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AIRPORT INFORMATION RETRIEVAL SYSTEM (AIRS)
USER'S GUIDE

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FINAL REPORT

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16. Abstract

    This handbook is a user's guide for a prototype air traffic flow control automation system developed for the FAA's System Command Center. The system is implemented on a time-sharing computer and is designed to provide airport traffic load predictions and flow control support. The User's Guide is a reference manual designed for use by the air traffic controllers and does not require any previous computer experience. The AIRS request (command) language is explained along with instructions on using remote teletype and graphical display terminals in working with the time-sharing computer. The manual tells the user how to obtain airport traffic demand data, flight listings, plots, arrival delay predictions and flow control assistance. It also describes how to enter operational data such as landing capacity estimates and how to add (or cancel) flight schedules to the AIRS centralized data base.

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1.INTRODUCTION

1.1 INTRODUCTION TO AIRS

THE AIRPORT INFORMATION RETRIEVAL SYSTEM (AIRS) IS A PROTOTYPE COMPUTER PROGRAM BASED UPON AIRPORT TRAFFIC INFORMATION AND DESIGNED FOR USE BY THE FAA'S CENTRAL FLOW CONTROL FACILITY. THE MONTHLY OFFICIAL AIRLINE GUIDE CONSTITUTES THE DATA BASE, WHICH IS ENHANCED BY REAL TIME ENTRY OF FLIGHT SCHEDULE UPDATES. THE ADDITION OF AIRPORT OPERATIONAL DATA, SUCH AS LANDING CAPACITY ESTIMATES, DEPARTURE DELAYS, AND GENERAL AVIATION ESTIMATES AS PERCENTAGE OF SCHEDULED TRAFFIC, ENABLE AIRS TO PREDICT DEMAND, LANDING DELAYS, AND AIR HOLD COUNTS IN THE TERMINAL AREAS. AIRS ALSO PERFORMS THE COMPUTATION SUPPORTING ADVANCED FLOW CONTROL PROCEDURES (AFCP) AND QUOTA FLOW CONTROL PROCEDURES (QFLOW). IN SUPPORT OF THESE FLOW CONTROL PROCEDURES AIRS PRODUCES EITHER ALLOCATION OR QUOTA TABLES.

REFERENCE

A detailed understanding of the AIRS design and data processing capabilities can be obtained from the publication, "Airport Information Retrieval System (AIRS), System Design", by Manuel F. Medeiros and Julie Sussman, July 1973, FAA-RD-73-77.

NOTE!

It is important to note for operational purposes, that the flight data obtained monthly from the R.H.Donnelley's Official Airline Guide tape has been altered when entered into the new data base once a month. Specifically, all gate arrival times have been adjusted to 10 minutes earlier to reflect the approximate wheels-down arrival time. For extremely short duration flights, the adjustment never shortens flight times below 10 minutes. The daily entry of flight schedules by the Airport Reservation Office is not automatically adjusted. The user may alter each flight schedule entry as desired to reflect wheels-down arrival times.

1.2 INTRODUCTION TO THIS GUIDE

THIS DOCUMENT PRESENTS THE OPERATIONAL FEATURES AND THE PROCEDURES REQUIRED TO USE AIRS. THE DOCUMENT IS DESIGNED AS A USER'S REFERENCE MANUAL. ALTHOUGH IT IS NOT A TRAINING MANUAL, IT CONTAINS SUFFICIENT INFORMATION TO ALLOW A PERSON UNFAMILIAR WITH AIRS TO USE AIRS.

CHAPTER 2 CONCENTRATES ON THE MECHANICS OF WORKING WITH THE TIME-SHARING COMPUTER AND THE PROCEDURES FOR CONTROLLING THE COMPUTER'S ACTIVITIES. CHAPTER 3 INTRODUCES THE AIRPORT DEMAND REQUEST, WHICH PRODUCES TABULATIONS OF AIRPORT TRAFFIC DEMAND TO SUIT SPECIFIC NEEDS. FURTHER INFORMATION ON THESE TRAFFIC DEMANDS IS POSSIBLE AS EXPLAINED IN CHAPTER 4 (LISTING FLIGHTS) AND CHAPTER 5 (DRAWING PLOTS). CHAPTER 6 PRESENTS THE MEANS OF PRODUCING AIRPORT ARRIVAL DELAY PREDICTIONS. CHAPTERS 7,8, AND 9 CONCENTRATE ON REAL TIME ENTRY OF: AIRPORT LANDING CAPACITY ESTIMATES, FACTORS TO COMPENSATE FOR GENERAL AVIATION DEMAND, AND AIRPORT DEPARTURE DELAY INFORMATION. THE AIRPORT FLOW CONTROL COMPUTATIONS CAN BE ACTIVATED AS DISCUSSED IN CHAPTER 10. UPDATING FLIGHT SCHEDULES AND ADDING NEW FLIGHTS ARE EXPLAINED IN CHAPTER 11, AND CHAPTER 12 CLOSES THE TEXT WITH COMMENT AND MESSAGE INFORMATION. APPENDICES INCLUDE A GLOSSARY OF TERMS AND LISTS OF AIRPORT CODES BY ARTCC, AIRPORT CODES BY FOREIGN GROUPINGS, AND AIRCRAFT CODES BY EQUIPMENT TYPE. THE OFFICIAL AIRLINE GUIDE SHOULD BE USED AS A REFERENCE FOR AIRLINE CODES, AIRCRAFT CODES, AND CITY/AIRPORT CODES. THE UNFAMILIAR USER SHOULD BE ABLE TO BEGIN USING AIRS AFTER READING CHAPTER 2 AND THE FIRST THREE PAGES OF CHAPTER 3.

2.HOW TO OPERATE THE COMPUTER

2.1 INTRODUCTION

AIRS IS IMPLEMENTED ON A TIME-SHARED COMPUTER AT THE FIRST DATA CORPORATION IN WALTHAM, MASS. CONNECTION TO THIS COMPUTER IS ACCOMPLISHED THROUGH USE OF A TELETYPE DEVICE OR A DISPLAY TERMINAL SUCH AS THE CONOGRAPH. CONNECTING (LOGGING IN) IS DIFFERENT FOR THESE TWO DEVICES, AS ARE THE KEYBOARDS. SECTION 2.2 IS DEVOTED TO TELETYPE DEVICES AND IS SUBDIVIDED INTO THE CONNECTING OPERATIONS AND THE CONTROLLING OPERATIONS. SECTION 2.3 IS SIMILARLY STRUCTURED FOR THE DISPLAY TERMINAL. SECTION 2.4 IS CONCERNED WITH TROUBLE-SHOOTING ACTIVITIES AND IS APPLICABLE FOR ALL DEVICES. LASTLY, 2.5 DISCUSSES SOME OF THE BASICS IN TALKING TO AIRS.

2.2 TELETYPE DEVICES

LOGGING IN:

TURN TELETYPE POWER ON

SET SWITCH TO FULL DUPLEX

DIAL ONE OF THESE NUMBERS:

110 BAUD TELETYPE (E.G. ASR 33)

LOCAL (WASH,D.C.)
9-785-2012
9-785-2018

LONG DISTANCE (WALTHAM, MASS.)
8-0-617-890-7500

300 BAUD TELETYPE (E.G. DCT 500)

LOCAL (WASH,D.C.)
9-785-4415

LONG DISTANCE (WALTHAM, MASS.)
8-0-617-0470

WAIT FOR HIGH FREQUENCY TONE.
PLACE HEADSET ON ACOUSTICAL COUPLER ON TELETYPE.

TYPE 'LOG 57041,1162'
(TYPE THOSE CHARACTERS WITHIN THE SINGLE QUOTES AND
END THE INPUT WITH A CARRIAGE RETURN)

IF ANSWER IS NOT 'PASSWORD:' BUT 'USER #',
RETYPE '57041,1162' (I.E. DO NOT REPEAT 'LOG')

TYPE YOUR PASSWORD IN ANSWER TO 'PASSWORD:'.
(THE PASSWORD WILL NOT TYPE OUT ON YOUR TERMINAL)

IF DEVICE USED IS THE DCT 500, TYPE 'I DCT500' WHEN
COMPUTER GIVES A '.'.

RUNNING AIRS:

WHEN THE COMPUTER SAYS '.', TYPE 'RUN AIRS'.

YOU HAVE NOW STARTED THE AIRS PROGRAM.
WAIT FOR THE 'REQUEST=' TO ENTER YOU COMMANDS.

IF AT ANY SUBSEQUENT TIME A '.' IS TYPED AT THE LEFT MARGIN, YOU HAVE EXITED THE AIRS PROGRAM. (SEE SECTION 2.4, 'TROUBLESHOOTING')

LOGGING OUT:

TO EXIT FROM AIRS, TYPE 'QUIT'.
WHEN A '.' IS TYPED IN THE LEFT MARGIN, TYPE 'K'.

YOU CAN NOW HANG UP THE TELEPHONE AND TURN OFF THE TELETYPE POWER.

2.3 SONOGRAPH DISPLAY TERMINAL

LOGGING IN:

Turn terminal power on.

Make sure terminal is in local mode by pressing "LOCAL" button, if it is not lighted.

Press "MACHINE CHECK" (upper row of colored buttons).
Press "HOME" key (upper left key of small group at center right).

Make sure terminal is in TTY mode by pressing "TTY" button if not lighted.

Dial One of These Numbers:

Local (Wash., D.C.)
9-785-5568

Long Distance (Waltham, Mass.)
8-0-617-890-0350

Wait for high frequency tone. Pull up white receiver cradle button.

Connect unit to computer channel by pressing "LOCAL" button (turning off its light). Only lights should now be "TTY" and "POWER ON", but the "WAIT" light will flicker as the computer sends data.

Type 'I'

Computer Responds: 'FIRST DATA CORP, ETC, ETC.'

Type 'LOG 57041,1162'
(Type those characters within the single quotes and
end the input with a carriage return)

If answer is not 'PASSWORD:' but 'USER #', retype
'57041,1162' (i.e. do not repeat 'LOG')

Type your password in answer to 'PASSWORD:'.
(The password will not type out on your terminal)

Type 'TTY PAGE 38'.

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RUNNING AIRS:

Type 'RUN AIRS'

You have now started the AIRS program.
Wait for the 'REQUEST=' before entering your commands.

If at any subsequent time a '.' is typed at the left
margin, you have exited the AIRS program (see section
2.4, 'TROUBLESHOOTING').

When the screen has been filled, a new page is started
by typing the "HOME" key. Then type '↑L' (i.e. control
'L'; depress both the control key and the 'L' key).
Although the 'REQUEST=' message might have been erased
in starting a new page, the computer is still waiting
for your next command. If the computer was in the
middle of typing, it will pick up where it left off and
continue typing.

LOGGING OUT:

To exit from AIRS, type 'QUIT'.

When a '.' is typed in the left margin, type 'K'.

Wait for the computer to acknowledge logging off and
then you can hang up the telephone and turn off the
terminal power.

If you are going to use the terminal again in the next
couple of hours or so, don't turn it off; instead just
put it in local mode by hitting the 'LOCAL' button.

TO OBTAIN HARD COPIES:

Wait until the page you want to copy is finished by the
computer, since any computer data sent while a copy is
being made will be lost.

When ready for a copy, press 'COPY' button on hard copy
unit front panel. A copy of data on the display (small
green screen) will be delivered in about 12 seconds.

The hard copy unit is susceptible to paper jams. Be sure
to read section 2.4, 'TROUBLESHOOTING'.

TO LOAD/UNLOAD CASSETTE TAPES:

Find the tape cassette you want, hold it with the side
you want up (so you can read the label). Rotate the

tape cassette until the exposed tape is at your right. Face the magnetic tape unit. Make sure there is no tape loaded in the magnetic tape unit (if so, see unload procedure). If not, insert the cassette into the slot provided. Push it all the way in and, holding it in place, press sharply down. The tape should snap into place. Press the "REWIND" button and wait until the "REWIND" light starts to blink. Tape is now ready to use.

To unload, press black "EJECT" button. Tape cassette should pop partially out of magnetic tape unit. If any trouble, see section 2.4, 'TROUBLESHOOTING'.

TO USE THE SONIC POINTER TABLET:

The sonic tablet is called a graf/pen. It consists of the plexiglass square with two raised, buff-colored borders on the top and left, a special ballpoint pen, and connections to the Conograph. When using the graf/pen, the plexiglass should have paper over it, since the pen will mar the surface. When the pen is pressed down, a signal (something like a "CLICK" or "BUZZ" sound) is generated which lets the Conograph track the position of the pen. Tracking of the pen will not happen, however, unless in conjunction with running programs on the computer which activate and use the graf/pen operation. At the time the tablet is activated, the keyboard will be deactivated. The pen position can then be tracked. In tracking the pen, the Conograph displays a cursor (dotted cross) in the relative position as if the tablet were overlayed on the display screen. Moving the cursor involves briefly depressing the pen (it will buzz or click) at the desired tablet positions and then the adjusted cursor position will follow. The screen cursor is faint on the small screen, but easy to see on the TV system (with the "CURSOR" switch of the scan converter in the "ON" position).

When the position desired is attained, the information is transferred to the computer by hitting the "SEND" button at the upper, left of the graf/pen tablet. The computer will then take appropriate action.

2.4 TROUBLESHOOTING

This section is divided into categories of trouble:

The most common difficulty - typing errors.

Deliberate program interruption techniques to cope with command errors.

Troubles associated with the display equipment.

Troubles in connecting to the computer or unscheduled disconnects.

AIRS program malfunctions.

2.4.1 TYPING ERRORS

It is possible to correct typing mistakes within the current line being typed. Such correction is permitted at all phases of computer operation from log in to log out.

RUBOUT or DEL: The rubout or delete key is used to delete a single character just typed. The key may be used repetitively to delete more than one character. The computer echoes the deleted character(s) within left slashes '\'.

↑U: The control U (i.e. depress both the 'CONTROL' key and the 'U' key) is used to delete an entire line. It must be issued before a carriage return is typed. A confirming control U is printed and the carriage is returned to the left margin by the computer.

After hitting RUBOUT, DEL or ↑U, continue typing just as though the error had not occurred; i.e. do not type a space or carriage return.

2.4.2 COMMAND ERRORS

In some instances, you may wish to abandon an operation already in progress. There are two ways to stop a command once the computer receives its carriage return confirmation:

↑O: Control O (i.e. depress both the 'CONTROL' key and the 'O' key) suppresses the teletype output. The program continues to run until the next input request. In AIRS, entry of the next request (command) should begin immediately after the "↑O" (i.e. no 'REQUEST=' will be typed).

↑C↑C: Two control C's will suppress teletype output as well as stop the running of the program. A '.' is typed at the left margin and at this point 'RUN AIRS', 'CONT', or 'K' may be typed as desired (see below).

If the Conograph was plotting when you hit ↑C↑C, you must not continue (i.e. do not type "CONT"). Instead you must do the following:
Press "MACHINE CHECK".
Press "HOME".
Type "TTY PAGE 38".

NOTE: if typing does not appear on screen, type blind (i.e. there will be no visible display of what you are typing): "TTY ECHO" and "↑L" (i.e. control "L"). You should then get "." and must restart AIRS (i.e. type "RUN AIRS").

OPTIONS FOLLOWING ↑C↑C:

'RUN AIRS'-restarts a fresh copy of the program and awaits your first command.

'CONT'-continues the program as if the two control C's had never been typed (unless AIRS was in the middle of plotting, as discussed above). This makes it possible to check if the computer is working properly or the teletype (or display) is still connected. (I.e. ↑C↑C should produce a '.' in the left margin if all is well; if it is, then 'CONT' resumes program operation).

'K'-kills the current computer connection.

2.4.3 CONOGRAPH TROUBLE

The Conograph can signal most troubles with the colored lights on the keyboard. Red lights are serious, yellow lights are less serious, and white lights just show status. The lights may be tested by pushing "WAIT". Most of the indicator lights are function switches and their meanings are as follows:

SIGNAL LIGHTS

NAME ON BUTTON	MEANING OF LIGHT AND/OR FUNCTION SWITCH
POWER ON	On/off Function: Lighted is on
PARITY 0	Not Used
PARITY 1	Not Used
KBD DISABLED	Lighted means no input typing by the keyboard is received. Cleared by MACHINE CHECK or by computer program.
LOCAL	Local/Remote function, determines whether Conograph actions are all self-contained or include computer interaction. Lighted indicates local mode, off means computer controlled.
TTY	Controls whether terminal acts like a standard teletype or like a full upper lowercase terminal. Lighted is TTY mode (AIRS operating mode).
PARITY ERROR	Light comes on when Conograph detects garbled data from computer. Push switch to clear light and continue.

RCVR DISABLED

Means no input from computer will be accepted. All computer data sent to Conograph while this light is on is lost. Pressing MACHINE CHECK clears this disabled condition.

MACHINE CHECK

Light means data was received that wasn't garbled but it was an incorrect transmission and didn't make sense. This switch clears entire Conograph. It also terminates graphics operations so if AIRS was plotting during the MACHINE CHECK problem, continuation of the plot is impossible. The user should type: "↑O" or "INT" Button and a carriage return. AIRS should then return to the previous pre-plot status.

WAIT

Light is on briefly when computer is sending data. It freezes on if bad input occurs - cleared by MACHINE CHECK. Switch lights every light to see if they are all working.

INT

Same as typing "↑O" (i.e. control "O", not zero)

COMMON PROBLEMS

The following are the most common problems and their remedies. Anything else will require help:

1. Terminal Freezes. No trouble indicating lights come on, but computer program won't respond.

Step 1

Usual cause is that the computer thinks it is at the bottom of the screen. Hit "HOME" key and "↑L" (i.e. control "L"). If this works, continue with what you were doing. If not, try step 2.

Step 2

Put terminal in local mode (i.e. press "LOCAL" button, which should light). Hit MACHINE CHECK. Test type a few letters. If this doesn't work, the Conograph is broken; call for repairs. If it does work, hit "HOME" key, "LOCAL" button, "↑L", "↑C↑C" (i.e. two control "C"'s), and watch for ".". If none appears, the computer is down. Wait for 15 minutes and login again.

2. "RCVR DISABLED" light comes on or "WAIT" light comes on and does not go off. This means the unit has gone into a mode which will require AIRS program termination. Proceed as follows:

Put Conograph into local mode (i.e. press "LOCAL" button), hit "MACHINE CHECK", hit "HOME" and hit "LOCAL" again. Then type "↑C↑C", and "↑L". You may need to erase again (i.e. press "HOME" key). At that time, another "↑C" should give you a dot. Then type "TTY PAGE 38"; if no typing appears on screen, but you get another dot, type "TTY ECHO". If no dot appears, hit "HOME", then "↑L". Try "↑C" again to see if it produces the "." response. At this point if a "." was produced, you may continue (i.e. type "CONT") the AIRS processing if it was not a graph request. Otherwise, you must restart AIRS (i.e. type "RUN AIRS").

3. "KBD DISABLED" light comes on when it was not expected. Use procedure for 2, except that the user, after hitting "LOCAL" a second time types: "↑C↑C", "TTY PAGE 38", "TTY ECHO", "HOME", and "↑L." This procedure assures that the Conograph is in the typing mode.

4. PARITY ERROR or MACHINE CHECK light comes on. In the case of parity error, repeated occurrences indicate a bad telephone line. Hang up and redial as soon as possible. Naturally, parity errors may cause other Conograph error conditions. Parity errors can be cleared by "MACHINE CHECK."

The MACHINE CHECK light does not have to be cleared for some AIRS operations. Certain tape cassette operations and minor errors in the data stream reception will light "MACHINE CHECK" without causing any other problem. In such cases, ignore it, the computer will eventually turn it off. If it does cause trouble, follow the procedure for part 2.

5. Hard Copy Paper Jams. There are three types of paper
   jams in the hard copy unit. Clearing them requires
   that you be shown previously how to do it.   In the
   first type, the paper jams where it feeds into the
   unit.   In the second, it jams in the delivery
   (output) slot. Clearing either one requires that the
   unit be opened. BE CAREFUL-IT IS HOT INSIDE.   The
   third type of jam is a cutter jam, where the copy
   paper continuously feeds from the unit.

   In case of the slot jam, you should lift out the
   black wooden guide immediately inside and above the
   slot and pull out the paper. Be sure you replace the
   guide properly or you will have jam after jam.

   In cases where the feed-in jam occurs, the paper will
   probably be pulled partly into the feed rollers (i.e.
   the rolls closest to the paper supply canister).
   Lift the processor cover (clearly labeled) and pull
   the jammed copy back out of the feed rollers.   You
   may have to cycle the unit (i.e. press the "COPY"
   button) to get all the paper out.

   The last type of jam is a cutter jam. In this case,
   the unit fails to cut off the paper being fed for
   your copy. The result is a continuous feed of paper.
   Usually, the cutter will cycle and terminate the
   paper flow if you just hit the "COPY" button again.
   If it does not, turn off the unit and call for repair
   service.

2.4.4 CONNECTION DIFFICULTIES

THERE ARE TWO KINDS OF CONNECTION PROBLEMS: NOT   BEING
ABLE TO PROPERLY CONNECT   TO   THE   COMPUTER AND BEING
DISCONNECTED PREMATURELY.

NOT ABLE TO CONNECT

IF YOU DO NOT GET THE HIGH FREQUENCY TONE AFTER
DIALING, EITHER THE LOCAL NUMBER IS OUT OF ORDER OR
THE COMPUTER IS DOWN. TRY THE OTHER LOCAL OR LONG
DISTANCE NUMBER TO SEE IF THE COMPUTER IS UP.

IF THE COMPUTER DOES NOT RESPOND (NO '.' IN RESPONSE
TO TWO CONTROL C'S, SEE ↑C↑C IN 2.4.2), THIS
INDICATES THAT THE COMPUTER IS DOWN. WAIT 15 MINUTES
AND DIAL IN AGAIN.

ACCIDENTAL DISCONNECT

WHILE USING THE COMPUTER AN ACCIDENTAL DISCONNECTION
MAY OCCUR DUE TO TELEPHONE LINE NOISE OR A COMPUTER
FAILURE. ACCIDENTAL DISCONNECT CAN BE DETECTED BY THE
↑C↑C TEST - SFE 2.4.2. IF THE PROBLEM IS LINE NOISE,
THE OPERATIONS IN THE COMPUTER CAN BE RESUMED BY THE
FOLLOWING PROCEDURE IF THE JOB NUMBER (THE NUMBER
ASSIGNED BY THE COMPUTER WHEN YOU LAST LOGGED IN) IS
KNOWN. FOR EXAMPLE, IF YOUR JOB NUMBER IS 33:

FOLLOW THE LOGIN PROCEDURE (SECTION 2.2 OR 2.3) UP
TO THE 'LOG'. INSTEAD OF TYPING 'LOG' AND
'57041,1162', TYPE 'AT 33 [57041,1162]' THE COMPUTER
SAYS: 'PASSWORD:' AND YOU TYPE THE PASSWORD.
IT SHOULD THEN TYPE A '.' IF ALL IS WELL. FINISH THE
LOGIN PROCEDURE WITH REGARD TO TYPING 'I DCT500' IF
ON THE DCT 500 OR 'TTY PAGE 38' IF ON THE CONOGRAPH.
THEN CONTINUE YOUR JOB BY TYPING 'CONT'.   ANY
RESPONSE OTHER THAN '.' INDICATES THAT THE COMPUTER
IS DOWN. WAIT 15 MINUTES, DIAL IN AGAIN, AND LOG IN
BY THE USUAL PROCEDURE.

FIRST-HAND INFORMATION ON THE STATUS OF THE COMPUTER
CAN BE OBTAINED BY CALLING FIRST DATA CORP. AND
INQUIRING ACCORDINGLY.

LOCAL NUMBER (WASH.,D.C.): 9-872-0580
WALTHAM.MASS.: 8-0-617-890-6701

2.4.5 AIRS MALFUNCTIONS

MALFUNCTIONS MAY OCCUR DURING THE OPERATION OF THE AIRS PROGRAM. THESE FAILURES ARE OF TWO TYPES. THE FIRST ARE PROBLEMS DUE TO PROGRAM INSTRUCTION ERRORS. SUCH ERRORS CAN BE INTRODUCED WITH EACH PROGRAM MODIFICATION. A BACKUP PROGRAM (TYPE 'RUN BACK' INSTEAD OF 'RUN AIRS') IS PROVIDED, WHICH IS THE VERSION PRIOR TO THE PRESENT AIRS. THE SECOND TYPE OF MALFUNCTION IS DUE TO RANDOM COMPUTER ERRORS WHICH CAUSE FILE DAMAGE OR PROGRAM DAMAGE, MANIFESTED BY VARIOUS ERROR MESSAGES AND RETURNING TO THE MONITOR (I.E. '.' IN LEFT MARGIN).

THE FOLLOWING SERIES OF RESTART ATTEMPTS SHOULD BE SUCCESSFUL IN OVERCOMING THESE COMPUTER MALFUNCTIONS.

FIRST ATTEMPT:

  TYPE 'RUN AIRS' AND RE-ENTER THE DESIRED COMMANDS. IF YOU GET THE SAME ERROR MESSAGE, GO ON TO THE SECOND APPROACH.

SECOND ATTEMPT:

  TYPE 'RUN BACK' AND RE-ENTER THE DESIRED COMMANDS. IF THE ERROR STILL OCCURS, GO TO THE THIRD ATTEMPT.

THIRD ATTEMPT:

  TYPE 'DET'
  FOLLOW THE LOGIN PROCEDURE (SECTION 2.2 OR 2.3) STARTING FROM 'LOG' (I.E. DON'T DIAL UP THE COMPUTER - YOU ARE ALREADY CONNECTED).
  TYPE 'RUN AIRS' AND RE-ENTER THE DESIRED COMMANDS.

  IF THIS DOES NOT WORK , IT MEANS THAT THE MAIN DATA BASE MAY BE DAMAGED AND BE NO LONGER USABLE.

PLEASE NOTIFY ONE OF US DURING THE NORMAL WORK WEEK WHEN PROBLEMS OCCUR.

  MANUEL (BUD) MEDEIROS OR JULIE SUSSMAN
     AT 8-0-617-494-2450

  OR DICK WRIGHT
     AT 8-0-617-494-2370

2.5 BASICS IN TALKING TO AIRS

TYPING

1. Be sure your terminal is set to transmit upper case characters only. AIRS does not understand lower case.

2. Correction of typing errors is explained in 2.4.1.

3. Nothing on a line is transmitted to the computer until you type a carriage return.

VOCABULARY

1. Times are in GMT.

2. 3-letter abbreviations (with a period) are used for months and days.

3. Standard FAA and Airline Guide codes are used for airports, centers, aircraft types, airlines.

4. Special AIRS words and symbols are listed in Appendix A, with references to their explanations in this guide.

5. Other words are defined throughout the guide.

REQUESTS

1. When AIRS says "REQUEST=", you can type any request except ARO entries.

2. When AIRS says "=", you can type any ARO request.

3. Normally a carriage return transmits your request and processing begins. To continue a request on another line, type ";" (semicolon) before the carriage return. AIRS will type "=" and accept another line. A single request can use up to 7 lines.

4. Punctuation (other than symbols having special meanings, see Appendix A) may be used freely in requests as desired to improve readability.

5. Stopping processing or output from an erroneous request is described in 2.4.2.

3.AIRPORT DEMANDS

3.1 INTRODUCTION

REQUESTS

CONTENT

THE AIRS DATA BASE CONTAINS ALL SCHEDULED FLIGHTS
ORIGINATING AND/OR TERMINATING IN THE U.S., PLUS ANY
FLIGHTS ENTERED BY THE ARO (SEE CHAPTER 11). REQUESTS
CAN BE MADE FOR DEMAND AT ANY AIRPORT (DOMESTIC OR
FOREIGN) WITH SCHEDULED TRAFFIC SERVING THE U.S.
DEPARTURE DELAYS, AFCP CONTROLS, AND GENERAL AVIATION
FACTORS ARE INCLUDED IF APPLICABLE (SEE CHAPTER
9,10,8). A SINGLE REQUEST CAN COVER UP TO A 24-HOUR
SPAN FOR ANY DATE IN THE CURRENT DATA BASE. THE DEMAND
CAN BE SPECIFIED BY ORIGIN, DESTINATION, AIRLINE,
AIRCRAFT TYPE, TIME, ETC. AS DESIRED. SECTIONS 3.2-3.9
DESCRIBE THE WAYS IN WHICH THE DESIRED DEMAND CAN BE
SPECIFIED. SECTIONS 3.10 AND 3.11 DESCRIBE WAYS OF
IMPROVING RESPONSE UNDER CERTAIN CIRCUMSTANCES.

FORM

REQUESTS ARE FREE-FORM; THAT IS, LEGAL WORDS AND
PHRASES, AS DESCRIBED IN SECTIONS 3.2-3.11, CAN BE
COMBINED IN ANY ORDER TO FORM A REQUEST. EVERY
REQUEST MUST CONTAIN A PLACE NAME (SECTION 3.2); ALL
OTHER PHRASES ARE OPTIONAL. IN GENERAL, THE ORDER OF
REQUEST ELEMENTS DOES NOT AFFECT THE MEANING (THE ONLY
EXCEPTION IS FOR MULTIPLE AIRPORTS - SEE SECTION 3.2).
WHEN IN DOUBT, TRY! SPACES ARE SUFFICIENT TO SEPARATE
WORDS IN A REQUEST, BUT COMMAS MAY BE USED TO IMPROVE
READABILITY IF DESIRED. REQUESTS CAN BE CONTINUED ON
ANOTHER LINE BY TYPING A SEMICOLON (;) AS THE LAST
CHARACTER IN THE LINE, THEN GOING ON TO TYPE ANOTHER
LINE. A REQUEST MAY BE UP TO SEVEN LINES LONG.

ANSWERS

THE RESPONSE TO A DEMAND REQUEST IS A TABLE SHOWING THE
NUMBER OF OPERATIONS SATISFYING THE REQUEST CRITERIA,
BROKEN DOWN BY HOUR AND BY ARRIVALS AND DEPARTURES. A
COLUMN (LABELED G/A) SHOWING ESTIMATED GENERAL AVIATION
OPERATIONS IS INCLUDED IF APPLICABLE (SEE CHAPTER 8 -
ESPECIALLY 8.1 AND 8.4). FOR MORE DETAILED OUTPUT, SEE
CHAPTER 4.

3.2 PLACES

PLACE NAMES

AIRPORTS

3-LETTER CODES - E.G. JFK

CENTER NAMES PRECEDED BY 'Z' - E.G. ZZNY
(IMAGINARY AIRPORTS FOR ARO USE - SEE SECTION 11.4)

CENTERS

U.S. ARTCC CODES

ZAB	ZBW	ZGT	ZJX	ZMA	ZOA
ZAI	ZDC	ZHN	ZKC	ZME	ZOB
ZAN	ZDV	ZHU	ZLA	ZMP	ZSE
ZAU	ZFW	ZID	ZLC	ZNY	ZTL

FOR LIST OF AIRPORTS IN EACH CENTER, SEE APPENDIX B.

FOREIGN AREAS

ZEUR	EUROPE
ZSAM	SOUTH AMERICA AND MEXICO
ZSAB	SOUTH ATLANTIC AND BERMUDA
ZSOA	SOUTH AMERICA
ZPAC	PACIFIC
CYQM	MONTREAL
CYYZ	TORONTO
CYWG	WINNIPEG
CYVR	VANCOUVER
CYEG	EDMONTON
CYUL	MONTREAL

FOR LIST OF AIRPORTS IN EACH AREA, SEE APPENDIX C.

GROUPS OF PLACES

ANY NUMBER OF PLACE NAMES   ENCLOSED   BY   PARENTHESES   OR
BRACKETS
E.G. (JFK ZMA ZEUR BOS)
      [JFK ZMA ZEUR BOS]

USE IN REQUESTS

FIRST PLACE (OR GROUP OF PLACES) IN REQUEST IS PLACE (GROUP) OF INTEREST - I.E. PLACE (GROUP) FOR WHICH DEMAND IS REQUESTED. ANY OTHER PLACES (GROUPS OF PLACES) IN REQUEST RESTRICT THE DEMAND TO ONLY THAT PORTION OF DEMAND TO OR FROM THOSE PLACES.

EX: (JFK LGA EWR) ZOA ZLA ZSE
      (JFK LGA EWR) (ZOA ZLA ZSE)

      ARRIVALS AT JFK, LGA, AND EWR FROM ZOA, ZLA, AND ZSE, AND DEPARTURES FROM JFK, LGA, AND EWR TO ZOA, ZLA, AND ZSE.

A MINUS SIGN (-) BEFORE A PLACE NAME MEANS EVERYPLACE BUT, OR EXCEPT FOR, THAT PLACE. THE '-' MUST PRECEDE EVERY PLACE TO BE EXCLUDED.

EX: JFK -BOS
      JFK TRAFFIC TO/FROM EVERYPLACE BUT BOSTON

EX: JFK ZMA -MIA -FLL
      JFK (ZMA -MIA -FLL)

      JFK TRAFFIC TO/FROM ALL OF THE MIAMI CENTER EXCEPT MIA AND FLL

3.3 ARRIVALS / DEPARTURES

KEY WORDS   MEANINGS

A   ARRIVALS
D   DEPARTURES

USE IN REQUESTS

REQUEST INCLUDES   DEMAND IS FOR

A,NOT D   ARRIVALS ONLY
D,NOT A   DEPARTURES ONLY
A,D   ARRIVALS AND DEPARTURES
NEITHER   ARRIVALS AND DEPARTURES

3.4 TIME PERIODS

N.B. ALL TIMES ARE IN GMT

NO TIME PERIOD

ASSUMES FIVE-HOUR PERIOD STARTING WITH CURRENT HOUR.

COMPLETE TIME PERIOD

THERE ARE FOUR WAYS TO SPECIFY A COMPLETE TIME PERIOD

1800 - 0200
1800 0200
1800 TO 0200
FROM 1800 TO 0200

DEMAND IS FOR GIVEN TIME PERIOD, INCLUDING START TIME,
UP TO BUT NOT INCLUDING END TIME.

OPEN-ENDED TIME PERIOD (CURRENT TIME ASSUMED)

FROM 1800   ASSUMES FROM 1800 THROUGH CURRENT HOUR
TO 1800   ASSUMES FROM CURRENT HOUR TO 1800

3.5 DAYS AND DATES

DAYS

FIRST THREE LETTERS FOLLOWED BY '.'

SUN.   MON.   TUE.   WED.   THU.   FRI.   SAT.

DATES

MONTH NAMES - FIRST THREE LETTERS FOLLOWED BY '.'

JAN.   MAY.   SEP.
FEB.   JUN.   OCT.
MAR.   JUL.   NOV.
APR.   AUG.   DEC.

DATES GIVEN IN TWO WAYS

APR. 13
4/13

(NOTE: PERIOD IS REQUIRED TO DISTINGUISH 3-LETTER
ABBREVIATIONS FROM AIRPORT CODES.)

USE IN REQUESTS

DATE GIVEN

   DEMAND REQUESTED FOR THAT DATE
   ONLY ONE DATE MAY BE GIVEN
   DATE REFERS TO START OF TIME PERIOD

DAY GIVEN BUT NO DATE

   DEMAND IS FOR THAT DAY, TODAY OR IN COMING WEEK. E.G.,
   IF TODAY IS THU. AND REQUEST SAYS THU. DEMAND IS FOR
   TODAY. IF TODAY IS THU. AND REQUEST SAYS WED. DEMAND
   IS FOR NEXT WED.
   ONLY ONE DAY MAY BE GIVEN
   DAY REFERS TO START OF TIME PERIOD.

DAY AND DATE GIVEN

   DEMAND IS FOR THAT DATE.
   CHECK IS MADE TO SEE IF GIVEN DATE FALLS ON GIVEN DAY
   OF WEEK.

3.6 AIRLINES

AIRLINE NAMES

2-LETTER CODES - E.G. TW, AA

COMMUTER AIR CARRIERS

TAXI - STANDS FOR ALL COMMUTER AIR CARRIERS AND SCHEDULED INTRA-STATE AIR CARRIERS AS LISTED IN THE OFFICIAL AIRLINE GUIDE

USE IN REQUESTS

TO RESTRICT TRAFFIC TO ONLY CERTAIN AIRLINES, LIST THE AIRLINES.

EX: JFK UA TW   JUST THE UA AND TW DEMAND FOR JFK
    ORD TAXI   JUST THE COMMUTER TRAFFIC FOR ORD

TO EXCLUDE AIRLINES, PRECEDE EACH BY A MINUS SIGN (-).

EX: JFK -UA -TW   JFK DEMAND EXCLUDING UA AND TW
    ORD -TAXI   ORD DEMAND EXCLUDING COMMUTER FLIGHTS

NOTE: "TAXI" refers to flights of certain airlines, as described above. It does not refer to the user class as entered by ARO. Thus the use of "TAXI" (or "-TAXI") does not necessarily select (or exclude) flights with user class AT. There is currently no way in AIRS to specify user class in a demand request. The user class can, however, be listed after the retrieval (see 4.5).

3.7 AIRCRAFT TYPES

AIRCRAFT TYPE NAMES

3-4 LETTER AIRLINE GUIDE CODES - E.G. J727, JDC8

JEQP,PEQP,TEQP - IMAGINARY TYPES FOR ARO USE (SEE SECTION 11.4)

NONE - IMAGINARY TYPE - USED IN ARO RESERVATIONS IF ENTRY CONTAINS NO TYPE (SEE 11.4)

GENERAL TYPES

J - JET
P - PROP
T - TURBO-PROP

FOR LIST OF TYPES IN EACH GROUP SEE APPENDIX D

USE IN REQUESTS

TO RESTRICT TRAFFIC TO ONLY CERTAIN TYPES, LIST THE TYPE CODES.

EX: JFK J   JET DEMAND FOR JFK
    JFK JD10 J747   JD10 AND J747 DEMAND FOR JFK

TO EXCLUDE TYPES, PRECEDE EACH BY A MINUS SIGN (-)

EX: JFK J -J747 -JD10
        JET DEMAND AT JFK EXCLUDING J747 AND JD10

3.8 FLIGHT TIME CONDITIONS

KEY WORDS

RELATIONS

L - LESS THAN
G - GREATER THAN

FLIGHT TIMES

PGTD - PLANNED (SCHEDULED) GATE TIME OF DEPARTURE
PGTA - PLANNED (SCHEDULED) GATE TIME OF ARRIVAL
EGTD - ESTIMATED GATE TIME OF DEPARTURE (INCLUDES
    DEPARTURE DELAYS AND AFCP CONTROLS IF ANY)
EGTA - ESTIMATED GATE TIME OF ARRIVAL (INCLUDES
    DEPARTURE DELAYS AND AFCP CONTROLS IF ANY)
ETE - ESTIMATED TIME ENROUTE (IN MINUTES)

USE IN REQUESTS

EX: JFK ETE G 120
    JFK TRAFFIC WITH ETE GREATER THAN 120 MINUTES

EX: IF THE TIME IS NOW 1200,
    A JFK EGTD G 1200
    ARRIVALS AT JFK IN THE NEXT 5 HOURS WHO HAVEN'T
    DEPARTED YET

3.9 SCREENING BY SCHEDULED, DELAYED, OR CONTROLLED FLIGHT TIMES

DEMAND IS NORMALLY BASED ON ESTIMATED FLIGHT TIMES - THAT IS, INCLUDING ANY DEPARTURE DELAYS AND AFCP CONTROLLED DELAYS. TO OVERRIDE, INCLUDE ONE OF THE FOLLOWING WORDS.

SCHED - SCHEDULED - IGNORE DEPARTURE DELAYS AND AFCP CONTROLS

NODEL - NO DEPARTURE DELAYS - INCLUDE AFCP DELAYS IF ANY BUT IGNORE AIRPORT DEPARTURE DELAYS

NOCON - NO CONTROLS - INCLUDE AIRPORT DEPARTURE DELAYS IF ANY BUT IGNORE AFCP DELAYS

3.10 FASTER RETRIEVAL (XLIST)

If you will definitely not want a listing of the traffic
from a request, you may include the word "XLIST" in the
request. This will speed up the request, since AIRS doesn't
have to remember the flights.

Examples:

    JFK 1300 0500
        Regular request for JFK traffic from 1300 to 0500.
        Listings can be obtained.

    JFK 1300 0500 XLIST
        Same traffic as above, but faster response.
        Listings can not be obtained.

    XLIST JFK 1300 0500
        Same as above.
        XLIST can go anywhere in request.

3.11 PRIORITY OVER ARO (XARO)

If your request includes "XARO", ARO entries will be prevented during processing of your request. This may speed up processing by removing some of the competition for computer resources. ARO is locked out until your request is completed and you get a "REQUEST=".

Note: If your request is interrupted for any reason, you should immediately RUN AIRS again to get a "REQUEST=". Otherwise ARO will be locked out needlessly.

Note: XARO should only be used if computer response is poor. When response is good, XARO may actually slow you down instead of speeding you up.

4.LISTINGS

4.1 INTRODUCTION

REQUEST CONTENT AND OUTPUT

IMMEDIATELY AFTER DEMAND COUNTS ARE TYPED OUT (SEE SECTION 3.1), DETAILED LISTINGS OF THE DEMAND, CONSISTING OF INFORMATION ABOUT INDIVIDUAL FLIGHTS, CAN BE REQUESTED. SEVERAL LIST REQUESTS MAY FOLLOW A SINGLE DEMAND REQUEST. THE LISTING GROUPS FLIGHTS BY HOUR AND SEPARATES ARRIVALS AND DEPARTURES, JUST AS THE DEMAND TABLE DOES. LISTINGS CAN ALSO BE OBTAINED AFTER TEST (CHAPTER 6) AND FLOW CONTROL (CHAPTER 10) REQUESTS, AS DESCRIBED IN CHAPTER 4.6.

THE LISTINGS CAN BE CONTROLLED AS FOLLOWS:

TIME PERIOD OF LISTING (SEE SECTION 4.3, 'LIST')

ORDER OF FLIGHTS LISTED (SEE SECTION 4.4, 'SORT')

COLUMNS OF INFORMATON LISTED (SEE SECTION 4.5, 'INFO')

IF THE ABOVE ARE NOT SPECIFIED, THE DEFAULT LIST HAS:

TIME: THE ENTIRE DEMAND REQUEST TIME PERIOD

ORDER: ARRIVALS IN ORDER OF ARRIVAL TIME, DEPARTURES IN ORDER OF DEPARTURE TIME

COLUMNS: FLIGHT NUMBER, ORIGIN, DEPARTURE TIME, DESTINATION, ARRIVAL TIME

FLIGHT TIMES THAT INCLUDE DEPARTURE DELAYS WILL BE FOLLOWED BY 'D' (FOR DELAY); TIMES THAT INCLUDE FLOW CONTROL DELAYS WILL BE FOLLOWED BY 'C' (FOR CONTROL).

FORM OF REQUEST

AT MOST ONE 'LIST' PHRASE, ONE 'SORT' PHRASE, AND ONE 'INFO' PHRASE SHOULD APPEAR IN A REQUEST. THE ORDER OF PHRASES IS IRRELEVANT. SPACES ARE SUFFICIENT TO SEPARATE WORDS IN A REQUEST, BUT COMMAS MAY BE USED TO IMPROVE READABILITY IF DESIRED. REQUESTS CAN BE CONTINUED ON ANOTHER LINE BY TYPING A SEMICOLON (;) AS THE LAST CHARACTER IN THE LINE, THEN GOING ON TO TYPE ANOTHER LINE. A REQUEST MAY BE UP TO SEVEN LINES LONG.

4.2 REQUESTING A LIST

KEY WORD

LIST - KEYWORD TO REQUEST LISTING OF TRAFFIC FROM LAST
DEMAND REQUEST

4.3 TIME PERIOD OF LIST

THE WORD 'LIST' MAY OPTIONALLY BE FOLLOWED BY A TIME
PERIOD, AS FOLLOWS.
THE TIME PERIOD MUST FALL WITHIN THAT OF THE DEMAND
REQUEST. TIMES OTHER THAN THE START AND END OF THE DEMAND
PERIOD ARE ROUNDED TO THE HOUR.

NO TIME PERIOD

LISTING IS FOR ENTIRE DEMAND PERIOD

COMPLETE TIME PERIOD

THERE ARE FOUR WAYS TO SPECIFY A TIME PERIOD

1800 - 0200
1800 0200
1800 TO 0200
FROM 1800 TO 0200

LISTING IS FOR THAT TIME PERIOD

OPEN-ENDED TIME PERIOD (DEMAND TIME ASSUMED)

FROM 1800   ASSUMES FROM 1800 TO END OF DEMAND PERIOD
TO 1800   ASSUMES FROM START OF DEMAND PERIOD TO 1800

EXAMPLE: REQUEST=LIST 1200 1600

4.4 ORDER OF LIST

KEY WORD

SORT - KEYWORD TO REQUEST NON-STANDARD SORTING OF LIST

OPTIONS

IDENT	FLIGHT NUMBER (E.G. AA00415)
AIRL	AIRLINE
ORIG	ORIGIN
DEST	DESTINATION
AIRP	FOR ARRIVALS, DEST THEN ORIG
	FOR DEPARTURES, ORIG THEN DEST
PGTD	PLANNED (SCHEDULED) GATE TIME OF DEPARTURE
PGTA	PLANNED (SCHEDULED) GATE TIME OF ARRIVAL
EGTD	ESTIMATED GATE TIME OF DEPARTURE (SEE 3.8)
EGTA	ESTIMATED GATE TIME OF ARRIVAL (SEE 3.8)
TIME	FOR ARRIVALS, EGTA THEN EGTD
	FOR DEPARTURES, EGTD THEN EGTA
ETE	ESTIMATED TIME ENROUTE
TYPE	AIRCRAFT TYPE
CLASS	USER CLASS

USE IN REQUESTS

TYPE 'SORT' FOLLOWED BY ONE OR MORE OF THE ABOVE OPTIONS

NO EFFECT UNLESS TYPED AS PART OF A 'LIST' REQUEST

GOVERNS ORDER OF CURRENT LIST ONLY

LIST WILL STILL BE GROUPED BY HOUR, BUT WITHIN HOURS
WILL BE SORTED AS SPECIFIED.

EXAMPLE:
   REQUEST=(JFK LGA EWR) IAD DCA
   REQUEST=LIST SORT AIRP AIRL

   THE EWR FLIGHTS ARE LISTED FIRST, THEN THE JFK, THEN
   THE LGA; WITHIN EACH OF THESE GROUPS, FIRST THE DCA
   AND THEN THE IAD FLIGHTS APPEAR; WITHIN EACH OF THESE
   GROUPS, THE ORDER IS BY AIRLINE.

4.5 COLUMNS OF LIST

KEY WORD

INFO - KEY WORD TO SPECIFY COLUMNS OF INFORMATION LISTED

OPTIONS

IDENT	FLIGHT NUMBER (E.G. AAC0415)
AIRL	AIRLINE
ORIG	ORIGIN
DEST	DESTINATION
AIRP	ORIG FOR ARRIVALS, DEST FOR DEPARTURES
PGTD	PLANNED (SCHEDULED) GATE TIME OF DEPARTURE
PGTA	PLANNED (SCHEDULED) GATE TIME OF ARRIVAL
EGTD	ESTIMATED GATE TIME OF DEPARTURE (SEE 3.8)
EGTA	ESTIMATED GATE TIME OF ARRIVAL (SEE 3.8)
TIME	EGTA FOR ARRIVALS, EGTD FOR DEPARTURES
TYPE	AIRCRAFT TYPE
CLASS	USER CLASS

USE IN REQUESTS

TYPE JUST 'INFO', OR TYPE 'INFO' FOLLOWED BY ONE OR MORE OF THE ABOVE OPTIONS.

MAY BE TYPED AS SEPARATE REQUEST OR AS PART OF 'LIST' REQUEST

GOVERNS FORMAT OF ALL LISTS UNTIL EXPLICITLY CHANGED BY ANOTHER 'INFO' REQUEST

SPECIFIED COLUMNS WILL APPEAR IN THE ORDER TYPED. IF NO OPTIONS, WILL REVERT TO STANDARD FORMAT (THAT IS, 'INFO' MEANS THE SAME AS 'INFO IDENT ORIG EGTD DEST EGTA')

EXAMPLE SESSION:

RUN AIRS

REQUEST=D JFK
   THE NUMBER OF DEPARTURES FROM JFK IN THE NEXT 5
   HOURS IS TYPED OUT

REQUEST=LIST
   COMPLETE INFORMATION FOR THE JFK DEPARTURES IS
   LISTED

REQUEST=LIST INFO IDENT DEST
   ONLY THE IDENTIFICATION AND DESTINATION OF THE JFK
   DEPARTURES ARE LISTED

REQUEST=D LGA
   THE NUMBER OF DEPARTURES FROM LGA IN THE NEXT 5
   HOURS IS TYPED OUT

REQUEST=LIST
   ONLY THE IDENTIFICATION AND DESTINATION OF THE LGA
   DEPARTURES ARE LISTED BECAUSE PREVIOUS INFO REQUEST
   REMAINS IN EFFECT.

REQUEST=INFO
   LISTINGS FOR THE REST OF THE SESSION WILL BE IN
   STANDARD FORMAT.

4.6 LIST AFTER TEST OR FLOW CONTROL

AFTER A TEST REQUEST (SEE CHAPTER 6) OR A FLOW CONTROL
REQUEST (CHAPTER 10) THE ARRIVALS AT THE GIVEN AIRPORT ARE
AVAILABLE FOR LISTING. 'LIST' REQUEST FORMATS AND OPTIONS
ARE AS GIVEN IN THE PRECEDING SECTIONS, WITH THE EXCEPTION
OF DEFAULT TIMES. REGARDLESS OF THE TIME PERIOD IN THE
TEST OR FLOW CONTROL REQUEST, THE DEMAND FOR THE WHOLE
OPERATIONAL DAY (0300 TO 0300 EASTERN LOCAL TIME) IS
AVAILABLE FOR LISTING. THIS PERIOD, RATHER THAN THE TEST
OR FLOW CONTROL TIME PERIOD, IS USED AS THE DEFAULT TIME
PERIOD BY THE 'LIST' REQUEST. TO LIST ONLY THE TEST OR
FLOW CONTROL PERIOD, THE 'LIST' REQUEST MUST SPECIFY THAT
TIME PERIOD (SEE 4.3).

IF THE REQUEST WAS FOR FLOW CONTROL AND CONTROLS WERE
RECOMMENDED:

ESTIMATED FLIGHT TIMES LISTED WILL INCLUDE THE
RECOMMENDED CONTROLS

IF A GENERAL AVIATION FACTOR WAS APPLIED, THE LIST WILL
INCLUDE MAKE-BELIEVE GENERAL AVIATION FLIGHTS USED IN
CALCULATING DELAYS. THESE WILL HAVE AIRLINE 'XX' AND NO
FLIGHT NUMBER, AND THEIR ORIGIN AND DESTINATION WILL
BOTH BE THE FLOW CONTROL AIRPORT.

5.PLOTS

5.1   INTRODUCTION

THE PLOT OPTION IN AIRS IS INTENDED TO PROVIDE FLOW
CONTROLLERS WITH A GRAPHICAL OUTPUT OF THE DATA ACCESSED
USING AIRS. THE PLOTTING SECTION OF AIRS IS IN A STATE OF
CONSTANT REVISION AND UPDATE. THEREFORE, THE USER SHOULD
TAKE PRECAUTION TO BE FULLY INFORMED AS TO THE CURRENT
OPTIONS AND STATUS OF THE PLOT SECTION.

THE USER IS ALSO CAUTIONED TO READ, CAREFULLY, THOSE
PARTS OF CHAPTER 2 PERTAINING TO USE OF THE CONOGRAPH.
SECTION 2.4 ON TROUBLESHOOTING IS ESPECIALLY VALUABLE.

CURRENTLY PLOTS ARE DIVIDED INTO TWO SECTIONS. ONE IS
THE PLOTTING OUTPUT AVAILABLE FROM DEMAND REQUESTS.   THE
OTHER IS THE OUTPUT AVAILABLE FROM FLOW CONTROL REQUESTS
SUCH AS TEST, AFCP AND QFLOW.

5.2 DEMAND PLOTS

The demand plotting programs are set up to produce plots of the data obtained from the last demand request.   This information exists when you make an actual demand request and it also exists when you make a request like QFLOW or TEST, where AIRS itself retrieves demand data.   When the data in the demand area of AIRS is valid, then it is always permitted to PLOT it.

Several plots may be requested for data from the same demand request.

PLOT REQUEST

The request must start with the key word "PLOT".

A time period may be included if desired.   Method of specifying times and defaults if they are not specified are as described in section 4.3 for "LIST" requests.

Examples: REQUEST=PLOT
          REQUEST=PLOT 1800 2200

PLOT PREPARATION

Before it begins plotting, AIRS may request further instructions as follows:

TIME INTERVAL

THE AMOUNT OF TIME REPRESENTED BY EACH BAR IN THE BAR GRAPH IS ADJUSTABLE. THIS IS DONE BY RESPONDING PROPERLY TO THE COMPUTER TYPED QUESTION, 'DIVISIONS PER HOUR='. THE ANSWER TO THIS QUESTION DETERMINES THE AMOUNT OF TIME COVERED BY EACH BAR AS FOLLOWS:

USER TYPES:	BAR WIDTH IS:
1	1 HOUR
2	30 MINUTES
3	20 MINUTES
4	15 MINUTES
5	12 MINUTES
6	10 MINUTES
7	9 MINUTES
8	8 MINUTES

IF '0','1', OR JUST CARRIAGE RETURN IS TYPED, THE COMPUTER WILL ASSUME A ONE HOUR INTERVAL.   IF ANYTHING BUT WHAT IS DESCRIBED ABOVE IS TYPED, THE COMPUTER REPEATS THE QUESTION.   IF TRAFFIC FOR ANY ONE HOUR EXCEEDS ONE HUNDRED AIRCRAFT, THE GRAPH CANNOT CONTAIN

PLOTS

BARS OF LESS THAN ONE HOUR WIDTH. IN THIS CASE, THE
DIVISIONS PER HOUR = QUESTION IS NEVER ASKED, AND ONE
HOUR INTERVALS ARE PLOTTED.

LANDING CAPACITIES

DEPENDING ON THE EXACT NATURE OF THE DEMAND REQUEST
ENTERED BY THE USER, IT MAY OR MAY NOT MAKE SENSE TO
PROVIDE A LANDING CAPACITY PLOT ON THE DEMAND GRAPH. IN
A FEW CASES, THE COMPUTER WILL NOT BE ABLE TO, SECOND,
GUESS, THE USER AS TO WHETHER CAPACITY PLOTS ARE
DESIRABLE OR NOT. IN THOSE CASES, THE COMPUTER WILL
ASK, 'CAPACITY PLOT?'. THE USER THEN TYPES 'Y' TO HAVE
THE PLOT GENERATED OR 'N' TO INHIBIT THE CAPACITY PLOT.

PLOT CONTENT

At this time, the computer will begin plotting.
Information on the demand graph is:
1. GRAPH IDENTIFICATION. THIS INCLUDES A TITLE, THE TIME
OF THE REQUEST, AND A PRINTOUT OF THE REQUEST WHICH
GENERATED THE DATA FOR THE GRAPH TO BE PLOTTED.
2. A TIME AXIS. THIS AXIS APPEARS ALONG THE BOTTOM OF THE
CONOGRAPH SCREEN. TICK-MARKS ALONG THE AXIS INDICATE
THE INTERVAL OF TIME COVERED BY EACH BAR IN THE GRAPH.
AS PERMITTED BY THE SIZE OF THE CONOGRAPH SCREEN AND
CHARACTERS, TICK-MARKS WILL BE LABELED WITH THE
GREENWICH TIME WHICH THEY REPRESENT. THE FIRST TIME
COVERED BY THE PLOT REQUEST WILL APPEAR AT THE LEFT OF
THE GRAPH, AND THE LAST TIME COVERED BY THE REQUEST
WILL APPEAR AT THE RIGHT SIDE OF THE GRAPH. IF NO
TIMES FOR THE PLOT WERE SPECIFIED, THE COMPUTER USES
THE TIMES OF THE ORIGINAL REQUEST.
3. A COUNT AXIS. THIS AXIS WILL APPEAR ALONG THE LEFT OF
THE CONOGRAPH SCREEN. IT GIVES THE NUMBER OF AIRCRAFT
REPRESENTED BY EACH BAR IN THE GRAPH. THE NUMBER AT
THE TOP OF THE AXIS CORRESPONDS TO THE LARGEST NUMBER
OF AIRCRAFT GENERATED BY THE REQUEST IN A SINGLE TIME
INTERVAL. A DUPLICATE AXIS APPEARS AT THE RIGHT.
4. THE GRAPH ITSELF. THE DEMAND PLOT IS A BAR GRAPH. THE
BARS SHOW THE NUMBER OF AIRCRAFT IN EACH TIME INTERVAL
OF THE GRAPH. IF THERE IS DOTTED LINE, IT REPRESENTS
THE AIRPORT LANDING CAPACITY.

PLOT TERMINATION

When finished with the graph, type carriage return. The
computer will respond with "REQUEST=".

5.3 DELAY PLOTS

In the case when the user has called on the delay prediction capabilities of AIRS (i.e. when the user has entered a "TEST" (Chapter 6), "QFLOW" or "AFCP" (Chapter 10) type request), several additional graphics can be provided. The procedure for obtaining a delay plot is given below.

In the course of processing a user's request for AFCP flow control delay information, the computer will type:

'I'SSUE ALLOCATIONS, 'P'RINT ALLOCATIONS, 'L'IST FLIGHTS, 'T'EST ISSUANCE, 'S'UMMARY DATA, (S=CTL PEAKS, S2=ORIGINAL TRAFFIC, S4=CONTRL TRAF), "G"RAPHICAL OUTPUT, OR 'R'ETURN TO AIRS?=

This question (or a similar one for 'QFLOW') is explained in chapter 10. Access to the delay plots is by typing the answer 'G' to the above question. In the 'TEST' request, the plot is accessed by an affirmative answer when asked if graphs are desired.

The delay graph routine is controlled by answers to a series of questions. They are:

QUESTION #1: NEED HELP (Y=YES, N=NO)?

If yes, each question is explained briefly before it is asked. Also, a list of the computer names for different graphs is typed out. Thus you can get a short version of this explanation as you go along.

QUESTION #2: 'S'TOP PLOTTING OR 'C'ONTINUE?

The answer to this question is "S" or "C". In case of "S", the computer returns to the general question. If it is "C", the computer proceeds with the plot.

QUESTION #3: NUMBER OF GRAPHS =

You may have from one to four graphs plotted on screen at once. Enter the desired number.

QUESTION #4: GRAPH #1 =

This question is repeated once for each of the graphs you are going to plot. For instance, if you typed "3" as an answer to question 3, question 4

will be repeated three times: once for graph 1, once for graph 2 and once for graph 3. The computer needs to be told what to plot, that is your answer to question 4. However, the answer must be in the form the computer understands. This is done by looking at the following table to pick the name for the delay graph you are interested in:

DELAY GRAPH LIST

```
ORGAR=ORIGINAL ARRIVALS
ORGLA=ORIGINAL LANDINGS
ORGAD=ORIGINAL AVERAGE DELAYS
ORGAH=ORIGINAL AVERAGE HOLDS
ORGPD=ORIGINAL PEAK DELAYS
ORGPH=ORIGINAL PEAK HOLDS
CONAR=CONTROLLED ARRIVALS
CONLA=CONTROLLED LANDINGS
CONAD=CONTROLLED AVERAGE DELAYS
CONAH=CONTROLLED AVERAGE HOLDS
CONPD=CONTROLLED PEAK DELAYS
CONPH=CONTROLLED PEAK HOLDS
LNDGC=LANDING CAPACITIES
```

There is another thing which is under your control. That is whether the graphs plotted are dotted or solid, bar or broken line graphs. The specification of these graph forms is accomplished by immediately following the graph name (e.g. ORGAR) with the number specifying the form (see table below) before you carriage return (CR) in answering question #4. If you don't want to worry about it, hit CR after answering question #4 and the computer will automatically pick out a graph type. The following table identifies the graph forms:

```
FORM #1-SOLID BROKEN LINE
FORM #2-DOTTED BROKEN LINE
FORM #3-DOT-DASHED BAR GRAPH
FORM #4-DASHED BAR GRAPH
```

For example, if the computer types "GRAPH #1=", a correct answer would be ORGAR 3. The entire line would appear as:

GRAPH #1=ORGAR 3

The space between "ORGAR" and "3" isn't required, but you must not separate the name from the graph form with a comma or period. To separate the quantity name and the graph type, use a space only. In this example, the quantity ORGAR (original arrivals) will be plotted as a

dot-dashed bar graph.

After you have given your instructions concerning desired graphs, the computer will plot your graph. It will work for a while, and then begin plotting.

DELAY PLOT EXPLANATION

The graph produced by the delay plotting program is much the same as that for the demand plots. The major difference is that for the delay graphs, you can request several graphs to be plotted on the same axis from the list of thirteen data choices listed above. Thus, you can easily compare various capacity, delay and flow control quantities. For instance, plotting the combined graphs of original arrival traffic, landing capacity and average delay will allow you to visualize the magnitude and duration of delay effects caused when the scheduled traffic surpasses the airport's landing capacity. Plotting average and peak delays together will indicate the fluctuation and therefore the rate of change in the predicted airborne delays.

It is noted that the vertical axis may show numbers of aircraft (such as when capacity, original traffic and original landings are plotted) or it may show minutes of delay when one of the delay graphs is plotted. In some case, both will be required. Then, the left vertical axis will show number of aircraft and the right will show minutes delay. These axes are clearly labeled.

6. PREDICTING ARRIVAL DELAYS

6.1 INTRODUCTION

REQUEST CONTENT

ARRIVAL DELAY PREDICTIONS MAY BE REQUESTED FOR ANY AIRPORT KNOWN TO THE SYSTEM, FOR ANY TIME PERIOD IN THE CURRENT OPERATIONAL DAY (0300 TO 0300 EASTERN LOCAL TIME).

LANDING CAPACITIES FOR THE AIRPORT MUST PREVIOUSLY HAVE BEEN ENTERED (SEE CHAPTER 7).

THE ACTUAL NUMBER OF AIRCRAFT HOLDING AT SOME TIME MAY BE SPECIFIED TO ENHANCE THE PREDICTION ACCURACY.

REQUEST FORM

THE KEY WORD 'TEST' MUST APPEAR FIRST.

THE REQUEST MUST CONTAIN ONE AIRPORT AND MAY CONTAIN AT MOST ONE TIME PERIOD AND ONE STACK SIZE. THE AIRPORT, TIME, AND STACK MAY APPEAR IN ANY ORDER.

SPACES ARE SUFFICIENT TO SEPARATE WORDS IN A REQUEST, BUT COMMAS MAY BE USED TO IMPROVE READABILITY IF DESIRED.

ANSWER

A DELAY PREDICTION TABLE IS TYPED OUT, SHOWING HOURLY ARRIVALS, LANDING COUNTS, AVERAGE AND PEAK HOLDING COUNTS, AND AVERAGE AND PEAK DELAYS. LANDING CAPACITIES AND PERCENTAGE OF GENERAL AVIATION APPLIED AT THE TEST AIRPORT ARE ALSO TYPED OUT.

DETAILED FLIGHT LISTINGS CAN ALSO BE OBTAINED (SEE SECTION 4.6).

6.2 KEY WORD

TEST - KEYWORD TO REQUEST DELAY PREDICTION

6.3 AIRPORT

THREE-LETTER CODES - E.G. JFK

6.4 TIME PERIODS

NO TIME PERIOD

CURRENT OPERATIONAL DAY ASSUMED (0300 TO 0300 EASTERN LOCAL TIME)

COMPLETE TIME PERIOD

THERE ARE FOUR WAYS TO SPECIFY A TIME PERIOD

1800 - 0200
1800 0200
1800 TO 0200
FROM 1800 TO 0200

TEST IS FOR THE GIVEN TIME PERIOD

OPEN-ENDED TIME PERIOD (OPERATIONAL DAY ASSUMED)

FROM 1800	ASSUMES FROM 1800 GMT TO 0700 GMT (=0300 EDT) OR TO 0800 GMT (=0300 EST)
TO 1800	ASSUMES FROM 0700 GMT (=0300 EDT) OR FROM 0800 GMT (=0300 EST) TO 1800 GMT

6.5 STACK SIZE

WITH STACK TIME

```
1600 STACK 20
1600 HOLD 20
```

GIVE TIME, THEN 'STACK' OR 'HOLD', THEN NUMBER OF AIRCRAFT HOLDING IN TERMINAL AREA AT THAT TIME

WITHOUT STACK TIME (TEST START TIME ASSUMED)

```
STACK 20
HOLD 20
```

GIVE 'STACK' OR 'HOLD', THEN NUMBER OF AIRCRAFT HOLDING IN TERMINAL AREA. TIME AT WHICH STACK OCCURS IS ASSUMED TO BE START OF TEST TIME PERIOD, WHICH MUST BE SPECIFIED IN THE REQUEST (SEE SECTION 6.4).

6.6 PRIORITY OVER ARO (XARO)

If faster response is required, you may lock out ARO entries by including "XARO" in your TEST request.

See 3.11 for explanation and warnings.

7.LANDING CAPACITIES

7.1 INTRODUCTION

LANDING CAPACITIES CAN BE ENTERED FOR ANY AIRPORT IN AIRS
FOR ANY HOUR OF THE DAY. EACH AIRPORT CAN HAVE TWO SETS OF
CAPACITIES ASSOCIATED WITH IT - A NORMAL SET AND A SET FOR
TODAY ONLY (SEE SECTION 7.4). CAPACITIES ARE USED BY THE
TEST (CHAPTER 6) AND FLOW CONTROL (CHAPTER 10) REQUESTS TO
PREDICT ARRIVAL DELAYS.

THERE ARE TWO TYPES OF REQUESTS FOR DEALING WITH
CAPACITIES: ONE FOR ENTERING VALUES (SECTION 7.2) AND ONE
FOR FINDING OUT WHAT VALUES ARE IN THE SYSTEM (SECTION
7.3).

7.2 ENTERING LANDING CAPACITIES (ENTER LNDG)

REQUEST MUST START WITH 'ENTER LNDG'

TIMES MUST BE PRECEDED BY 'FROM' OR 'TO'

7.2.1 ENTERING NORMAL CAPACITIES

THE WORD 'NORM' MAY APPEAR ANYWHERE AFTER 'ENTER LNDG'.

REQUEST=ENTER LNDG NORM BOS FROM 1200 TO 1400 30
   (BOS CAN NORMALLY LAND 30 AIRCRAFT DURING THE 1200 HOUR AND 30 DURING THE 1300 HOUR)

REQUEST=ENTER LNDG NORM BOS FROM 1300 30 40 30
   (SAME AS:
      REQUEST=ENTER LNDG NORM BOS FROM 1300 TO 1400 30;
            =FROM 1400 TO 1500 40, FROM 1500 TO 1600 30)

REQUEST=ENTER LNDG NORM BOS FROM 1200 30, REST 35
   (CAPACITY IS 30 FOR 1200 TO 1300, CAPACITY FOR REST OF DAY, BOTH BEFORE AND AFTER THE PERIOD ENTERED, IS 35)

REQUEST=ENTER LNDG NORM BOS REST 30
   (THE NORMAL CAPACITY AT BOS IS 30 AN HOUR ALL DAY.)

REQUEST=ENTER LNDG NORM BOS FROM 1200 CLEAR
   (THE NORMAL CAPACITY FOR BOS AT 1200 WILL BE CLEARED. THAT IS, AIRS WILL FORGET IT. AIRS WILL HAVE NO INFORMATION ON THE BOS 1200 CAPACITY UNLESS A NEW ONE IS ENTERED.)

7.2.2 ENTERING CAPACITIES FOR TODAY ONLY

SAME AS NORMAL (SECTION 7.2.1) BUT WITHOUT THE WORD 'NORM'

REQUEST=ENTER LNDG BOS FROM 1200 20
   (FOR TODAY ONLY, THE CAPACITY OF BOS AT 1200 IS 20.
   ITS NORMAL VALUE IS UNAFFECTED.)

SEE SECTION 7.4 FOR USE OF TODAY VS. NORMAL VALUES.

7.2.3 RESETTING TODAY'S CAPACITIES TO THE NORMAL VALUE

SAME AS ENTERING TODAY CAPACITIES (7.2.2), BUT ENTER "RESET" INSTEAD OF A NUMBER.

REQUEST=ENTER LNDG BOS FROM 1200 TO 1400 RESET
   (ANY SPECIAL CAPACITIES ENTERED FOR TODAY BETWEEN 1200
   AND 1400 ARE ERASED AND THE NORMAL VALUES ARE USED)

REQUEST=ENTER LNDG BOS REST RESET
   (ANY SPECIAL CAPACITIES ENTERED FOR BOS FOR TODAY ARE
   RESET TO NORMAL)

7.3 LOOKING UP CAPACITIES (? LNDG)

REQUEST FORM:

REQUEST MUST START WITH '? LNDG'

A TIME PERIOD AND/OR ANY NUMBER OF AIRPORTS MAY BE INCLUDED (SEE BELOW)

AIRPORTS:

3-LETTER CODES - E.G. JFK

ANY NUMBER OF AIRPORTS MAY BE GIVEN. REPORT IS FOR ALL AIRPORTS NAMED. IF NONE GIVEN, REPORT IS FOR ALL AIRPORTS FOR WHICH VALUES HAVE BEEN ENTERED.

TIME PERIODS:

NO TIME PERIOD

REPORT IS FOR ENTIRE OPERATIONAL DAY (0300 TO 0300 EASTERN LOCAL TIME)

COMPLETE TIME PERIOD

THERE ARE FOUR WAYS TO SPECIFY A TIME PERIOD

1800 - 0200
1800 0200
1800 TO 0200
FROM 1800 TO 0200

REPORT IS FOR THE GIVEN TIME PERIOD.

SINGLE TIME - ONE HOUR ASSUMED

1200

MEANS SAME AS: 1200 - 1300

REPORT:

CAPACITIES (IN NUMBER OF OPERATIONS PER HOUR) ARE LISTED IN TWO COLUMNS LABELED N(NORMAL) AND T(TODAY ONLY)

7.4 TODAY VERSUS NORMAL CAPACITIES

'TODAY ONLY' CAPACITIES ARE IN EFFECT FROM 0300 TO 0300 EASTERN LOCAL TIME, WHICH CORRESPONDS TO EITHER 0800 TO 0800 OR 0700 TO 0700 GMT, DEPENDING ON THE SEASON. NOTE: TODAY CAPACITIES DO NOT CORRESPOND TO GMT DAYS. THIS IS SO THAT THE TODAY VALUES WILL APPLY THROUGHOUT A NORMAL CFCF WORK DAY AND NOT GO OUT OF EFFECT DURING THE EVENING SHIFT. THUS TEST AND AFCP REQUESTS, WHICH ARE ALWAYS FOR THE CURRENT DAY ('TODAY') WILL USE THE 'TODAY' VALUES (IF NONE HAVE BEEN ENTERED WILL USE THE NORMAL). FIRST THING EVERY MORNING, AIRS WILL AUTOMATICALLY ERASE THE TODAY ONLY VALUES (SINCE THEY APPLIED TO THE DAY BEFORE), SETTING EVERYTHING BACK TO NORMAL.

8.GENERAL AVIATION FACTORS

8.1 INTRODUCTION

GENERAL AVIATION FACTORS CAN BE ENTERED FOR ANY AIRPORT IN AIRS. EACH AIRPORT MAY HAVE TWO FACTORS ASSOCIATED WITH IT - A NORMAL VALUE AND A VALUE FOR TODAY ONLY (SEE SECTION 8.5). THESE FACTORS APPLY REGARDLESS OF TIME OF DAY OR DAY OF WEEK. THE G/A FACTOR IS A PERCENTAGE WHICH IS APPLIED TO THE SCHEDULED DEMAND TO ESTIMATE THE UNSCHEDULED DEMAND. THUS IF AN AIRPORT HAS A G/A FACTOR OF 10% AND A SCHEDULED DEMAND OF 50 AIRCRAFT FOR SOME HOUR, ITS G/A ESTIMATE FOR THAT HOUR WILL BE 5 AIRCRAFT (10% OF 50).

THERE ARE TWO TYPES OF REQUESTS FOR DEALING WITH G/A - ONE FOR ENTERING FACTORS (SEE SECTION 8.2) AND ONE FOR FINDING OUT WHAT FACTORS ARE IN THE SYSTEM (SEE SECTION 8.3). AIRS AUTOMATICALLY USES G/A FACTORS IN THE RESPONSE TO ANY REQUEST IN WHICH IT MAKES SENSE TO DO SO (SEE SECTION 8.4).

8.2 ENTERING FACTORS (ENTER GENAV)

8.2.1 ENTERING NORMAL G/A FACTORS

REQUEST=ENTER GENAV NORM JFK 10 LGA 25
   (JFK'S NORMAL G/A FACTOR WILL BE 10% AND LGA'S WILL
   BE 25%)

REQUEST=ENTER GENAV NORM JFK EWR LGA 15
   (JFK,EWR, AND LGA WILL ALL HAVE A NORMAL G/A FACTOR
   OF 15%)

REQUEST=ENTER GENAV NORM JFK CLEAR
   (THE NORMAL G/A FACTOR FOR JFK WILL BE CLEARED - THAT
   IS, AIRS WILL FORGET IT. JFK WILL HAVE NO G/A FACTOR
   UNLESS A NEW ONE IS ENTERED, JUST AS IF ONE HAD NEVER
   BEEN ENTERED)

N.B. 1. THE REQUEST MUST START WITH 'ENTER GENAV'. THE
        WORD 'NORM' MAY APPEAR ANYWHERE.

     2. YOU MAY USE THE % SYMBOL IF YOU LIKE (E.G.
        REQUEST=ENTER GENAV NORM LGA 10%)

8.2.2 ENTERING G/A FACTORS FOR TODAY ONLY

SAME AS IN SECTION 8.2.1, BUT WITHOUT THE WORD 'NORM'.

REQUEST=ENTER GENAV LGA 15
   (FOR TODAY ONLY, LGA'S G/A FACTOR WILL BE 15. ITS
   NORMAL FACTOR IS UNAFFECTED.)

SEE SECTION 8.5 FOR DISCUSSION OF WHEN TODAY VALUES ARE
USED.

8.2.3 RESETTING TODAY'S FACTOR TO THE NORMAL VALUE

REQUEST=ENTER GENAV JFK RESET
(ANY SPECIAL FACTOR ENTERED FOR JFK FOR TODAY IS ERASED AND THE NORMAL FACTOR IS USED, JUST AS IF A SPECIAL TODAY VALUE HAD NEVER BEEN ENTERED.)

N.B. 1. THIS COULD ALSO BE ACCOMPLISHED IN TWO STEPS BY FINDING OUT THE NORMAL FACTOR (AS IN 8.3) AND ENTERING IT (AS IN 8.2.2), BUT THIS METHOD IS SIMPLER.

2. CLEARING A TODAY VALUE (ENTER GENAV JFK CLEAR) AND RESETTING IT TO THE NORMAL (ENTER GENAV JFK) ARE NOT EQUIVALENT. IN THE FIRST CASE, ALTHOUGH THERE MAY BE NORMAL G/A INFORMATION, AIRS HAS NO INFORMATION FOR TODAY. IN THE SECOND CASE, AIRS USES THE NORMAL VALUE FOR TODAY.

3. YOU MAY LEAVE OUT THE WORD 'RESET'.

8.3   LOOKING UP G/A FACTORS (? GENAV)

        REQUEST=? GENAV JFK LGA EWR
            (THE G/A FACTORS FOR JFK,LGA, AND EWR WILL BE LISTED)

        REQUEST=? GENAV
            (THE G/A FACTORS WILL BE LISTED FOR ALL AIRPORTS FOR
            WHICH AIRS HAS INFORMATION)

        N.B. 1. THE REQUEST MUST START WITH '? GENAV'.
             2. TWO COLUMNS OF INFORMATION WILL BE LISTED,
                 LABELLED   T(TODAY ONLY VALUE) AND N(NORMAL
                 VALUE).

8.4 G/A FACTORS IN ANSWERS TO REQUESTS

G/A FACTORS WILL BE INCORPORATED INTO DEMAND REQUEST RESPONSES (SEE 3.1) WHENEVER POSSIBLE. INSTEAD OF JUST ONE NUMBER FOR EACH HOUR, THERE WILL BE TWO, LISTED UNDER A/C (SCHEDULED DEMAND) AND G/A (G/A DEMAND ESTIMATE, CALCULATED FROM THE A/C DEMAND AND G/A FACTOR AS DESCRIBED IN SECTION 8.1). THE G/A ESTIMATE WILL APPEAR ONLY WHEN THE FOLLOWING TWO CONDITIONS HOLD.

(1) THE REQUEST IS FOR A SINGLE AIRPORT AND CONTAINS NO RESTRICTIONS OTHER THAN A, D, OR DATES AND TIMES. (BECAUSE THE FACTOR IS A PERCENTAGE OF THE TOTAL TRAFFIC, IT DOESN'T MAKE SENSE TO APPLY IT TO ONLY THE JETS, ONLY THE ARRIVALS AT JFK FROM MIA, OR ANY OTHER RESTRICTED PORTION OF THE TRAFFIC)

(2) A G/A FACTOR IS KNOWN FOR THE AIRPORT IN QUESTION.

THE ESTIMATED G/A TRAFFIC IS ALSO USED FOR ARRIVAL DELAY PREDICTION (CHAPTER 6) AND FLOW CONTROL (CHAPTER 10).

8.5 TODAY VERSUS NORMAL FACTORS

TODAY ONLY FACTORS ARE IN EFFECT FROM 0300 TO 0300 EASTERN
LOCAL TIME, WHICH CORRESPONDS TO EITHER 0800 TO 0800 OR
0700 TO 0700 GMT, DEPENDING ON THE SEASON.   NOTE: TODAY
FACTORS DO NOT CORRESPOND TO GMT DAYS.   THIS   IS   SO   THAT
THE TODAY FACTOR WILL APPLY THROUGHOUT A NORMAL CFCF WORK
DAY AND NOT GO OUT OF EFFECT DURING   THE   EVENING   SHIFT.
THUS DEMAND COUNTS FOR HOURS BETWEEN 0300 AND 0300   LOCAL
TIME WILL USE THE TODAY FACTOR (IF NONE HAS BEEN ENTERED,
WILL USE THE NORMAL), AND COUNTS FOR ANY OTHER TIMES   WILL
USE THE NORMAL FACTOR.   FIRST THING   EVERY   MORNING,   AIRS
WILL AUTOMATICALLY ERASE THE TODAY ONLY VALUES (SINCE THEY
APPLIED TO THE DAY BEFORE), SETTING EVERYTHING BACK   TO
NORMAL.

9.DEPARTURE DELAYS

9.1 INTRODUCTION

DEPARTURE DELAYS CAN BE ENTERED FOR ANY AIRPORT IN AIRS
FOR ANY HOUR OF THE CURRENT DAY (0300 TO 0300 EASTERN
LOCAL TIME). AIRS WILL INCLUDE THESE DELAYS WHEN
ANSWERING REQUESTS.

THE DEPARTURE DELAY FEATURE OF AIRS IS UNREALISTIC IN
THAT:
1. DELAYS CAN ONLY BE ENTERED FOR WHOLE HOURS, NOT FOR
   PARTS OF HOURS.
2. DELAYS ARE ENTERED FOR ALL FLIGHTS SCHEDULED TO DEPART
   IN AN HOUR; THERE IS NO WAY TO DELAY ONLY SOME FLIGHTS
   IN AN HOUR.
3. ENTERING DELAYS FOR ONE HOUR DOESN'T AFFECT THE NEXT
   HOUR. THUS SOME FLIGHTS MAY GET OUT OF ORDER WHEN
   DELAYS ARE ENTERED.
BECAUSE OF THESE LIMITATIONS, DELAYS WILL ONLY BE USEFUL
IN AIRS WHEN REAL WORLD DELAYS ARE EXTREME. WHEN DELAYS
ARE LARGE, YOU WILL PROBABLY GET BETTER TRAFFIC ESTIMATES
OUT OF AIRS BY ENTERING SOME DELAYS THAN YOU WOULD BY NOT
ENTERING ANY.

9.2   ENTERING DELAYS (ENTER DELAY)

REQUEST MUST START WITH 'ENTER DELAY'
TIMES MUST BE PRECEDED BY 'FROM' OR 'TO'

REQUEST=ENTER DELAY BOS FROM 1200 TO 1400 30
   (A 30 MINUTE DELAY IS APPLIED TO ALL FLIGHTS SCHEDULED
   TO DEPART BOS BETWEEN 1200 AND 1400 OF THE CURRENT
   DAY)

REQUEST=ENTER DELAY BOS FROM 1300 30 60 30
   (SAME AS:
   REQUEST=ENTER DELAY BOS FROM 1300 TO 1400 30;
         =FROM 1400 TO 1500 60, FROM 1500 TO 1600 30)

REQUEST=ENTER DELAY BOS FROM 1200 30, REST 0
   (30 MINUTE DELAY ENTERED FOR 1200 TO 1300, DELAY FOR
   REST OF DAY (BOTH BEFORE AND AFTER THE PERIOD ENTERED)
   SET TO 0)

REQUEST=ENTER DELAY BOS REST 30
   (30 MINUTE DELAY APPLIED TO ALL FLIGHTS DEPARTING BOS
   IN CURRENT DAY)

9.3   LOOKING UP DELAYS (? DELAY)

REQUEST FORM:

REQUEST MUST START WITH '? DELAY'

A TIME PERIOD AND/OR ANY NUMBER OF AIRPORTS MAY BE INCLUDED (SEE BELOW)

AIRPORTS:

3-LETTER CODES - E.G. JFK

ANY NUMBER OF AIRPORTS MAY BE GIVEN. REPORT IS FOR ALL AIRPORTS NAMED. IF NONE GIVEN, REPORT IS FOR ALL AIRPORTS FOR WHICH VALUES HAVE BEEN ENTERED.

TIME PERIODS:

NO TIME PERIOD

REPORT IS FOR ENTIRE OPERATIONAL DAY (0300 TO 0300 EASTERN LOCAL TIME)

COMPLETE TIME PERIOD

THERE ARE FOUR WAYS TO SPECIFY A TIME PERIOD

1800 - 0200
1800 0200
1800 TO 0200
FROM 1800 TO 0200

REPORT IS FOR THE GIVEN TIME PERIOD.

SINGLE TIME - ONE HOUR ASSUMED

1200

MEANS SAME AS: 1200 - 1300

REPORT:

DELAYS (IN MINUTES) ARE LISTED FOR EACH AIRPORT FOR EACH HOUR.

9.4 CAUTIONS IN USING DEPARTURE DELAYS

1. DO NOT INTERRUPT AIRS WHILE IT IS ENTERING DELAYS. IF AIRS IS INTERRUPTED (I.E. IF THE COMPUTER CRASHES, THE TELETYPE SHUTS OFF, ETC.) YOU SHOULD REPEAT THE ENTER DELAY REQUEST THE NEXT TIME AIRS IS RUN. OTHERWISE THE DATA BASE MAY BE MESSED UP.

2. ALL DEPARTURE DELAYS ARE ENTERED FOR THE CURRENT LOCAL 0300 TO 0300 DAY. BE CAREFUL THAT YOUR TIME PERIODS FALL WITHIN THIS RANGE, AS AIRS DOES NOT CHECK.

3. DELAYS APPLY TO FLIGHTS ACCORDING TO THEIR SCHEDULED DEPARTURE TIMES. THIS MEANS THAT YOU DO NOT SIMPLY ENTER THE DELAY CURRENTLY BEING EXPERIENCED AT WHEELS UP TIME, BUT MUST ADJUST BACKWARD AND APPLY THE DELAY EARLIER, AT THE SCHEDULED DEPARTURE TIME OF THE DELAYED FLIGHTS.
   FOR EXAMPLE:
      60 MINUTE DEPARTURE DELAYS ARE REPORTED AT BOS AT 1100 AND ARE EXPECTED TO CONTINUE. YOU MIGHT:
      ENTER DELAY BOS FROM 1000 TO 1100 60

9.5 NOTES

1. DELAYS ARE AUTOMATICALLY RESET TO 0 EVERY MORNING.

2. THE WORDS 'CLEAR' AND 'RESET' HAVE THE SAME EFFECT AS THE NUMBER '0', NAMELY TO CLEAR, OR ZERO, THE DELAYS.

10. FLOW CONTROL ASSISTANCE

AIRS is equipped to aid the users in conducting flow control procedures by computing control quantities for air traffic clearances (i.e. departure and/or tier center release quotas). The computation involves predicting traffic arrival delays and stack sizes, recommending appropriate flow control action, computing the quantities of arrivals for maintaining desired air traffic loading at the destination airport and preparing the applicable control tables. The quality of flow control assistance is dependent upon the user's skill and knowledge about the AIRS flow control operation. The user has the responsibility for conveying to AIRS holding stack status and the impacted airport's landing capacity. At an earlier time the airport's control zones and selected control criteria must have been established by the user. AIRS bases its flow control results upon these inputs and thus extreme care is warranted in formulatng the input data and control specifications.

Section 10.1 is designed to give the user a detailed understanding of the AIRS flow control processing in order to obtain maximum aid from AIRS. The subsequent sections of this chapter describe the command forms and data entry for structuring, controlling and the operation of AIRS flow control.

10.1 UNDERSTANDING OF AIRS FLOW CONTROL PROCESSING

OVERVIEW

The flow control procedures implemented in AIRS produce four categories of output:

1) Recommendations for implementation
2) Arrival delay predictions
3) ARTCC arrival hour allocations or tier ARTCC quotas
4) Listings of individual flight information

AIRS FLOW CONTROL

AIRS flow control can be applied to any airport known by AIRS. The procedures can only be applied for the current operational day (0300 to 0300 eastern local time). Control zones may be entered for each airport by utilizing the "EDIT" mode. Landing estimates are entered for the current day (see "ENTERING LANDING CAPACITIES", Chapter 7) and if desired, general aviation can be factored in (see "GENERAL AVIATION FACTORS", Chapter 8, and section 10.3, question 4). Departure delays are included in flight arrival time

estimates (see "DEPARTURE DELAYS," Chapter 9). Updates and additions to flight schedules are utilized in flow control computations (see airport reservation entry, Chapter 11). Once flow control is implemented, allocations or quotas can be issued in increments in order that status changes can be factored into the next issuance.

DISCUSSION

There are two distinct flow control processes built into AIRS. One process is based upon ground departure delays controlled by periodic allocations to each ARTCC. This procedure is referred to as the Advanced Flow Control procedure (AFCP). The other process is based upon distributing arrival delays among tier ARTCC's (adjacent to the impacted ARTCC) controlled by periodic quotas to each tier ARTCC. This procedure is known as quota flow control (QFLOW). The first procedure, AFCP, substitutes departure ground delays for excessive airborne arrival delays; the second procedure manages the excessive arrival delays by spreading this burden of the airborne traffic among several ARTCC's.

Both AIRS flow control processes have been designed to give the user the maximum flexibility in structuring control criteria for each airport. Although a default set of control criteria is provided, the user is urged to tailor the criteria for each desired airport to meet the airport's specific flow control needs. The major difference between the two procedures is that the QFLOW procedure for any airport requires the user to define zones. These zone definitions consist of grouping ARTCC's and foreign airport groups such that each group represents a directional segment of traffic flow. In this manner, although AIRS currently has no enroute or flight path knowledge, the tier center quotas can be computed based upon flight origins and the applicable tier center group. Unlike QFLOW, AFCP has no requirement for zone structuring in order that its user processing make sense. The zones in AFCP give the user extra freedom to selectively control traffic based upon geographic area of flight origination. The details of entering zone structures are given in section 10.3.

The approach used in computing the flow control recommendations varies between QFLOW and AFCP. The variation is not in the computational method but in the criteria used to manage the flow of traffic. For example, AFCP normally attempts to minimize excessive air delays by employing ground delays, while QFLOW attempts to present excess holding stacks in the impacted center by distributing the air delays into tier centers.

As a result of the differences between the control criteria and zone structures for AFCP or QFLOW, it is impractical to structure an airport for both procedures since AIRS currently can store only one set of flow control criteria per airport. This does not present a problem since QFLOW superseded AFCP as the approved flow control procedure. However, AFCP remains operational in AIRS if and when ground delay flow control is desired (for example, if the conservation of fuel becomes critical).

An understanding of the AIRS flow control processes requires knowledge of the scope, algorithms and operational aspects of these processes.

SCOPE

Any airport known to AIRS may be flow controlled. Applying flow control for the first time to an airport requires that the user specify control criteria and/or set up the appropriate zone structure before AIRS can assist in the procedure. See 10.3 for tailoring the airport's flow control data.

In the event that the flow controlled airport does not have ARO schedule updates, AIRS can use the airport's GA factor (see chapter 8) to improve predictions of arrival delays and computations of control quotas. When the airport is supported by ARO daily updates, the GA factor may also be specified for application only during the non-ARO hours.

To further improve the accuracy of the AIRS predictions, two additional areas of adjustment are included in the flow control processing. The first is consideration of known stack size, specifically the number of airborne (holding) aircraft in the impacted center at a given time (see 10.2). AIRS uses this information to align the computed stacks to the specified size at the specified time, thus improving the accuracy of the subsequent stack variations. It is noted that in QFLOW procedures involving stacks in the tier centers as well as the stack in the impacted center, AIRS considers the specified stack size to be the measure of just the impacted center's stack condition. The second area of adjustment involves departure delays at origin airports as they affect the arrival times at the destination impacted (flow controlled) airport. The airport departure delay data entered into the AIRS data base (see Chapter 9) is factored into each affected flight's arrival time at the impacted airport. If a significant number of arrivals have been delayed in departing from their origination airports (due to non-flow control reasons), the entry of such departure delays (especially at major traffic

producing airports) can improve the flow control prediction and control accuracy.

The AIRS flow control processes can only be applied within the current twenty-four hour period from 0300 to 0300 local eastern time zone. The 0300 time was selected because it represents about the lowest traffic volume time in the eastern United States. The twenty-four hour limitation was determined by two factors: 1. a single flow control problem would not exceed this period; and 2. this discrete period simplified programming requirements. The current 0300 to 03C0 period is consistent with the experience that airport flow control problems are individual current day situations. Longer range flow control management is impractical with regard to AFCP or QFLOW operations.

ALGORITHMS

The flow control algorithms used in both AFCP and QFLOW are predicated on first-come-first-served equitability. The scheduled arrival order is the order used in computing the flow controls. This order is preserved within the accuracy of the procedures. Since flow control is administered by allocations or quotas, not flight identification, some minor reordering is unavoidable even though the AIRS flow controls are rigidly computed using flight identities to assure the first-come-first-served ordering.

Using first-come-first-served ordering, the predicted landing slots (at the flow controlled airport) are applied to the flights as they arrive or are taken from a holding stack. When the impacted center's flow control threshold for stack size and/or air delay is exceeded, the algorithm either computes allocations based upon ground delays for excess AFCP aircraft or computes quotas which detain the excess aircraft in the tier center under quota flow procedures.

The flow control threshold is set by the user (see 10.2 and 10.3) and can be structured to consider air delay, stack size or a mix of these as threshold criteria. The threshold is formulated through four values. The first value is that of maximum air delay, primarily used for AFCP. This value does not play an important role in QFLOW because impacted center air delay is not the control criterion but rather maximum stack sizes. Maximum stack size is the second value. This value is a required entry during QFLOW dialog and it becomes the "CONTROL LEVEL" at the impacted ARTCC. In AFCP this value can be used as a further restriction on the controlled arrivals to avoid exhausting the arrival ARTCC's holding capacity. The third and fourth values are

extra threshold regulating criteria and are best understood as desired or minimum levels of air delay and stack size as opposed to maximum levels intended by the first two values. Instead of controlling to maximum conditions flow control can be instituted to produce control to desired levels, with the threshold maxima being applied only when the maxima would be exceeded by application of the desired levels. In current flow control situations, however, the desired levels are normally set equal to the maximum levels. Thus threshold formulation simply becomes maximum stack size for QFLOW and maximum air delay for AFCP. Since both criteria must be set whether AFCP or QFLOW, care must be given to negate the unimportant criterion (i.e. in QFLOW the maximum air delay should be set very large to let the stack size be the controlling factor and in AFCP, the maximum stack size should be set very large to let the air delay be the controlling factor).

OPERATIONAL ASPECTS

When using AIRS flow control assistance, several operational aspects must be understood. During the processing of an AFCP request (not a "TEST AFCP" request) the AIRS data base is automatically locked with regard to the entering of ARO updates. This locking is required to insure the continuity of data used and modified in the issuance of AFCP allocations. If ARO were permitted to change the files during AFCP computation, serious damage to the data base could result. After the issuance of AFCP allocations and the returning to AIRS ("REQUEST") mode, the data base is automatically freed for ARO updates. Storing AFCP control data (e.g. controlled departure times) with each issuance of allocations is essential if AIRS is to factor the knowledge (or history) of the previous flow control delays into the next issuance period. For example, some aircraft may be AFCP ground delayed and can not be considered as having departed on schedule in computing revised arrival delay predictions. In the application of QFLOW, since aircraft are not ground delayed, it is reasonable to assume that they departed as scheduled. Thus QFLOW does not require data base retention of flow control data (e.g. controlled departure times) and does not lock the data base during any of its computations.

One further operational aspect must be discussed. AIRS computes the AFCP and QFLOW controls based upon all aircraft being controllable (i.e. capable of being delayed in arriving). In reality, not all aircraft are controllable. For example, under AFCP the domestic flights which have already departed for the AFCP airport are no longer capable of being ground delayed. If AFCP is computed in advance of

any flow control departure delays, there is no problem in flight controllability. But if AFCP is implemented in the midst of the arrival congestion problem, only those on the ground can be expected to be ground delayed (foreign arrivals excepted). To cope with this late initiation situation, the AIRS flow control processing has been designed to determine the controllability of flights with regard to the current time of day. The user must instruct AIRS through the "EDIT" mode (10.3) to consider controllability of flights in computing flow controls. With regard to QFLOW, the controllability of flights is not important since aircraft are normally flow controlled through air delays near the end of their flight. Essentially they are controllable by QFLOW until cleared into the impacted ARTCC. In summary, the AIRS default mode of considering all flights controllable is consistent with QFLOW operations and with early AFCP implementation. The optional flight controllability determination is available for late AFCP implementation purposes.

10.2 REQUEST ENTRY AND DIALOG

The flow control request initiates the AIRS flow control processing. Its content specifies which process, AFCP or QFLOW, is to be activated and whether editing of control criteria is desired. It also can contain optional override times and a stack size for a given time. When QFLOW is requested, a special short dialog follows to acknowledge the landing capacity estimates and to set the stack control level before the processing begins. After several minutes of computation AIRS produces a flow control recommendation. This recommendaton can be preceded by an editing dialog if the keyword "EDIT" was used in the request (10.3). Any editing of the control criteria or zones which precedes the recommendation is used in the current flow control processing. It is noted that such edited control criteria can also, if desired, be made permanent and will be used for subsequent flow control requests for the airport. Editing zones always produces permanent modification to the zone structure for the airport.

Following the flow control recommendation, AIRS asks one or more questions. The user's answers produce further processing of selected outputs or the return of processing control to the normal AIRS "REQUEST=" mode, terminating flow control assistance.

10.2.1 REQUEST ENTRY

CONTENT

A QFLOW request must contain the keyword "QFLOW". An AFCP request must contain the keyword "AFCP". The request must also contain a single airport code. Optionally the request may include implementation times (overriding the computer's recommended times), an arrival stack size (terminal area airborne count), and the key word "EDIT". In AFCP Requests several additional keywords are permitted (BEGIN, CONT, TEST). The request implicitly covers the arrivals for the 24-hour local day (eastern local time) from 3:00 a.m. today to 3:00 a.m. tomorrow.

        Examples: REQUEST = QFLOW ORD
                    REQUEST = TEST AFCP JFK

FORM

QFLOW requests must begin with "QFLOW" while AFCP requests can begin with either "TEST", "AFCP", "BEGIN", or "CONT". The remainder of the flow control request is free form; that is, legal words and phrases, as described in the following sections, can be combined in any order to completely specify the request. Spaces are suffcient to separate words in a request, but commas may be used to improve readability if desired. Requests can be continued on another line by typing a semicolon (;) as the last character in the line, then going on to type another line. A request may be up to seven lines long.

KEYWORDS

QFLOW:This word specifies quota flow control procedures are to be computed.

AFCP: This word specifies Advanced Flow Control Procedures are to be computed.

TEST: This may be used with AFCP requests to prevent accidental implementation (i.e. prevents data base updating of controlled traffic). This keyword does permit the modification of the zoning and the control criteria when used in conjunction with the keyword "EDIT".

BEGIN:This word will insure the AFCP request is treated as a new startup for the procedures. If the procedures were implemented earlier that day, this

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command word will make the program ignore the earler controls. This keyword is implicit (default) in the first AFCP implementation request for a given airport that day.

CONT: This word indicates a continuation of the controls implemented earlier in the day. If no previous AFCP request has been entered for that day and that airport, this keyword is automatically replaced by "BEGIN". If an AFCP implementation had been requested earlier the keyword "CONT" would be assumed (default) even if omitted from the current request.

EDIT: This word produces a dialog between the controller and the computer prior to performing the desired flow control computation. This dialogue is the means for entering or changing zones and control criteria. Entry of control data can be effective for the duration of the current request or can be saved (filed) as a permanent (until changed) set of criteria for the given airport. Each airport can have its own special criteria and zones (see "Structuring Airport Flow Control Assistance", section 10.3).

AIRPORT

Three-letter codes - e.g. JFK

STACK SIZE

1600 STACK 20
1600 HOLD 20

Order is as follows: give the time, the keyword 'STACK' or 'HOLD' and then the number of aircraft holding in the terminal area. Caution: the time entered with the stack size should be an adjusted time, adding to the time at which the count was made the time required to travel from the holding fix to the runway. This will provide better delay predictions by adjusting stack times to correspond to the wheels down times of the data base. If the time is omitted from the stack phrase and there is a starting time given in a time phrase (see following paragraph), then the starting time is automatically used for the time of the stack size.

IMPLEMENTATION TIME PERIODS

NO TIMES GIVES

AIRS computes the need for flow control today. If it
determines implementation is required, it computes the
times to start and to terminate controls.

COMPLETE TIME PERIOD GIVEN

There are four ways to specify a time period:

```
18CC-020C
1800 02C0
18C0 TO C200
FROM 18CC TO 020C
```

Specifying the complete time period forces the program
to implement flow controls for the specified duration
even if the delays or stack size conditions do not
warrant controls. Entering a time period produces a
direct override of the computer's evaluation of the
required implementation period.

OPEN-ENDED TIME PERIOD GIVEN

There are two forms of entry:

```
FROM 1800
TO 0200
```

AIRS calculates the start and terminate times for flow
control implementation. If a start time (FROM) has
been entered it overrides the computed start time, and
similarly the end time (TO) overrides the computed
terminate time. The program then recommends flow
controls for the resultant time period.

PRIORITY OVER ARO (XARO)

If faster response is required, you may lock out ARO
entries by including "XARO" in your flow control request.

See 3.11 for explanation and warnings.

NOTE: APO is locked out until you get back to a
"REQUEST=", so if you use XARO and spend a long time
getting flow control reports, ARO is locked out the whole
time.

10.2.2   FLOW CONTROL DIALOG

RECOMMENDATIONS FOR IMPLEMENTATION

Peak values of arrival delay and arrival stack size are given along with the times of occurrence. Based on these uncontrolled delays and the threshold conditions of maximum air delay and/or maximum stack size, a recommendation is given to implement or not to implement flow controls. If control is recommended, delay and stack size predictions are given for the intervals when the procedures start and end. Whether or not control is recommended, further reports can be obtained. In the case of AFCP, if control is not recommended, the user must specifically request this continued processing by answering 'Y' to the question "DO YOU WISH ADDED DATA?". An answer of 'N' terminates the flow control processing, returning to a "REQUEST=".

SELECTIVE DESIRED REPORTS

If further reports are to be given (see above), one of two general questions is asked to determine the desired outputs.

QUESTION WHEN QFLOW

'P'RINT QUOTAS, 'S2' ORIGINAL DELAYS, 'S4' QFLOW DELAYS, 'G'RAPH, OR 'R'ETURN TO AIRS?=

QUESTION WHEN AFCP

'I'SSUE ALLOCATIONS,'P'RINT ALLOCATIONS, 'L'IST FLIGHTS, 'T'EST ISSUANCE, 'S'UMMARY DATA, (S=CTL PEAKS, S2=ORIGINAL TRAFFIC, S4=CONTRL TRAF), 'G'RAPHICAL OUTPUT, OR 'R'ETURN TO AIRS?=

ANSWER "P"

In QFLOW this answer will result in printing the flow control quotas. These quotas are given by zoned groups and by time interval in two-line sets; the first line gives the release quantity (i.e. the number of flights to be released during the interval), the second line gives the number of detained flights. Before printing the quotas, the time range for the report is requested and your choice of zones is requested. In addition, you can print these quota tables for the flow controlled traffic or, for comparison, for the original uncontrolled traffic. The time intervals for the

zone groupings are automatically adjusted by boundary times entered by the user when structuring the airport's zones (See 10.3).

In AFCP this answer will print out the arrival hour allocation tables for the AFCP implementation. These tables can be printed out completely or in part by time period and/or by zoning criteria. The tables contain by zone, the ARTCC allocations. These allocations are subdivided by arrival intervals (intervals can be specified from one an hour to six an hour; see section 10.3 question 4). Unzoned allocations are tabulated by domestic, foreign, and general aviation.

ANSWER "S2"

This answer produces the same report in either QFLOW or AFCP, a table of predicted arrival delays and stack sizes. Specifically, the report gives original arrival traffic statistics (normally by hours) and contains the following columns of data: number of arrivals, number landed, average number of flights holding, average air delay, peak number holding and peak air delay. In addition the landing capacity estimates and the GA factor used are given. (This "S2" summary report is exactly the same as that produced by the "TEST" request - Chapter 6).

ANSWER "S4"

This answer produces the same kind of report as the "S2" report described above. The difference is that the "S4" summary report is for the flow controlled traffic while the "S2" is for the original traffic flow.

ANSWER "S"

This answer produces the same report as "S4" but without the average number of flights holding and the average delay columns.

ANSWER "G"

This answer initiates a dialog to produce graphs of the data contained in both the "S2" and "S4" summary reports above. See section 5.3 which discusses user commands and data inputs required to specify the desired plots.

ANSWER "L"

This answer is meaningless to AIRS at present since the listing feature within AFCP has not been implemented to date. Flow control flight listings can be obtained by returning to AIRS with the "R" answer and making the normal "LIST" request to AIRS (see section 4.6).

ANSWER "R"

This answer exits the flow control procedure and returns the user to the normal AIRS "REQUEST=" mode. As stated in the previous paragraph, flight listings may be obtained of the flow controlled aircraft similar to the listings requested following a demand request.

ANSWER "I"

This answer produces the AFCP allocation tables by interval and selected zone breakdown. The user is asked to set the time of issuance (i.e. from the program supplied AFCP initiation time or last issue time up to a user specified firm issuance time). Issuance should be made in small steps (one or two hours at a time), so that continued AFCP's will factor into the next issuance the latest user supplied landing capacity estimates and/or ARO updates of flight schedules. The allocation tables are produced as in the "P" answer discussed above. The unseen operation which is performed when "I"ssue is selected is that the flow control delays for all flights, up to the latest issue time, are stored in the master schedule file for continuity in the subsequent continuation or termination of AFCP's.

ANSWER "T"

This answer produces the same outputs as the answer "I" above. But updating of flow control data on the master shcedule file is inhibited. This answer gives the user the opportunity to preview the allocation tables without affecting the files.

10.3 STRUCTURING AIRPORT FLOW CONTROL ASSISTANCE

GENERAL COMMENTS

The entry of the keyword "EDIT" in any flow control request initiates a dialog permitting the controller to add, change, or remove zones and control criteria for the referenced airport. The extent of the dialog is controlled by answers to questions. Most questions have provisions for controlling the scope of editing or terminating editing and going on to the flow control computations. The following paragraphs describe the dialogs for entering and editing all of the flow control parameters. The order of editing specific parameters does not matter. Choose the editing desired, do it, and exit the editing phase. In exiting the edit phase, the last question asked is:

UPDATE CONTROL FILE? 'Y' OR 'N'=

An answer 'N' (NO) restricts all the AFCP control criteria changes or additions (except for zones) to the present flow control request. An answer 'Y' (Yes) saves all the changes and additions for automatic application any time that airport is used in a flow control request. Zones are permanently changed whenever you edit them.

QUESTIONS AND ANSWER CHOICES

1. ANY PROCEDURAL CHANGES,'Y','Y*', OR 'N'?=

   'N'-(No) terminates the editing session. The flow control request is processed following the choice of "UPDATE CONTROL FILE?" discussed in the previous paragraph.

   'Y'-(YES) allows selected editing of the key flow control parameters by going to question 2 below.

   'Y*'-(Yes, detailed level) allows editing of all the flow control parameters by going to question 3 below.

2. WHICH? 'P'RINT, 'S'TACK CONTROLS, 'D'ELAY CONTROLS, 'Z'ONES, '*', OR 'N'ONE?=

   'N'-(None) terminates editing session.

   '*'-(More detailed level) enters the more detailed level of editing by going to question 3.

'P'-(Print current control criteria) types out the airport's key control parameters as they exist at that instant (i.e. including editing just performed). Outputs are: maximum stack, maximum air delay controls, flow control allocation interval (intervals per hour), and the number of zones for that airport. Further information is available by way of question 3 (see 'P' answer under question 3 below).

'S'-(Stack control) permits the entry of the maximum stack size control criterion (i.e. number of aircraft held in terminal area). This editing has no effect in QFLOW because the stack criterion ("CONTROL LEVEL") is entered each time QFLOW is requested (see 10.1).

'D'-(Delay control) permits the setting of the maximum air delay criterion (i.e. maximum terminal area air delay in minutes.

'Z'-(Zone editing) initiates a dialog permitting zone specifications and/or zone modifications. Caution! any use of zone editing dialog which adds to or changes the zones, replaces the previous version of zoning for that airport. The following dialog results if the 'Z' answer is given:

FIRST QUESTION: 'N'EW OR 'E'DIT?=

'N'-(New) destroys any previous zone structure for the airport (i.e. starts with a clear unzoned structure). Entry of zone 1 structure is then permitted.

'E'-(Edit) Enters the existing airport zone structure for printout, additions, or modifications.

SECOND QUESTION:
'L'IST, 'P'RINT ALL, 'R'EPLACE ZONE, 'A'DD ZONE?=

Note: A carriage return answer will return control to question 2 (or 3).

'L'-(List of zone) produces an inquiry of which zone to list (by number), and proceeds to list the ARTCC's and special place groups (expanded list of all airport and center codes in the group).

'P'-(Print all zones) produces a list by zone of all the ARTCC codes and airports.

'R'-(Replace a zone) produces an inquiry of which zone to replace (by number), clears all previous information in the specified zone, and then allows entry of the new zone structure. (See following paragraph for description of zone data entry).

'A'-(Add a new zone) allows the entry of a new zone to the current airport zone structure. A question is asked: "CONTROLLABLE ZONE? 1=NO, 2=YES, 3=YES WITH ETE CUTOFF=". An answer '1' means that centers and airports in this zone are exempt from controls; the answer '2' means that controls are applied in this zone; and answer '3' means that the controls are applied (in this zone) only on those aircraft with flight times less than a given duration (see answer 'E' to question 4 below below for information on ete cutoffs). Following your answer, the computer types "CENTERS=". You can now enter the appropriate ARTCC 3-letter codes, separated by spaces or commas. The carriage return terminates the line and generates another "CENTERS=" for more inputs. If you are finished entering the center codes, give an extra carriage return. "GROUP TITLE=" is then typed out and allows entry of a heading (used later in the allocation tables). Following the entry of this heading (limited to 5 characters), the user is asked "BOUNDRY TIME=". This time, expressed in minutes, is intended for use in QFLOW procedures. In order to properly compute QFLOW release quantities by time interval for each group, AIRS must compensate for the flight time from point of release (i.e. tier ARTCC) to wheels down. This boundary time serves to adjust the quotas for each group to an imaginary boundary or area associated with the group's release point. Zero boundary times are legal answers when no adjustment is desired. At this point the group may be defined in response to the "=" typed by AIRS. To define the group constituents you can now enter ARTCC codes and/or airport areas (e.g. ZEUR, see section 3.2 and appendix C) into this specific group. A carriage return ends a line and starts another. An extra carriage return will permit entry of another group title, etc. If no (further) group

titles are to be entered, a carriage return will
bring you back to the second question,
"'L'IST....".

The zone structuring for QFLOW requires that a
group be entered for each of the directional
traffic groups. A group is set up to contain
the proposed departures from the impacted ARTCC.
This group might be titled by the ARTCC's code
preceded by "PR" (e.g. PRZAU), and would contain
the ARTCC code to be entered in the subsequent
"=" definition. For each of the tier ARTCC's
similar proposed groups are produced (e.g.
PRZOB, PRZID, PRZKC) each defined as the
associated center code. Lastly, the
through-traffic associated with each tier ARTCC
is entered for each tier center. The groups
might be titled with the tier center's code
preceded by "TH" (e.g. THZOB, THZID, THZKC).
Each of these through-traffic groups must be
defined in their definition dialog as consisting
of the origin ARTCC's and foreign airport areas
(e.g. ZEUR, ZSAB) whose traffic is likely to
transit the tier center enroute to the flow
controlled airport. The order of entering the
groups does not effect the flow control
procedures but is the order by which the groups
are tabulated in the quota reports. This order
should be selected to facilitate administration
of the procedures (for example, define the
proposed and the through-traffic groups for the
same ARTCC in order before defining the next
ARTCC groups).

3. CHANGE WHICH? 'P'RINT, 'Z'ONES, 'S'TACK CONTROLS,
   'D'ELAY CONTROLS, 'O'THER CONTROL PARAMETERS, OR 'N'ONE?

   'N'-(NONE) terminates editing session.

   'P'-(print current control criteria) - types out
   detailed control parameters as applicable and as
   they exist at that instant. Outputs are: maximum
   stack; maximum air delay; minimum (desired) stack
   size; desired delay; stack variance allowable
   (between computed stack size and given stack size);
   airborne control status (i.e. control foreign
   airbornes); allocation interval (number of
   intervals per hour); number of zones; ete cutoff in
   minutes; departure cutoff, domestic cutoff, landing
   cutoff (a cutoff, in minutes, is the time threshold
   used to consider a flight has entered the next

phase, such as a flight on the departure ramp is committed to depart and not able to be ground delayed when he is within the departure cutoff of his scheduled departure time); user entered flow control start and/or end times overriding computed times; last AFCP issuance time; (omitted on QFLOW or if beginning AFCP); general aviation factor; ARO reservation time period (during which no GA factor is used); and stack size and time if entered previously.

'Z'-(zone editing) see question 2 answer 'Z' above.

'S'-(stack controls) permits entry of the maximum stack size and the minimum (desired) stack size. (Under question 2, the 'S' answer automatically sets the minimum stack size equal to the maximum stack size.) This editing has no effect in QFLOW because the stack criterion ("CONTROL LEVEL") is entered each time QFLOW is requested (see 10.1).

'D'-(Delay controls) permits entry of the maximum terminal area air delay and the desired air delay. (Under question 2, the 'D' answer automatically sets the desired delay equal to the maximum air delay.)

'O'-(Other control parameters) initiates a dialog controlled by question 4 below.

4. CHANGE WHICH? 'A'IRBORNE CONTROLS, 'E'TE CUTOFF, 'I'NTERVAL FOR CONTROLS, 'G'EN/AV USAGE, 'L'ANDING CUTOFF, 'S'TACK VARIANCE, 'C'ONTROL ALL OPTION, 'D'EPARTURE LIMITS, 'N'ONE, OR 'M'ORE =

Note: After the first typeout of question 4, retyping of the complete question is suppressed to "CHANGE WHICH?=".

'N'-(None) terminates editing session.

'M'-(More editing) returns to question 3.

'A'-(Airborne controls) permits you to specify whether airborne flights (foreign and/or domestic) are to be considered controllable and therefore delayable. In particular, AFCP might consider domestic airborne flights as uncontrollable while for QFLOW all airborne flights should be specified as controllable. The user's choice to this airborne controllability option has an effect only when the

editing under "C" (discussed below) specifies that not all flights are controllable.

'E'-(Ete cutoff) permits setting of cutoff flight times for use primarily in AFCP control zones with controllability option 3. All flights in such zones within the specified flight duration will be considered controllable. This parameter should not be employed (i.e. no zone controllability option 3) for QFLOW.

'I'-(Interval for reports) permits setting the AFCP allocation and the "S" reports to be tabulated by time interval from 1 to 6 per hour. In QFLOW the user selects a separate report interval in the dialog associated with printing quota tables.

'G'-(General aviation) permits the use or omission of the general aviation factor (see chapter 8) in predicting delays and computing flow controls. If GA factors are to be used, entry of an ARO reservation period during which GA factors are not used, is also permitted.

'L'-(Landing cutoff) permits specification of a cutoff time within which an arrival flight is considered on final approach or landed and therefore not air delayable.

'S'-(Stack variance) permits the specification of a deviation allowance for comparisons between the computer's predicted stack size and a given stack size entered in the flow control request.

'C'-(Control all option) permits the setting of a master mode switch which considers all aircraft (airborne or not) as controllable by flow control procedures. If the user specifies that not all flights are controllable, the computer program checks controllability with regard to current time and flight status in determining whether delays can be assigned.

'D'-(Departure limits) permits entry of departure cutoffs for foreign and/or domestic flights (in minutes). These limits are used to consider when an aircraft is committed to depart and no longer ground delayable by AFCP. This parameter is meaningless under QFLOW.

11.AIRPORT RESERVATION OFFICE

11.1 INTRODUCTION

THE AIRPORT RESERVATION OFFICE (ARO) SECTION OF AIRS ALLOWS THE ADDITION AND CANCELLATION OF FLIGHTS. THESE MODIFICATIONS ARE MADE TO THE CENTRAL AIRS DATA BASE, UPDATING THE ORIGINAL AIRLINE GUIDE SCHEDULES. ENTRIES CAN BE MADE EITHER MANUALLY OR VIA PAPER TAPE. THE FOLLOWING SECTIONS TELL HOW TO BEGIN AND EXIT THE ARO SECTION (11.2), HOW TO USE PAPER TAPE (11.3), HOW TO ENTER FLIGHTS (11.4), HOW TO CANCEL FLIGHTS (11.5), HOW TO RETRIEVE ARO-ENTERED FLIGHTS (11.6), AND HOW TO GET HELP (11.7).

NOTE: THE ARO SECTION OF AIRS TYPES JUST '=' INSTEAD OF THE USUAL 'REQUEST=' WHEN READY FOR INPUT.

NOTE: ALL TIMES MUST BE IN GMT, NOT LOCAL TIME.

NOTE: ENTRIES CAN ONLY BE MADE FOR DATES BETWEEN YESTERDAY AND 3 WEEKS IN THE FUTURE.

11.2 ENTERING AND EXITING ARO.

ENTERING ARO

FLIGHTS CAN ONLY BE ENTERED OR CANCELLED BY THE ARO
SECTION OF AIRS. TO ENTER THIS SECTION, TYPE 'ARO.' AS
AN AIRS REQUEST. NOTE THAT THE '.' IS NECESSARY. THE
ARO SECTION TYPES '=' WHENEVER IT IS READY FOR A
REQUEST.

EXITING ARO

WHEN DONE ENTERING FLIGHTS, EXIT THE ARO PROGRAM BY
TYPING EITHER:

QUIT - EXITS THE AIRS PROGRAM. THE COMPUTER TYPES '.'
AND YOU THEN HAVE THE OPTION OF EITHER STARTING AIRS
AGAIN (RUN AIRS) OR LOGGING OFF THE COMPUTER (K).
(SEE CHAPTER 2)

AIRS - EXITS THE ARO SECTION AND RETURNS TO THE REGULAR
AIRS SECTION. THE COMPUTER TYPES 'REQUEST=' AND ANY
AIRS REQUEST CAN BE TYPED.

11.3 PAPER TAPE OPERATION

ARO DATA ENTRY MAY BE ACCOMPLISHED THROUGH PREPUNCHED
PAPER TAPE. IN LOCAL TELETYPE MODE AN EIGHT HOLE (ASCII)
PAPER TAPE MAY BE PREPARED CONTAINING ANY NUMBER OF ARO
ENTRIES. THE FOLLOWING SECTIONS EXPLAIN HOW TO PREPARE
THE TAPE (11.3.1), HOW TO USE THE TAPE (11.3.2), AND HOW
TO TROUBLESHOOT IF THE PROGRAM IS INTERRUPTED (11.3.3).

11.3.1 PREPARING PAPER TAPE

WHAT TO PUNCH

RESERVATION AND CANCELLATION REQUESTS (11.4, 11.5) MAY BE PUNCHED.

EACH LINE SHOULD END WITH A CARRIAGE RETURN AND A LINE FEED INSTEAD OF JUST THE CARRIAGE RETURN.

THE LAST REQUEST (LINE) ON THE TAPE MUST BE ONE OF THE FOLLOWING:

KEY - RETURNS CONTROL BACK TO THE KEYBOARD AND THE PROGRAM REMAINS IN THE ARO SECTION, READY WITH AN '=' TO ACCEPT REQUESTS FROM THE KEYBOARD. IF YOU WISH TO ENTER ANOTHER TAPE YOU MAY PUT IT IN THE READER AND SIMPLY TYPE 'TAPE' ON THE KEYBOARD.

QUIT - SAME EFFECT AS IN SECTION 11.2

AIRS - SAME EFFECT AS IN SECTION 11.2

NOTE: DO NOT PUNCH MORE ENTRIES AFTER THE QUIT, AIRS, OR KEY ON THE SAME TAPE.

HOW TO PUNCH

TAPES ARE PUNCHED WITH THE TELETYPE IN LOCAL MODE (NOT ATTACHED TO THE COMPUTER).

EACH REQUEST MUST BE TERMINATED BY A CARRIAGE RETURN AND A LINE FEED.

IF YOU MAKE A TYPING ERROR, YOU MAY DELETE THE ENTIRE CURRENT LINE BY TYPING ↑U (CONTROL U - HOLD DOWN THE CONTROL KEY AND TYPE 'U'). THIS WILL NOT SHOW ON YOUR TELETYPE PAPER, BUT WILL MAKE THE COMPUTER IGNORE THE CURRENT LINE. NOW CONTINUE AND RETYPE THE REQUEST.

IMPORTANT NOTE!! THE RUBOUT KEY HAS NO EFFECT WHEN PREPARING TAPES. IT DOES NOT ERASE THE PREVIOUS CHARACTER(S).

11.3.2 USING PAPER TAPE

DIAL THE COMPUTER, RUN AIRS, AND ENTER THE ARO PROGRAM AS USUAL. YOU ARE NOW IN THE KEYBOARD MODE.

TO READ FROM TAPE, PUT THE TAPE IN THE READER AND WHEN AIRS SAYS '=', TYPE 'TAPE'.

REQUESTS WILL BE AUTOMATICALLY READ FROM THE TAPE INSTEAD OF THE KEYBOARD.

WHEN READING FROM PAPER TAPE, THE PROGRAM DOES NOT ALLOW INTERACTION. THAT IS, IT DOES NOT ASK YOU ANY QUESTIONS, BUT SIMPLY REJECTS ANY REQUEST IT IS NOT SURE ABOUT, GIVING AN APPROPRIATE ERROR MESSAGE.

DUPLICATION CHECKING ('VERIFY')

When you start a tape, AIRS will ask whether you want to "VERIFY".

If you answer "N" or "NO", AIRS will not check for duplicate reservations (see 11.4).

If you answer "Y" or "YES", AIRS will ask how many entries to verify.

If you answer "0" or carriage return, all entries on the tape will be checked.

If you answer a number, that number of reservations will be checked, then checking will stop.

Duplication checking is time-consuming, so you will usually not use it except as described in the next section under "BACKING UP TAPE".

11.3.3 TROUBLESHOOTING

IF THE TAPE IS NOT READ TO COMPLETION BUT YOU ARE STILL
ATTACHED TO THE COMPUTER (E.G. IF YOU TYPE TWO CONTROL
C'S OR THE TAPE IS PHYSICALLY STOPPED), YOU WILL FIND
THAT NOTHING YOU TYPE APPEARS ON THE TELETYPE. TO FIX
THIS, DO THE FOLLOWING:

TYPE ↑C↑C (HOLD DOWN CONTROL KEY AND TYPE 'C' TWICE).

TYPE ↑S (HOLD DOWN CONTROL KEY AND TYPE 'S').

TYPE 'TTY ECHO' FOLLOWED BY A CARRIAGE RETURN. (NOTE
- THIS WILL NOT PRINT, BUT AFTER YOU TYPE IT, THINGS
SHOULD BE BACK TO NORMAL).

YOU CAN NOW RUN AIRS AGAIN IF DESIRED.

BACKING UP TAPE

If tape processing is interrupted (as above, or due to
a computer crash), you should back up the tape part
way before telling AIRS to process it. This is
because the computer reads ahead, and may have moved
the tape beyond what it has processed. If you don't
back up, entries may be lost. When you restart the
tape, you may use the "VERIFY" option (see previous
section) to avoid duplicate entries if the tape is
backed up too far.

AIRPORT RESERVATION OFFICE

11.4 ENTERING FLIGHTS

EXAMPLE: RA N122H GA JFK CLE 171900 0200
EXAMPLE: RA N122H GA JFK ZZOB 171900 0200 JDC9

RULES: THE FOLLOWING INFORMATION MUST BE TYPED IN THE ORDER GIVEN.

1. FIRST WORD MUST BE 'RA'. STANDS FOR RESERVATION APPROVED'. TELLS COMPUTER TO ENTER RESERVATION.

2. SECOND WORD MUST BE FLIGHT ID', FROM 1 TO 7 LETTERS OR NUMBERS WITH NO EMBEDDED BLANKS.

3. THIRD WORD MUST BE USER CLASS - ONE OF THE FOLLOWING CODES.
   AO   AIR CARRIER
   AT   COMMUTER AIR CARRIER
   AN   AIR CARRIER EXTRA SECTION
   GA   GENERAL AVIATION
(NOTE: THESE ARE NOT CURRENTLY USED BY AIRS IN RETRIEVING INFORMATION)

4. FOURTH WORD MUST BE CODE FOR AIRPORT OF ORIGIN. IF AIRPORT IS NOT KNOWN OR THE MESSAGE 'UNKNOWN AIRPORT', IS TYPED, THE CENTER NAME PRECEDED BY 'Z' MAY BE USED INSTEAD (E.G. ZZNY). THESE 'ZZ' CODES REPRESENT IMAGINARY AIRPORTS, AND ARE TREATED JUST LIKE ANY OTHER AIRPORT IN AIRS.

5. FIFTH WORD MUST BE DESTINATION AIRPORT. SEE 4 ABOVE FOR RULES.

6. SIXTH WORD MUST BE DATE AND TIME OF DEPARTURE. FIRST TWO DIGITS GIVE DATE (NO WAY TO SPECIFY MONTH', LAST FOUR GIVE TIME (MUST BE GMT)'. THE DATE NUMBER MAY RANGE FROM YESTERDAY UP THROUGH THREE WEEKS INTO THE FUTURE.

7. SEVENTH WORD MUST BE ETE (ESTIMATED TIME ENROUTE) IN HOURS AND MINUTES.

8. EIGHTH WORD IS OPTIONAL. IF INCLUDED', IT MUST BE AIRCRAFT TYPE (SEE APPENDIX D FOR LIST OF TYPE CODES)', IF EXACT TYPE UNKNOWN, THE FOLLOWING MAY BE USED:
   JEQP   JET EQUIPMENT
   PEQP   PROP EQUIPMENT
   TEQP   TURBO-PROP EQUIPMENT
IF OMITTED', 'NONE' IS AUTOMATICALLY SUBSTITUTED.

If there are errors in the request, a message is typed and the request is rejected.

DUPLICATION CHECKING

If the reservation was typed manually, or if the reservation was on paper tape and you said to "VERIFY" when you started the tape (see 11.3.2), AIRS will check for duplicate entries.
If the flight already exists (same flight ID, same origin and destination, same date and hour of departure), the computer types out the duplicate entry.

If the entry was on tape, AIRS will reject it.

If the entry was manual, AIRS asks:
ENTER FLIGHT ANYWAY?('Y' OR 'N')
If you type 'Y' (YES), the flight will be entered.
If you type 'N' (NO), the flight will not be entered.

Duplication checking is not done for entries on tape if you say not to 'VERIFY'.

11.5 CANCELLING FLIGHTS

A FLIGHT CAN BE CANCELLED BY GIVING EITHER: ITS ID, ORIGIN AIRPORT, AND DEPARTURE TIME (CANCEL DEPARTURE REQUEST); OR ITS ID, DESTINATION AIRPORT, AND ARRIVAL TIME (CANCEL ARRIVAL REQUEST). ITS OTHER AIRPORT MAY ALSO BE GIVEN TO SPEED PROCESSING.

CXD,CD - CANCEL DEPARTURE

    EXAMPLE: CXD N122H LGA 171900
            CD N122H LGA 171900
            CD N122H LGA 171900 HPN

THE FOLLOWING INFORMATION MUST BE GIVEN:

1. FIRST WORD MUST BE 'CXD' OR 'CD' (CANCEL DEPARTURE)

2. SECOND WORD MUST BE FLIGHT ID, FROM 1 TO 7 LETTERS OR NUMBERS WITH NO EMBEDDED BLANKS.

3. THIRD WORD MUST BE AIRPORT OF ORIGIN.

4. FOURTH WORD MUST BE DATE AND TIME OF DEPARTURE. FIRST TWO DIGITS GIVE DATE (NO WAY TO SPECIFY MONTH), LAST FOUR GIVE TIME (MUST BE GMT). ONLY THE HOUR NEED BE GIVEN. E.G. IF THE FLIGHT DEPARTS ON THE 18TH AT 1925, ONLY 181900 NEED BE GIVEN. THE DATE NUMBER MAY RANGE FROM YESTERDAY UP THROUGH THREE WEEKS INTO THE FUTURE.

5. FIFTH WORD IS OPTIONAL
   IF INCLUDED, MUST BE DESTINATION AIRPORT.
   IF AIRS DOESN'T RECOGNIZE 2ND AIRPORT, IT IGNORES IT.
   INCLUDING 2ND AIRPORT SPEEDS PROCESSING, SINCE IT
   HELPS AIRS FIND THE FLIGHT TO CANCEL.

CXA, CA - CANCEL ARRIVAL

    EXAMPLE: CXA N122H HPN 172100
             CA N122H HPN 172100
             CA N122H HPN 172100 LGA

THE FOLLOWING INFORMATION MUST BE GIVEN:

1. FIRST WORD MUST BE 'CXA' OR 'CA' (CANCEL ARRIVAL)

2. SECOND WORD MUST BE FLIGHT ID, FROM 1 TO 7 LETTERS OR
   NUMBERS WITH NO EMBEDDED BLANKS.

3. THIRD WORD MUST BE DESTINATION AIRPORT.

4. FOURTH WORD MUST BE DATE AND TIME OF ARRIVAL. FIRST
   TWO DIGITS GIVE DATE (NO WAY TO SPECIFY MONTH), LAST
   FOUR GIVE TIME (MUST BE GMT). ONLY THE HOUR NEED BE
   GIVEN. E.G. IF THE FLIGHT ARRIVES ON THE 18TH AT 1925,
   ONLY 181900 NEED BE GIVEN. THE DATE NUMBER MAY RANGE
   FROM TODAY UP THROUGH THREE WEEKS INTO THE FUTURE.

5. FIFTH WORD IS OPTIONAL
   IF INCLUDED, MUST BE ORIGIN AIRPORT.
   IF AIRS DOESN'T RECOGNIZE 2ND AIRPORT, IT IGNORES IT.
   INCLUDING 2ND AIRPORT SPEEDS PROCESSING, SINCE IT
   HELPS AIRS FIND THE FLIGHT TO CANCEL.

NOTE: Airports must exactly match those entered for the
      flight, or it cannot be cancelled. For example, "ZZ"
      codes (see 11.4) should not be used in a cancellation
      unless they were used in the reservation. The "ZZ"
      codes are imaginary airports; they do not represent all
      airports in the corresponding center.

If the flight cannot be found (same ID, same airport(s), same date and hour), the message "**FLIGHT NOT FILED" is typed.

If the flight cannot be uniquely found, the matching entries are typed out.

If the cancellation was typed manually, AIRS asks you which one (if any) to cancel.

If the cancellation was on paper tape, AIRS does nothing.

11.6 RETRIEVING ARO-ENTERED FLIGHTS

AIRS does not distinguish in its data base between ARO-entered and Airline Guide flights. Thus there is no direct way to retrieve them separately. However, there is an indirect way to separate them, based on the fact that, in practice, ARO does not enter aircraft types. If they entered types, the method below would not work.

Method

All flights which come from the Airline Guide have real aircraft types. Flights entered by ARO generally have the imaginary type "NONE", since ARO omits the type (see 11.4). Thus the type "NONE" can be used to distinguish ARO-entered flights. See 3.7 for use of types in demand requests.

Examples:

REQUEST=LGA NONE
Demand for LGA having type NONE.
I.e. ARO-entered LGA demand.

REQUEST=LGA -NONE
Demand for LGA excluding those with type NONE.
I.e. LGA demand excluding ARO-entered flights.

11.7 HELP

THE REQUEST 'HELP' WILL TYPE OUT SOME OF THE FORMAT
INFORMATION IN THIS SECTION OF THE MANUAL.

12.AIRSMAIL

12.1 COMMENTS

TO TYPE A COMMENT (WHEN AIRS TYPES 'REQUEST='): TYPE 'C', THEN A SPACE, THEN YOUR MESSAGE. TO CONTINUE ON ANOTHER LINE, TYPE A ';' JUST BEFORE THE CARRIAGE RETURN, THEN CONTINUE ON THE NEXT LINE. A SINGLE COMMENT MAY USE UP TO SEVEN LINES.

COMMENTS SHOULD BE USED TO TELL TSC ABOUT PROBLEMS WITH AIRS, GIVE SUGGESTIONS FOR IMPROVEMENTS TO AIRS, ASK QUESTIONS ABOUT AIRS, TELL US WHY YOU ARE MAKING YOUR REQUESTS (FOR TRAINING PURPOSES, FOR REAL PROBLEMS, FOR DEMONSTRATIONS, ETC.). LIBERAL USE OF COMMENTS IS ENCOURAGED SO THAT WE CAN BETTER MEET YOUR NEEDS.

12.2 MAIL

TO RECEIVE MESSAGES FROM TSC, TYPE 'MAIL' WHEN AIRS TYPES 'REQUEST='. MAIL WILL BE USED TO ANSWER YOUR COMMENTS, TELL YOU ABOUT NEW AIRS FEATURES, ETC. IF THERE IS MAIL, AIRS WILL TELL YOU SO WHEN YOU RUN IT.

APPENDIX A - INDEX TO AIRS TERMINOLOGY

Special words used in AIRS requests are listed alphabetically below, followed by special symbols used in requests. Next to each word or symbol is a list of sections of the guide in which its use is defined.

```
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```

APPENDIX B - AIRPORTS BY ARTCC

Note: This list is correct as of July, 1973. As new codes become known to AIRS, this list may become incomplete, although AIRS will include the new codes in the appropriate groups.

ZAB

ABQ	ALM	AMA	CNM	CVN	DUG	ELP	FHU	FLG	GUP	INW
LCR	PHX	PRC	ROW	RTN	SAF	SOW	SVC	TSA	TUS	WLF
ZZAB									

ZAI

AET	BTT	BYA	CEM	CHP	CIK	CKD	CKX	CRC	EAA	FAI
FYU	KBC	KBM	KPC	LIV	MLY	MNT	RMP	SVS	TAL	TLA
VEE	WBQ	WSM	WUV	ZZAI					

ZAN

ABL	ADK	ADQ	AGN	AHT	AIN	AKI	AKK	AKN	AKP	ALZ
AMT	ANC	ANI	ANN	ANV	ARC	ATU	AUK	BET	BKC	BMX
BRW	BTI	CCV	CDB	CDL	CDV	CGA	CLP	CSH	CXC	CYF
CYT	CZF	CZN	DFB	DGJ	DLG	DRG	DUT	EEK	EGX	EHM
ELI	ENA	FLT	FWL	GAL	GAM	GKN	GLV	GMT	GNU	GST
HCR	HNH	HNS	HOM	HPB	HSL	HUS	HYG	IAN	IGG	IKO
ILI	JNU	JSE	KAL	KBE	KCD	KCG	KCL	KCN	KDK	KEK
KFP	KGK	KGX	KIB	KKA	KKB	KKI	KKK	KKU	KLG	KLL
KLN	KLW	KMC	KMO	KMY	KNW	KOT	KOY	KOZ	KPH	KPK
KPN	KPR	KPV	KPY	KQA	KSM	KTB	KTN	KTY	KVC	KVL
KWG	KWK	KWN	KWP	KWT	KXA	KYK	KYU	KZB	LAM	LJS
LUR	MCG	MDO	MDR	MOS	MOU	MXY	MYU	NHB	NUL	NUP
OBU	OHC	OLH	OME	OOK	ORI	ORT	ORV	OTZ	PBA	PEC
PHO	PIP	PKA	PML	PSG	PTH	PTU	PUO	RBY	RDV	RSH
SCM	SDP	SGY	SHG	SHH	SHX	SIT	SKJ	SKK	SKW	SLQ
SMK	SNP	SRV	SVA	SWD	SXP	SYA	TCT	TKE	TLT	TNC
TNK	TOG	UGA	UGS	UMB	UMT	UNK	UTO	VAK	VDZ	WAA
WBB	WDC	WDD	WDE	WDF	WKK	WLK	WMO	WNA	WRG	WSJ
WSN	WTK	WTL	WWT	WYC	YAK	YXY	ZZAN			

ZAU

ALO	AMW	ATW	AUW	AZO	BEH	BMI	BRL	BTL	CGX	CID
CMI	CWA	CWI	DBQ	DNV	DSM	DVN	EKI	FLD	FOD	FWA
GBG	GRB	GRR	ISW	JVL	MBL	MDW	MFI	MGC	MKE	MKG
MLI	MQB	MSN	MTW	MUT	ORD	OSH	OTM	PIA	PRI	QTM
RFD	SBM	SBN	SQI	STE	UES	VPZ	WDJ	WMK	WUK	XES
ZZAU									

ZBW

ACK	ALB	ART	AUG	BDL	BGR	BHB	BID	BML	BOS	BTV
EEN	EFK	EWB	GFL	GON	HFD	HIE	HYA	LCI	LEB	LEW
MHT	MPV	MSS	MVY	OGS	ONH	ORH	PLB	PQI	PSF	PVC
PVD	PWM	RKD	RUT	SLK	SYR	UCA	VSF	WGU	WNI	WVL
YKT	ZZBW									

ZDC

BAL	CHO	CPJ	DAN	DCA	ECG	EKN	EWN	FAY	FRQ	GSB
GVE	HGR	HSP	IAD	ILM	ISO	LWB	LYH	MNS	OAJ	ODM
ORF	ORG	PHF	RDU	RIC	ROA	RWI	SHD	SOP	WEC	WSS
ZZDC										

ZDV

AIA	ALS	ASE	BFF	CDR	CEZ	CNY	COS	CPR	CYS	DEN
DRO	EGE	FMN	GCC	GJT	GLD	GUC	HDN	LAA	LAR	LBF
LHX	LXV	MCK	MTJ	PUB	RAP	SBS	SNY	TAD	VEL	WMU
ZZDV										

ZFW

ABI	ACT	AXS	BWD	DAL	DUC	ELD	GGG	HCA	HOB	LAW
LPB	MAF	MKO	MLC	MLU	OKC	PHI	PON	PRX	PSN	SHV
SJT	SPS	STN	SWO	TUL	TXK	TYR	ZZFW			

ZGT

| BIS | CKN | DTL | DVL | FAR | FCA | GDV | GFK | GGW | GTF | HLN |
| HVR | ISN | JMS | LWT | MLS | MOT | MSO | OLF | SDY | TVF | ZZGT |

ZHN

| HKP | HNL | HNM | ITO | KDF | KOA | LIH | LNY | LUP | MKK | MUE |
| OGG | WSQ | ZZHN | | | | | | | | |

ZHU

AUS	BPT	BRO	BTR	BYT	CLC	CLL	CRP	DRT	EGP	ESF
GLS	GPT	HBG	HEZ	HOU	HRL	HUM	IAH	ILE	LCH	LFK
LFT	LJN	LOI	MCB	MFE	MOB	MSY	PGL	POE	PTN	SAT
SNE	TPL	VCT	WFK	ZZHU						

ZID

AID	BKW	BLF	BMG	CMH	CRW	CVG	DAY	EVV	HTS	HUF
IND	LAF	LEX	LIA	LOZ	MIE	MZZ	OKK	OWB	PKB	SDF
ZZID										

ZJX

ABY	AGS	AYS	CAE	CHS	CRE	DAB	DHN	FLO	GNV	HHH
JAX	MGR	NBC	NEA	PFN	PNS	SAV	SSI	TBR	TLH	TMA
VLD	VPS	ZZJX								

ZKC

AIZ	BVO	COU	CPS	DDC	DEC	DMO	EMP	EOK	FOA	GBD
GCK	HUT	HYS	ICT	IJX	IRK	JEF	JLN	JUC	LBL	LJY
LWC	MCI	MDH	MHK	MKC	MTO	MVN	MWA	NVD	OJC	PNC
PPF	PTS	RLA	SGF	SLN	SPI	STL	TBN	TOP	UIN	WDG
WDX	WKS	WLD	ZZKC							

ZLA

APV	AVX	BFL	BLH	BUR	CDC	CIB	EMT	FUL	GCN	IGM
IPL	IYK	LAS	LAX	LGB	LHU	MHV	OBR	ONT	OXR	PGA
PMD	PSP	RAL	SAB	SAN	SBA	SBP	SBT	SGU	SMX	SNA
TSP	TWH	VIS	WFX	YUM	ZZLA					

ZLC

BIL	BKE	BMC	BOI	BTM	BYI	BZN	COD	DTA	EKO	ELY
IDA	JAC	LGU	MLF	MPB	OGD	ONO	PIH	PUC	PVU	RIW
RKS	RWL	SHR	SLC	SUN	TWF	WRL	WYS	ZZLC		

ZMA

APF	DWS	EYW	FLL	FMY	ISM	KEZ	LAL	MCO	MIA	MLB
MRK	MTH	OCF	OMP	ORL	PBI	PGD	PIE	SEF	SPG	SRQ
TIX	TPA	VRB	ZZMA							

ZME

AEJ	AYJ	BNA	BNU	BWG	CGI	CKV	CRH	EWL	FOC	FSM
FYV	GLH	GTR	GWO	HOT	HRO	HSV	JAN	JBR	LIT	LMS
LUL	MAW	MEI	MEM	MKL	MSL	OSX	PAH	PBF	PKR	POF
SYI	TUP	UBS	UOX	VKS	ZZME					

ZMP

ABR	APN	ASX	ATY	AVW	AXN	BJI	BKX	BRD	CMX	DLH
EAR	EAU	EGV	ESC	EVM	FRM	FSD	GPZ	GRI	HIB	HON
HSI	HYR	ILL	IMT	INL	IWD	LNK	LSE	MCW	MHE	MKT
MML	MNM	MQT	MSP	MVQ	OFK	OLU	OMA	ONA	OTG	PIR
PKD	PLN	RHI	ROX	RST	SPW	SSM	SUX	TVC	WIS	YKN
YQT	ZZMP									

ZNY

ABE	AIY	ARX	AVP	BDR	BGM	ELM	EWR	FLU	HAR	HPN
HTO	HVN	HZL	ILG	IPT	ISP	ITH	JFK	LGA	LNS	MDT
MIV	MSV	MTP	NPT	OXC	PHL	PNE	POU	PSB	RDG	SBY
SCE	TTN	WKV	WKW	WWD	ZZNY					

ZOA

ACV	APC	BIH	CCR	CIC	EKA	FAT	MCE	MMH	MOD	MRY
MYV	OAK	OVE	PAO	PRB	RBL	RDD	RNO	SCK	SFO	SJC
SMF	STS	SUU	TVL	UKI	WLW	WPM	WRM	WVI	ZZOA	

ZOB

AGC	AOO	BFD	BKL	BUF	BYN	CAK	CBE	CKB	CLE	COV
CVL	DET	DTW	DUJ	ERI	FKL	FNT	GQQ	HLG	IPA	JHW
JST	JXN	LAN	MBS	MFD	MGW	MOP	OLE	PHN	PIT	ROC
TOL	WET	WMY	YIP	YNG	ZZOB					

ZSE

ALW	AST	BFI	BLI	CEC	CLM	CLS	CVO	EAT	EPH	EUG
GEG	GRF	HQM	LMT	LWS	MFR	ODW	OLM	OTH	PDT	PDX
PSC	PUW	PWT	RBG	RDM	RLD	SEA	SHN	SLE	TIW	WBK
WBP	WBR	WBU	WBV	WBZ	WCC	WCD	WCF	WCG	WCM	WUQ
YKM	ZZSE									

ZTL

AHN	ANB	AND	ATL	AVL	BHM	CHA	CLT	CSG	CSV	DBN
GAD	GRD	GSO	GSP	HKY	IKB	INT	MCN	MGM	MRN	PSK
RMG	TCL	TRI	TYS	WDZ	WPO	ZZTL				

APPENDIX C - AIRPORTS BY FOREIGN GROUPINGS

Note: This list is correct as of July, 1973. As new codes
      become known to AIRS, this list may become incomplete,
      although AIRS will include the new codes in the
      appropriate groups.

CYEG
      YEG   YYC

CYQM
      YHZ   YQB   YQI   YSJ

CYUL
      YGK   YOW   YUL

CYVR
      YPR   YVR   YYJ

CYWG
      YWG

CYYZ
      YHM   YXU   YYZ

ZEUR
      AGP   AMS   ARN   ATH   BGO   BRH   BRU   CGN   CMN   CPH   DKR
      DUS   FBU   FCO   FRA   GLA   GVA   HAM   KEF   LGW   LHR   LIS
      MAD   MAN   MUC   MXP   ORY   OSL   PIK   PRG   PSA   ROB   SMA
      SNN   STR   SVG   TER   TLV   ZRH

ZPAC
      AKL   BNE   GUM   HKG   HND   JON   KWA   MAJ   MDY   MNL   NAN
      NOU   OKA   OSA   PPG   PPT   SEL   SYD   TYO

ZSAB
      ANU   AUA   BDA   BDI   FPO   KIN   LPA   MBJ   NAS   PAP   POS
      SDQ   SJU   STX   UBL   ZSA

ZSAM
```
    ACA   ASD   BAQ   BGI   BIM   BZE   CJS   CLX   CTM   CUR   CXY
    CZM   DAV   ELH   EZE   FDF   GCM   GDL   GDT   GGT   GHB   GHC
    GIG   GUA   GYE   HMO   LAP   LCE   LMM   MEX   MGA   MHH   MID
    MIQ   MTY   MZT   NOG   OCO   PTP   PTY   PVR   SAL   SAP   SAQ
    SJO   SMR   STT   SXM   TAM   TCB   TIJ   TUM   WTD   XSC
```

ZSOA
```
    ADZ   BEL   BOG   CLO   CTG   LIM   MAR   MDE   UIO   VCP
```

APPENDIX D - AIRCRAFT CODES BY EQUIPMENT TYPE

Note: This list is correct as of July, 1973. As new codes
      become known to AIRS, this list may become incomplete,
      although AIRS will include the new codes in the
      appropriate groups.

J

    J111 J707 J720 J727 J72F J72S J737 J73S J747 J880 JB2F
    JB3F JB7F JBAC JCVL JD10 JD8F JD8S JD9F JD9S JDC8 JDC9
    JEQP JJET JL10 JV10 JY62

P

    PA50 PAD PB18 PB80 PBB PBNI PCES PCN PCV2 PCV3 PCV4
    PD6A PD6B PDC3 PDC4 PDC6 PDHO PDTO PEQP PGGM PGGS PHP
    PHR PHRN PMR4 PPAP PPAZ PPCH PPCU PPDS PPGU PPNV PPPS
    PPRP PPSM PTB8

T

    TAO TB99 TBTP TCO TCV5 TCV6 TEQP TF27 TFH7 TLEC TN26
    TPCB TPR4 TSKV TTC4 TVG TVV TY51