

AD-A277 753



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DOT/FAA/SP-93/2
Office of Safety Information
and Promotion
Washington, DC 20591

**Performance Guidelines
for Pilot Information
Centers**

National Association of State
Aviation Officials, Center for Aviation
Research and Education
Silver Spring, MD 20910

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Final Report

April 1991
Published December 1993

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3486 **94-09923**



**U.S. Department of Transportation
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U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave. S.W.
Washington, D.C. 20591

January 15, 1994

Dear Colleague:

For some time, the Federal Aviation Administration (FAA) has been concerned about the number of general aviation (GA) accidents resulting from inadequate preflight preparation. Recently, we contracted for several studies on a concept called Pilot Information Center (PIC). We also developed a prototype PIC model and demonstrated it to the GA community. While those efforts were well received, there is not a universal consensus that PIC should be implemented.

In an era of fiscal constraints, the FAA must continually look for ways to provide better services at less cost. As a part of this reexamination, we ask the aviation community for advice.

What is the best way to provide the preflight services needed by GA?

What is the best way to encourage a greater percentage of pilots to do adequate preflight planning?

What services are needed?

Who should provide them?

How do we pay for them?

In concert with the GA community, the FAA has initiated several efforts to address these issues. It is not our intent to offer PIC as the answer to all of these questions. Rather, we offer this report in the interest of information sharing, particularly on the issue of what services are required.

Looking back over the last dozen years, we see tremendous growth in the quantity and quality of information available for preflight preparation and the number of sources from which such information can be obtained. As we continue grappling with how to provide better services at lower costs, let us not lose sight of the need to do this in a way that contributes to safer operations.

Technical Report Documentation Page

1. Report No. DOT/FAA/SP-93/2		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Performance Guidelines for Pilot Information Centers				5. Report Date April 1991	
				6. Performing Organization No.	
7. Author (s)				8. Performing Organization Report No.	
9. Performing Organization Name and Address National Association of State Aviation Officials Center for Aviation Research and Education Silver Spring, MD 20910				10. Work Unit No. (TR AIS)	
				11. Contract or Grant No. DTFA01-90-P-01286	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Aviation Administration 800 Independence Avenue, S.W. Washington, D.C. 20591				13. Type Report and Period Covered Final Report	
				14. Sponsoring Agency Code AOV-300/ASP-200	
15. Supplementary Notes AOV-300, Aircraft and Technology Division, Office of Safety Information and Promotion; ASP-200, Safety Promotion and Special Projects Division					
16. Abstract The purpose of a Pilot Information Center (PIC) is to promote general aviation (GA) safety by making available a comprehensive and readily accessible base of information to assist pilots in preflight planning and to stimulate pilot awareness. This document was developed as a standardized source of those elements of information that would enhance flight safety by facilitating proper preflight planning practices and procedures. While it was designed to serve as a basic guide for the development of State-provided PICs, it is not intended to promote any particular manufacturer(s) or product(s). This report is one of two being published on PIC. The other report is DOT/FAA/SP-93/1, Pilot Information Center for Preflight Planning. Both documents address the issue of what services are required for GA preflight planning.					
17. Key Words Pilot Information Center preflight planning aviation weather briefing			18. Distribution Statement This document is available to the U.S. Public through the National Technical Information Service, Springfield, Virginia 22161.		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages	22. Price

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I. PREAMBLE

The purpose of this document is to aid the Federal Aviation Administration in the development of Pilot Information Centers (PICs). It is intended to provide, to the maximum extent possible, a standardized source of those elements of information which enhance flight safety by facilitating proper preflight planning practices and procedures. Therefore, it is also designed to serve as a basic guide for the development of State-provided PICs. It is not intended to promote a particular manufacturer or product, but rather to base programs on "performance standards" and not "technical standards;" nor is it intended to be a procurement document.

An effort has been made to identify those capabilities which will best serve the general aviation public, and to outline recommendations which will foster standardization in the development and use of the system. Not all of the Guidelines herein need to be included in a PIC. The introduction to each provides recommendations in this regard. However, it is strongly recommended that as a minimum, the capabilities recommended in Guidelines #1 through #8 should be essential elements of any PIC.

In addition to performance standards, there are numerous policy questions which must be addressed by any State contemplating such a system. One of these is system financing. While States must develop their own methods, they may wish to evaluate the merits of systems which do not require direct charges to pilots for pilots' use, either at the on-airport locations or by remote access.

It should be recognized that the Guidelines were based on knowledge acquired through current state-of-the-art systems in place as of the date of publication. This document is not intended to inhibit any potential upgrading or expansion in the development of PICs which might be possible as a result of future advancements in technology. On the contrary, it is vital that the PIC program be capable of, and encourages, continual improvement through application of latest technology to supply pilots with the most current, available information.

Toward these ends, this document is offered. The document was prepared by the National Association of State Aviation Officials Center for Aviation Research and Education (NASAO/CARE) and reviewed and modified through a multiple iteration process by a Review Group constituted by the FAA and NASAO/CARE. The Review Group was chaired by Mr. George Woods of the Pennsylvania Bureau of Aviation and included: aviation agency representatives of the States of Iowa, Minnesota, Virginia and Wisconsin; user representatives from the Aircraft Owners and Pilots Association (AOPA) and National Business Aircraft Association (NBAA); federal government provider-agency representatives from FAA and the National Weather Service (NWS); and private sector provider representatives from Kavouras Corporation, the National AVCOMPS Council and Pan Am Weather Systems.

NASAO/CARE gratefully acknowledges the contributions to this process provided by all members of the Review Group.

II. PROJECT BACKGROUND

On September 3, 1990, an agreement was signed which formally established a partnership between the National Association of State Aviation Officials Center for Aviation Research and Education (NASAO/CARE) and the FAA Assistant Administrator for Aviation Safety whereby NASAO/CARE would assist in the development of a nationwide system of Pilot Information Centers (PIC). The purpose of the PIC is to promote general aviation safety by making available a comprehensive and readily accessible base of information to assist pilots in pre-flight planning and to stimulate pilot awareness. As part of this agreement, NASAO/CARE was tasked to participate in the development of PIC performance-based guidelines.

A wide variety of privately-owned and operated and Federal or State-sponsored systems are currently in use providing preflight weather briefing information to general aviation pilots. These systems have the potential to offer a more extensive base of information related directly to the safety of flight. Typically, systems consist of current technology terminals or personal computers, printers, and monitors with enhanced graphics capability. It is the opinion of the Review Group that there are additional safety data which could be made available to pilots and which could be made compatible with expanded systems.

In the interest of enhancing overall aviation system safety, additional safety-related information should be quickly and conveniently accessible to pilots. This information, whether acquired during preflight briefings or otherwise, should be presented in a consistent manner and be accessible following the same procedures wherever access is provided. These guidelines are intended to assist the States that have acquired, or are contemplating acquiring, pilot information systems to develop a common performance standard for such systems. They represent a base of information concerning the characteristics of automated pilot preflight briefing systems currently being used in the States represented by the National Association of State Aviation Officials.

The benefits to be derived through the establishment of an effective system of Pilot Information Centers are many. They may be summarized in terms of enhanced flight safety resulting from increased pilot awareness and education, convenience to users and a vast improvement in preflight planning and decision-making.

III. BACKGROUND ON CURRENT STATE SYSTEMS

The history of State involvement with safety and weather information dissemination began over twenty years ago. A summary of the highlights of State involvement are attached in the Appendix. The information contained in this section is provided for historical reasons only and is not intended to constrain any future development of Pilot Information Centers. Since the early 1980's, States have become particularly more involved in weather dissemination. The need for improved dissemination of weather information, together with the consolidation of the FAA's Flight Service Stations has provided the motivation for supplemental State programs to assist in using advanced technology at numerous airport locations.

The States that have seen fit to go forward with such programs have largely based their requirements for systems on "performance," not "technical standards." This stipulation by the State agency of a weather dissemination product - rather than stipulation of technical standards, technology and hardware - has exploited private sector initiative to develop new technologies and provide more effective and efficient systems. State agencies are limited in their available resources and therefore are extremely cost sensitive in their development, procurement and management of such systems. The competitive bidding process required by State procurement regulations has also assured the "best value for the public dollar." Costs notwithstanding, as of this writing States that have provided Statewide systems have made a determination not to charge pilots directly for system access.

Similarly, the various States have used a variety of "State only" and "State/local" funding options for procurement and operation of these systems. There are a variety of written agreements with local governments and/or airport sponsors for procurement and/or operation of the equipment. In some cases, private firms which operate public-use airports are permitted to enter into agreements with State governments, while in other States this is precluded by State law. A number of examples of these "local" agreements are available at NASAO/CARE. The variety in funding options utilized by States illustrate differing philosophies in ensuring local "ownership" and investment in the project. The table below indicates the arrangements that exist, as of the date of publication, between some of the State and local entities in the purchase and operation of State weather dissemination systems.

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STATE FUNDING COMMITMENTS

(expressed as a percentage of total state weather dissemination system costs)

<u>ITEM</u>	<u>MI</u>	<u>MN</u>	<u>ND</u>	<u>NE</u>	<u>PA</u>	<u>VA</u>	<u>WA</u>	<u>WI</u>
Hardware/Software/Cabinet	100	(1)	100	100	100	100	100	50
Installation	100	100	100	(2)	100	100	100	50
Monthly Costs	50	100	100	(3)	100	(2)	100	100
Telephone Line Installation	(2)	(1)	(2)	(2)	(2)	100	100	(2)
Printer Paper & Ribbon, Electricity, Insurance (Theft, Vandalism, Damage)	50	(1)	(2)	(2)	(2)	(2)	(2)	(2)

- (1): These costs are included in a Statewide lease arrangement with a weather vendor.
- (2): The State aviation agency does not fund these items. Funding is usually provided by a local airport owner or operator or a "host" fixed base operator. Other creative funding methods - utilizing private funds - also exist.
- (3): Nebraska pays 100% for the first year; sponsor pays percentage thereafter.

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Per-unit costs of State-provided units vary based on many factors including: delivery technology, volume discounts, optional features, and year and terms of purchase or lease. NASAO/CARE retains a current database of State costs for all in-place systems.

The "technology" used to deliver Statewide systems also varies. The State of Minnesota, which began Statewide computer delivery of pilot weather information in 1983, utilizes "terminal-printers" at most locations and personal computers with color monitors at other locations. These units are connected via telephone landline to a weather vendor's mainframe computer. This arrangement includes the State providing for the cost of equipment as well as continuing telephone landline charges and computer access fees. Subsequent to 1984, the other Statewide systems competitively-bid and contracted, have resulted in the use of satellite-delivered, locally databased technology.

Satellite-delivered, locally databased systems, similar to a concept developed by MITRE Corporation for the FAA in the early 1980's, provide virtually unlimited use at each of the airport locations without use-sensitive charges. The State (or in various circumstances, the local sponsor) is charged a flat monthly fee for unlimited access use at the airport location, access via remote modem, a hardware equipment service agreement and periodic software updates delivered via satellite. This delivery technology, along with the "performance-based" specifications and flexible State procurement arrangements, has permitted considerable enhancements of the weather systems being provided by the States. The following "optional" products are being made available to State agencies at this time: digitized airport aerial photographs, color satellite imagery, full text of the Airman's Information Manual, and site radar presentations.

A test case in Pennsylvania has linked a State-provided automated weather observing station (AWOS) directly with the entire State-provided weather dissemination. More recently, the State of Minnesota has launched an operational program of this type. As of this writing, the State is entering hourly observations from 20 non-Federal AWOS sites via FAA's NADIN system into the national weather data network. The Commonwealth of Virginia is nearing a similar arrangement. Other States are investigating the potential of collecting the data from their State AWOS's and making it available to those States that have compatible weather dissemination systems and can accommodate the information.

Additional enhancements are being actively investigated to mature the existing State weather dissemination systems into Pilot Information Centers. These are discussed in the enclosed guidelines. Additional information could easily include: safety seminar information from State agencies, FAA and the National Transportation Safety Board (NTSB); Advisory Circulars; Airworthiness Directives (including digitized photographs where applicable); special-use airspace status; and, FAA Accident Prevention Program activities and information. The current project to develop a "State standard" for Pilot Information Center through the FAA and the NASAO Center for Aviation Research and Education is an additional step in the evolution towards providing cost efficient safety information to pilots at airport locations and via personal computer modem access.

IV. RECOMMENDED GUIDELINES

GUIDELINE No. 1: GENERAL PROVISIONS

1.1.0 INTRODUCTION

For those States that opt to provide Pilot Information Centers, the performance standards contained in this Guideline are recommended to achieve a maximum degree of product uniformity for pilot users.

1.2.0 OBJECTIVE

To list and outline performance standards which are recommended between the vendor(s) and purchaser(s) of the PIC system.

1.3.0 PERFORMANCE RECOMMENDATION

- 1.3.1 The system proposed may be on a turnkey basis with all equipment, installation, maintenance and system management provided by the contractor. Provision must be made to track and promptly report the usage of each product per site, per month. New, government-provided data products and routine software updates should be incorporated without additional cost. Major system changes and new vendor-developed products may be negotiated when and if appropriate.
- 1.3.2 The system should be as user friendly as possible, readily usable by the average pilot without computer experience or training. The system should provide on-screen tutorials for each product, adequate to allow a first-time user to retrieve the data desired. User manuals should be furnished by the contractor and assistance provided for appropriate training seminars if deemed necessary. Data should be displayed in an organized and readable manner on a color monitor. A desirable feature, at the contractor's option, would be to provide plain language output in those instances where source data is provided in a coded format. The ability, at the viewer's option, to print a hard copy of the information should be provided with a minimum of lag time to initiation of printing.
- 1.3.3 In order to assure timely information and maximize cost-effectiveness of the system, response times for the on-airport units should be kept to a minimum. Extended response times by on-airport units may result in increased operational cost and may create delays in use.

- 1.3.4 Remote modem access should be provided to information that is available at the on-airport system.
- 1.3.5 All components of an on-airport unit should be consistent with federal specifications, and State and local building codes, if applicable.
- 1.3.6 The system should be expandable to provide for increased use.
- 1.3.7 At on-airport access sites, the system should provide for automatic system fail detector/restarter capability to monitor system performance and automatically initiate restart completely independent of any system hardware or software.
- 1.3.8 System should provide for automatic detection and annunciation of data or system communications interruption at each system location. Vendors should have a means to validate and ensure the integrity of system data.
- 1.3.9 Routine system software updates should be performed by qualified personnel within a 24 hour period. If provided by the vendor, the update should be incorporated without additional cost.
- 1.3.10 Archived system data should be available and a means provided for data recovery. Provision should be made for archiving in accordance with applicable Federal and State requirements.
- 1.3.11 System should include a secure (locked) work station/cabinet which will allow complete user access while still maintaining equipment and physical security at all times.
- 1.3.12 System should be capable of integrating certified weather observation data with computerized weather information system output.

GUIDELINE No. 2: PREFLIGHT WEATHER INFORMATION SYSTEM

2.1.0 INTRODUCTION

Federal regulations require that the pilot in command have an adequate knowledge of weather conditions prior to commencing flight. A system for providing comprehensive weather information should be an integral part of any Pilot Information Center. This Guideline lists the recommended items of information, the graphics and the performance desired.

2.2.0 OBJECTIVE

- 2.2.1 To enhance aviation safety by providing a system that meets the needs of the general aviation pilot for timely, accurate weather data to assist in the process of pre-flight planning.

2.3.0 SYSTEMS PERFORMANCE RECOMMENDATION

All weather data should be acquired from NWS, FAA and other certified weather sources.

2.3.1 ALPHANUMERIC

- 2.3.1.1 Surface Observations (SA, SP): Both U.S. and Canadian, updated as available by site, State and route of flight. Current and previous reports should be recallable by site and State.
- 2.3.1.2 Radar Reports (SD): Both U.S. and Canadian, updated as available. Current and previous reports should be recallable by site and State.
- 2.3.1.3 Terminal Forecast (FT): Both U.S. and Canadian, updated as available, by site, State and route of flight. Current and previous reports should be recallable by site and State.
- 2.3.1.4 Area Forecast (FA): For all U.S. regions, updated as available, by category, State, site and forecast office.
- 2.3.1.5 State Forecast (FP): For all available U.S. States, updated as available, recallable by site, State and forecast office.
- 2.3.1.6 Extended State Forecast (FE): (Same as FP)
- 2.3.1.7 Pilot Reports (PIREPS): Updated as available and recallable by State and issuing office.

- 2.3.1.8 **AIRMETS:** Updated as available and recallable by State and issuing office.
- 2.3.1.9 **Weather Watches:** Updated as available. All current Weather Watches should be recallable by State and issuing office.
- 2.3.1.10 **SIGMETS and Convective SIGMETS:** Updated as available, recallable by site and State. All SIGMETS should be recallable by issuing office and region.
- 2.3.1.11 **Radar Narrative Summary:** Available and recallable by site and State.
- 2.3.1.12 **Winds Aloft (FD):** For all reported altitudes, updated as available, and the current version recallable by site and State.
- 2.3.1.13 **En route Data:** Display departure, destination, alternate and en route weather data, including surface observation, terminal forecast, NOTAMS (including specified en route nav aids), winds aloft and convective SIGMETS along the route of flight.
- 2.3.1.14 **Certified weather observations:** disseminate observations from non-Federal AWOS or SAWRS locations, recallable by airport site and state.
- 2.3.1.15 **Other products provided at the option of the contractor.**

2.3.2 **GRAPHICS**

- 2.3.2.1 **Graphic products shall be generated from one or more of the following sources and should be equivalent or better than:**
 - a. **NWS DIFAX, or**
 - b. **Automation of Field Operations and Services (AFOS) products available from National Weather Service (NWS), or**
 - c. **graphic products generated from approved FAA data by the PIC contractor that are equal in quality, detail and resolution to AFOS products. These graphics should include but not be limited to those graphics as outlined in FAA Order 7110.10, as a minimum.**

GUIDELINE No. 3: AIRPORT INFORMATION

3.1.0 INTRODUCTION

Federal regulations require that the pilot-in-command be familiar with all airports involved in a planned flight. The purpose of this Guideline is to propose performance standards which will provide a pilot with basic elements of information useful for preflight planning purposes.

If the capabilities and standards proposed by this Guideline are accepted for inclusion in any Pilot Information Center, a disclaimer should be included in the display announcing the limitations of the information provided and that reference to other sources is required to obtain current information as applicable.

3.2.0 OBJECTIVE

To provide a ready access to information normally found in the Airport/Facility Directory and similar publications.

3.3.0 PERFORMANCE RECOMMENDATION

- 3.3.1 Display current information on the airport requested, including; latitude/longitude, telephone numbers, services, city served, State, elevation, runway information, type of navaid and frequency, magnetic variation and other data as agreed upon.**
- 3.3.2 Graphic display of airport is desirable.**
- 3.3.3 Data should be recallable by each of the following: airport name, airport identifier or city served.**

GUIDELINE No. 4: NOTICES TO AIRMEN (NOTAMS)

4.1.0 INTRODUCTION

Federal regulations require that the pilot-in-command be aware of all NOTAM information prior to each planned flight. NOTAMS should be an integral part of any Pilot Information Center which a State may choose to acquire. This Guideline provides the performance standards recommended.

4.2.0 OBJECTIVE

To provide a ready reference to current NOTAMS.

4.3.0 PERFORMANCE RECOMMENDATION

- 4.3.1 All current and available NOTAM information, including NOTAM (D) or distant, NOTAM (L) or local, and Flight Data Center (FDC) NOTAMs, should be provided. Recognizing that the NOTAM system is currently being revised by FAA, Pilot Information Centers should be capable of providing the same information now contained in the NOTAMS referenced above.**
- 4.3.2 Information should be updated as available and recallable by airport, State and reporting FSS.**
- 4.3.3 All current and available NOTAM information should be archived in accordance with Guideline 1.3.10.**

GUIDELINE No. 5: FLIGHT PLANNING

5.1.0 INTRODUCTION

The purpose of this guideline is to provide the pilot with two levels of flight planning capability. The basic level provides at least a quick calculation of time en route and total time, based on zero wind. The full level would include a template (worksheet) for pilot inputs which will result in outputs (based on currently-available winds) of more comprehensive information pertinent to a planned flight.

In addition to the information that would be provided through the capabilities and standards under this Guideline, there is a related service pertinent to FAA preferred routing, which could be available through the system under the standards set forth in Guideline 13.

This Guideline should be an integral part of any Pilot Information Center.

5.2.0 OBJECTIVE

To facilitate flight planning by providing the pilot with rapid calculation of distances, heading and courses, and time en route for each route segment of flight.

5.3.0 PERFORMANCE RECOMMENDATION

5.3.1 Basic flight planning service

- 5.3.1.1** System should calculate and display the heading and distance between specified points, and the total distance.
- 5.3.1.2** System should calculate and display the time between each point and the total time with calm winds based on aircraft speed.

5.3.2 Full flight planning service

- 5.3.2.1** Provide a flight planning worksheet and calculation system allowing users to input the required information concerning their aircraft performance and route of flight. The system should then calculate distance, great circle course, magnetic course, magnetic heading, time en route and fuel burn information, after automatically adjusting for current winds.
- 5.3.2.2** The system should be capable of planning RNAV routes and waypoints, or of routing via specified navigational aids or

latitude/longitude points.

- 5.3.2.3 An optional command should allow automatic attachment of terminal and en route weather data, if desired, including pertinent surface observation and terminal forecast reports and winds aloft data used in its calculations.
- 5.3.2.4 This package should include applicable NOTAMS, and should also provide reports for the nearest available point in the event that the specified departure or destination points do not have current surface observation or terminal forecast reports.
- 5.3.2.5 A desired feature of this service may include the determination of the flight altitude which will provide optimum time en route and/or fuel burn.

GUIDELINE No. 6: FLIGHT PLAN FILING

6.1.0 INTRODUCTION

The purpose of this Guideline is to propose standards for providing a system which will process and file flight plans. This capability would be particularly useful in supplementing the efforts of FAA Flight Service Stations, especially during peak utilization periods normally associated with instrument weather conditions.

This Guideline should be an integral part of any Pilot Information Center.

6.2.0 OBJECTIVE

To provide a convenient system which will serve as a viable mechanism for the purpose of filing flight plans, as an alternative to the FAA process.

6.3.0 PERFORMANCE RECOMMENDATION

- 6.3.1 System should be capable of accepting flight plan filing input from the user, automatically processing it, forwarding it to the FAA's NADIN computer for entry into the system and providing a printed copy to the user.
- 6.3.2 Corrections - System should be capable of recognizing erroneous input in routing and displaying an error message to allow pilot to re-enter data as necessary. Desired changes to any portion of the flight plan prior to transmittal should be easily accomplished.
- 6.3.3 System should provide the user with an acknowledgement of receipt of the flight plan by the vendor.

GUIDELINE No. 7: AIRMAN'S INFORMATION MANUAL (AIM)

7.1.0 INTRODUCTION

This Guideline serves to propose standards for the cataloguing and retrieval of information contained in the AIM. Its benefit to the aviation community would be to provide a ready reference to assist pilots in obtaining information pertinent to preflight planning, as well as to serve as a general reference for instructional and other purposes.

This Guideline should be an integral part of any Pilot Information Center.

7.2.0 OBJECTIVE

- 7.2.1 To provide a ready reference system which will assist pilots in flight planning.**
- 7.2.2 To provide quick retrieval of desired information.**
- 7.2.3 To provide an ability for automated linkage from AIM references to the appropriate FARs.**

7.3.0 PERFORMANCE RECOMMENDATION

- 7.3.1 System should be capable of text and image retrieval.**
- 7.3.2 System should provide for user-friendly, quick retrieval of desired information.**
- 7.3.3 System should provide a ready reference highlighting recent changes to the AIM.**

GUIDELINE No. 8: AWOS/NADIN INTERFACE

8.1.0 INTRODUCTION

The purpose of this Guideline is to propose a performance standard which would provide for a system of more widespread dissemination of available weather information.

This Guideline should be an integral part of any Pilot Information Center.

8.2.0 OBJECTIVE

To augment dissemination of weather reporting capability by making available the information provided by non-Federal Automated Weather Observing System III (AWOS III) sites.

8.3.0 PERFORMANCE RECOMMENDATION

- 8.3.1 System should be capable of entering AWOS data into FAA's NADIN computer for national distribution.**

V. OPTIONAL GUIDELINES

GUIDELINE No. 9: TERMINAL AND SPECIAL-USE AIRSPACE INFORMATION

9.1.0 INTRODUCTION

The purpose of this Guideline is to provide a pilot with basic elements of information useful for preflight planning purposes. The information provided is intended to assist pilots in deciding a course and/or altitude to be flown in consideration of various types of airspace.

If this Guideline is accepted for inclusion in any Pilot Information Center, a disclaimer should be included in the display announcing any limitations of the information provided.

9.2.0 OBJECTIVE

To provide current and available information on terminal airspace such as: Terminal Control Areas (TCA), Airport Radar Service Areas (ARSA) and Terminal Radar Service Areas (TRSA); special-use airspace; and military training routes.

9.3.0 PERFORMANCE RECOMMENDATION

- 9.3.1 Information should be accessible by flight plan route, airport, airport identifier, special-use airspace name/identification, and city, as appropriate.
- 9.3.2 System should provide information on control/service area and military training routes and should provide appropriate geographic area references. Boundaries, floors, ceilings, frequencies and telephone numbers of controlling agency should be provided. Graphic depiction is desirable.
- 9.3.3 A disclaimer stating "Not for Navigational Use" should appear on each page of any hard copy.

GUIDELINE No. 10: WEIGHT AND BALANCE CALCULATION

10.1.0 INTRODUCTION

The purpose of this guideline is to assist the pilot in accomplishing two goals. First, it provides a basic template for weight and balance calculations to assist in aircraft loading decisions. Secondly, this weight calculation is basic, when coupled with information provided outside of this guideline, in determining runway landing and take-off distance requirements.

Inclusion of this Guideline in any Pilot Information Center should be at the option of the State.

Federal regulations require weight and balance calculations to be accomplished as part of preflight actions for all flights.

10.2.0 OBJECTIVE

To assist pilots in determining proper loading and allowable fuel load for their aircraft during pre-flight planning.

10.3.0 PERFORMANCE RECOMMENDATION

- 10.3.1 Provide a weight and balance calculation system to assist pilots in determining allowable loading. Based on pilot inputs, the system should determine the allowable fuel load for departure and arrival for each leg of flight.
- 10.3.2 The system should also be capable of calculating maximum CG and gross weight limitations given variances in aircraft loading.
- 10.3.3 A disclaimer stating "For Basic Preflight Planning Purposes Only - Pilot-In-Command is Responsible for Compliance with all Applicable FARs" should appear on each page of any hard copy.

GUIDELINE No. 11: AIRCRAFT OPERATIONAL INFORMATION

11.1.0 INTRODUCTION

The purpose of this Guideline is to propose standards for providing a basic template which will allow the user to catalogue data pertinent to certain performance characteristics of his aircraft for later retrieval during the preflight planning process.

Inclusion of this Guideline in any Pilot Information Center should be at the option of the State.

11.2.0 OBJECTIVE

To provide a convenient reference system which will facilitate retrieval of certain aircraft performance data, archived earlier by a user, for purposes of pre-flight planning.

11.3.0 PERFORMANCE RECOMMENDATION

- 11.3.1 System should be capable of cataloguing selected information from manuals of general aircraft which normally operate from airfields in the United States.
- 11.3.3 Data should include as a minimum:
 - 11.3.3.1 V Speeds
 - 11.3.3.2 Endurance (Range/Hours)
 - 11.3.3.3 Service Ceiling
 - 11.3.3.4 Maximum Allowable Weights (Ramp, Takeoff, Landing)
 - 11.3.3.5 Standard Empty Weight
 - 11.3.3.6 Baggage Allowance
 - 11.3.3.7 Fuel Capacity
 - 11.3.3.8 Take-off tables
- 11.3.4 A disclaimer stating "For Basic Preflight Planning Purposes Only - Pilot-In-Command is Responsible for Compliance with all Applicable FARs" should appear on each page of any hard copy.

GUIDELINE No. 12: SELECTED FEDERAL AVIATION REGULATIONS

12.1.0 INTRODUCTION

This Guideline serves to propose standards for the cataloguing and retrieval of recent changes to selected FAA regulations, including highlighted recent changes which would be especially pertinent with regard to preflight preparation.

Inclusion of this Guideline in any Pilot Information Center should be at the option of the State.

12.2.0 OBJECTIVE

To enhance pilot awareness concerning up-to-date Federal Aviation Regulations (FARs) pertinent to flight operations. At a minimum, this should include FARs Parts 91 and 135. It may be desirable, dependant upon anticipated use and location, to include FARs Parts 61, 67, 141, and others.

12.3.0 PERFORMANCE RECOMMENDATION

- 12.3.1 System should provide a ready reference highlighting recent changes in Federal Aviation Regulations.
- 12.3.2 System should provide for user-friendly, quick retrieval of desired information.

GUIDELINE No. 13: PREFERRED ROUTING

13.1.0 INTRODUCTION

This Guideline proposes standards to provide information regarding FAA published preferred routing, where appropriate, for purposes of preflight planning. In addition, it would be desirable to provide a capability to highlight routes which penetrate terminal and special use airspace.

Inclusion of this Guideline in any Pilot Information Center should be at the option of the State.

13.2.0 OBJECTIVE

To provide a system which will assist pilots during pre-flight planning to determine prescribed flight routing.

13.3.0 PERFORMANCE RECOMMENDATION

- 13.3.1 System should be capable of determining FAA-preferred routing, if available, based on pilot's selection of navigational mode (Nav aids, LORAN-C, RNAV) and departure/arrival airport inputs.
- 13.3.2 System should have available, and should advise pilot of, the FAA preferred routes, if available, during the flight planning or flight plan filing phase. (See Guidelines 5 and 6.)

GUIDELINE No. 14: AIRWORTHINESS DIRECTIVES AND SERVICE BULLETINS

14.1.0 INTRODUCTION

The purpose of this Guideline is to assist pilots and operators in complying with FAA emergency airworthiness directives, and similar information as desired and available.

Inclusion of this Guideline in any Pilot Information Center should be at the option of the State.

14.2.0 OBJECTIVE

Provide for review of airworthiness directives (ADs), service bulletins and other information.

14.3.0 PERFORMANCE RECOMMENDATION

- 14.3.1 System should be capable of retrieving FAA-issued airworthiness directives and manufacturer-issued service bulletins.
- 14.3.2 Data should be accessible by make and model of aircraft, engine and/or component.

APPENDIX A: Historical Summary of State Efforts for Safety and Weather Information Dissemination

1969 - Montana created the first and most unique program to encourage weather briefings and flight plan filing by making Statewide credit card numbers available for any Montana pilots "free of charge" to obtain weather information and file flight plans. This program was extremely popular and preceded Federal Aviation Administration 800 numbers for Flight Service Station information. This program was widely accepted by Montana pilots and stayed in use until 1984.

1971 - Washington began the first known Statewide 800 number program to provide weather information for pilots. This program linked Washington State pilots with the State Aeronautics Office and directly to the FAA FSS after regular State office hours providing weather information for all flying operations including the Statewide search and rescue program. This program gave way to the FAA 800 number in the mid-1970's.

1976 - Virginia played a strong supporting role with the FAA during the combining of the Charlottesville, Richmond and Washington FSS's into the Leesburg consolidated FSS demonstration. Representatives of these Virginia communities were flown to Leesburg for demonstrations and were encouraged to prepare for the future, recognize the changing technologies and note the human resource limitations that would necessitate a revised delivery system for FAA's FSS's in the coming decades.

1983 - Minnesota led the way in computer delivery of pilot weather information with their National Association of State Aviation Officials award-winning network of 53 terminals at 49 airports. This delivery system was created to supplement the services provided by the FAA FSS's. This leadership role of Minnesota led the way for Wisconsin to follow suit as States saw the continuing need to supplement the existing delivery system for weather information by the FAA.

1984 - Wisconsin installed 18 terminals using leased land lines and began a detailed study for a lower-cost weather information delivery system which included a review of an FAA-funded study. The Wisconsin study resulted in a \$67,000 contract to develop a low-cost, service-effective satellite technology delivery system. Wisconsin's success with this satellite technology system at over fifty airports created interest in other States looking for ways to supplement the FAA's AFSS program as it experienced delays in providing services for pilots.

1987 - Virginia began acquiring these satellite technology systems and in 1988 with FAA approval began a demonstration of computer-to-computer flight plan filing to the Leesburg AFSS. This demonstration co-sponsored with a private vendor resulted in the refinement of the format and process which led to phase II now in place whereby flight plans are filed through NADIN. The FAA through the Eastern Region played a continuing role in this demonstration.

1988-1989 - Wisconsin's lead in the development of the satellite-based technology provided the basic specifications for other States to analyze and adopt for their systems. Nebraska, North Dakota, Pennsylvania, Virginia and Washington have all installed this basic type of system with some individual requirements. Combined, the above six States have 164 units located at airports with phone-line modem access to all pilot-owned personal computers.

1990 - Michigan joined the above six States with a contract for six satellite technology units and an option for additional units to provide Michigan's pilots with flight planning, weather information (including graphics) and flight plan filing.

1990 - In January, NASAO/CARE, representing all the 50 States, submitted a proposal "Project Safety Advisories For Each Pilot Including Latest Weather Observations Transmitted via Satellite" (Project SAFE PILOTS) to the FAA to extend the State-developed and tested low-cost, service-effective, satellite-based technology system service nationwide. This proposal is a sincere effort to join hands with the FAA to provide a weather and safety information delivery system via computers to America's pilots nationwide including Alaska and Hawaii.

1990 - NASAO/CARE Board of Directors passed a Resolution emphasizing the value of and support for Project "SAFE PILOTS." The Resolution was transmitted to FAA Deputy Administrator Barry L. Harris by the NASAO/CARE Board Chairman on March 22, 1990.

1990 - In May, Montana provided a single satellite-based unit in the State with unlimited 800-line, in-WATS service for pilot use and evaluation over a three-month period. The utilization far exceeded expectations provoking the State to consider installing additional units at high-demand locations.

1990 - In September, NASAO/CARE signed a partnership contract with the FAA's Office of Aviation Safety to develop "Performance Guidelines for Pilot Information Centers." The Pilot Information Center is a computer terminal that would be placed at airports to provide not only weather information but any other pre-flight information conducive to safety, such as NOTAMs, airport diagrams, terminal airspace depictions, regulations, text from the Airman's Information Manual, and any other appropriate information. This contract signals FAA interest in using the States' experience in acquiring and installing weather-dissemination units, and possibly supplementing or enhancing the State-supplied systems already in place.

APPENDIX B: ACRONYMS

AD	airworthiness directives
AFSS	automated flight service station
AFOS	automation of field operations and services
AIM	Airman's Information Manual
AIRMET	airmen's meteorological information
AOPA	Aircraft Owners and Pilots Association
ARSA	airport radar surface area
AVCOMPS	aviation computer software
AWOS	automated weather observing system
CARE	Center for Aviation Research and Education (NASAO)
CG	center of gravity
DIFAX	digital facsimile
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FSS	flight service station
GA	general aviation
NADIN	National Airspace Data Interchange Network
NASAO	National Association of State Aviation Officials
NBAA	National Business Aircraft Association
NOTAM	notice to airmen
NTSB	National Transportation Safety Board

NWS **National Weather Service**

PIC **Pilot Information Center**

PIREP **pilot report**

RNAV **area navigation**

SA **surface aviation observations**

SAFE PILOT **Safety Advisories For Each Pilot Including Latest Weather Observations**
Transmitted via Satellite

SAWRS **supplemental aviation weather reporting station**

SIGMET **significant meteorological information**

TCA **terminal control area**

TRSA **terminal radar service area**