABLE=PT$
  TERM$
//DACNTL  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
```

3.3.5 DA Input Raw Data List Data Set

At the user's request, input raw data records are listed on the input raw data list data set. The DDNAME is provided on the output list specification control card with the INPLST keyword. Data records are 132 bytes in length. For proper pagination,record format should be RECFM=FBA.

Example

```
//SYSIN  DD  *
  START$
  MODE=UPDATE;...
  CNTLST=DACNTL;INPLST=DADATA;...
  TABLE=AJ;...
  TERM$
//DACNTL  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
//DADATA  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
```

3.3.6 Formatted Data Base Record List Data Set

Data base records are listed, unconditionally, in the create mode and, upon user request,in the update, merge, and list modes, on the formatted data base record list data set. The DDNAME for this data set is provided

on the output list specification control card with the DBLST keyword. Data records are 132 bytes in length. For proper pagination, record format should be RECFM=FBA.

Example

```
//SYSIN  DD  *
  START$
  MODE=LIST;...
  CNTLST=DACNTL;DBLST=DABASE;...
  TABLE=PT$
  TERM$
//DACNTL  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
//DABASE  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
```

3.3.7 DA Error Diagnostic Message Data Set

DA error diagnostic message data is a partitioned data set containing the skeleton error message text. Its DDNAME is provided on the output list specification control card with the ERRIN keyword. Data records are 80 bytes in length and are blocked 1 per block. This data set must be built with the predefined skeleton error messages described in Section 5 before executing DA software. The size of this data set is three tracks which includes two directory blocks. In allocating space for this set, the following atrributes should be used:

```
//OUTPUT  DD  DSN=SPCX.LIB.ERROR.CURRENT,
              DISP=(NEW,CATLG,DELETE),
              UNIT=2314,SPACE=(TRK,(3,1,2)),
              DCB=(RECFM=F,LRECL=80,BLKSIZE=80)
```

The following example illustrates how to specify the DA error diagnostic message data set.

```
//SYSIN  DD  *
  START$
  MODE=LIST;...
  CNTLST=DACNTL;ERRIN=DAEMSG;...
  TABLE=PT$
  TERM$
//DACNTL  DD  SYSOUT=A,DCB=(RECFM=FBA,LRECL=132,BLKSIZE=132)
//DAEMSG  DD  DSN=SPCX.LIB.ERROR.CURRENT,DISP=SHR
```

3.3.8 Flight Record Header Set

The flight record set is a sequential data set containing information related to the OAG tape processing. The DDNAME of this set is OAGHDR. The structure of this data set is defined in the C7 set of the DA Compool. Data values are set during step 1 of OAG flight record set creation or merge operation and are used during step 1 recovery and step 2 processing. OAGHDR must be retained after step 1 processing, and can be deleted after successful step 2 completion. This data set contains only one record of 100 bytes in length.

Example: To Allocate

```
//OAGHDR  DD  DSN=DA.OAGHDR,
//            DISP=(NEW,CATLG,DELETE)
//            UNIT=SYSDA,SPACE=(100,(1))
//            DCB=(RECFM=FB,LRECL=100,BLKSIZE=100)
```

Example: To Use During Execution

```
//OAGHDR  DD  DSN=DA.OAGHDR,DISP=SHR
```

3.3.9 Sort Data Sets

In the create or merge mode of operation, formatted data records are sorted in specified order before insertion into the CFC Data Base. The IBM System/360 Operating System Sort/Merge program is used. In order to use this program, the following DD statements are required:

//SORTIN	DD	Defines the input data set for a sorting application
//SORTWK01 //SORTWK06	DD	Define intermediate storage data sets for a sorting application
//SORTOUT	DD	Defines the output data set for sort applications
//SORTLIB	DD	Defines a data set that contains load modules for the Sort/Merge program

For creating the OAG flight record set or merging the existing OAG flight record set with the new OAG tape, other DD statements are required for OS/SORT, and are as follows:

//OAGTIN	DD	Defines the input data set(containing formatted OAG flight records) for a sort application. This data set must be retained from step 1 of the create or merge mode and can be deleted after successful step 1 operation
//OAGTOUT	DD	Defines the output data set (containing sorted formatted OAG flight records) for a sorting application. This data set must be retained from step 1 of the create or merge mode and can be deleted after successful step 2 operation
//OAGTWK01 //OAGTWK06	DD	Define intermediate storage data sets for a sorting application

Tapes can be used for either SORTIN and SORTOUT or OAGTIN and OAGTOUT data sets. Intermediate storage data sets (SORTWKXX or OAGTWKXX) must be assigned to direct access devices. When SORTIN, SORTOUT, OAGTIN, and OAGTOUT are assigned to direct access devices, approximately 248 tracks are required for each of the sets to store 30,000 records of 60 bytes length, blocked 121 records.

Using six intermediate storage data sets, SORTWK01 through SORTWK06 or OAGTWK01 through OAGTWK06 on direct access devices, the total storage required to sort 30,000 records of 60 bytes length is 321 tracks. The tracks allocated for each of the six intermediate storage data sets are 54,54,54,54,54, and 54. All tracks in each of the data sets must be contiguous. Refer to the System/360 Operating System Sort/Merge Program Manual for more information.

The following example shows all required DD statements and their attributes for sorting any CFC data base records in the create mode of operation. All sort data sets are assigned to direct access devices

and will be deleted after the current job step. This example also satisfies all requirements of the clean-up operation (Mode=Merge, Type=Clean) of the OAG and Non-OAG flight record sets, 'OF' and 'NF', respectively.

```
//SORTIN  DD  DSN=DA.SORTIN,DCB=(LRECL=60,BLKSIZE=7260),
//       DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//       SPACE=(TRK,(248),,CONTIG)
//SORTOUT  DD  DSN=DA.SORTOUT,DCB=(LRECL=60,BLKSIZE=7260),
//       DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//       SPACE=(TRK,248),,CONTIG)
//SORTWK01  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK02  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK03  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK04  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK05  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK06  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SYSOUT  DD  SYSOUT=A
//SORTLIB  DD  DSN=SYS1.SORTLIB,DISP=SHR
```

The following example shows all required DD statements and their attributes in step 1 of the OAG flight record set creation or merge operations. The maximum number of formatted verified data records is assumed to be 30,000. All sort data sets are assigned to direct access devices. OAGTIN and OAGTOUT data sets are retained after successful step 1 job step. OAGTIN can be deleted after successful step 1 of the create or merge mode.

```
//OAGTIN  DD  DSN=DA.OAGTIN,DCB=(LRECL=60,BLKSIZE=7260),
//       DISP=(NEW,CATLG,DELETE),UNIT=SYSDA,
//       SPACE=(TRK,248),,CONTIG)
//OAGTOUT  DD  DSN=DA.OAGTOUT,DCB=(LRECL=60,BLKSIZE=7260),
//       DISP=(NEW,CATLG,DELETE),UNIT=SYSDA,
//       SPACE=(TRK,248),,CONTIG)
//OAGTWK01  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//OAGTWK02  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//OAGTWK03  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//OAGTWK04  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//OAGTWK05  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//OAGTWK06  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SYSOUT  DD  SYSOUT=A
//SORTLIB  DD  DSN=SYS1.SORTLIB,DISP=SHR
```

The following example shows all required DD statements and their attributes in step 2 of the OAG flight record merge operation. All sort data sets are assigned to direct access devices. OAGTOUT is retained from step 1 of the merge operation and will be deleted after successful step 2 completion.

```
//OAGTOUT  DD  DSN=DA.OAGTOUT,DISP=(OLD,DELETE,KEEP)
//SORTIN   DD  DSN=DA.SORTIN,DCB=(LRECL=60,BLKSIZE=7260),
//         DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//         SPACE=(TRK,248),,CONTIG)
//SORTOUT  DD  DSN=DA.SORTOUT,DCB=(LRECL=60,BLKSIZE=7260),
//         DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//         SPACE=(TRK,248),,CONTIG)
//SORTWK01  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK02  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK03  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK04  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK05  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SORTWK06  DD  UNIT=SYSDA,SPACE=(TRK,(54),,CONTIG)
//SYSOUT   DD  SYSOUT=A
//SORTLIB  DD  DSN=SYS1.SORTLIB,DISP=SHR
```

In step 2 of the OAG flight record set creation, sorting is not required; therefore, only one DD statement is required. OAGTOUT must be retained after step 1 of the create operation, and will be deleted after successful step 2 completion.

```
//OAGTOUT  DD  DSN=DA.OAGTOUT,DISP=(OLD,DELETE,KEEP).
```

SECTION 4 - PROGRAM OUTPUTS

DA generates the following reports:

- DA Control Card listing
- DA Input Raw Data listing
- Formatted Data Set Record listing
- Error Diagnostic listing
- CFC Data Base sets

The control card listing report, illustrated in Figure 4-1, is generated unconditionally in all modes of operation. The input raw data record listing report, illustrated in Figure 4-2, is generated conditionally at the user's request. The formatted data set record listing report, illustrated in Figure 4-3, is generated conditionally at the user's request in the Update and Merge modes, and unconditionally in the Create mode of operation. Error diagnostic messages, illustrated in Figure 4-4, are printed along with the control card listing, input raw data listing or formatted data set record listing based on where the error is detected.

The data base sets created by DA are characterized in Table 3-26 and their structural definition is found in the OPCX CQMPOOL.

```
DATE =  08/31/78              ***  DA INPUT CONTROL CARDS LISTING  ***              PAGE =      1

START$
MODE=CREATE;USER=RMS;PASSWORD=ARTO;DBIN=YES$
CNTLST=DACNTL;ERRIN=DAEMSG;INPLST=DADATA;DBLST=DABASE$
TABLE=PT;DATALST=YES;DATAIN=PTINP$
TERM$
```

Figure 4-1. DA Control Card Listing

```
STPTIM=6;STPDAT=14;DELMIN=0;DELMAX=240;ENROTM=0;ENROTX=180;STKMIN=4+
STKMAX=2;HOLDMN=0;HOLDMX=180;CAPMIN=0;CAPMAX=200;NMBAPT=35;NMRCET=47+
MXIOTM=0;MINSTK=0;MAXSTK=200;ACTELO=14400;JULIAN=2443145;MNCTGA=0;+
MXCTGA=500;MNAPGA=0;MXAPGA=50;ENRTDF=600;DEPTDF=600;TIMDEF=1200;+
CDAYP1=12;CDAYP2=12;CDAYP3=24;STMEXT=2;MERGDF=1209600;CLENDF=108000$
```


Figure 4-2. DA Input Raw Data Listing

DATE = 09/19/78 PARAMETER TABLE SET (PT) LISTING PAGE = 5

STATUS INDICATOR	RELATIVE RECORD NO	STOP TIME	STOP DATE	MIN DELAY FACTOR	MAX DELAY FACTOR	MIN ETE	MAX ETE	MIN STACK TIME	MAX STACK TIME	MINIMUM HOLD-TIM
MAXIMUM HOLD-TIME	MINIMUM CAPACITY	MAXIMUM CAPACITY	ACT NO. PAC/ART	MAX NO. PAC/ART	ACT NO. CENTERS	MAX NO. CENTERS	MAX I/O TIME	OF EFF DATE-MMDDYY	NE EFF DATE-MMDDYY	OF EPOCH MMDDYY
OF EPOCH HHMMSS	NE EPOCH MMDDYY	NE EPOCH HHMMSS	MINIMUM STACK SIZE	MAXIMUM STACK SIZE	ACTIVE FLT TIME DIFF	JULIAN DATE OF REFRNCE	MIN CENTER GA EST.	MAX CENTER GA EST.	MIN PAC GA EST.	MAX PAC GA EST.
DAY OF WEEK	NON-DAY DAY OF WEEK	DELTA TIME FOR ETE	DELTA TIME FOR DEPART	DEPART TIME TEST	DAY PARM P1	DAY PARM P2	DAY PARM P3	SIM EXT LIMIT	DELTA D TIME SECS	DELTA T TIME SEC
1	0	6	14	0	240	0	180	4	2	0
180	0	200	15	35	20	47	0			10177
000000	10177	000030	0	200	14400	2443145	0	500	0	50
0	0	600	600	1200	12	12	24	2	1209600	108000

Figure 4-3. Formatted Data Set Record Listing

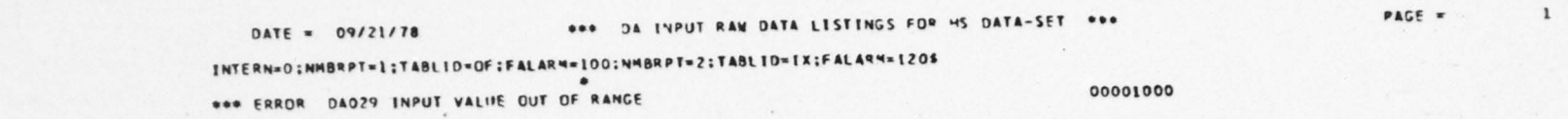


Figure 4-4. Error Diagnostic Listing

SECTION 5 - DIAGNOSTICS

Diagnostic messages generated by the DA component are described in this section. Probable cause and recommended user action are provided.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA001	DA LOAD MODULE ABORTED	FATAL	DA execution terminated. See other diagnostic message(s) printed before this message for reason.
DA002	DISC/TAPE/CARD READER I/O ERROR YYYYYYYY	FATAL	I/O error occurred on specified data set YYYYYYYY. DA execution terminated. Hardware malfunction or bad data set. Rerun job and if this error occurs recreate (reallocate) specified data set.
DA003	UNSUCCESSFUL FILE READ XXXXXXXX	FATAL	I/O error occurred while reading the specified data set XXXXXXXX. DA execution terminated. Recreate specified data set.
DA004	DATA BASE ACCESS ERROR: DATA-SET = XXXXXXXX ; ERROR CODE = XXXXXX	FATAL OR INFORM-ATION	Error detected by the DB Subsystem modules while accessing the specified data set XX. Further explanation of this error is given by the error code. All DB subsystem error codes are defined in CFC Operational Program Users Manual Positive error code suggests informative message while negative error code suggests fatal condition with termination of DA execution

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DAC05	XX DATA-SET CANNOT BE CLEANED ; SYSTEM DATE = MM/DD/YY	FATAL	Specified data-set ('OF' or 'NF') cannot be cleaned due to either (1) system date is not within the range of old effective date from the PT set +ΔT (approximately 2 days) to old effective date from the PT set + 31 days, or (2) error in data base retrieval, sort, or writing to the 'sortin' data set. Refer to other listed messages for more information. Processing is terminated.
DA006	DATA-SET NOT FOUND IN AO	FATAL	The specified data base data set entry was not found. Processing terminated. Check for misspelling of the data base data set ID.
DA007	OAG TAPE IS LATE ; USE CREATE MODE INSTEAD OF MERGE MODE	FATAL	When OAG tape effective date is greater than or equal to existing flight record set 'OF' effective date + 31 days -ΔT (approximately 2 days) then OAG tape data cannot be merged with the existing 'OF' set. 'OF', 'YX', 'OS', 'IX', and 'HS' data sets must be deleted from the data base and 'OF' and 'HS' data sets must be recreated using create mode (restart=yes)

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA008	OAG TAPE DATE IS INEFFECTIVE (TOO OLD)	FATAL	When OAG tape effective date is less than effective date of the existing 'OF' set - ΔD (approximately 14 days), then OAG tape data is not merged with the existing 'OF' set. Processing terminated. OAG tape arrived too late.
DA009	XX DATA SET IS EMPTY (NO DATA RECORD FOUND)	SERIOUS	Specified data set was initialized but no data record is found. List specification control card or input raw data update record for 'OF' or 'NF' set discarded. Processing continued. Update data set with data records.
DA010	INVALID KEYWORD	INFORMATION	Keyword specified by an asterisk is misspelled. If control card keyword is misspelled then correct it and rerun job. If keyword on input raw data card is misspelled and mode of operation is not create then correct keyword and rerun job. If mode of operation is create then correct keyword and rerun job in update add type mode.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA011	INVALID KEYWORD VALUE	INFORMATION	Keyword value specified by an asterisk is misspelled. This error occurs for values provided on control cards. Correct the error and rerun job.
DA012	UNABLE TO LOAD CORE RESIDENT CFC DATA BASE SET(S)	FATAL	Data Base retrieval error encountered while loading the table mapping table set (TZ) or other CFC core resident Data Base Sets from disk to core. Processing terminated. Either JCL error or hardware problem. Check JCL for missing DD cards for CFC Data Base Sets.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA013	''START $'' CARD MISSING	INFORMATION	'START' control card is missing from the DA control deck. Job is executed normally.
DA014	''TERM $'' CARD MISSING	SERIOUS	Last card in DA Control Deck is not 'Term' card. If only one mode of operation is specified: 1. If mode is create then execution terminated with DA001 message. Include 'TERM' card as last card in control deck and rerun. 2. If mode is update or list, all but last specification control card is processed and last specification card is discarded. Rerun job.with last specification card and 'TERM' card. If multi-mode operation, then all but last mode of operations performed. For last mode of operation conditions 1 & 2 apply.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA015	TWO GENERAL CONTROL CARDS PRECEDING DATA-SET SPECIFICATION CARDS	FATAL	Two 'mode' cards appearing one after the other is not allowed. DA execution terminated abnormally. Rearrange cards properly and rerun job.
DA016	OUTPUT LIST SPEC CARD MISSING OR OUT OF SEQUENCE	FATAL	If output list spec card was missing from the control card deck then job is aborted with proper DA error code (as user code) but without dump. Include output list spec card after first general control card and rerun.
DA017	GENERAL CONTROL CARD MISSING OR OUT OF SEQUENCE	FATAL	Place first general control card following 'START' card and rerun.
DA018	TWO OUTPUT LIST SPEC CARDS SHOULD NOT BE PROVIDED	FATAL	Only one output list spec card after first general control card is allowed in DA control deck. Remove other output list spec cards and rerun.
DA019	EQUAL SIGN IS EXPECTED	FATAL/ SERIOUS	After keyword, equal sign is missing. If this error occurs on general control card, or output list spec card than DA execution is terminated. If this error is on either create, update, merge, or list spec card then that card is discarded and next card is processed. Correct error and rerun.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA020	DELIMITER IS EXPECTED	FATAL/ SERIOUS	Delimiter was expected at the position indicated by asterisk. Refer to control card description section in the DA User's Manual for proper usage of delimiters. When this error occurs on the General Control Card or the output list spec card then DA execution is terminated; otherwise, card with error is discarded and processing continues.
DA021	INSUFFICIENT INFORMATION ON CONTROL CARD	SERIOUS	Update or merge spec card is missing required keywords/value. Refer to control card section in the DA User's Manual. Data card with error is discarded and processing continues.
DA022	DATA BASE LIST FILE DDNAME NOT SPECIFIED	FATAL	Output list spec card is missing data base file DDNAME. DA execution terminated. Include DDNAME and rerun job.
DA023	INPUT RAW DATA LIST FILE DDNAME NOT SPECIFIED	FATAL	Output list spec card is missing input raw data list file DDNAME. DA execution terminated. Include DDNAME and rerun job.
DA024	NUMBER OF CARDS PER DATA BASE RECORD EXCEEDED	FATAL	Input raw data card limit per any data base record is set at 29 in HlNENT data item of the DA COMPOOL. DA execution terminated. First check all input raw data for

AD-A069 837 COMPUTER SCIENCES CORP SILVER SPRING MD SYSTEM SCIEN--ETC F/G 5/2
CENTRAL FLOW CONTROL SYSTEM DATA ASSEMBLER DA COMPONENT USER'S --ETC(U)
JAN 79

UNCLASSIFIED CSC/SD-78/6141 FAA-RD-79-36 DOT-FAA77WA-3955 NL

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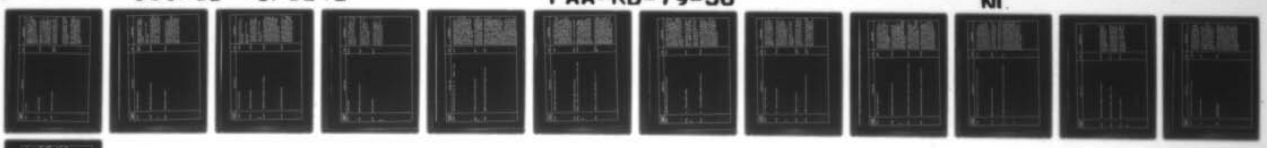

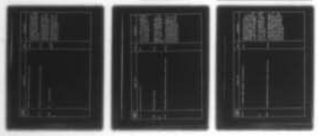

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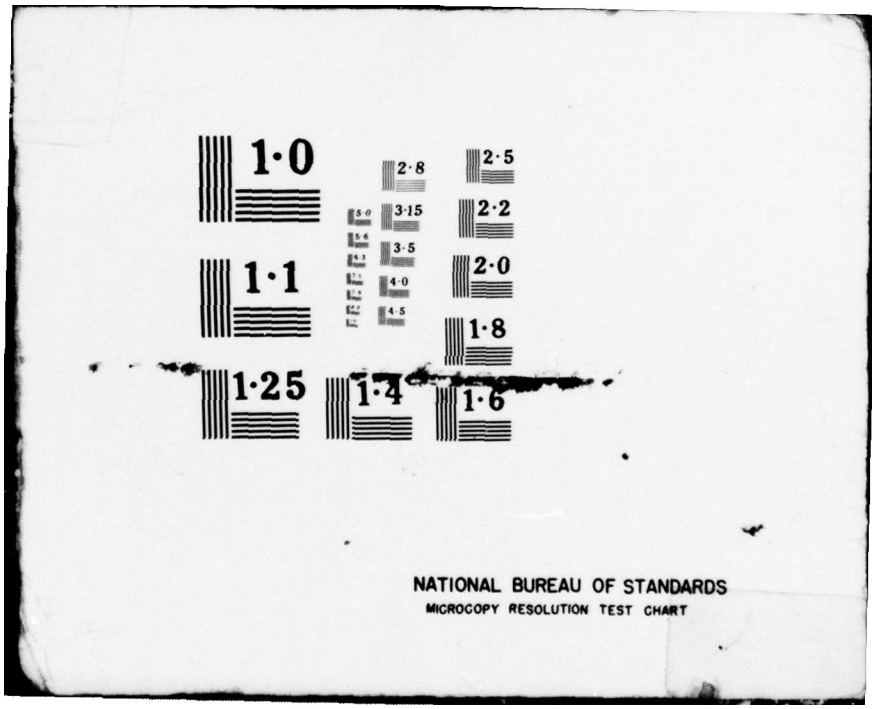
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1·4
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1·8
2·0
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3·15
3·5
4·0
4·5
5·0
NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA024	Continued		missing '$' sign. If '$' is not missing then change value in COMPOOL, run COMPOOL edit, compile DAGECO with new COMPOOL, relink and then rerun job. Otherwise correct card with error and rerun job.
DA025	ILLEGAL CHARACTER	SERIOUS	RASCAN module found character other than A to Z, 0 to 9, ● , ; ( ) $ + : * - on either control card or input raw data card. Card with error is discarded and processing continues. Correct card with error and rerun job.
DA026	FIRST ITEM NOT A KEYWORD	FATAL/ SERIOUS	First item on a control or input raw data card has to be a keyword except on continuation card. If error was on control card then DA execution terminated. Correct error and rerun job from that step onwards. When error occurs on input raw data record, then it is discarded and processing continues. Rerun job with corrected cards only. If error was in create mode then change mode to update and then rerun.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA027	KEYWORD FOLLOWS KEYWORD	FATAL/ SERIOUS	Keyword cannot follow another keyword immediately. Sequence is keyword = value(s); keyword= value(s). Refer to DA026 for further explanation.
DA028	INPUT VALUE LENGTH OR TYPE INVALID	SERIOUS	Every keyword value has maximum length and type assigned. Card with error is discarded and processing continues. Correct error and rerun job. If error was in create mode then change mode to update.
DA029	INPUT VALUE OUT OF RANGE	SERIOUS	Input value pointed to by an asterisk does not fall within minimum and maximum range of values. Input raw data record with error is discarded and processing continued. Correct error and rerun job with corrected records only. If error was in create mode then change mode to update.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA030	INPUT VALUE UNDEFINED	SERIOUS	Input value pointed to by an asterisk does not match the discrete values. Refer to DA029 for further explanation.
DA031	RETRIEVAL KEY UNDEFINED	SERIOUS	Retrieval keyword provided by the User on either the list specification control card or input raw data card is invalid. Refer to DA029 for further explanation.
DA032	RETRIEVAL KEY MISSING/OR OUT OF SEQUENCE	SERIOUS	For update mode of operation, retrieval keyword and value must be provided as the first value sequence on input raw data card. User either misspelled it, did not provide it, or misplaced it on input raw data card. Cards with error are discarded and processing continues. Correct error and rerun job.
DA033	DATA RECORD ENTRY NOT FOUND	SERIOUS	In update mode, data record to be updated was not found on the existing specified data-set. Input raw data record is discarded and processing continues. Rerun job with add type on the update specification control card.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA034	KEYWORD EXPECTED	SERIOUS	Keyword was expected after ';' delimiter on list specification control card. Card(s) with error is discarded and processing continued
DA035	KEYWORD ASSOCIATED VALUE(S) EXPECTED	SERIOUS	Data values were expected following following either '=' or ',' delimiters on list specification control card. Card(s) with error is discarded and processing continued.
DA036	INVALID DELIMITER	SERIOUS	Proper delimiter was expected following either a keyword or a data value at the position designated by as asterisk. Card(s) with error is discarded and processing continued.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA038	DATA SET ITEM NOT FOUND: DATA SET = XX ; KEYWORD = YYYYYY	FATAL	Specified data item keyword for the specified data-set is not found in the A2 table set of the DA COMPOOL. Either data are not present properly in the A2 set or ZY set. If error is in the A2 set then only COMPOOL recompilation is required. If error is in the ZY set then COMPOOL and some of DA module recompilations are required. For this error processing is terminated.
DA041	OUTPUT LIST & DATA-SET SPEC CARDS MISSING	FATAL	Output list & either create, update, merge or list specification control cards are missing from the DA control deck. Processing is aborted with the user code of 41.
DA044	NUMBER OF PACING AIRPORTS EXCEEDS PARAMETER TABLE LIMIT	FATAL	Maximum number of pacing airports allowed in the airport table set (AJ) is defined in the parameter table set (PT). User exceeded the specified limit. Processing is terminated with DA053 and DA001 messages. Check input raw data records for mistakes in identifying the non-pacing airports as pacing airports. When this error is found then rerun job after correcting error. When nomenclature error is not found, then restructuring of the data-set related to the airport and center table sets will be required. Coordination with the data base administrator is mandatory as it may require changes in the OPCX monitor.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA045	VECTOR LENGTH EXCEEDS ALLOCATED SPACE IN XX RECORD	FATAL	User exceeded space limit in a given vector of the specified data set. Correcting this error will require restructuring of the specified data set and possibly the dependent data sets. Processing is terminated with DA053 and DA001 messages. Coordination with the data base administrator is mandatory as it may require changes in the OPCX monitor.
DA047	REPEATING GROUP EXCEEDS ALLOCATED SPACE	FATAL	Refer to DA045 for explanation.
DA048	NUMBER OF VECTOR VALUES XXX IS NOT MULTIPLE OF VECTOR LENGTH	SERIOUS	Number of values for a given variable length vector (NMBVAL keyword) in a repeating group does not equal total number of vector values provided by the user on input raw data record. Input raw data record with error is discarded and processing continues. Correct error and rerun job.
DA049	UPDATE OF XX MAY CAUSE INCONSISTENCY IN YY, ZZ. . .	INFORMATION	This message warns user that updating the specified data set may cause inconsistency in the listed dependent data base data sets. Normal processing continues with update of the specified data set. User should look into the list of dependent data sets and see if updating of particular data item causes inconsistency. If so, then update affected data sets.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA050	TABLE MAPPING TABLE DATA SET (TZ) NOT CREATED	FATAL	User requested to list some data base records, but 'TZ' set was not found. Processing terminated. If //TZD DD card is missing from the JCL then provide one and rerun. Otherwise check for 'DBIN=YES' sequence on the DA general control card. If not provided then include on general control card and rerun. Otherwise whole data base must be recreated.
DA051	XX DATA-SET ALREADY CREATED	FATAL	Specified data set to be created already exists on the CFC Data Base. Processing terminated with error messages of DA053 and DA001. Delete the specified data set using update mode delete type and then create the data set.
DA052	XX DATA-SET CANNOT BE CREATED PRIOR TO TABLE XX	SERIOUS	In order to create the specified dependent data set XX, either data sets YY have to be created prior to this run or create specification control cards for YY data sets must be provided in the DA Control Card Stream. Control cards with error is discarded and processing continued. Provide create specification control cards for YY sets and rerun.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA053	XX DATA-SET CANNOT BE CREATED	FATAL	Specified data set XX cannot be created due to information provided by the other error messages preceding it. Processing terminated with error message of DA001.
DA054	XX DATA-SET CANNOT BE UPDATED	SERIOUS	When entry of the data set to be updated is not found in the 'TZ' set, then update specification control card with error is discarded and processing continues. Create the specified data set first and then update it. Otherwise refer to other error messages preceding it for more information.
DA055	UNABLE TO LIST DATA-SET YY	INFORMATION	Specified data-set was empty (i.e. no data record found). Processing continues for other data-set(s). Delete and then recreate the data set.
DA056	UNABLE TO LIST DATA RECORD XXXXXX OF DATA SET YY	INFORMATION	Specified data record to be listed is not found on the specified data set. Processing continues for other data set(s). Update the data set with the specified record.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA057	INVALID FORM CONVERSION TYPE	FATAL	External to internal form conversion value obtained from the A2 set is not within 0 to 11. Check A2 preset values in the DA compool. Correct error, recompile compool, and relink. Processing terminated with other error messages.
DA058	RECORD CANNOT BE RETRIEVED FROM DATA BASE	SERIOUS	Data record to be updated and pointed to by asterisk is not retrieved from the specified data set due to information provided by DA004 error message. Input data record with error is discarded and processing continues. Check misspelling of the retrieval key or key value.
DA060	SINGLE ITEM VALUE CANNOT BE ADDED TO/DELETED FROM EXISTING RECORD	SERIOUS	Simple data-item values cannot be added or deleted from the existing data record as dynamic restructuring of data set data record is not allowed. Input raw data record with error is discarded and processing continues.
DA061	OLD OR NEW VALUE MISSING/OR NUMBER OF CHANGES EXCEEDS LIMIT	SERIOUS	To change the old vector value in a data record, user must provide both old and new value on input raw data record. Also user cannot change more vector values than exist in a given data record. Input data record with error is discarded and processing continues. Correct error and rerun.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA062	FIXED LENGTH VECTOR , UPDATE *ADD* OR *DELETE* TYPE INVALID	SERIOUS	Values cannot be added to or deleted from the fixed length vector (e.g., capacity vector) of a given data record as dynamic restructuring of data record is not allowed. Input raw data record with error is discarded and processing continues.
DA064	NUMBER OF REPEATING GROUPS UNDEFINED	SERIOUS	Number of values provided for each of the simple data items is not same for all repeating groups. Input raw data card with error is discarded and processing continues.
DA065	NO RECOVERY: OAG HEADER FILE (C7) IN ERROR; RERUN WITH RESTART=NO	FATAL	Based on total number of records processed from the previous step 1, last 10 blocks of the OAG tape were searched for the last valid aircraft identification processed. Search was unsuccessful. Either record counts or aircraft identification are in error in the OAG header data set designated by the OAGHDR DDNAME. Recovery is not possible. Rerun Step 1 with no recovery operation.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA066	INSUFFICIENT OR EXTRANEOUS INPUT INFORMATION	SERIOUS	User provided either more or less input data items then required. Input raw data record with error is discarded and processing continues.
DA067	REQUIRED INPUT MISSING, KEYWORD = YYYYYY	SERIOUS	User did not provide required keyword and value sequence for the specified data item. Input raw data record with error is discarded and processing continues.
DA068	TABLE INDEX OUT OF RANGE	SERIOUS	User did not provide all required input values. Refer to DA066 error message description for more information.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA069	ITEM TO BE DELETED NOT FOUND, VALUE =XXXXXXXX	SERIOUS	Specified vector value to be deleted from the specified old record is not found. Input data record with error is discarded and processing continues.
DA070	INVALID VALUE FOR MODE	FATAL	On general control card, mode value must be either 'create', 'update', 'merge' or 'list'; otherwise, processing terminated. If output list specification card was not input, then processing aborted with user code of 70. Correct card with error and rerun.
DA071 DA072	INVALID USER - ID INVALID PASSWORD	FATAL	User identification or password provided on general control card is invalid. Processing terminated. If output list specification card was not input, then processing aborted with user code of either 71 or 72. Valid user ID's and passwords are predefined in the A8 set of the DA compool. Check for misspelling. If not misspelled then recompilation of the DA compool with new preset values will be required.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA073	NUMBER OF VALUES TO BE DELETED EXCEEDS VECTOR LIMIT	SERIOUS	User has provided more values to be deleted from a given vector than existed in the specified data record. Input raw data record with error is discarded and processing continued.
DA074	MORE THAN ONE VALUE SUPPLIED FOR SIMPLE ITEM CHANGE	SERIOUS	For changing a simple data-item value only new value must be provided by the user. Input raw data record with error is discarded and processing continued.
DA075	XX DATA-SET DELETED	INFORMATION	User requested deletion of the specified data set from the data base and the DA operation is successful. Processing continues with next control card.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA076	INVALID DATA SET FILE XXXXXXXX	FATAL	Device specified for the OAGTIN data set in the recovery/restart of step 1 of OAG tape processing is not same as the previous run. Processing terminated. Rerun with valid OAGTIN data set.
DA077	OAG TAPE DATE IS INVALID	FATAL	Effective date provided in the header record of the OAG tape is invalid. Check header record for garbled value. Processing terminated. Rerun job with good OAG tape.
DA078	ERROR MESSAGE TEXT LENGTH NOT CONSISTENT WITH LENONE AND LENTWO	SERIOUS	Number of characters provided in the transaction error message text for the MM set does not equal to sum of length one and length two values provided by the user. Input raw data record with error is discarded and processing continued. Correct error and rerun.

MESSAGE NUMBER	MESSAGE TEXT	TYPE	DESCRIPTION
DA079	XX DATA-SET CANNOT BE MERGED; SYSTEM DATE=MM/DD/YY	FATAL	Specified data-set cannot be merged due to either 1. system date is not within the range of effective date from PT set + AT (approximately 2 days) to effective date from PT set + 31 days, or 2. refer to other preceding error messages for more information. In either case processing is terminated. When system date is greater then the old effective date from PT + 31 days then create mode should be used.
DA080	DUPLICATE RECORD DISCARDED DUE TO ERROR IN PREVIOUS RECORD	SERIOUS	In OAG Tape processing, duplicate records are combined with respect to departure date mask and only one new data record is entered into the data base. When error is detected in one of the duplicate records then all duplicate records are discarded and processing continued. Correct error and run under update mode.