

NO-A185 886

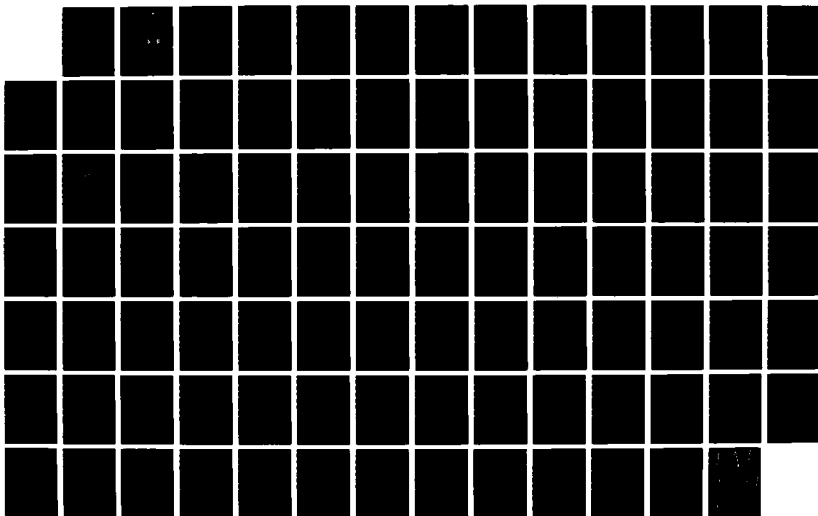
CHICAGO'S D'HARE RUNWAY CONFIGURATION MANAGEMENT SYSTEM
(RCMS) VOLUME 1 D. (U) COMPUTER RESOURCE MANAGEMENT INC
VIENNA VA A BRADLEY ET AL. JUL 87 DOT/FAR/CT-86/15-1
DTFA83-85-C-00046

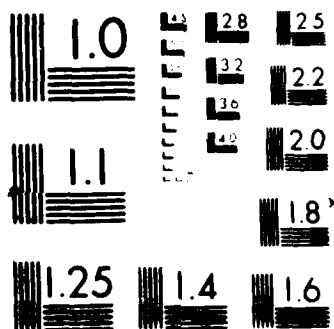
1/1

UNCLASSIFIED

F/G 1/5

NL





AD-A185 886

DTIC FILE COPY

2

DOT/FAA/CT-86/15-I

FAA TECHNICAL CENTER
Atlantic City International Airport
N.J. 08405

Chicago's O'Hare Runway Configuration Management System (RCMS) Volume I - Description of the Operational Software

Anthony Bradley
Helen Monk
Edward Jaggard

DTIC
ELECTE
OCT 28 1987
S D

July 1987

This document is available to the U.S. public
through the National Technical Information
Service, Springfield, Virginia 22161.

DISTRIBUTION STATEMENT
Approved for public release
Distribution Unlimited



US Department of Transportation
Federal Aviation Administration
Technical Center
Atlantic City Airport, N.J. 08405

NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

The United States Government does not endorse products or manufacturers. Trade or manufacturer's names appear herein solely because they are considered essential to the object of this report.

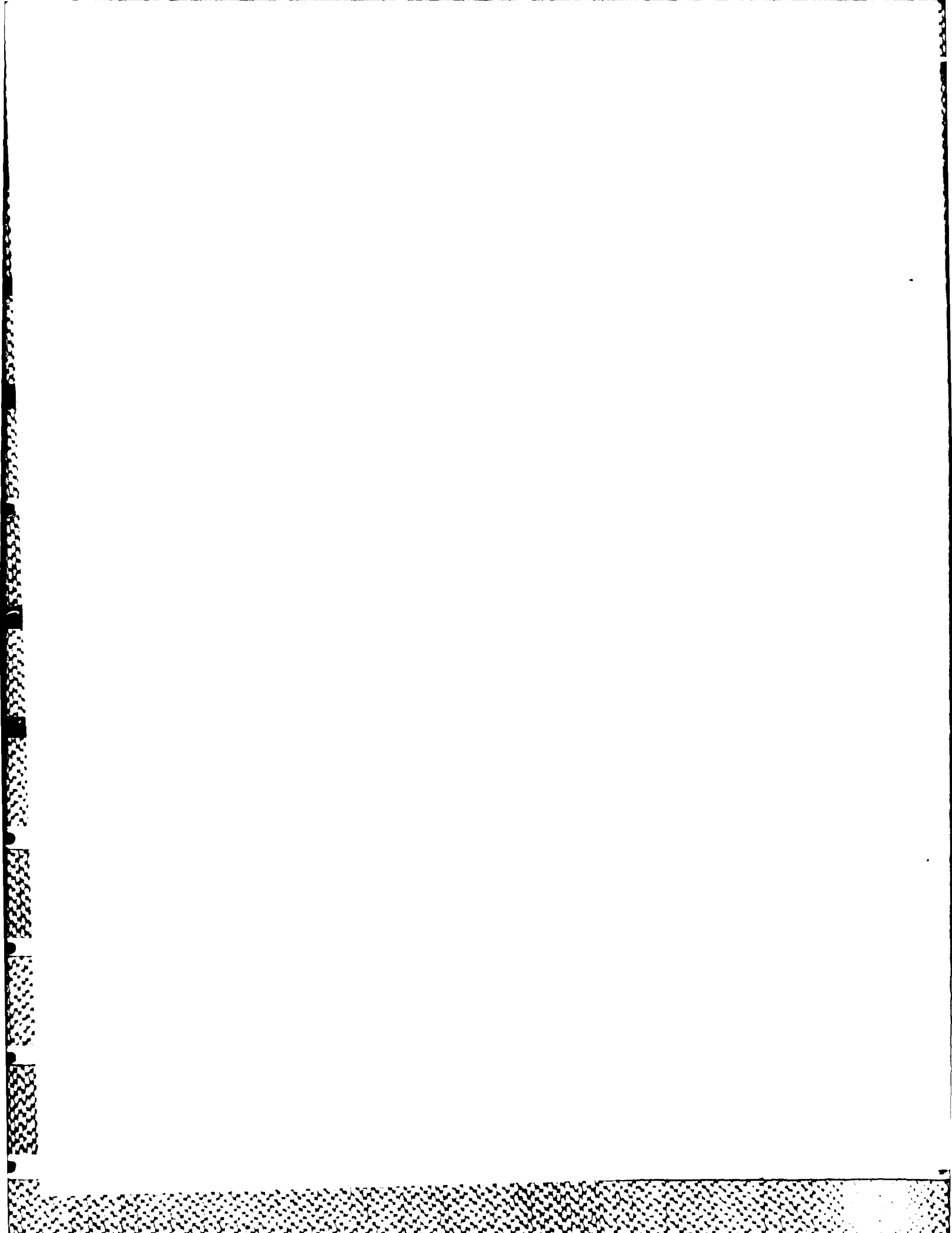


TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	vi
1. INTRODUCTION	1
1.1 Purpose	1
1.2 Background	1
2. DISCUSSION	2
2.1 RCMS Description	2
2.2 Background Program Operation	3
2.3 Foreground Program Operation	9
2.4 Supporting Programs	15
APPENDIX	
A - RCMS Library	A-1
B - Application of Sensor Data to RCMS Logic	B-1
C - Foreground Documentation	C-1
D - Glossary	D-1
E - Distribution List	E-1



Approved For		☒
NRO/CPA21		☒
TAB		☐
Unclassified		☐
Distribution		
By		
Distribution		
Availability Codes		
Dist	Availability for Special	
A-1		

LIST OF ILLUSTRATIONS

Figure		Page
1	Runway Configuration Management System Hardware	19
2	Relationship of Data Bases to Software Programs	20
3	Relationship of Data Bases to Modes of Operation	21
4	Current Background Program Flowchart	22
5	Quarter-Hour Processing (2 Sheets)	23
6	Foreground Program Flowchart (2 Sheets)	25
7	PF-1 Master Auto Panel	27
8	PF-2 Master Panel	28
9	PF-3 Eligible Current Configuration Panel	29
10	PF-3 (Repeated) Eligible Planning Configuration Panel for Next Quarter-Hour	30
11	PF-9 (Selected from PF-3) Ineligible Planning Configuration Panel	31
12	PF-9 (Repeated from PF-9) Ineligible Planning Configuration Panel for Next Quarter-Hour	32
13	PF-4 User Message Panel	33
14	PF-5 Demand Panel	34
15	PF-6 Weather Panel	35
16	PF-6 (Repeated) Area Weather Panel	36
17	PF-7 Runway Conditions Panel	37
18	PF-8 Equipment Panel	38
19	PF-9 Trigger Value Panel	39
20	PF-10 Planning/Forecast Selection Panel	40
21	Weather Planning Log (PF-6)	41
22	Runway Closure Planning Log (PF-7)	42
23	Equipment Planning Log (PF-8)	43
24	PF-10 Forecast Control Panel	44
25	Forecast Status Panel (PF-2)	45

LIST OF ILLUSTRATIONS (CONTINUED)

Figure		Page
26	Forecast Configuration Panel (PF-3)	46
27	Forecast Demand Panel (PF-5)	47
28	Forecast Weather Planning Log (PF-6)	48
29	Forecast Runway Closure Planning Log (PF-7)	49
30	Forecast Equipment Planning Log (PF-8)	50
31	Equipment Status and Readings Panel	51
32	Taxiway/Notam Panel	52

LIST OF TABLES

Table		Page
1	Critical Routines for Current Background Program	4
2	Message Types	6
3	Message Line Protocol	7
4	Resolution of Current Information	8
5	Description of Weather Data	17
6	RCMS Application of Weather Data	18

EXECUTIVE SUMMARY

The operational software for the Chicago O'Hare Runway Configuration Management System (RCMS), described in Volume I, was prepared in response to operational requirements expressed by both facility and regional personnel from the Federal Aviation Administration (FAA) Great Lakes Region.

The software was developed for the three modes of operation -- the current mode, the planning mode, and the forecast mode. Each mode was designed to perform certain functions for an RCMS user.

The current mode is intended to be responsive to the existing airport conditions and the changes which may occur within a short period of time (for example, an equipment failure). The software examines configuration eligibility after any significant change in runway or equipment status to determine the impact on the current situation. The user is informed of this status through a screen of data which is refreshed without an operator's intervention.

The planning mode provides the user with the capability to plan equipment, runway, and weather changes throughout the facility day. It operates in concert with the current mode and forecast mode to prohibit undesirable reactions to current and future selected configurations.

The forecast mode offers an unrestrained examination of both configuration selection and plans. It enables the user to resolve conflicts before submitting the data to the current mode of operation.

This software was the starting point for the operational evaluation of the RCMS at the Chicago O'Hare Airport.

Volume II of this report, the user's guide, is organized by computer terminal operation, modes of operation, and external inputs (supporting programs) to RCMS.

1. INTRODUCTION.

1.1 PURPOSE.

This report describes the proposed Runway Configuration Management System (RCMS) operational software to undergo test and evaluation at the Chicago O'Hare Federal Aviation Administration (FAA) Tower Facility (ORD). It will also serve as an input to RCMS functional specifications for the Traffic Management System (TMS) program.

1.2 BACKGROUND.

RCMS is a planning tool for Chicago O'Hare International Airport. Using interactive computer logic, RCMS helps supervisors select runway configurations which reduce aircraft delays by optimizing throughput capacity in dynamic operational environments.

The formation of the O'Hare Delay Task Force, to identify the causes of and the potential solutions to air traffic delays at Chicago, provided the impetus for this system. MITRE Corporation conducted the initial RCMS effort as described in Federal Aviation Administration Report No. FAA-EM-82028 (Volumes I and II), dated October 1982. AEM-100 requested the FAA Technical Center to purchase a computer and to set up the system for evaluation by the Chicago O'Hare personnel. Later, the effort was expanded to make the system operationally acceptable to the facility personnel.

2. DISCUSSION.

2.1 RCMS DESCRIPTION.

RCMS incorporates both the operational requirements and improvements to three interconnected PL/1 software application programs developed by the MITRE corporation. The following describes the computer, the hardware, the software, and the data bases which comprise RCMS.

Computer and Hardware Equipment. RCMS consists of an IBM 4321 processor and the support equipment shown in figure 1. The computer runs under the Virtual Machine/Special Product (VM/SP) Operating System which is a user-oriented, time-sharing processor. Details of the final computer configuration will be documented when the system is installed at the facility. The computer hardware and the associated licensed software are maintained under contract with IBM.

Software Programs. The RCMS software is comprised of three different types of application programs: a background program, a foreground program, and several supporting programs.

The background software runs independently, that is, without a terminal operator or a user. As the executive program of RCMS, it interfaces with the other programs through the data bases.

The foreground program consists of user-oriented software which generates two types of screen data for facility personnel -- the write full screen (WFS) data and the static panel data. The WFS is refreshed every 2 minutes or is updated when a significant event occurs or when a panel changes. Users may alter the fixed panels but not the WFS panel.

Data Bases. The master data base, the WFS data base, the personal computer (PC) data base, and the forecast mode data base enable the software programs and the users to exchange data and to transfer results. Their contents are described in appendix A, RCMS Library.

The master data base is the main channel of communication for RCMS. It contains the updated information required by each program for the current and planning modes of operation. Protocol messages control the exchange of data. The background and foreground programs attach to and detach from this data base during their read and write functions. When accessing the master data base, each program assumes the responsibility of resolving the data.

The WFS data base is a one-way channel from the background program to a user program. It contains the screen data and the messages for the user viewing the Master Auto Panel (PF-1). There are three types of messages -- alerts, advisories, and ordinary -- which the user may display one at a time. Alerts and advisories are indicated via a ringing bell and/or the highlighting of screen data.

The PC data base provides the equipment status and readings to the background program through the master data base. The PC User program automatically updates the PC data base and resolves the master data base.

The forecast mode data base is very similar to the master data base. It is independent of all other data bases and provides a user the opportunity to exercise WHAT IF conditions in the forecast mode. Configurations, weather

conditions, and equipment outages can be planned for an entire day rather than an immediate look-ahead time. The entire day's demand data is available through a DEMAND file generated by a supporting program. Portions of the forecast mode data base -- selected configurations and revised planning logs -- can be inserted into the master data base for use in the current mode. The background program processes the data as user input and performs its normal functions to establish current conditions, determine configuration eligibility, and resolve the master data base.

Figures 2 and 3 show the relationship of the data bases to the software programs and to the modes of operation.

2.2 BACKGROUND PROGRAM OPERATION.

The current background program controls the flow of data among all users, determines configuration eligibility, generates messages for the users, and either accepts or rejects a plan submitted by a user. The following sections describe the operation of the current background program for the current and planning modes. There is a separate background program for the forecast mode, called the forecast background program; its special features enable the user to exercise WHAT IF conditions.

2.2.1 Auto Startup and Restart.

The background program is designed to run without the intervention of a user. It is initialized by the computer operator and then placed in a wake-up mode. If the program does stop for some reason, a restart feature enables the operator to resume the operation with the existing master data base rather than the initial data.

2.2.2 Software Routines and Functions.

The current background program operates every quarter-hour or when activated by a wake-up call if a significant event occurs. The flowchart for the current background program is shown in figure 4. The PC program and assorted supporting programs resolve the appropriate data bases and pass information to the users via the master data base. Application of the sensor data to the RCMS logic is shown in appendix B.

The background program determines the eligibility of 62 configurations -- a maximum of 80 may be defined. A conflict occurs if a selected configuration is ineligible. The user is alerted if current conditions cause the conflict; he can then review a list of alternate eligible configurations. If new planning data generates a conflict, the plan is rejected and the plan is reset to the previous acceptable plan.

During the execution of the current background program, ordinary and advisory messages are generated for the user. Management of the data bases guarantees continually updated data and acceptable inputs from the users and the supporting programs. Table 1 describes the critical routines in the current background program.

TABLE 1. CRITICAL ROUTINES FOR CURRENT BACKGROUND PROGRAM

<u>ROUTINE</u>	<u>DESCRIPTION</u>
ADDPLAN	Adds plans to work tables APTSTAT(96) & PEQUIP(96) from PLAN(96).
ASMDISC	Assembly program to run the background program in disconnected mode.
ASSLNK2	Assembly program to link to the WFS data base.
ASSLNK7	Assembly program to link to the master data base.
ASSULK2	Assembly program to unlink from the WFS data base.
ASSULK7	Assembly program to unlink from the master data base.
BACKGR4	Main procedure in the current background program.
BLDPLAN	Builds PLAN(96) from planning logs & sets PSTATUS (planning status).
CLEAR96	Clears 96 bins in APTSTAT & PEQUIP.
CMPMSG	Generates runway composite messages.
CTIME	Converts quarter-hour to four-character time (HHMM).
CTIME4	Converts four-character time (HHMM) to quarter-hour.
CURMSG	Generates current messages (planned and unplanned) using runway and equipment status codes in APTSTAT & PEQUIP.
ELIG	Determines configuration eligibility for the quarter-hour.
GENA	Generates alert and advisory messages.
GENQ	Generates quarter-hour messages for PF-4.
GETMINS	Initializes the arrival runway minimums in RWYMIN.
INITOLD	Saves a copy of the master data base.
MINIMA	Calculates arrival runway minimums for the quarter-hour.
MI.OOP	Performs "do loop" for nine quarter-hours to calculate eligibility.
MODUP	Computes current time and controls plan building, plan testing, data base management, eligibility logic, and message generation.
NFWDAY	Clears data base. Initializes equipment status, trigger values, and configuration data.

TABLE 1. ROUTINE DESCRIPTIONS FOR THE BACKGROUND PROGRAM.

ROUTINE	DESCRIPTION
REALM	Reads the master data base.
RESTART	Reads master data base. Initializes current configuration.
SFICUR	Puts current data into APT, ICA, and WFS data bases.
ISTPLAN	Tests a plan by calculating eligibility.
UPDALEM	Resolves current & planning panels. Updates master data base.
WFSL	Generates the WFS data and writes to the WFS data base. Calls programs WRITWFS, and ASSUMK2.
WIND	Calculates crosswinds & tailwinds for each runway for the current configuration.
WRITEM	Writes to the master data base.
WRITWFS	Assembly program to write the WFS data base.

2.2.3 Configuration Eligibility Processing.

Configuration eligibility is determined for 9 quarter-hours -- the current quarter-hour and each quarter-hour during the next 2 hours (figures 5A and 5B). The background program constructs 96 bins of information representing the airfield conditions for each quarter-hour in the facility day. It assumes that the current airfield conditions will continue through the entire day. As planned activities and changes are introduced, they overlay the existing conditions for the appropriate quarter-hours.

The background program then determines eligibility based on runway closures, arrival runway minimums which are affected by equipment outages, surface and braking conditions, and weather conditions (CAB ceiling and CAB visibility). The eligibility status and the reasons for ineligibility are inserted in the master data base.

A message on the WFS panel alerts the user when a selected configuration becomes ineligible. Portions of the WFS are highlighted to help the user resolve the problem. For example, if an arrival runway in the current configuration is closed, three areas of the screen are highlighted -- the menu item for PF-7 (runway conditions panel), the alert message "CURRENT CONFIGURATION IS INELIGIBLE AT PHMM DUE TO CA" and the word "CURRENT" in the configuration description at the top of the screen.

2.2.4 Message Processing and Handling.

Asserted messages are generated and/or updated by the background program. Table 2 describes the message types and their location on the panels. Message packets for distribution within the master and WFS data bases, is a separate function from the message generation.

The background program adds or refreshes messages in the data bases during each update cycle. The protocol messages (table 3) are placed in the message line area of the user's screen. In the current mode, they contain the update time and the user's identification. In the planning and forecast modes, they provide the plan status and prevent other users from modifying an unresolved plan.

TABLE 2 MESSAGE TYPES

<u>MESSAGE TYPE</u>	<u>LOCATION ON THE PANELS</u>
1. Alert Message	PF-1 Master Auto Panel Message Line PF-4 Message Panel
2. Planned Configuration	PF-1 Master Auto Panel Message Line PF-4 Message Panel
3. Quarter-Hour Messages	PF-1 Master Auto Panel Message Line PF-4 Message Panel
5. New Planned Outages	PF-1 Master Auto Panel Message Line
6. New Current Outages (Equipment or Runway)	PF-1 Master Auto Panel Message Line PF-4 Message Panel
7. Current and Planned Runway or Equipment Outages (Historical Information)	PF-4 Message Panel PF-7 Runway Conditions Panel (Scroll Area) or PF-8 Equipment Panel (Scroll Area)
8. Runway Composite Messages	PF-1 Master Auto Panel PF-2 Master Panel (Scroll Area)
9. Runway Remarks	PF-3 Current and Planned Eligible Configurations
10. Reasons for Configuration Ineligibility	PF-9 Current and Planned Ineligible Configurations (Selected from PF-3)
11. Planned Weather Change	PF-3 Current and Planned Eligible Configurations (Next Change) PF-6 Weather Panel (Next Three Changes)
12. Protocol Messages	PF-2 - PF-10 Static Panel Message Lines

TABLE 3. MESSAGE LINE PROTOCOL

CURRENT MODE

1. "Screen Updated by [User ID] at [Time]"

PLANNING & FORECAST MODES

1. "Available for Input [User ID] Reviewed Plan [Time]"
2. "Available for Input [User ID] Filed Plan [Time]"
3. "Available for Input [User ID] Forced Plan [Time]"
4. "[User ID] Controls Plan [User ID] Reviewing Plan [Time]"
5. "[User ID] Controls Plan [User ID] Plan Accepted [Time]"
6. "[User ID] Controls Plan [User ID] Plan Rejected [Time]"
7. "[User ID] Controls Plan [User ID] Plan Submitted [Time]"

Notes

[User ID] is either AT, AF or CAB
 [Time] is Hours, Minutes (HHMM) -- GMT

2.2.5 Data Base Management.

A data base is controlled when it is accessed to transfer information. The foreground program reads and displays the WFS data base which is written by the background program. The foreground program reads and writes only that part of the master data base required for the panel the user is displaying or modifying. The background program reads and writes the entire master data base. The current and planning data is resolved when a user changes a panel or when the background program accesses the master data base.

For the current data, the background program applies the hierarchy of information (table 4) to the current data and to the master data base. It resolves conflicting data by determining what changes occurred since the last update and by applying the most critical condition to the data. Each user resolves the current data in a similar way.

Planning data is rigidly controlled by a protocol between a user and the background program. Plans, submitted by a user from a planning log, are accepted or rejected by the background program based on the eligibility of the selected configurations. No user may enter a plan controlled by another user. The background program maintains the integrity of the master data base by replacing the rejected plan with the previously acceptable plan. The user is prohibited from changing screens until the plan is either accepted or rejected.

Forecast data is controlled just like planning data, with these two exceptions. While a user is in the forecast mode, no other user may modify any planning log or any forecast planning log. A user may force a forecast planning log submission into the current mode; that data will be accepted unconditionally.

TABLE 4. RESOLUTION OF CURRENT INFORMATION

DEFINITION OF STATUS VALUES

'b' (Blank)	- Equipment or Runway Available
'X'	- Equipment Monitor Detection of Out-of-Service
'F'	- Equipment Monitor Detection of Failure
'O'	- Equipment or Runway Removed-from-Service by User (User has Overwrite Capability)
'R'	- Equipment or Runway Returned-to-Service in Plan
'I'	- Equipment or Runway Put In-Service by User (User has Overwrite Capability)
'P'	- Planned Equipment or Runway Out-of-Service
'N'	- CAT Operations not Available
'Y'	- CAT Operations Selected by User

PRIORITY OF CURRENT STATUS VALUES

'b'	Replaces	'X' and 'F' (Previous PC Status)
'X' and 'F'	Replaces	'b'
'P'	Replaces	'b', 'X', and 'F'
'R'	Conflicts with	'O' in Current Quarter-Hour
'P'	Conflicts with	'I' in Current Quarter-Hour
'I'	Replaces all others	*
'O'	Replaces all others	*
'N'	Replaces	'Y'
'Y'	Replaces	'b'

*Only designated users on selected panels have this overwrite capability.

RESOLUTION OF CURRENT STATUS VALUES

1. The priority of current status values is applied whenever the master data base is accessed (e.g., when a user enters new data on a panel).
2. If an 'I' or an 'O' is removed by a user, then 'b', 'X', 'F', and 'P' priority determines the new value.
3. If an 'I' or an 'O' is changed in master data base by designated user, then the master data base entry holds for the current data. (A user may not view a current panel for an extended period of time without considering the effects of changes occurring in the interim time period.)

2.3 FOREGROUND PROGRAM OPERATION.

The foreground program controls the panels selected by and presented to the user. In addition to displaying current data, it enables the user to submit plans for operating the airport and to select current and future configurations throughout the day. The following describes its operation.

2.3.1 Logon Functions and Software Routines.

A user can logon to the software program designed for a particular position or area of responsibility (AT, CAB, AF, etc.). A built-in executive routine starts the program which displays the WFS (PF-1) or the user's primary panel. Each user can select most of the screens, but a user may not need the full capabilities of the foreground program. Therefore, individual user programs will be constructed after the facility personnel provide their recommendations on panel formats and program operation.

The user controls the panel selection through program function (PF) keys. A PF key menu appears on each panel as a quick reference for the user; the function of a particular PF key may change from panel to panel. A cursor function enables the user to enter panel data and a scroll function permits the user to view additional messages or data. A message line on the bottom of the screen provides the status of the panel (update time, planning status, input errors, etc.)

The flowchart of the foreground program is shown in figures 6A and 6B. Appendix C contains the following foreground program documentation -- the PL/1 and assembler language programs used in the foreground user programs, the calling sequence of the programs in the foreground user, and the list of panels and their associated PF keys.

2.3.2 User Modes of Operation.

The foreground program has three modes of operation: current, planning, and forecast. Selection of a PF key initiates the appropriate mode of operation. The protocol messages on the current and planning panels establish communications among the users and between the foreground and the background programs. Protocols for all modes of operation regulate the access and transfer of data in the master data base (table 3).

Current Mode.

The current mode is the normal mode of operation. Typically, the user views the WFS data which is automatically updated every 2 minutes or whenever something significant occurs. The user remains in current mode when selecting a current panel with the PF key. However, a static panel is displayed and no update occurs until the user hits a PF key -- either the same key or another key.

Data entered through a current panel is checked for format errors. If it contains no errors, the data is then resolved with current data, PC data, and planning data. Then the background program is activated to determine configuration eligibility and to generate appropriate messages.

Planning Mode.

The planning mode is entered through the planning/forecast selection panel. The the PF-12 key enables the user to submit planning data directly to the current mode, through the master data base, from any of three planning logs -- weather, runway closure, or equipment.

Unlike the current mode, the user controls the planning panels upon entering the planning mode. No user may enter a plan which another user controls. Once the user submits a plan, he must remain on that panel until the background program determines the plan's acceptability. If the new plan causes a selected configuration to become ineligible within 9 quarter-hours, it is replaced with the previously accepted plan; otherwise, the plan is accepted.

The planning mode logic is straightforward. If a new plan is entered by a user, a complete recycle of the entire day's activities takes place. The new plan is broken down and reassembled in a time-ordered pattern intermixing all three planning panel inputs. This overall plan is then tested to determine if it generates a conflict within 9 quarter-hours. If there is a conflict, the overall current conditions are reconstructed with the previously acceptable plan. Resolution of the overall plan is a user task. If the user cannot pinpoint the problem to a specific item in the plan, he may employ the forecast mode. Within the forecast mode, all plans are accepted and screen data further defines the source of the conflict.

Forecast Mode.

The forecast mode uses a separate forecast background program to allow the user full access to the existing data base in an off-line environment. All the planning functions are available without interfering with the current background and other user foreground programs.

The forecast mode is executed through a specific control panel. It permits the user to communicate directly with another user and to operate independently of the current mode, the master data base, and the background program. The user may insert runway conditions, equipment outages, and weather conditions throughout the facility day using the planning panels. Once a compatible plan and eligible configurations are generated in the forecast mode, the user may forward the new selected configurations and plans to the current mode through the control panel. Then the user is notified of the current mode's acceptance or rejection of the submitted data based on the eligibility of the selected configurations. In addition, designated users have the option of forcing the revised plans and configurations into the current mode. Submissions are made through positive action by the user; a default submission returns to the current data and previous plans.

Selection of the master auto panel (PF-1) cancels the forecast mode and returns the user to the current status panel. The user does not have to submit forecast data or save forecast data.

The forecast mode logic depends on user selections (for example, today's forecast or a forecast for another day). The user can work with another user or work independently. The look-ahead start time can be specified for the forecast session. In addition, re-entry selections to the current background program can include the submission of plans and/or configurations for the entire day's activities.

The forecast mode has its own panels. The user can view and arrange the entire day's activities, look at the day's demand data, and review configuration selection and eligibility for any quarter-hour. The user can change configurations or plan equipment outages to determine if any conflicts occur over extended time periods. By coordinating with others, the user can resolve the day's plans with some assurance of operational compatibility.

The configuration eligibility process in the forecast background program is identical to the eligibility process in the current background program with one exception; it covers up to 96 quarter-hours (from the selected look-ahead time to the end of the day).

2.3.3 Panel Descriptions and User Functions.

The panels shown in figures 7 to 32 comprise the user's interaction with RCMS. The user function associated with the panels is explained in the following subsections. However, there are some common functions for the panels; namely, scrolling, entering data into the data base, and recalling the original data after typing in new data.

The scroll function is initiated by hitting the ENTER key. Panel data is entered into the master data base through the PF-12 key. If a user types in data and wishes to see the original data, the PF-11 RECALL key returns the screen to its initial state. All panels contain a menu of PF keys available to the user, some of which have different functions on different panels. The panels are described below.

Master Auto Panel (PF-1).

The master auto panel (figure 7) summarizes the airfield conditions and displays composite messages for the active runways. No user inputs are allowed. The screen is updated every 2 minutes or when a significant event occurs. Alerts, advisories, and any ordinary messages are displayed on the message line. The user can scroll through the advisory and ordinary messages by pressing the "enter" key. Alert messages are forced onto the screen along with highlighted areas pertaining to the causes of any conflicts. The user may select any panel listed in the menu of PF keys.

Master Panel (PF-2).

The master panel (figure 8) is a static display of the master auto panel with some differences. The user can enter a 30-character note under the NOTE PAD heading, adjacent to the arrival runway minimums. A scroll function enables the user to examine composite messages for all 12 runways.

Configuration Panels (PF-3 and PF-9).

The eligible current configuration panel (figure 9) displays all eligible configurations available to the user through the scroll function. It also contains abbreviated remarks concerning the runway conditions and equipment status. If there is a planned weather change within an hour, a message will appear near the bottom of the screen. The planned eligible configuration panels for the next 5 quarter-hours provide the same information and options. The PF-3 key enables the user to advance the screen to the next quarter-hour.

The eligible configurations are listed in order. Appearing first are those configurations with the same runway headings (flow direction) as the selected configuration. If the capacity satisfies the demand, if the configuration has no wind condition, and if the configuration is not affected by Midways' operations, the configuration is highlighted. The highlighted configurations are the recommended configurations. The remaining configurations are listed in the order of the clockwise flow direction within a given flow direction, the simplest configurations (from an operational aspect) appear first.

If no configurations (with the same flow direction as the selected configuration) are recommended (highlighted), the foreground program highlights the eligible configurations in the next clockwise flow direction which satisfy the capacity, wind, and Midway requirements.

The user may select a new eligible configuration by typing the desired configuration number on the screen and by using the PF-12 key to enter the data.

If the user selects a new configuration, the foreground program automatically updates succeeding quarter-hours throughout the day. This update follows these rules to insure that user selections are maintained in the RCMS.

a. The newly selected configuration replaces only the old configuration selection in each quarter-hour. A planned configuration change in any quarter-hour will remain in that quarter-hour and no further changes will occur after that time.

b. The configuration selected by the user must be eligible for at least an hour. Beyond that hour, configuration eligibility is not a factor in configuration selection. For example, if a new configuration is selected for the second quarter-hour and there are no planned configuration changes, the new configuration will be entered from the second quarter-hour to the end of the day. However, an alert message will be generated if the configuration becomes ineligible.

With the PF-9 key, the user may view the list of ineligible configurations for each quarter-hour (figures 11 and 12). Reasons for the ineligibility are included for each configuration. No user inputs are allowed on this panel.

User Message Panel (PF-4).

The user message panel (figure 13) displays up to 20 recent alert and advisory messages and up to 60 current equipment and runway messages, accessible through the scroll functions. No user inputs are allowed on this panel.

Demand Panel (PF-5).

The demand panel (figure 14) shows the arrival and departure demand for the next six hours. The data is broken down into eight quarter-hour periods and six hour-long periods. The traffic demand is displayed for each arrival and departure fix, and for three aircraft categories under each arrival fix (total, number of heavy, and number of light). No user inputs are allowed on this panel.

Weather Panel (PF-6).

The weather panel (figure 15) allows the user to enter current weather, forecast weather, CAB ceiling, and CAB visibility. The CAB visibility and CAB ceiling are

some of the criteria for the configuration eligibility. Repeating the PF-6 key displays the local weather forecasts (figure 16).

Runway Conditions Panel (PF-7).

The runway conditions panel (figure 17) allows the user to take a runway out of service (OTS) or to indicate the surface and braking conditions for the airfield. A local remarks area is provided for runway related comments. The user may scroll through 36 messages which give both current and planned runway outages.

Equipment Panel (PF-8).

The equipment panel (figure 18) contains the equipment status and the arrival runway minimums. The user may enter an overwrite character ("I" for in-service, "O" for out-of-service). A field may contain an existing out-of-service "X" detected by the 3270 PC interface equipment or it may be blank (in-service). When the data is entered, new arrival runway minimums are calculated and displayed.

A "Y" (yes) may be entered for CAT II and CAT III operations to indicate the runway is in that mode operation. An "N" indicates the operation is not available due to an equipment outage. The user can examine up to 60 messages concerning current and planned equipment outages by employing the scroll function.

Trigger Value Panel (PF-9).

The trigger value panel (figure 19) allows the user to set various parameters as boundaries above which the background program generates advisory messages.

The user can select crosswind and tailwind advisory levels for both arrivals and departures. A message is generated when one of these thresholds is exceeded.

The warning times for some messages (equipment OTS and RTS, runway OTS and RTS, and planned configurations changes for various reasons) can be specified by the user. These times determine when the user is advised of the upcoming event.

Triggered advisory levels for various parameters (demand, wind, ceiling, visibility, and RVR readings) can be preset by the user. A message is generated when the particular threshold is exceeded. Asterisks (***) indicate that the trigger value was exceeded since it was last set by the user.

Planning/Forecast Selection Panel (PF-10).

The planning mode can be entered directly from the planning/forecast selection panel (figure 20). The weather, runway closure, and equipment planning logs are shown in figures 21, 22, and 23.

At selection of a planning panel, the plan can be submitted directly to the background program for acceptance or rejection in the current mode.

The forecast control panel (figure 24) provides the user with a variety of functions including with the clearing of the forecast mode data base, reviewing and changing the data over a seven-day period, testing today's activities, returning to the current mode, the local stored version of today's forecast, or submitting the data to the master data base in the current mode.

Upon entering the forecast mode, the user may select the master data base for "today's" activity or the day file for "today." The user may also choose another day file (for any day within the next six days) to plan outages and select configurations.

After selecting an initial option using the PF-12 key, a summary of the day's configurations is presented along with their eligibility status. A selected start time may be entered so the user can examine any six quarter-hours in detail or change the selected configurations.

If the user selects "today's" activity, the master data base is read into the forecast mode data base and the user controls all planning logs. While in the forecast mode, the user can access any planning log. After changing a planning log, the user can enter it into the forecast mode through the PF-12 key. This WHAT IF option has no constraints; the user can resolve conflicts (configuration ineligibility) by changing configuration selections and/or planned outages. After resolving the conflicts, the user may re-enter the plan or submit all the plans and selected configurations to the current mode through the forecast control panel (PF-10).

The background program treats any submission from the forecast mode as a plan to be accepted or rejected. If the user specifies a forced entry on the control panel, the current background program unconditionally accepts the plan and generates alert messages if any selected configurations are ineligible within 9 quarter-hours.

The following panels are available to the user in the forecast mode:

a. Forecast Status Panel (PF-2). This panel (figure 25) summarized the weather, runway conditions, and equipment status of the particular quarter-hour selected by the user.

b. Forecast Configuration Panel (PF-3). This panel (figure 26) is identical to the eligible configuration panel in the current mode, except it contains both eligible and ineligible configurations.

The configurations are listed in order. Appearing first are those configurations with the v headings (flow direction) that best satisfy the eligibility, wind, capacity, and Midway requirements. If the configuration is eligible, if the flow direction is best for the wind direction and speed, if the capacity satisfies and, if the configuration has no wind conditions, and if the configuration is not affected by Midways' operation, the configuration is highlighted. The highlighted configurations are the recommended configurations. The remaining configurations are listed in order of the clockwise flow direction. Within a given flow direction, the simplest configurations (from an operational aspect) appear first.

c. Forecast Demand (PF-5). This panel (figure 27) is identical to the demand panel in the current mode, except it describes the conditions starting at the quarter-hour selected by the user.

d. Forecast Planning Logs (PF-6, PF-7, and PF-8). The forecast planning logs for the weather, runway closure, and equipment accept user input in any order (figures 28, 29, and 30). The software does the appropriate sorting. Users may input 16 weather items, 16 runway closure items, and 31 equipment

items. The USERID is inserted in the log. If the plan is accepted, the ACCEPT TIME is placed next to each entry.

2.4 SUPPORTING PROGRAMS.

The following supporting programs are employed by the RCMS operational software to automate inputs and/or coordinate activities with distant data sources.

2.4.1 Central Flow Control Facility.

The Central Flow Control Facility will be requested to send the demand data for the Chicago O'Hare Airport every hour. This data will contain the aircraft call sign, the aircraft type, the arrival fix, the departure fix, the estimated time at the arrival fix, and the estimated gate departure time. The DEMAND user will process the data, write it to the master data base, and generate a file containing the entire day's demand for the forecast mode. The Central Flow Control Facility will also have access to all data base information.

2.4.2 PERSONAL COMPUTER (PC3270).

The PC user program collects the status and equipment readings from the Facility Sensor Equipment (figure 31); this data is written to the PC data base and resolved in the master data base for the current background program. In some cases, this process utilizes averaging techniques and rejects unconfirmed data. The PC data base and the master data base are updated periodically or whenever the PC program determines there is a significant change in newly acquired data.

2.4.3 City of Chicago.

The City of Chicago is treated like another foreground user. When the city submits new panel data, the program creates a file which is compatible with their present television screen distribution system. Using a PC program, city personnel can transfer this file, through a keyboard interface device, to the existing TV displays. This permits consistent interpretation of data for both systems.

The City of Chicago RCMS interactive screens include the runway conditions panel (PF-7), the equipment panel (PF-8), and the runway closure and equipment planning logs. In addition, a taxiway/notam panel (figure 32) is accessible from the runway conditions panel and the equipment panel to describe the status of the taxiway system. The taxiway/notam panel can be viewed by selecting the PF-9 key from the PF-7 or PF-8 panel.

2.4.4 Weather Data.

The presentation of weather information and its processing within the RCMS software program depends upon the origin and type of data. There are three sources of weather data: the manual entries into the RCMS panels, the 3270 PC sensor interface, and the National Weather Service (NWS) interface via the Center Weather Service Unit (CWSU).

Table 5 describes the weather data, its source, and its mode of operation within RCMS. Table 6 describes the application and mode of operation for each type of weather information.

The weather information is applied in the RCMS software to:

- a. Determine the eligibility of current and planned configurations.
- b. Advise the user of weather conditions by presenting both the weather information and triggered advisories for specified conditions.
- c. Construct a weather planning log.

In the current mode, RCMS uses CAB ceiling and CAB visibility to determine configuration eligibility. In the planning/forecast mode, it uses the CAB ceiling and visibility, modified by the weather planning/forecast log entries, to determine eligibility.

RCMS generates a wind comment for an eligible configuration when there are excessive crosswinds or tailwind for a runway in the configuration. The planning/forecast mode uses the centerfield wind, modified by the wind entries in the weather planning/forecast log.

Triggered advisories are generated when CAB ceiling or visibility changes or when crosswinds, tailwinds, or PC sensor data (for wind, ceiling, RVR readings) exceed a level preset by the user.

The weather forecast log can be changed by manual entry of planned weather or by automatic entry of the ORD FT reports. At the user's request, RCMS translates the ORD FT weather reports into wind, ceiling, and visibility entries in the weather forecast log.

The NWS provides several types of reports: SA (Surface Observations), FT (Terminal Forecasts), and SW (Selected Weather Warnings). Included in the SW reports are AWW (Severe Weather Forecast Alerts) and WST (Convection Segments). An attempt will be made to have the weather data updated when special bulletins are issued. This arrangement demands upon the session level interface currently being defined with the Center Weather Service Unit.

2.4.5 Remote Terminal.

The remote terminal for the RCMS can support program development throughout the RCMS effort. A software programmer can develop and test an application program before introducing it into the operational environment.

TABLE 5. DESCRIPTION OF WEATHER DATA

<u>SOURCE OF DATA</u>	<u>DEFINITION OF WEATHER DATA</u>	<u>MODE OF OPERATION</u>
WX Panel (from CAB)	Ceiling and Visibility	Current
WX Planning Log (from AT & CAB)	Planning Ceiling, Visibility, and Wind	Planning
WX Forecast Log (from AT & CAB)	Forecast Ceiling, Visibility and Wind	Forecast
<u>3270 PC Interface</u> (Automated Inputs from Field Equipment)		
LLWAS	Center Field Wind	Current
Field Ceilometer	Computer Ceilometer Reading	Current
RVR	Runway Visual Range Reading	Current
DASE	Digital Altimeter Reading	Current
<u>NWS Interface via CWSU</u> (Computerized Weather Reports)		
SA Reports	ORD - Surface Weather Report	Current
FT Reports	ORD - Terminal Forecast	Forecast
SA Reports	Nearby Airports Weather Report	Current
FT Reports	Nearby Airports Forecast	Forecast
AWW Reports	Severe Weather Forecast Alerts	Forecast
WST Reports	Convection Segments	Current

TABLE 6. RCMS APPLICATION OF WEATHER DATA

<u>APPLICATION</u>	<u>MODE OF OPERATION</u>	<u>SOURCE OF DATA</u>
Current Configuration Eligibility	Current	CAB Ceiling and Visibility
Planned/Forecast Configuration Eligibility	Planning /Forecast	CAB Ceiling and Visibility modified by weather planning/forecast log
Wind Comment for Eligible Configurations	Current	LLWAS Center Field Wind resulting in excessive crosswinds and tailwinds for a runway in the configuration
Wind Comment for Eligible Configurations	Planning /Forecast	LLWAS Center Field Wind modified by weather planning/forecast log, resulting in excessive crosswinds or tailwinds for a runway in the configuration
Weather Information for RCMS Panels	Current	NWS computerized weather reports for ORD and nearby airports
Triggered Advisories	Current	3270 PC equipment by RCMS generated readings reaching preset trigger values for wind, ceiling, RVR, crosswind, tailwind -- or -- any change in CAB ceiling or visibility
Weather Planning Log	Planning	Manual entry
Weather Forecast Log	Forecast	Manual entry or automatic entry of planned weather and ORD FT reports

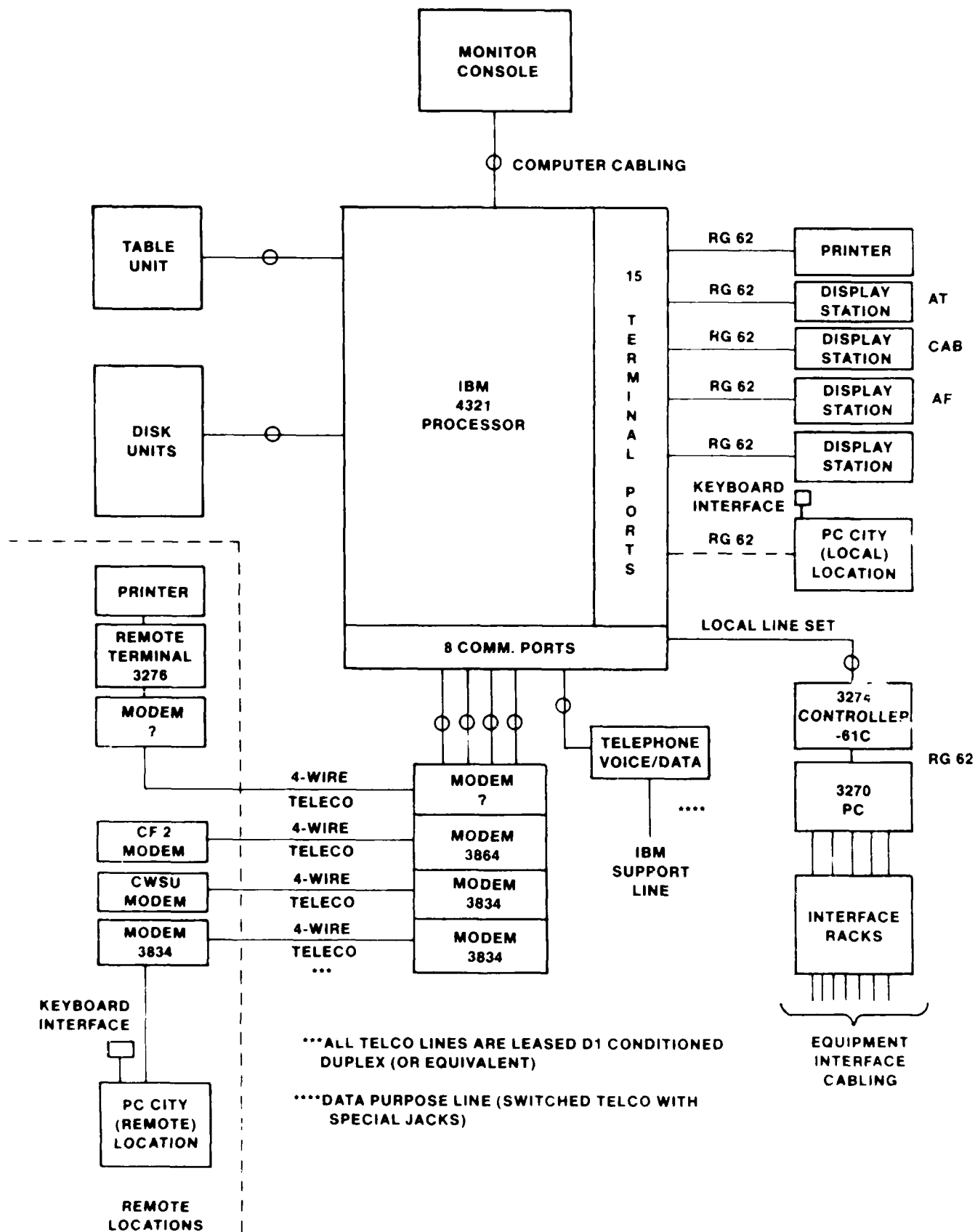


FIGURE 1. RUNWAY CONFIGURATION MANAGEMENT SYSTEM HARDWARE

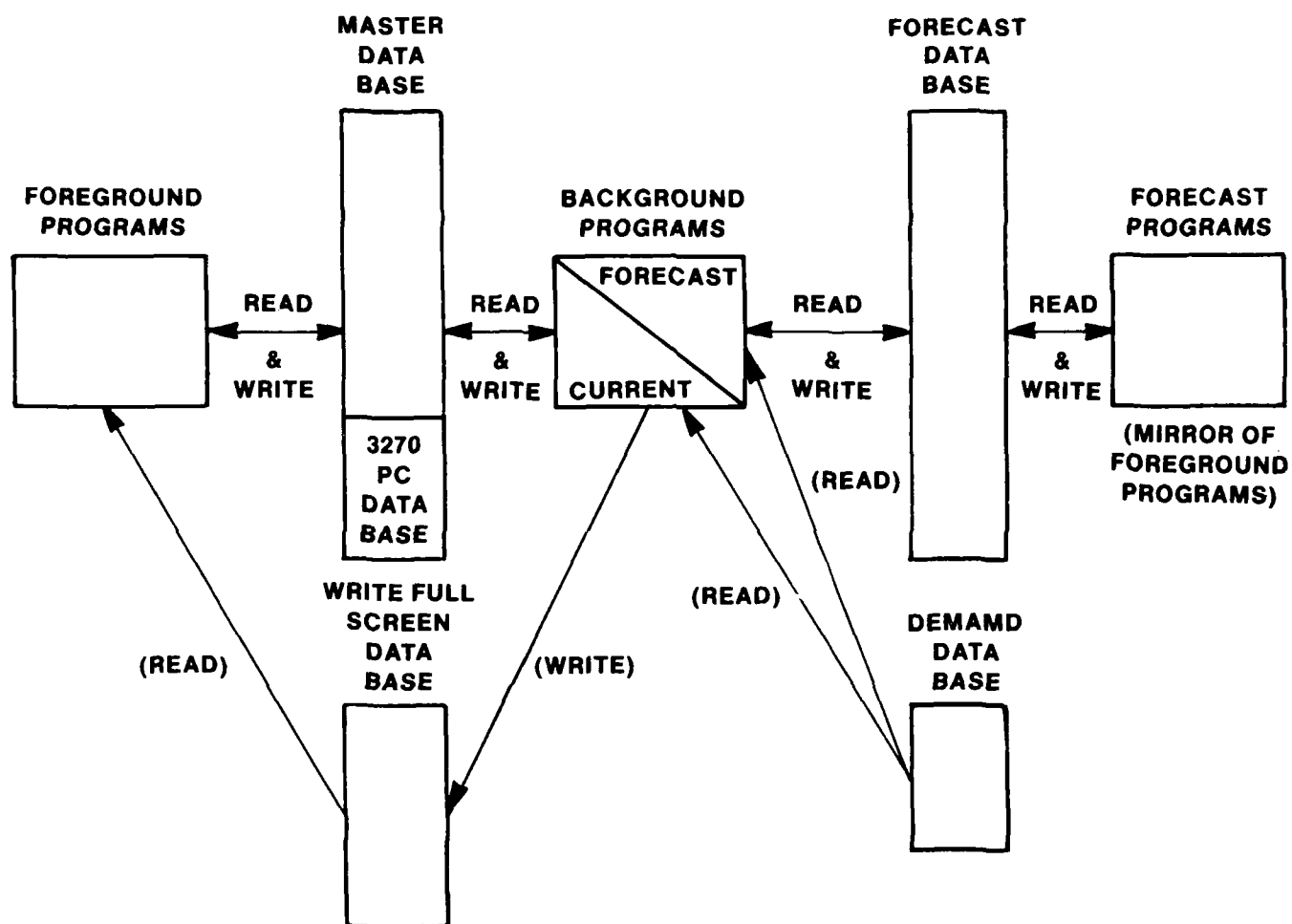


FIGURE 2. RELATIONSHIP OF DATA BASES TO SOFTWARE PROGRAMS

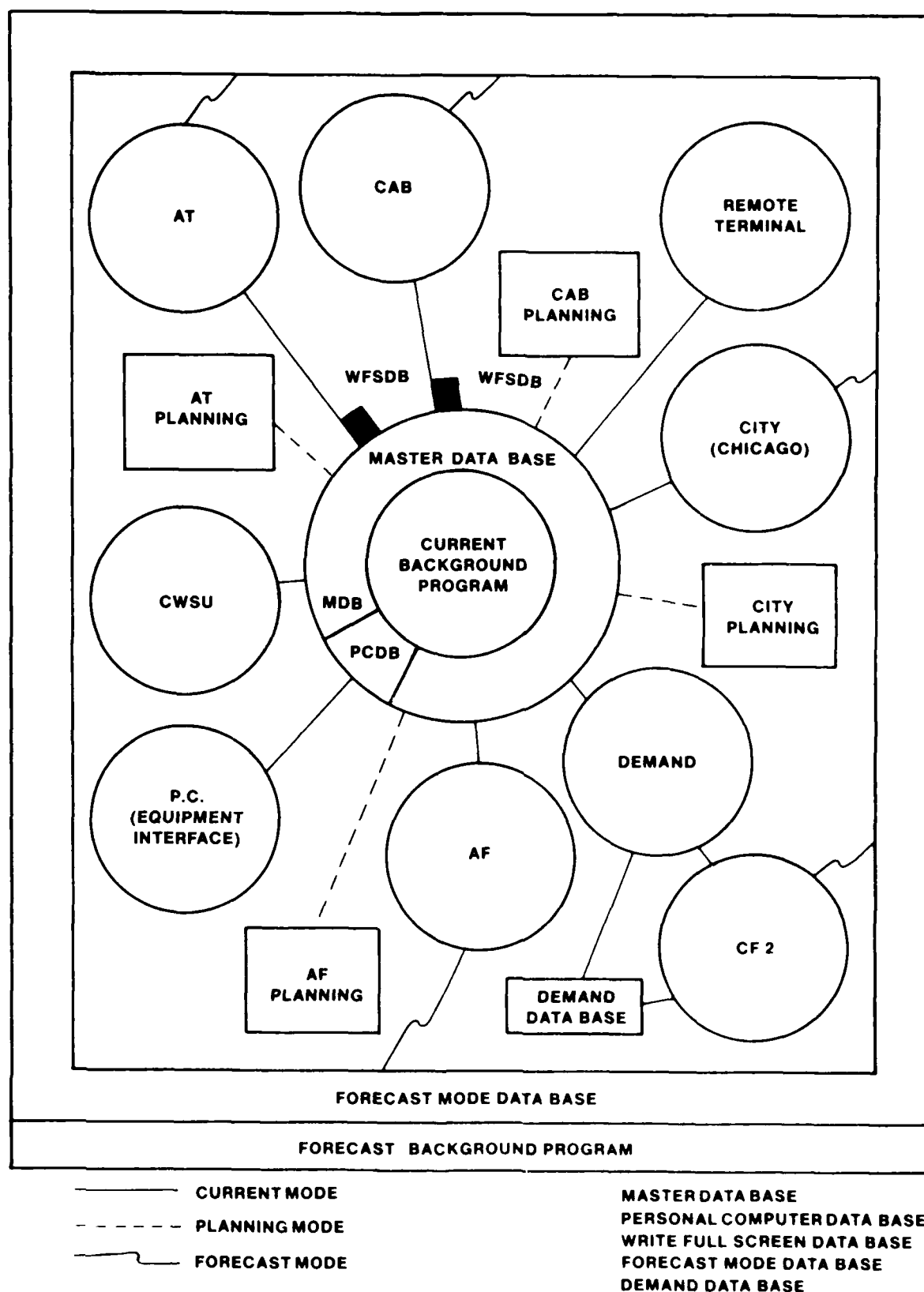


FIGURE 3. RELATIONSHIP OF DATA BASES TO MODES OF OPERATION

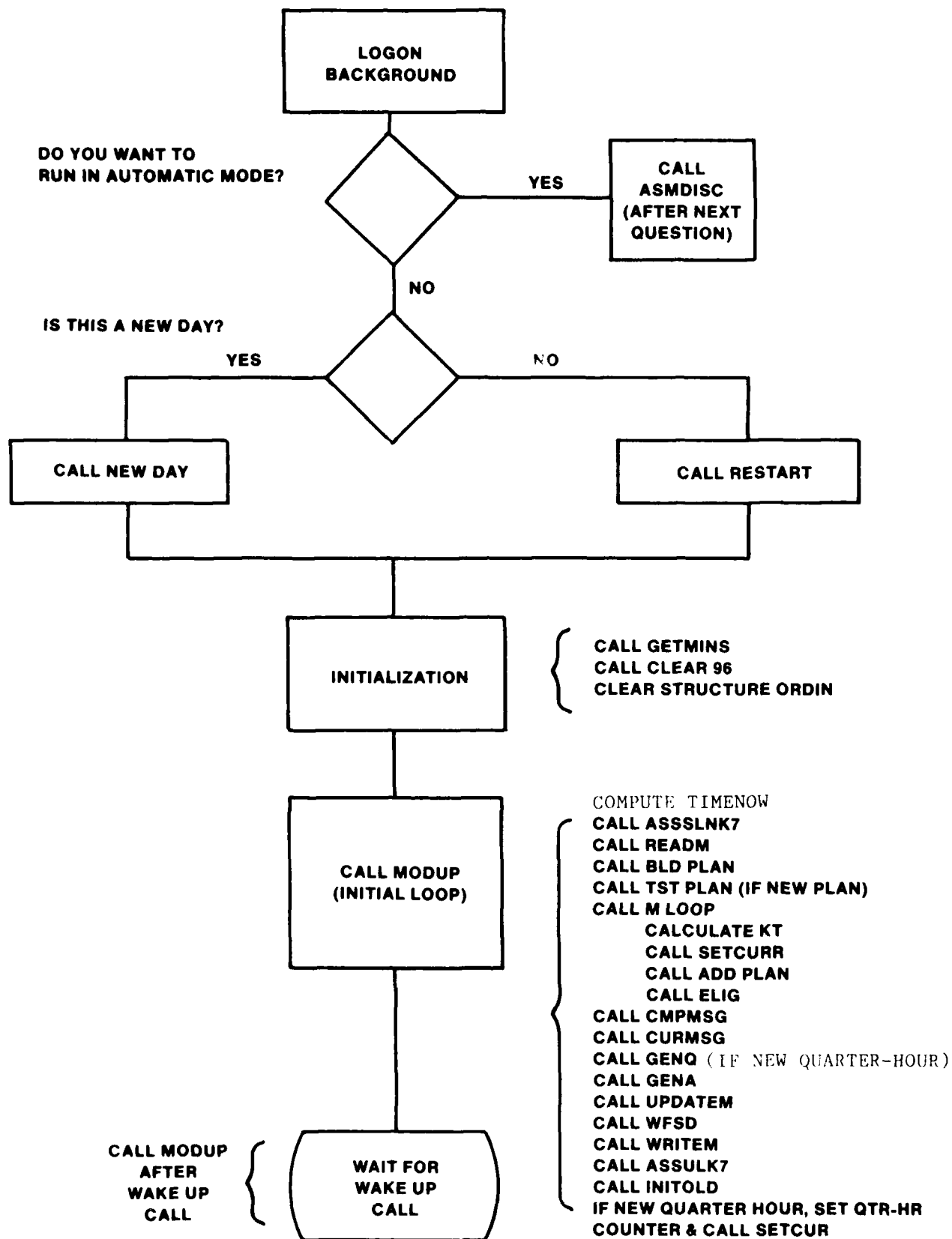


FIGURE 4. CURRENT BACKGROUND PROGRAM FLOWCHART

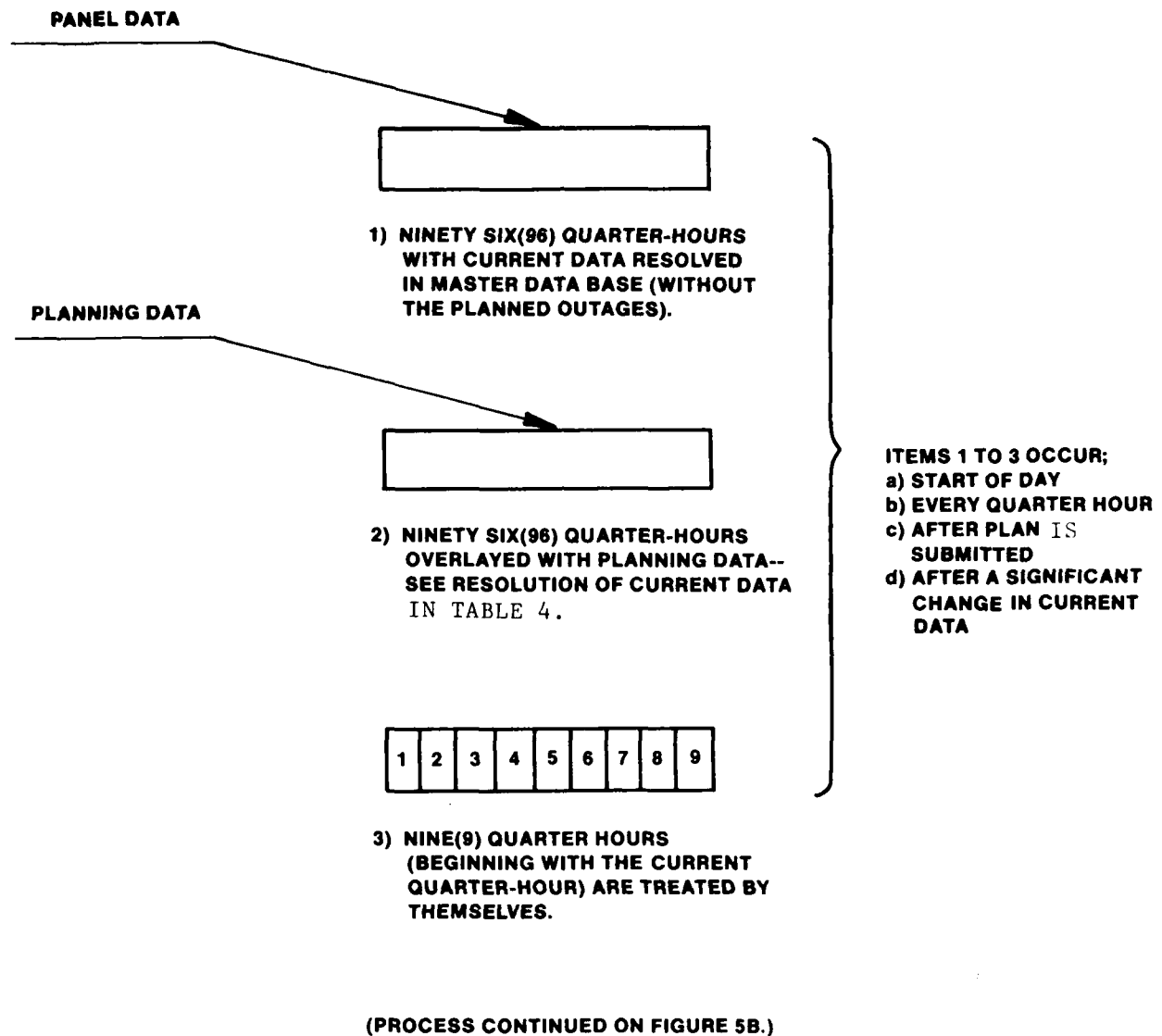


FIGURE 5A. QUARTER-HOUR PROCESSING (1 of 2 Sheets)

**FOR CURRENT MODE
NINE (9) QUARTER-HOURS**

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

- 4) A "DO LOOP" EXAMINES CONFIGURATION ELIGIBILITY FOR THE 9 QUARTER-HOURS
- 5) AN INELIGIBLE SELECTED CONFIGURATION IN THE 9 QUARTER-HOURS GENERATES ALERT(S) -- PROBLEM(S) SHOULD BE RESOLVED USING THE APPROPRIATE CONFIGURATION PANEL(S)

**ITEMS 4 & 5
EVERY CURRENT
UPDATE**

-OR-

**FOR PLANNING MODE
NINE (9) QUARTER-HOURS**

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

- 6) A "DO LOOP" EXAMINES CONFIGURATION ELIGIBILITY FOR THE 9 QUARTER-HOURS
- 7) AN INELIGIBLE SELECTED CONFIGURATION IN THE 9 QUARTER-HOURS CAUSES THE SUBMITTED PLAN(S) TO BE REJECTED. PREVIOUSLY ACCEPTED PLANS ARE RETAINED.

**ITEMS 6 & 7
OCCUR WHEN A PLAN
IS SUBMITTED**

FIGURE 5B. QUARTER-HOUR PROCESSING (2 of 2 Sheets)

PRIMARY CALLING SEQUENCE OF THE FOREGROUND PROGRAM
FOR USER AT

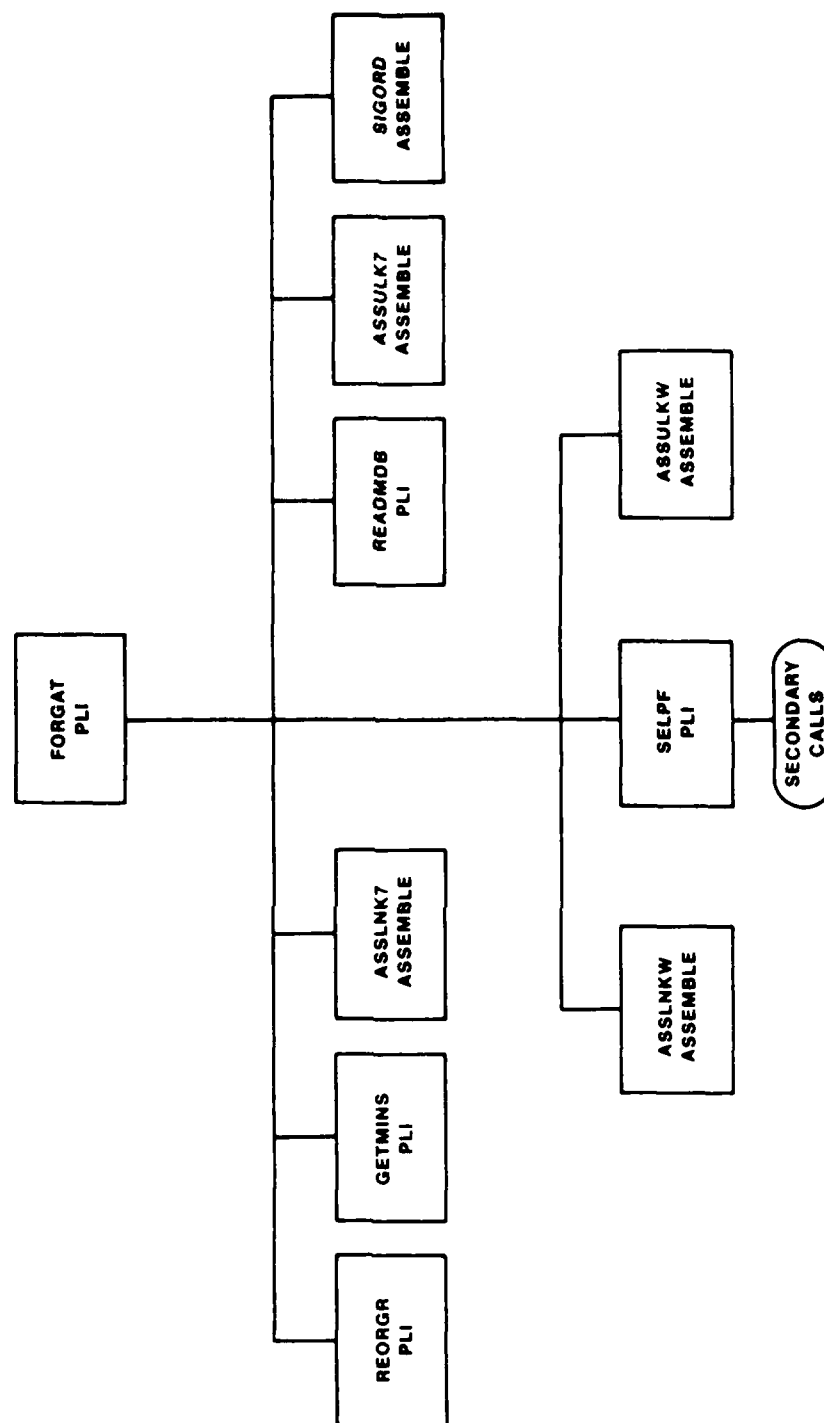
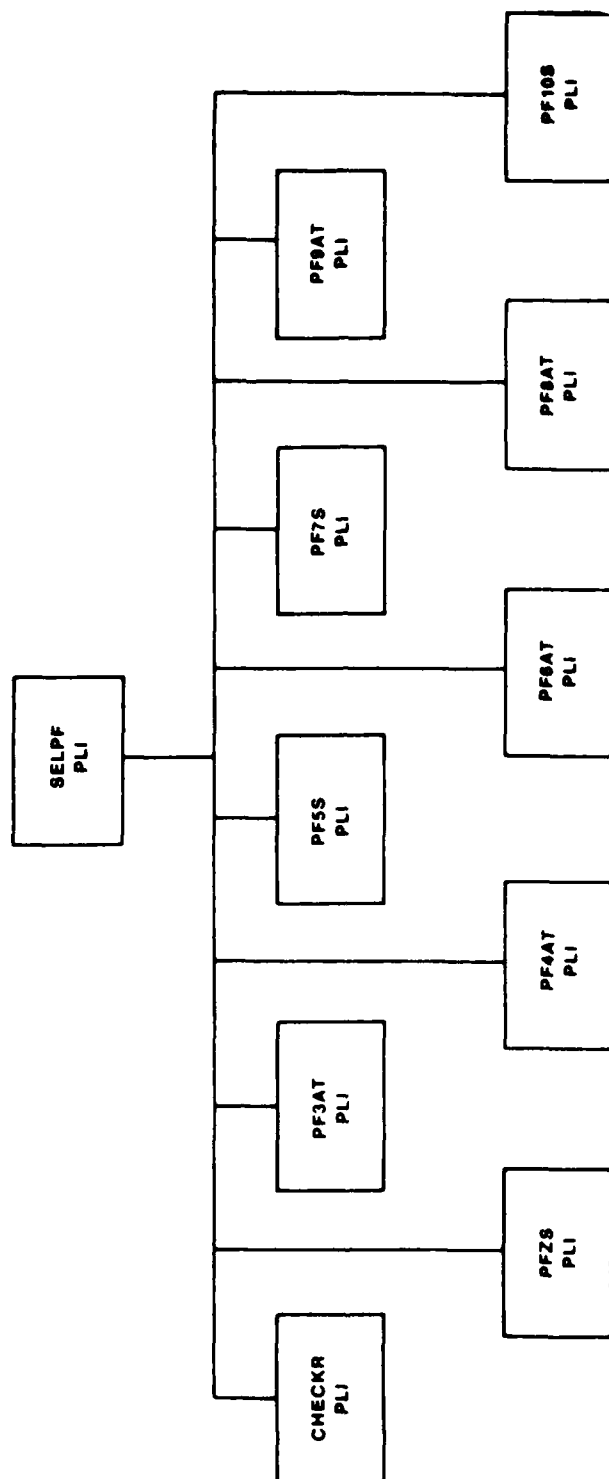


FIGURE 6. FOREGROUND PROGRAM FLOWCHART (1 of 2 Sheets)

SECONDARY CALLING SEQUENCE OF THE FOREGROUND PROGRAM
FOR USER AT



B

FIGURE 6. FOREGROUND PROGRAM FLOWCHART (2 of 2 Sheets)

```

*****
**
** CONFIG.      TIME ARRIVAL      DEPARTURES      TOTAL   ARR   DEP
** CURRENT 0920 14R 22R      9L 22L 27L      217    67   150
** PLANNED
**
**----- ( AT USER ) ----- ( NOTE PAD ) -----
** MINMA CEIL VIS/RVR      MINMA CEIL VIS/RVR      SPECIAL MEETING AT 14:30 TO
** 14R      200      2400      22R      200      3/4      DISCUSS RCMS
**
**-----
** 1200 X 220 35
**
**----- ACT -----
**
** TIME      TOTAL KUBBS CGT PLANO FARM      TOTAL NORTH EAST SOUTH WEST
** 1200      25      3      1      1      20      25      5      5      10      5
** 1215      25      3      1      1      20      25      5      5      10      5
**
** MESSAGES----- ( 09:20:39 ) -----
** 9L CA/CD/LOC/S/B
** 14R OM/MM/IM
** 22R CA/CD/ALS
** 22L CA/S
**
** /PF1 MASTER AUTO /PF2 MASTER /PF3 CONFIG /PF4 MSG /PF5 DEMAND /PF6 WX
** /PF7 RWY COND /PF8 EQUIP /PF9 TRIG /PF10 FORECAST /PF11 CLEAR
** HIT ENTER TO SCROLL MESSAGES ONE BY ONE
**
*****

```

FIGURE 7. PF-1 MASTER AUTO PANEL


```

*****
* PF6 -- WEATHER PANEL 1554 GMT
*
* CURRENT WEATHER-----
* TIME | SKY | CEILING | VISIBILITY | ATMOSPHERICS |
* 1200 | X | | | |
* BAR PRESSURE | TEMP | DEW | WIND | ALT SETTING | OTHER
* 220 | 35 | | | |
* 1200 X 220 35
* FORECAST WEATHER-----
* TIME | SKY | CEILING | VISIBILITY | ATMOSPHERICS |
* BAR PRESSURE | TEMP | DEW | WIND | ALT SETTING | OTHER
*
* CAB VISIBILITY >7 -----CAB CEILING >4500 -----
* >7 1-7/8 1 1/4 | RVR READINGS | PLANNED WEATHER CHANGE
* 4 1-3/4 7/8 3/16 | 9R | 1)
* 3 1-5/8 3/4 1/8 | 14R | 2)
* 2-3/4 1-1/2 5/8 1/16 | 14L | 3)
* 2-1/2 1-3/8 1/2 | 27R | 0'HARE DASE
* 2-1/4 1-1/4 3/8 | 32R | MIDWAY DASE
* 2 1-1/8 5/16 | |
* /PF1 MASTER AUTO/PF2 MASTER/PF3 CONFIG/PF4 MSG/PF5 DEMAND/PF6 AREA WX/PF7 RWY
* /PF8 EQUIP/PF9 TRIG/PF10 FORECAST/PF11 RECALL/PF12 ENTER/PA2 PRINT
* SCREEN UPDATED BY AT 1052 GMT
*****

```

FIGURE 15. PF-6 WEATHER PANEL


```

*****
* PF7 -- RUNWAY CONDITIONS PANEL 1400 GMT
* PAVEMENT AND SAFETY REMARKS
*
* RY * BOTH ARR DEP SURFACE BRAKING
*
* 4R | | | | |
* 4L | | | | |
* 9R | | | | |
* 9L | 0 | 0 | 0 | SNOW | POOR |
* 14R | | | | |
* 14L | | | | |
* 22R | | | | |
* 22L | 0 | | | ICE |
* 27R | | | | |
* 27L | | | | |
* 32R | | | | |
* 32L | | | | |
* ALL | | | | |
* SCROLL 3 LINES
* 9L CA OTS FROM 1345
* 9L CD OTS FROM 1345
*
* /PF1 MASTER AUTO/PF2 MASTER/PF3 CONFIG/PF4 MSG/PF5 DEMAND/PF6 WX/PF7 RWY COND
* /PF8 EQUIP/PF9 TAXIWAY/PF10 FORECAST/PF11 RECALL/PF12 ENTER/PA2 PRINT
* SCREEN UPDATED BY AT 0837 GMT
*****

```

FIGURE 17. PF-7 RUNWAY CONDITIONS PANEL


```

*****
PF10 ---- FORECAST CONTROL PANEL
*****
DO FORECAST MODE ( MON )
*****
USE SAVED FORECAST
FILE FROM
*****
(USE AN X TO SELECT
OPTIONS)
*****
MON
X TUE
WED
THU
FRI
SAT
SUN
*****
FORECAST
CO-PARTICIPANTS
. AT
. CAB
. AF
X CITY
X CF2
. REMOTE
*****
0934 GMT
EXIT CHOICES
. SUBMIT CONFIG
. SUBMIT PLANS
. SUBMIT WX PLAN
. SUBMIT RWY PLAN
. SUBMIT EQUIP PLAN
. FORCE SELECTIONS
*****
SCROLL 6 LINES |
CONFIG SUMMARY -- SELECT START TIME 0900
START | ELIG |
TIME | STATUS | ARRIVALS |
0900 | | 14R 22R |
1030 | | 14R 22R |
2200 | | 4R 9R 9L |
*****
DEPARTURES
9L 22L 27L
22L 27L
32R 32L
*****
HOURLY CAP PEAK DMD/CAP
| TOT ARR DEP | TOT ARR DEP
| 217 67 150 |
| 181 68 113 |
| 162 104 58 |
*****
/ PF1 MASTER AUTO/ PF2 STATUS/ PF3 CNFG/ PF4 WHAT IF/ PF5 DEMAND/ PF6 P-WX/ PF7 P-RWY
/ PF8 P-EQUIP/ PF10 NEW PARTNER/ PF11 END/ PF12 ENTER/ PA2 PRINT
*****

```

FIGURE 24. PF-10 FORECAST CONTROL PANEL.

***** FORECAST PF5 -- DEMAND PANEL 1200 GMT *****											
***** ARRIVALS X/Y/Z X= TOTAL Y=HEAVY Z= LIGHT DEPARTURES *****											
TIME	TOTAL	KURBS	CGT	FLAND	FARM	TOTAL	N	E	S	W	
1200	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1215	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1230	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1245	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	

1200 1300	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	

1300	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1315	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1330	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	
1345	25	3/1/1	1/ /1	1	20/10/10	25	5	5	10	5	

1300 1400	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	

1400	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	
1500	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	
1600	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	
1700	100	12/4/4	4/ /4	4	80/40/40	100	20	20	40	20	
***** /PF1 MASTER AUTO/PF2 STATUS/PF3 CNFG/PF4 WHAT IF/PF5 DEMAND/PF6 F-WX/PF7 F-RWY *****											
***** /PF8 P-EQUIP/PF10 FORECAST/NO RECALL/NO ENTER/PA2 PRINT *****											
***** SCREEN UPDATED BY CF 1200 GMT *****											

FIGURE 27. FORECAST DEMAND PANEL (PF-5)

*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									
*****										*****									

EQUIPMENT STATUS AND READINGS															1105 GMT	
RWY	I	LOC	I	GS	I	LOM	IMM	I	ALS	F	DME	RVR	TD/H/D	RVR	I	HRL
4R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
4L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
9R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
9L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
14R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
14L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
22R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
22L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
27R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
27L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
32R	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
32L	1	11100110	1	1110011	1	1	1	1	1	1	1	1	1	1	1	1
IMDUGAT																
111S	1	WIND 359	5	114R R-MID/H/D/	2400	1	1	114R CATII	1							
110C	1	GUCT 10		114R R-MID/RVR	1			114R CATIII	1							
114R	1	DMF		114L R-MID/H/D/	2400	1	1	1 4R GS UPS	1							
131L	1	MIDFIELD	1	114L R-MID/RVR	1			114R ENG	0							
129L	1	VGP	1	114R CATII/CATIII	1111001000	1111001000	114L ENG	0								
113R	1	BASE-DEP	2990	114L CATII/CATIII	1111001000	114L ENG	0									
1 4R	1	BASE-MID	2990	ICEIL1 18S				1ASR-7 ENG	0							
				ICEIL2 17S												

FIGURE 31. EQUIPMENT STATUS AND READING PANEL

APPENDIX A
RCMS LIBRARY

LIBPDS

```

DCL 1 FELIG(96) LIKE ELTABLE STATIC EXTERNAL, /*FPF3-ELIG INFO-9-11-86*/ MAS00220
/ /
DCL 1 FORECAST STATIC EXTERNAL, /*FORECAST INFO -- 9-11-86*/ MAS00240
2 STARTQH FIXED BIN(15), /*START QTR HR*/ MAS00250
2 MSG CHAR(79); MAS00260
/ /
DCL 1 FSURF LIKE SURF STATIC EXTERNAL, /*FPF7-SURF INFO-9-16-86*/ MAS00220
/ /
DCL 1 FRWYEQP LIKE RWYEQP STATIC EXTERNAL, /*FPF8-REQP INFO-9-16-86*/ MAS00230
/ /
DCL 1 CABVIS, /*CAB VISIBILITIES -- 7-28-86*/ CAB00010
2 DISPLAY(25) CHAR(6) INIT CAB00020
( ' 7' ' 4' ' 3' ' 2-3/4' ' 2-1/2' ' 2-1/4' CAB00030
' 2' ' 1-7/8' ' 1-3/4' ' 1-5/8' ' 1-1/2' ' 1-3/8' CAB00040
' 1-1/4' ' 1-1/8' ' 1' ' 7/8' ' 3/4' ' 5/8' CAB00050
' 1/2' ' 3/8' ' 5/16' ' 1/4' ' 3/16' ' 1/8' CAB00060
' 1/16' CAB00070
2 VALUE(25) BIN FLOAT(21) INIT CAB00080
( 36961., 21120., 15840., 14520., 13200., 11880., CAB00090
10560., 9900., 9240., 8580., 7920., 7260., CAB00100
6600., 5940., 5280., 4620., 3960., 3300., CAB00110
2640., 1980., 1650., 1320., 990., 660., CAB00120
330.) CAB00130
/ /
DCL MAXCNFG FIXED BIN(15) INIT(62), /*MAX # CONFIG IN CNFGRQ--7-14-86*/ JUN00010
/ /
DCL RWYNAME(12) CHAR(3) /*RUNWAY NAMES -- 7-14-86*/ JUN00030
INIT ( ' 4R', ' 4L', ' 9R', ' 9L', ' 14R', ' 14L', JUN00040
' 22R', ' 22L', ' 27R', ' 27L', ' 32R', ' 32L' ); JUN00050
/ /
DCL 1 RWYMIN (12) STATIC EXTERNAL, /*ARR MINS--10-85*/ RWY00010
2 CATIII, \ /* CAT III */ RWY00020
3 NONE, /* NONE OTS */ RWY00030
4 CEIL BIN FLOAT (21), RWY00040
4 VIS BIN FLOAT (21), RWY00050
2 CATII, /* CAT II */ RWY00060
3 NONE, /* NONE OTS */ RWY00070
4 CEIL BIN FLOAT (21), RWY00080
4 VIS BIN FLOAT (21), RWY00090
3 RVRMID, /* RVR MIDPOINT OTS */ RWY00100
4 CEIL BIN FLOAT (21), RWY00110
4 VIS BIN FLOAT (21), RWY00120
3 RVRMR, \ /* RVR MIDPOINT & RVR ROLLOUT OTS */ RWY00130
4 CEIL BIN FLOAT (21), RWY00140
4 VIS BIN FLOAT (21), RWY00150
3 IMI, /* INNER MARKER 1 OTS */ RWY00160

```

4	CEIL	BIN FLOAT (21),	RWY00180
4	VIS	BIN FLOAT (21),	RWY00190
3	IM2,	/* INNER MARKER 2 OTS */	RWY00200
4	CEIL	BIN FLOAT (21),	RWY00210
4	VIS	BIN FLOAT (21),	RWY00220
			RWY00230
2	CATI,	/* CAT I */	RWY00240
3	NONE,	/* NONE OTS */	RWY00250
4	CEIL	BIN FLOAT (21),	RWY00260
4	VIS	BIN FLOAT (21),	RWY00270
3	GS,	/* GLIDE SLOPE OTS */	RWY00280
4	CEIL	BIN FLOAT (21),	RWY00290
4	VIS	BIN FLOAT (21),	RWY00300
3	TDZL,	/* TOUCHDOWN ZONE LIGHTS OTS */	RWY00310
4	CEIL	BIN FLOAT (21),	RWY00320
4	VIS	BIN FLOAT (21),	RWY00330
3	RCLS,	/* RWY CENTERLINE LIGHTS OTS */	RWY00340
4	CEIL	BIN FLOAT (21),	RWY00350
4	VIS	BIN FLOAT (21),	RWY00360
3	ALS,	/* ALS OTS */	RWY00370
4	CEIL	BIN FLOAT (21),	RWY00380
4	VIS	BIN FLOAT (21),	RWY00390
3	FLASHER,	/* FLASHERS OTS */	RWY00400
4	CEIL	BIN FLOAT (21),	RWY00410
4	VIS	BIN FLOAT (21),	RWY00420
3	OM,	/* OUTER MARKER OTS */	RWY00430
4	CEIL	BIN FLOAT (21),	RWY00440
4	VIS	BIN FLOAT (21),	RWY00450
3	MM,	/* MIDDLE MARKER OTS */	RWY00460
4	CEIL	BIN FLOAT (21),	RWY00470
4	VIS	BIN FLOAT (21),	RWY00480
3	RVRTD,	/* RVR TOUCHDOWN OTS */	RWY00490
4	CEIL	BIN FLOAT (21),	RWY00500
4	VIS	BIN FLOAT (21),	RWY00510
			RWY00520
2	LOC,	/* LOCALIZER */	RWY00530
3	NONE,	/* NONE OTS */	RWY00540
4	CEIL	BIN FLOAT (21),	RWY00550
4	VIS	BIN FLOAT (21),	RWY00560
3	ALS,	/* LOCALIZER & ALS OTS */	RWY00570
4	CEIL	BIN FLOAT (21),	RWY00580
4	VIS	BIN FLOAT (21),	RWY00590
			RWY00600
2	VOR,	/* VOR */	RWY00610
3	NONE,	/* NONE OTS */	RWY00620
4	CEIL	BIN FLOAT (21),	RWY00630
4	VIS	BIN FLOAT (21),	RWY00640
3	ALS,	/* VOR & ALS OTS */	RWY00650
4	CEIL	BIN FLOAT (21),	RWY00660
4	VIS	BIN FLOAT (21),	RWY00670
3	FLASHER,	/* VOR & FLASHER OTS */	RWY00680
4	CEIL	BIN FLOAT (21),	RWY00690
4	VIS	BIN FLOAT (21),	RWY00700
			RWY00710
2	NDB,	/* NON-DIRECTIONAL BEACON */	RWY00720

```

3 NONE,                                     /* NONE OTS */RWY00730
4 CEIL      BIN FLOAT (21),                RWY00740
4 VIS       BIN FLOAT (21),                RWY00750
3 RAIL,                                     /* RAIL OTS */RWY00760
4 CEIL      BIN FLOAT (21),                RWY00770
4 VIS       BIN FLOAT (21),                RWY00780
3 ALS,                                     /* ALS OTS */RWY00790
4 CEIL      BIN FLOAT (21),                RWY00800
4 VIS       BIN FLOAT (21),                RWY00810
3 RAD_DME,  /* RADAR DME OTS */RWY00820
4 CEIL      BIN FLOAT (21),                RWY00830
4 VIS       BIN FLOAT (21),                RWY00840
/ /
MOD00280
/* BLANK=NO PLAN, 'TEST'=PLAN IN TEST, 'PLAN'=PREVIOUSLY ACCEPTED PLN*/MOD00290
/* OR PLAN FORCED BY USER */
DCL 1 PSTATUS      STATIC EXTERNAL,        /*7-14-86*/MOD00300
2 ANYPLAN          CHAR(4),                MOD00310
2 CFLOG            CHAR(4),                MOD00320
2 WXLOG            CHAR(4),                MOD00320
2 CLSLOG           CHAR(4),                MOD00330
2 EQPLOG           CHAR(4),                MOD00340
/ /
DCL 1 PLAN (96)    STATIC EXTERNAL, /*PLANNED FLAGS -- 8-01-86*/PLA00010
2 WX,              PLA00020
3 DIR              BIN FLOAT(21),          PLA00030
3 SPD              BIN FLOAT(21),          PLA00040
3 CEIL             BIN FLOAT(21),          PLA00050
3 VIS              BIN FLOAT(21),          PLA00060
2 RUNWAY(12),      PLA00070
3 TWRCLAS,         PLA00080
4 ARR              CHAR(1),                PLA00090
4 DEP              CHAR(1),                PLA00100
3 SURF             CHAR(5),                PLA00110
3 BRAK             CHAR(5),                PLA00120
3 LOC              CHAR(1),                PLA00130
3 GS               CHAR(1),                PLA00140
3 COM              CHAR(1),                PLA00150
3 OM               CHAR(1),                PLA00160
3 MM               CHAR(1),                PLA00170
3 IN               CHAR(1),                PLA00180
3 ALS              CHAR(1),                PLA00190
3 FLASHER          CHAR(1),                PLA00200
3 DME              CHAR(1),                PLA00210
3 RVR              CHAR(1),                PLA00220
3 RVRMID           CHAR(1), /* TOUCHDOWN RVR */PLA00230
3 RVRROLL          CHAR(1), /*INDIVIDUAL RVR -- MID POINT */PLA00240
3 HIRL             CHAR(1), /*INDIVIDUAL RVR -- ROLL OUT */PLA00250
3 CL               CHAR(1),                PLA00260
3 TDZ              CHAR(1),                PLA00270
/ /
APT00010
DCL 1 APTSTAT(96) STATIC EXTERNAL, /*AIRPORT STATUS -- 7-09-86*/APT00020
2 ACTUAL,          APT00030

```

```

      3 DIR      BIN FLOAT(21),      APT00040
      3 SPD      BIN FLOAT(21),      APT00050
      3 CEIL     BIN FLOAT(21),      APT00060
      3 VIS      BIN FLOAT(21),      APT00070
2 RUNWAY(12),      APT00080
  3 TWRCLOS,      APT00090
    4 ARR        CHAR(1),            APT00100
    4 DEP        CHAR(1),            APT00110
  3 SURF        CHAR(5),            APT00120
  3 BRAK        CHAR(5),            APT00130
/ /

DCL 1 PEQUIP(96) STATIC,EXTERNAL, /*EQUIPMENT STATUS -- 7-03-86*/ MAS00500
2 RUNWAY(12),      MAS00510
  3 CATII        CHAR(1), /*Y=IN SER,N=NOT AVAIL,' '=AVAILABLE*/ MAS00520
  3 CATIII       CHAR(1), /*Y=IN SER,N=NOT AVAIL,' '=AVAILABLE*/ MAS00530
  3 LOC          CHAR(1),      MAS00540
  3 GS           CHAR(1),      MAS00550
  3 COM          CHAR(1),      MAS00560
  3 OM           CHAR(1),      MAS00570
  3 MM           CHAR(1),      MAS00580
  3 IM           CHAR(1),      MAS00590
  3 ALS          CHAR(1),      MAS00600
  3 FLASHER      CHAR(1),      MAS00610
  3 DME          CHAR(1),      MAS00620
  3 RVR          CHAR(1),      MAS00630
  3 RVRMID       CHAR(1), /* INDIVIDUAL RVR -- MID POINT */ MAS00640
  3 RVRROLL      CHAR(1), /* INDIVIDUAL RVR -- ROLL OUT */ MAS00650
  3 HIRL         CHAR(1),      MAS00660
  3 CL           CHAR(1),      MAS00670
  3 TDZ          CHAR(1),      MAS00680
  3 CONVERT,     MAS00690
    4 CEILMIN    BIN FLOAT(21), MAS00700
    4 VISMIN     BIN FLOAT(21), MAS00710
2 VOR            CHAR(1),      MAS00720
2 MID_DME        CHAR(1),      MAS00730
2 UPS(3)         CHAR(1),      MAS00740
2 ENG(3)         CHAR(1),      MAS00750
/ /

DCL 1 STATUS CONNECTED, /*AIRPORT STATUS -- LIKE APTSTAT -- 7-09-86*/ STA00010
2 ACTUAL,      STA00020
  3 DIR      BIN FLOAT(21),      STA00030
  3 SPD      BIN FLOAT(21),      STA00040
  3 CEIL     BIN FLOAT(21),      STA00050
  3 VIS      BIN FLOAT(21),      STA00060
2 RUNWAY(12),      STA00070
  3 TWRCLOS,      STA00080
    4 ARR        CHAR(1),            STA00090
    4 DEP        CHAR(1),            STA00100
  3 SURF        CHAR(5),            STA00110
  3 BRAK        CHAR(5),            STA00120
/ /

DCL 1 EQUIP CONNECTED, /*EQUIPMENT STATUS -- LIKE PEQUIP-- 7-03-86*/ EQU00010

```

```

2 RUNWAY(12), EQU00030
3 CATII CHAR(1), /*Y=IN SER,N=NOT AVAIL., '=-AVAILABLE=/EQU00040
3 CATIII CHAR(1), /*Y=IN SER,N=NOT AVAIL., '=-AVAILABIE=/EQU00050
3 LOC CHAR(1), EQU00060
3 GS CHAR(1), EQU00070
3 COM CHAR(1), EQU00080
3 OM CHAR(1), EQU00090
3 MM CHAR(1), EQU00100
3 IM CHAR(1), EQU00110
3 ALS CHAR(1), EQU00120
3 FLASHER CHAR(1), EQU00130
3 DME CHAR(1), EQU00140
3 RVR CHAR(1), /* TOUCHDOWN RVR */EQU00150
3 RVRMID CHAR(1), /*INDIVIDUAL RVR -- MID POINT */EQU00160
3 RVRROLL CHAR(1), /*INDIVIDUAL RVR -- ROLL OUT */EQU00170
3 HIRL CHAR(1), EQU00180
3 CL CHAR(1), EQU00190
3 TDZ CHAR(1), EQU00200
3 CONVERT, EQU00210
4 CEILMIN BIN FLOAT(21), EQU00220
4 VISMIN BIN FLOAT(21), EQU00230
2 VOR CHAR(1), EQU00240
2 MID_DME CHAR(1), EQU00250
2 UPS(3) CHAR(1), EQU00260
2 ENG(3) CHAR(1), EQU00270

```

```

DCL 1 CNFG CONNECTED, /*CONFIG INFO -- LIKE CONFIG(PF3) -- 7-14-86*/MAS02020
2 ACCTIME CHAR(4), /*ACCEPT TIME OF CONFIG CHANGE */MAS02040
2 CONFIND FIXED BIN(15), /*CONFIG NUM FOR QTR HR*/ MAS02050
2 FORCE CHAR(1), /*FORCED CONFIG CHANGE Y=YES,N=NO*/ MAS02060
2 REASON, /*'=-NO AND '=-YES*/ MAS02070
3 NOISE CHAR(1), MAS02080
3 RMAINT CHAR(1), MAS02090
3 STAFF CHAR(1), MAS02100
3 DEMAND CHAR(1), MAS02110
3 OTHER CHAR(1), MAS02120
2 MID_13R CHAR(1), /*MIDWAY FLAG -- 5-20-85*/ MAS02130

```

```

DCL 1 ELIGIB CONNECTED, /*ELIGIB INFO--LIKE ELTABLE(PF3) -- 7-14-86*/MAS02140
2 PW_TIME CHAR(4), /*'=-NO CHANGE, ELSE USE TIME*/ MAS02160
2 ELIG, MAS02170
3 CNT FIXED BIN(15), MAS02180
3 ID BIT(80), MAS02190
2 NOTELIG, MAS02200
3 WX BIT(80), MAS02210
3 RMYCLOS BIT(80), MAS02220
3 SRFBRK BIT(80), MAS02230
2 WINDCND BIT(80), MAS02240
2 RMYRMK(12) CHAR(26), MAS02250

```

```

DCL 1 MPANEL STATIC EXTERNAL, /*PF2 -- MASTER PANEL -- 7-03-86*/
2 NOTEPAD(3) CHAR(30), /*FOR USER GENERATED NOTES */

```

MAS01220
 MAS01230
 MAS01240 START OF
 MASTER DATA
 BASE

```

2 ACT_WX,          /*ACTUAL WEATHER -- FOR TRIGGERS*/      MAS01250
3 DIR              CHAR(3), /*VIA LLWAS*/              MAS01260
3 SPD              CHAR(2), /*VIA LLWAS*/              MAS01270
3 CEIL             CHAR(8), /*VIA CEILOMETER -- AAANNNNN*/  MAS01280
2 RWMMSG(12)       CHAR(79), /*COMPOSITE RMY MSG*/        MAS01290
2 MSG              CHAR(79), /*COMPOSITE RMY MSG*/        MAS01300
/*REST OF PF2 DATA IS TAKEN FROM OTHER PANELS*/          MAS01310
/*PF3 -- CONFIG, ELIGIB */                                MAS01320
/*PF5 -- DEMAND*/                                          MAS01330
/*PF6 -- WEATHER -- CURRENT, FORECAST*/                  MAS01340
/*PF8 -- MINIMA CEILING, VISIBILITY, RVR*/                MAS01350
/*NOTE -- WIND DIRECTION -- SCREEN PGMS CONVERT IT TO 2 CHAR*/ MAS01360
/ /

DCL 1 CONFIG(96) STATIC EXTERNAL, /*PF3 -- CONFIG INFO -- 7-03-86*/ MAS01430
2 ACCTIME          CHAR(4), /*ACCEPT TIME OF CONFIG CHANGE */ MAS01440
2 CONFIND          FIXED BIN(15), /*CONFIG NUM FOR QTR HR*/  MAS01450
2 FORCE             CHAR(1), /*FORCED CONFIG CHANGE Y=YES,N=NO*/ MAS01460
2 REASON,          /*' '=NO AND ' '=YES*/                  MAS01480
3 NOISE            CHAR(1), MAS01490
3 RMAINT           CHAR(1), MAS01500
3 STAFF            CHAR(1), MAS01510
3 DEMAND           CHAR(1), MAS01520
3 OTHER            CHAR(1), MAS01530
2 MID_13R          CHAR(1), /*MIDWAY FLAG -- 5-20-85*/      MAS01540
/ /

DCL 1 ELTABLE(9) STATIC EXTERNAL, /*PF3 -- ELIGIB INFO -- 7-03-86*/ MAS01550
2 PW_TIME          CHAR(4), /*' '=NO CHANGE, ELSE USE TIME*/ MAS01560
2 ELIG,            MAS01570
3 CNT              FIXED BIN(15), MAS01580
3 ID               BIT(80), MAS01590
2 NOTELIG,         MAS01600
3 WX               BIT(80), MAS01610
3 RMYCLOS          BIT(80), MAS01620
3 SRFBRK           BIT(80), MAS01630
2 WINDCND          BIT(80), MAS01640
2 RMYRNM(12)       CHAR(26), MAS01650
/ /

DCL 1 MESSAGE STATIC EXTERNAL, /*PF4 -- MESSAGE PANEL -- 5-18-85*/ MAS01670
2 AT_ADV,          MAS01680
3 COUNT            BIN FLOAT(21), MAS01690
3 TABLE(20) CHAR(79), MAS01700
2 CAB_ADV,         MAS01710
3 COUNT            BIN FLOAT(21), MAS01720
3 TABLE(20) CHAR(79), MAS01730
2 CURRENT,         MAS01740
3 COUNT            BIN FLOAT(21), MAS01750
3 TABLE(60) CHAR(79), MAS01760
2 MSG              CHAR(79), MAS01770
/ /

DCL 1 DEMAND STATIC EXTERNAL, /*PF5 -- DEMAND PANEL -- 7-03-86*/ MAS01790
2 TABLE(14),      MAS01800
/ /

```

```

3 TIME, MAS01820
4 START CHAR(4), MAS01830
4 END CHAR(4), MAS01840
3 ARR, MAS01850
4 TOTAL CHAR(3), MAS01860
4 KUBBS(3) CHAR(2), MAS01870
4 CGT(3) CHAR(2), MAS01880
4 PLANO(3) CHAR(2), MAS01890
4 FARM(3) CHAR(2), MAS01900
3 DEP, MAS01910
4 TOTAL CHAR(3), MAS01920
4 NORTH CHAR(2), MAS01930
4 EAST CHAR(2), MAS01940
4 SOUTH CHAR(2), MAS01950
4 WEST CHAR(2), MAS01960
2 MSG CHAR(79); MAS01970
/ /

DCL 1 WEATHER STATIC EXTERNAL, /*PF6 -- WEATHER PANEL -- 7-03-86*/ MAS01980
2 CURRENT, MAS01990
3 TIME CHAR(4), MAS02000
3 SKY CHAR(2), MAS02010
3 CEIL(3) CHAR(8), MAS02020
3 VIS CHAR(10), MAS02030
3 ATMOS CHAR(12), MAS02040
3 BAROM CHAR(3), MAS02050
3 TEMP CHAR(3), MAS02060
3 DEW CHAR(3), MAS02070
3 WIND, /*SCREEN PGM CONVERTS DIR TO 2 CHAR*/ MAS02080
4 DIR CHAR(3), MAS02090
4 SPD CHAR(2), MAS02100
3 ALTIM CHAR(4), MAS02110
3 OTHER CHAR(12), MAS02120
2 CWX CHAR(79), MAS02130
/*LIKE WEATHER.CURRENT*/ MAS02140
2 FORECAST, MAS02150
3 TIME CHAR(4), MAS02160
3 SKY CHAR(2), MAS02170
3 CEIL(3) CHAR(8), MAS02180
3 VIS CHAR(10), MAS02190
3 ATMOS CHAR(12), MAS02200
3 BAROM CHAR(3), MAS02210
3 TEMP CHAR(3), MAS02220
3 DEW CHAR(3), MAS02230
3 WIND, /*SCREEN PGM CONVERTS DIR TO 2 CHAR*/ MAS02240
4 DIR CHAR(3), MAS02250
4 SPD CHAR(2), MAS02260
3 ALTIM CHAR(4), MAS02270
3 OTHER CHAR(12), MAS02280
2 FWX CHAR(60), MAS02290
2 CAB, MAS02300
3 VIS CHAR(6), /*IN MILES*/ MAS02310
3 CEIL CHAR(5), MAS02320
2 PW_CHANGE(3), /*PLANNED WX CHANGE */ MAS02330
3 TIME CHAR(4), MAS02340
3 NAME CHAR(4), /*CEIL, VIS, WIND */ MAS02350

```

```

      3 VALUE      CHAR(6),      /*NOTE -- WIND SPD/DIR = 4 CHAR*/MAS02360
      2 MSG        CHAR(79),      MAS02370
/ /
                                     MAS02380
DCL 1 ADDWX STATIC EXTERNAL,      /*PF6 -- ADDED WX PANEL -- 7-03-86*/MAS02390
      2 RWY(12),      MAS02400
      3 RVR(3)      CHAR(4),      MAS02410
      2 DAS_ORD      CHAR(4),      MAS02420
      2 DAS_MID      CHAR(4),      MAS02430
      2 MSG          CHAR(79),      MAS02440
/ /
                                     MAS02450
DCL 1 SURF STATIC EXTERNAL,      /*PF7 -- RWY COND PANEL -- 7-03-86*/MAS02460
      2 RUNWAY(13),      /*RUNWAY(13) = ALL*/MAS02470
      3 ARR          CHAR(1),      MAS02480
      3 DEP          CHAR(1),      MAS02490
      3 SURF         CHAR(5),      MAS02500
      3 BRAK         CHAR(5),      MAS02510
      3 REMARKS      CHAR(40),      MAS02520
      2 SURFMSG(36) CHAR(79),      MAS02530
      2 MSG          CHAR(79),      MAS02540
/ /
                                     MAS02550
DCL 1 TAXIWAY STATIC EXTERNAL, /*PF78 -- TAXIWAY PANEL -- 7-03-86*/MAS02560
      2 ZONE(37),      MAS02570
      3 TWY          CHAR(20),      MAS02580
      3 SURF         CHAR(5),      MAS02590
      3 BRAK         CHAR(5),      MAS02600
      3 REMARKS      CHAR(36),      MAS02610
      2 NOTAM(25)    CHAR(49),      MAS02620
      2 MSG          CHAR(79),      MAS02630
/ /
                                     MAS02640
DCL 1 RWYEQP STATIC EXTERNAL, /*PF8 -- EQUIP PANEL -- 7-03-86*/MAS02650
      2 RUNWAY(12),      MAS02660
      3 CATII        CHAR(1),      /*Y=IN SER,N=NOT AVAIL,' '=AVAILABLE*/MAS02670
      3 CATIII       CHAR(1),      /*Y=IN SER,N=NOT AVAIL,' '=AVAILABLE*/MAS02680
      3 LOC          CHAR(1),      MAS02690
      3 GS           CHAR(1),      MAS02700
      3 COM          CHAR(1),      MAS02710
      3 OM           CHAR(1),      MAS02720
      3 MM           CHAR(1),      MAS02730
      3 IM           CHAR(1),      MAS02740
      3 ALS          CHAR(1),      MAS02750
      3 FLASHER      CHAR(1),      MAS02760
      3 DME          CHAR(1),      MAS02770
      3 RVR          CHAR(1),      /* TOUCHDOWN RVR */MAS02780
      3 RVRMID       CHAR(1),      /*INDIVIDUAL RVR -- MID POINT */MAS02790
      3 RVRROLL      CHAR(1),      /*INDIVIDUAL RVR -- ROLL OUT */MAS02800
      3 HIRL         CHAR(1),      MAS02810
      3 CL           CHAR(1),      MAS02820
      3 TDZ          CHAR(1),      MAS02830
      3 CEILMIN      CHAR(4),      MAS02840
      3 VISMIN       CHAR(6),      MAS02850
      3 RVRMIN       CHAR(4),      MAS02860

```

2 VOR	CHAR(1),	MAS02870
2 MID_DME	CHAR(1),	MAS02880
2 UPS(3)	CHAR(1),	MAS02890
2 ENG(3)	CHAR(1),	MAS02900
2 EQPMSC(60)	CHAR(79),	MAS02910
2 MSG	CHAR(79),	MAS02920
/ /		
DCL 1 TRIG STATIC EXTERNAL,	/#PF9 -- TRIGGERS -- 7-03-86#	MAS02930
2 CRSS,		MAS02940
3 ARR	CHAR(2),	MAS02950
3 DEP	CHAR(2),	MAS02960
2 TAIL,		MAS02970
3 ARR	CHAR(2),	MAS02980
3 DEP	CHAR(2),	MAS02990
2 MSGTIME,		MAS03000
3 EQPOTS	CHAR(3),	MAS03010
3 EQPRTS	CHAR(3),	MAS03020
3 RWYOTS	CHAR(3),	MAS03030
3 RWYRTS	CHAR(3),	MAS03040
3 NOISE	CHAR(3),	MAS03050
3 RMAINT	CHAR(3),	MAS03060
3 STAFF	CHAR(3),	MAS03070
3 DEMAND	CHAR(3),	MAS03080
3 OTHER	CHAR(3),	MAS03090
2 AT_VAL,		MAS03100
3 TOTDMD	CHAR(3),	MAS03110
3 ARRDMD	CHAR(3),	MAS03120
3 DEPDMD	CHAR(3),	MAS03130
3 WIND,		MAS03140
4 DIR	CHAR(3),	/#SCREEN PGM CONVERTS DIR TO 2 CHAR#
4 SPD	CHAR(2),	MAS03150
3 CEIL	CHAR(5),	MAS03160
3 RVR	CHAR(4),	MAS03170
2 AT_FLG,		MAS03180
3 TOTDMD	CHAR(1),	MAS03190
3 ARRDMD	CHAR(1),	/# ' '=NOT TRIGGERED & ' '=TRIGGERED#
3 DEPDMD	CHAR(1),	MAS03200
3 WIND	CHAR(1),	MAS03210
3 CEIL	CHAR(1),	MAS03220
3 RVR	CHAR(1),	MAS03230
2 CAB_VAL,		MAS03240
3 TOTDMD	CHAR(3),	MAS03250
3 ARRDMD	CHAR(3),	MAS03260
3 DEPDMD	CHAR(3),	MAS03270
3 WIND,		/#LIKE PARAM.AT_VAL#
4 DIR	CHAR(3),	MAS03280
4 SPD	CHAR(2),	MAS03290
3 CEIL	CHAR(5),	MAS03300
3 RVR	CHAR(4),	/#SCREEN PGM CONVERTS DIR TO 2 CHAR#
2 CAB_FLG,		MAS03310
3 TOTDMD	CHAR(1),	MAS03320
3 ARRDMD	CHAR(1),	MAS03330
3 DEPDMD	CHAR(1),	MAS03340
3 WIND	CHAR(1),	MAS03350
		/#LIKE PARAM.AT_FLG-- ' '=NOT TRIG & ' '= TRIG#
		MAS03360
		MAS03370
		MAS03380
		MAS03390
		MAS03400

```

      3 CEIL      CHAR(1),      MAS03410
      3 RVR      CHAR(1),      MAS03420
      2 MSG      CHAR(79),     MAS03430
/ /

DCL 1 CFLOG STATIC EXTERNAL,    /*PF9 -- CONFIG PLAN LOG -- 7-03-86*/ MAS03440
      2 CONFIND(96) FIXED BIN(15), /*CONFIG INDEX */ MAS03450
      2 MSG      CHAR(79),     MAS03460
/ /

DCL 1 WXLOG STATIC EXTERNAL,    /*PF9 -- WX PLAN LOG -- 7-03-86 */ MAS03486
      2 TABLE(16),            MAS03490
      3 START      CHAR(4),    /*START TIME */ MAS03500
      3 END        CHAR(4),    /*END TIME */ MAS03510
      3 CEIL      CHAR(5),     MAS03520
      3 VIS        CHAR(6),     MAS03530
      3 DIR        CHAR(3),    /*SCREEN PGM CONVERTS IT TO 2 CHAR*/ MAS03540
      3 VEL        CHAR(2),     MAS03550
      3 REMARKS    CHAR(25),    MAS03560
      3 USER       CHAR(3),     MAS03570
      3 ACCTIME    CHAR(4),     MAS03580
      2 MSG      CHAR(79),     MAS03590
/ /

DCL 1 CLSLOG STATIC EXTERNAL, /*PF9 -- RMY CLOSURE LOG -- 7-03-86*/ MAS03610
      2 TABLE(16),            MAS03620
      3 RMY        CHAR(3),     MAS03630
      3 ARR        CHAR(1),     MAS03640
      3 DEP        CHAR(1),     MAS03650
      3 CLSTIME    CHAR(4),     MAS03660
      3 OPNTIME    CHAR(4),     MAS03670
      3 SURF       CHAR(5),     MAS03680
      3 BRAK       CHAR(5),     MAS03690
      3 REMARKS    CHAR(9),     MAS03700
      3 USER       CHAR(3),     MAS03710
      3 ACCTIME    CHAR(4),     MAS03720
      2 MSG      CHAR(79),     MAS03730
/ /

DCL 1 EQPLOG STATIC EXTERNAL, /*PF9 -- EQUIP PLAN LOG -- 7-03-86*/ MAS03750
      2 TABLE(31),            MAS03760
      3 RMY        CHAR(3),     MAS03770
      3 EQUIPMENT  CHAR(4),     MAS03780
      3 OTS        CHAR(4),     MAS03790
      3 RTS        CHAR(4),     MAS03800
      3 REMARKS    CHAR(30),    MAS03810
      3 USER       CHAR(3),     MAS03820
      3 ACCTIME    CHAR(4),     MAS03830
      2 MSG      CHAR(79),     MAS03840
/ /

DCL 1 PCSTAT STATIC EXTERNAL, /*PC EQUIP STATUS PANEL 7-09-86*/ PCS00010
      2 RUNWAY(12),            /* -- SET BY PC USER -- PCS00020
      3 CATII      CHAR(1),    /*Y=IN SER,N=NOT AVAIL --AVAILABLE*/ PCS00030
      3 CATIII     CHAR(1),    /*Y=IN SER,N=NOT AVAIL --AVAILABLE*/ PCS00040

```

3 LOC	CHAR(8),	PCS00060
3 GS	CHAR(7),	PCS00070
3 LOM	CHAR(1),	*/PCS00080
	/*LOM = COM + OM	
3 OM	CHAR(1),	PCS00090
3 MM	CHAR(1),	PCS00100
3 IM	CHAR(1),	PCS00110
3 ALS	CHAR(1),	PCS00120
3 FLASHER	CHAR(1),	PCS00130
3 DME	CHAR(1),	PCS00140
3 R_READ(3)	CHAR(6),	/*RVR READINGS -- TD, MID, ROLL
	/*	*/PCS00150
3 RVR	CHAR(1),	TOUCHDOWN RVR
	/*	*/PCS00160
3 RVRMID	CHAR(1),	/*INDIVIDUAL RVR -- MID POINT
	/*	*/PCS00170
3 RVRROLL	CHAR(1),	/*INDIVIDUAL RVR -- ROLL OUT
	/*	*/PCS00180
3 HIRL	CHAR(1),	PCS00190
2 MIDWAY,		PCS00200
3 FLG_ILS	CHAR(1),	PCS00210
3 FLG_LOC	CHAR(1),	PCS00220
3 FLG_MDB	CHAR(1),	PCS00230
3 FLG_31L	CHAR(1),	PCS00240
3 FLG_22L	CHAR(1),	PCS00250
3 FLG_13R	CHAR(1),	PCS00260
3 FLG_4R	CHAR(1),	PCS00270
2 WIND,		PCS00280
3 DIR	CHAR(3),	/*SCREEN PGM CONVERTS TO 2 CHAR
	/*	*/PCS00290
3 SPD	CHAR(2),	PCS00300
2 GUST	CHAR(2),	PCS00310
2 MID_DME	CHAR(1),	PCS00320
2 VOR_4R	CHAR(1),	PCS00330
2 DAS_ORD	CHAR(4),	PCS00340
2 DAS_MID	CHAR(4),	PCS00350
2 CAT_14R	CHAR(10),	/*14R -- CAT II/III READINGS
	/*	*/PCS00360
2 CAT_14L	CHAR(10),	/*14L -- CAT II/III READINGS
	/*	*/PCS00370
2 CEIL(2)	CHAR(8),	/*CFILOMETER -- AAANNNNN
	/*	*/PCS00380
2 UPS(3)	CHAR(1),	PCS00390
2 ENG(3)	CHAR(1),	PCS00400
2 MSG	CHAR(79),	PCS00410
		MAS04240
DCL 1 PLNSTAT STATIC EXTERNAL,		/*PLAN STATUS -- 7-03-86*/MAS04250
2 RUNWAY(12),		/*CLOSURE & EQP STATUS
	/*	*/MAS04260
3 ARR	CHAR(1),	MAS04270
3 DEP	CHAR(1),	MAS04280
3 LOC	CHAR(1),	MAS04290
3 GS	CHAR(1),	MAS04300
3 COM	CHAR(1),	MAS04310
3 OM	CHAR(1),	MAS04320
3 MM	CHAR(1),	MAS04330
3 IM	CHAR(1),	MAS04340
3 ALS	CHAR(1),	MAS04350
3 FLASHER	CHAR(1),	MAS04360
3 DME	CHAR(1),	MAS04370
3 RVR	CHAR(1),	/* TOUCHDOWN RVR
	/*	*/MAS04380
3 RVRMID	CHAR(1),	/*INDIVIDUAL RVR -- MID POINT
	/*	*/MAS04390
3 RVRROLL	CHAR(1),	/*INDIVIDUAL RVR -- ROLL OUT
	/*	*/MAS04400
3 HIRL	CHAR(1),	MAS04410

```

      3 CL          CHAR(1),          MAJ04420
      3 TBZ        CHAR(1),          MAJ04430
/ /
DCL DAYLITE CHAR(3) STATIC EXTERNAL, /*DAYLITE SAVINGS TIME--YES,NO*/MAJ04440
/ /
DCL 1 CNFGRQ(42) STATIC EXTERNAL,    /*FAATC DEFINITION -- 7-14-86*/ CNF00010
      2 ID          BIT(24),         /* 12 ARR BITS & 12 DEP BITS */ CNF00020
      2 FLOW_INDX   FIXED BIN(15),   /* 1=A 2=AB 3=B 4=BC 5=C */ CNF00030
      2 FLOW        CHAR(2),         /* A, AB, B, BC, C */ CNF00040
      2 ARR(4)      CHAR(3),         CNF00050
      2 DEP(4)      CHAR(3),         CNF00060
      2 VFR_CAP(3)   CHAR(3), /*VFR CAPACITY 1-TOT 2=ARR 3=DEP*/ CNF00070
      2 IFR_CAP(3)   CHAR(3), /*IFR CAPACITY 1-TOT 2=ARR 3=DEP*/ CNF00080
/ /
DCL 1 AREAWX STATIC EXTERNAL, /*PF6A -- AREA WX PANEL -- 2-11-87*/ ARE00010
      2 DATA(21)   CHAR(79), ARE00020
      2 MSG         CHAR(79), ARE00030
/ /

```

END OF

MASTER

DATA BASE

APPENDIX B

APPLICATION OF SENSOR DATA TO RCMS LOGIC

RCMS LOGIC APPLICATION

CURRENT DATA

ALSF-2 (14R only)

ALSF/SSALR switch	System selection
Light switch	Switch on or off (OTS)
Flasher switch	Switch on or off (OTS)

ALSF-1 (14L only)

Light switch	Switch on or off (OTS)
Flasher switch	Switch on or off (OTS)

SALSR (27L, 32R, 32L)

SALSR switch	Switch on or off (OTS)
SFL switch	Switch on or off (OTS)
4L SALSR being replaced with Lion Lighting System	

MALSR (4R, 9R, 9L, 22R, 22L, 27R)

MALSR switch	Switch on or off (OTS)
Flasher switch on 4R, 9L, 22R, 27R only	Switch on or off (OTS)
9R & 22L follow brightness	
22L will have flasher switch eventually	

RCMS LOGIC APPLICATION

CURRENT DATA

LOC (all runways)

Main	System on (primary channel)
Standby	System on (secondary channel)
Abnormal-off	No failure
steady	Failure
flashing (TI equipment)	Out-of-service for maintenance
Trans 1	Transmitter on or off (Both
Trans 2	transmitters required for
	CAT III operations)
Alarm	Failure

IM (14R & 14L only)

Switch on or off (OTS)

MM (all runways except 4L)

14R, 14L, 27L, 32R are monitored

Switch on or off (OTS)

OM (all runways)

14R & 14L are monitored

Switch on or off (OTS)

LOM/NDB (14R & 14L Monitored)

Switch on or off (OTS)

RCMS LOGIC APPLICATION

CURRENT DATA

GS (all runways except 4L)

Main	System on (primary channel)
Standby	System on (secondary channel)
Abnormal-off	No failure
steady	Failure
flashing (TI equipment)	

Out-of-service (OTS) for maintenance

Trans 1	Switch on or off (OTS)
---------	------------------------

Trans 2	Switch on or off (OTS)
---------	------------------------

DME (9R, 14R, 14L, 32L, 27L)

Normal	Switch on or off (OTS)
	DME failure if associated localizer is on

<u>DME Midfield (Wilcox model)</u>	Switch on or off (OTS)
------------------------------------	------------------------

<u>VOR</u>	Switch on or off (OTS)
------------	------------------------

Manual Panel (14R & 14L)

CAT II and CAT III after completing checklist, user may enter 'Y' into CAT II or CAT III for 14R or 14L

a. ILS	e. CAT II	i. ALS EG
b. RVR	f. CAT III	j. City EG
c. Other 14 up	g. City lights	
d. IM	h. Equipment EG	

RICE Unit (14R)

CAT II & CAT III	Light on or off indicates availability
------------------	--

Uninterrupted Power Sources

4R 100, 4R GS (monitored), 9R GS	If off, then system has 15 minutes of operation
----------------------------------	---

RCMS LOGIC APPLICATION

CURRENT DATA

DASE (Chicago O'Hare and Midway)

A1 - A7	
B1 - B7	Numeric values for altimeter setting
A1 - A7	Numeric values for altimeter setting
B1 - B7	Numeric values for altimeter setting

LLWAS (Centerfield Wind)

Wind direction	Numeric value - degrees displayed on PF-1
Wind velocity	Numeric value - knots displayed on PF-1
Gust value	Numeric value - knots

No crosswind advisory messages are generated if the wind is gusting.

Ceilometer (Two field units)

Cloud height conditions & ceiling 18 bits of data for the 2 ceilometers
(Scattered, broken, or overcast)

RCMS LOGIC APPLICATION

CURRENT DATA

Midway Light Panel

ILS	Not presently used
LOC	Not presently used
NBD	Not presently used
31L	Not presently used
22L	Not presently used
13R	If light is on, 13R operations affect departures on 22L & 27L
4R	Not presently used

Engine Generator

Eng 1 (14R Engine)	Required for CAT II and CAT III
Eng 2 (14L Engine)	Required for CAT II and CAT III
Eng 3 (ASR-7 Engine)	Required for CAT II and CAT III

High Intensity Runway Lights (runway edge lights)

9R, 9L, 14R, 14L, 27R, 27L, 32R, 32L	Switch on or off (OTS) depending on monitored by RVR the brightness level
4R, 4L, 22R, 22L	are not monitored

Touchdown RVR

9R, 9L, 14R, 14L, 27R, 27L, 32R, 32L	Readings of RVR, HIRL, Daylight, and status bit
4R, 4L, 22R, 22L	are not monitored

Mid RVR

14R and 14L	Readings of RVR, HIRL, Daylight, and status bit
-------------	---

APPENDIX C

FOREGROUND PROGRAM DOCUMENTATION

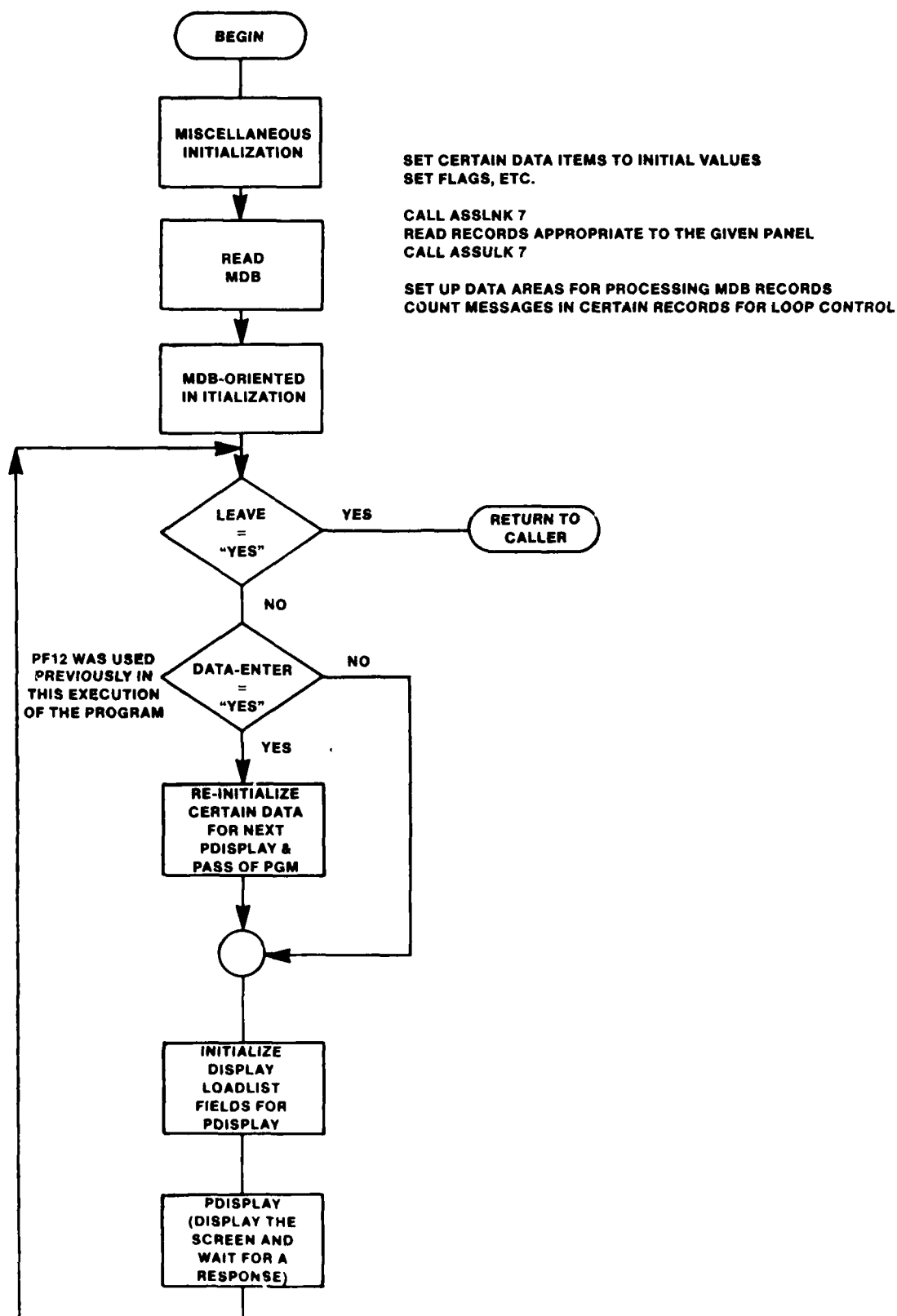


FIGURE C-1. GENERIC SCREEN PROGRAM FLOW CHART (1 of 2 Sheets)

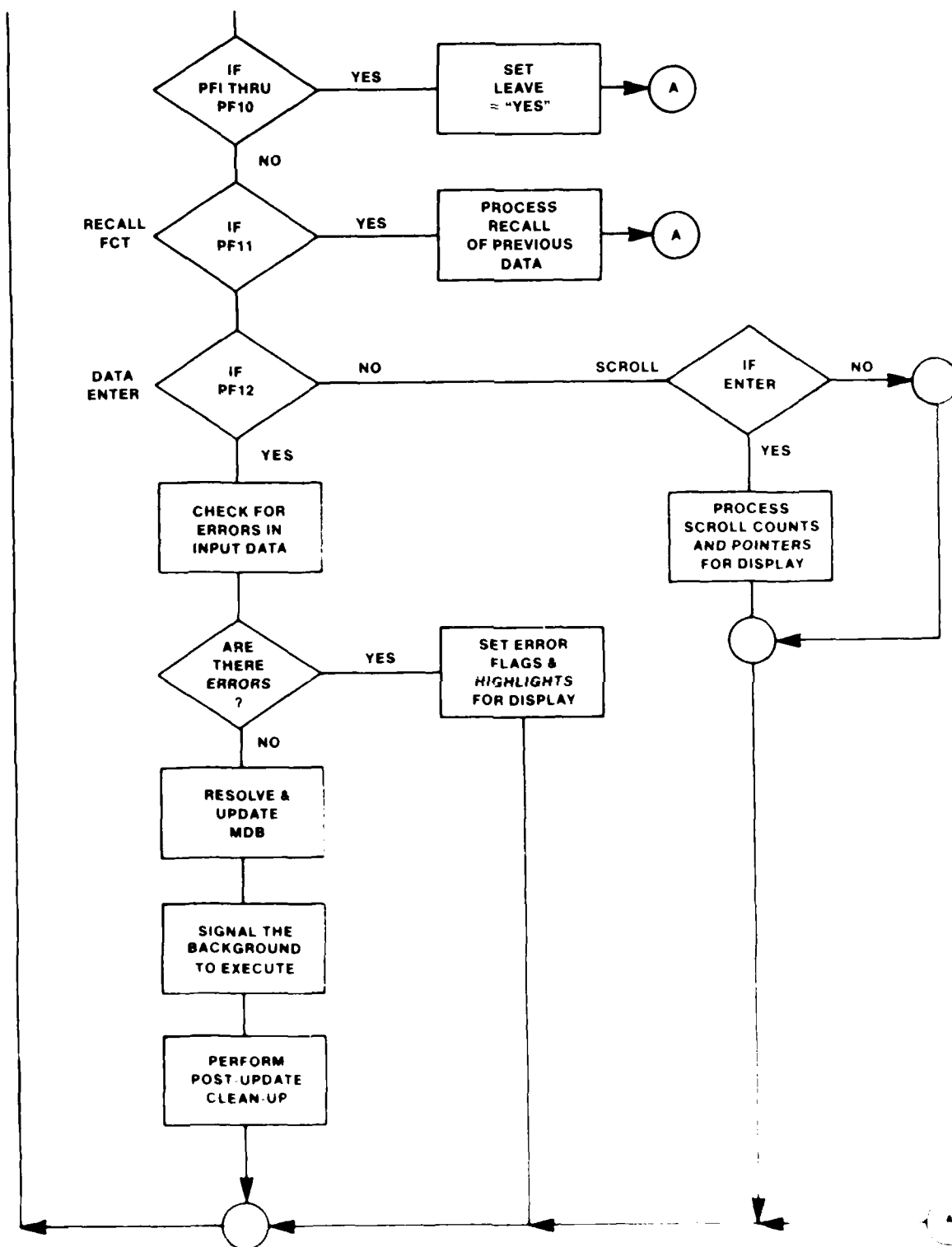


FIGURE 1. EDITING SYSTEM PROGRAM FLOWCHART

FILE ASH1 DUC A

VM/SP CONVERSATIONAL MONITOR SYSTEM

ASSEMBLER LANGUAGE PROGRAMS USED IN THE FOREGROUND USER PROGRAMS

AREDCMS	TEST MASTDB DATA ON CMS7 TO SEE IF IT NEEDS TO BE REORGANIZED
ASMERSC	ERASE CITY DATA FILE IN USER CITY (ERASE CITY DATA D)
ASMERSE	ERASE OLD FORECAST WORK FILES IN CMS8 (FILE FWRK & FILE FCAST)
ASMERSE	ERASE OLD REORG FILE IN CMS7 - USED WHEN REORGANIZING MASTDB DATA
ASMEFWRK	COPY FWRK DATA C TO ORDDATA DATA B (NOTE: THIS PGM OBSOLETE)
ATMAENF	EXECUTE RENF EXEC (RENAME FILE FCAST C FILE FWRK C)
ASMTWRK	MOVE R FWRK - USED IN FORECAST (NOTE: THIS PGM NEEDS MODIFICATION)
ASNRENA	EXECUTE NRENA EXEC - USED IN REORGANIZING MASTDB DATA
ASSLNK2	LINK TO CMS2 WRITE FULL SCREEN DATA (ACC 198 C)
ASSLNK7	LINK TO CMS7 MASTER DATA BASE (ACC 197 B)
ASSLNK8	LINK TO CMS8 FORECAST FILES (ACC 198 C)
ASSLNK1	LINK TO CITY USER (CMS15) (ACC 199 D)
ASSLNK5	LINK TO FORECAST FILES IN USER ERIC (CMS8) (ACC 197 B)
ASSLNK6	LINK TO CMS2 (WFS DATA) FOR THE WFS PGM (ACC 200 W)
ASSLNK1	UNLINK - REL C & DET 198
ASSLNK7	UNLINK - REL B & DET 197
ASSLNK8	UNLINK - REL C & DET 198
ASSLNK1	UNLINK - REL D & DET 199
ASSLNK6	UNLINK - REL W & DET 200
ERRRGE	CALLED BY SCREEN PROCESSING PROGRAMS TO HANDLE ERRORS
ERRRGE	SEND A SPECIAL MESSAGE TO CURRENT BACKGROUND TO WAKE IT UP
ERRRGE	SEND A SPECIAL MESSAGE TO FORECAST BACKGROUND TO WAKE IT U
ERRRGE	SEND A SPECIAL MESSAGE TO CURRENT BACKGROUND TO WAKE IT UP
WAKEUP	ISSUE A WAKEUP COMMAND FOR 3 SECONDS (WAKEUP +00 03)
WAKEUP	ISSUE A WAKEUP COMMAND FOR 10 SECONDS (WAKEUP +00 10)
WAKEUP	CREATE AND MAINTAIN THE MASTER AUTO PANEL (PFI)
WAKEUP	KEEP IT OPEN TO ALLOW USER TO WRITE A MSG ANYWHERE ON THE SCREEN

C-4

THE FOLLOWING SEQUENCE OF THE PROGRAMS IS SUGGESTED FOR STUDENT USE. THE PROGRAMS ARE LISTED SEQUENTIALLY.

C-5

1. The first of these is the fact that the

2. second is the fact that the

3. third is the fact that the

4. fourth is the fact that the

5. fifth is the fact that the

6. sixth is the fact that the

7. seventh is the fact that the

8. eighth is the fact that the

9. ninth is the fact that the

10. tenth is the fact that the

11. eleventh is the fact that the

12. twelfth is the fact that the

13. thirteenth is the fact that the

14. fourteenth is the fact that the

15. fifteenth is the fact that the

16. sixteenth is the fact that the

17. seventeenth is the fact that the

18. eighteenth is the fact that the

19. nineteenth is the fact that the

20. twentieth is the fact that the

21. twenty-first is the fact that the

22. twenty-second is the fact that the

23. twenty-third is the fact that the

24. twenty-fourth is the fact that the

25. twenty-fifth is the fact that the

26. twenty-sixth is the fact that the

27. twenty-seventh is the fact that the

28. twenty-eighth is the fact that the

29. twenty-ninth is the fact that the

30. thirtieth is the fact that the

MTOWRK FLI
 ASMRKSF ASSEMBLE
 ASMRNF ASSEMBLE
 REND EXEC
 ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 CTIME4 FLI
 NO CALLS

FFF1 FLI
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE10 ASSEMBLE
 CTIME FLI
 NO CALLS
 CTIME4 FLI
 NO CALLS
 MINIMA FLI
 NO CALLS

FFF3 FLI
 ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 ERROR ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE10 ASSEMBLE
 CTIME FLI
 NO CALLS
 CTIME4 FLI
 NO CALLS

FFF5 FLI
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ERROR ASSEMBLE
 FUNCHF ASSEMBLE

FFF6 FLI
 ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 ERROR ASSEMBLE
 FUNCHF ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 WAKE10 ASSEMBLE
 CTIME4 FLI
 NO CALLS

FFF7 FLI
 ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 ERROR ASSEMBLE
 FUNCHF ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 WAKE10 ASSEMBLE
 CTIME4 FLI
 NO CALLS

FFF8 FLI

ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 ERROR ASSEMBLE
 FUNCHF ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 CTIME4 FLI
 NO CALLS

SUREOF FLI

ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 WAKE10 ASSEMBLE

SURWY FLI

ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 WAKE10 ASSEMBLE

SURWY FLI

ASSLNK7 ASSEMBLE
 ASSLNK8 ASSEMBLE
 ASSULK2 ASSEMBLE
 ASSULK7 ASSEMBLE
 FUNCHF ASSEMBLE
 WAKE3 ASSEMBLE
 WAKE10 ASSEMBLE

THIS LIST IS FOR THE FOREGROUND FANE'S WHICH ARE INVOKED BY MEANS OF HITTING CERTAIN FUNCTION KEYS WHILE THE FOREGROUND PROGRAM IS RUNNING.

THE FANE'S ARE LISTED IN SUCH A WAY THAT THE PRIMARY FANE'S NAMES BEGIN IN COLUMN ONE, THEN EACH FANE WHICH CAN BE INVOKED FROM WITHIN THE PRIMARY FANE IS LISTED INDENTED TO COLUMN FIVE. IN MOST CASES, THE ARE OTHER PRIMARY FANE'S THESE WILL BE NOTED IN THE LETTER KEY IN COLUMNS 10-11. IN ONE SPECIAL CASE, HOWEVER, WHERE A FANE CAN BE KEYPAD REACHED FROM SOME OTHER OTHER THAN A PRIMARY FANE, THE FANE WILL BE NOTED WITHIN THE LETTER KEY IN COLUMNS 10-11 IN COLUMNS 12-13.

EE MASTER ALERT FANE

```
EE1 MASTER ALERT FANE (EE)
EE2 MASTER FANE (STATUS) (EE)
EE3 CONFIGURATION FANE (EE)
EE4 MESSAGE FANE (EE)
EE5 DEMAND FANE (EE)
EE6 WEATHER FANE (EE)
EE7 RUNWAY CONDITIONS FANE (EE)
EE8 RUNWAY EQUIPMENT FANE (EE)
EE9 TRIGGER VALUE FANE (EE)
EE0 PLANNING FORECAST MODE ENTRY FANE (EE)
EE10 CLEAR THE SCREEN AND RE-DISPLAY MASTER ALERT FANE
```

EE MASTER FANE (STATUS)

```
EE1 MASTER ALERT FANE (EE)
EE2 MASTER FANE (STATUS) (EE)
EE3 CONFIGURATION FANE (EE)
EE4 MESSAGE FANE (EE)
EE5 DEMAND FANE (EE)
EE6 WEATHER FANE (EE)
EE7 RUNWAY CONDITIONS FANE (EE)
EE8 RUNWAY EQUIPMENT FANE (EE)
EE9 TRIGGER VALUE FANE (EE)
EE0 PLANNING FORECAST MODE ENTRY FANE (EE)
EE10 CLEAR
EE11 ENTER
EE12 PRINT SCREEN
```

EE3 CONFIGURATION FANE

```
EE1 MASTER ALERT FANE (EE)
EE2 MASTER FANE (STATUS) (EE)
EE3 CONFIGURATION FANE FOR NEXT QUARTER HOUR (OF 15) (EE)
EE4 MESSAGE FANE (EE)
EE5 DEMAND FANE (EE)
EE6 WEATHER FANE (EE)
EE7 RUNWAY CONDITIONS FANE (EE)
EE8 RUNWAY EQUIPMENT FANE (EE)
EE9 INTELLIGENCE CONFIGURATION (EE)
EE10 RETURN TO EE3 CONFIGURATION FANE
EE11 ADVANCE TO INTELLIGENCE CONFIGURATIONS FOR NEXT QUARTER HOUR
EE12 PRINT SCREEN
EE13 PLANNING FORECAST MODE ENTRY FANE (EE)
EE14 RETAIL
EE15 ENTER
EE16 PRINT SCREEN
```


1

• • •

1 2

[illegible]

C-11

APPENDIX D

GLOSSARY

ALS	APPROACH LIGHTING SYSTEM
ALSF	APPROACH LIGHTING SYSTEM WITH FLASHERS
CL	CENTERLINE LIGHTING
DASE	DIGITAL ALTIMETER SYSTEM
DME	DISTANCE MEASURING EQUIPMENT
EG	ENGINE GENERATOR
F	FLASHERS
FFM	FAR FIELD MONITOR
GS	GLIDE SLOPE
HHMM	HOUR-HOUR-MINUTE-MINUTE
HIRL	HIGH INTENSITY RUNWAY LIGHTS (RUNWAY EDGE LIGHTS)
IM	INNER MARKER
LLWAS	LOW LEVEL WIND SHEAR ALERT SYSTEM
LOC	LOCALIZER
LOM	COMPASS LOCATOR AT THE OUTER MARKER
MALSR	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RAIL (FLASHERS)
MM	MIDDLE MARKER
NDB	NONDIRECTIONAL RADIO BEACON
OM	OUTER MARKER
OTS	OUT-OF-SERVICE
RAIL	RUNWAY ALIGNMENT INDICATOR LIGHTS
RTS	RETURN-TO-SERVICE
RVR	RUNWAY VISUAL RANGE
RWY	RUNWAY
SFL	SEQUENCE FLASHING LIGHTS
SSALR	SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM WITH RAIL (FLASHERS)
TDZ	TOUCHDOWN ZONE LIGHTS
VOR	VERY HIGH FREQUENCY OMNI-RANGE

COMPASS LOCATORS ARE LOM/NDB

APPENDIX E
DISTRIBUTION LIST

Mr. Chester Mendygral
FAA-AFFO
O'Hare International Airport
P.O. Box 66519
Chicago, IL 60666

AES-1

AES-300

AES-320

Mr. Art Hill
ORD-3
FAA ATCT
O'Hare International Airport
P.O. Box 66519
Chicago, IL 60666

AGL-1

AGL-4

AGL-400

AGL-421

AGL-500

Mr. Oren Hauge
ORD - DSS
FAA - DSO
O'Hare International Airport
P.O. Box 66519
Chicago, IL 60666

ORD-AFFO

ORD-ATCT-1

ORD-ATCT-3

ORD-DSS

Mr. Chester Anderson
ORD-1
FAA Facility Chief
O'Hare International Airport
P.O. Box 66519
Chicago, IL 60666

ACT-500

ACT-550

ACT-300

ACT-310 (15 copies)

Mr. Lou Yates
FAA AGL-4
Regional Planning Manager
2300 East Devon Avenue
Des Plaines, IL 60018

Mr. Gary St. John
FAA AGL-421
Associate Program Manager
2300 East Devon Avenue
Des Plaines, IL 60018

Mr. Paul Bohr, Director
Federal Aviation Administration
Great Lakes Region
2300 East Devon Avenue
Des Plaines, IL 60018

END

12-87

DTIC