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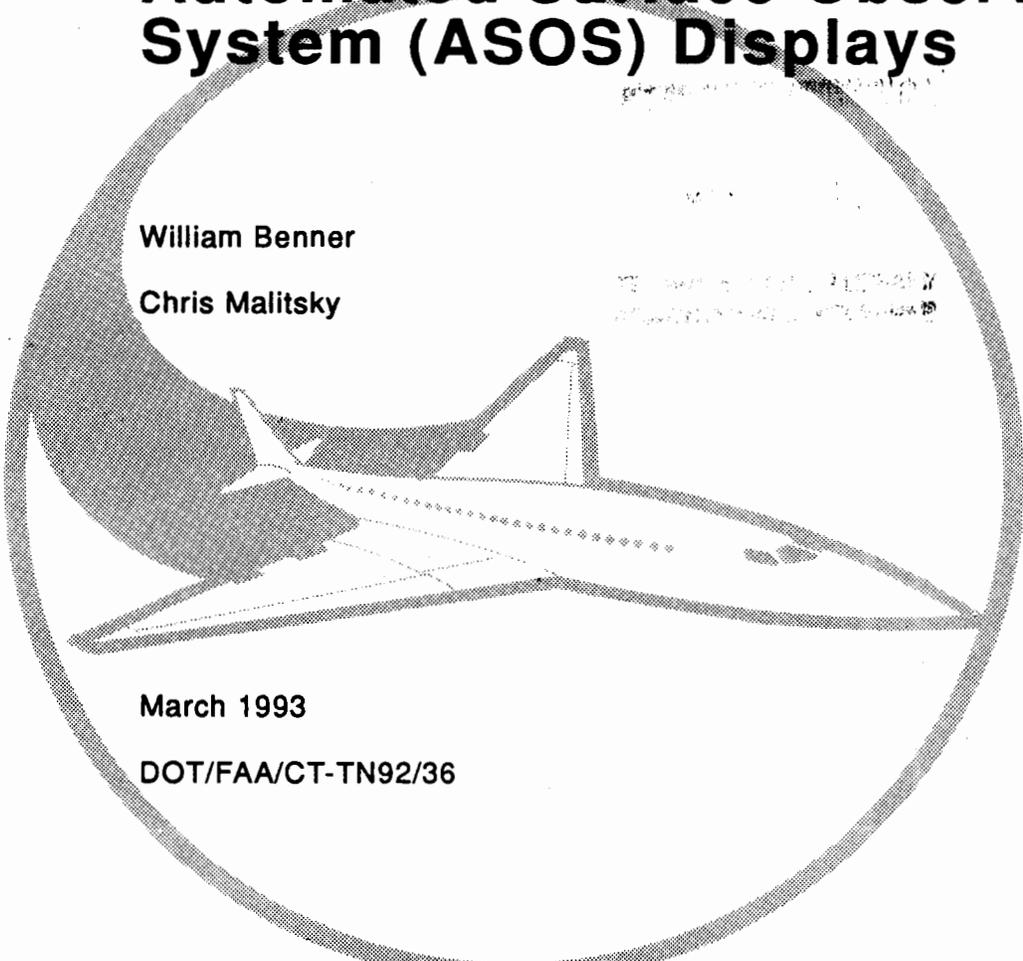


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Air Traffic Operational Evaluation Plan of the Automated Surface Observing System (ASOS) Displays

William Benner

Chris Malitsky



March 1993

DOT/FAA/CT-TN92/36

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1. Report No. DOT/FAA/CT-TN92/36		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle AIR TRAFFIC OPERATIONAL EVALUATION PLAN OF THE AUTOMATED SURFACE OBSERVING SYSTEM (ASOS) DISPLAYS				5. Report Date March 1993	
				6. Performing Organization Code	
7. Author(s) William Benner, Chris Malitsky, Alanna Randazzo, Bruce E. Ware (TPI)				8. Performing Organization Report No. DOT/FAA/CT-TN92/36	
				10. Work Unit No. (TRAIS)	
9. Performing Organization Name and Address U.S. Department of Transportation Federal Aviation Administration Technical Center Atlantic City International Airport, NJ 08405				11. Contract or Grant No.	
				13. Type of Report and Period Covered Technical Note	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Aviation Administration Technical Center Atlantic City International Airport, NJ 08405				14. Sponsoring Agency Code	
				15. Supplementary Notes	
16. Abstract The Automated Surface Observing System (ASOS) is a weather collection and display system that will be installed in airport traffic control towers (ATCT). The system is being procured, installed, operated, and maintained by the National Weather Service (NWS) for the Federal Aviation Administration (FAA). This plan outlines the FAA's evaluation of the limited production ASOS system, which is being produced by SMI Corporation. The FAA will conduct the evaluation of the limited production ASOS at seven air traffic field sites. They are Will Rogers World Airport, OK., Wiley Post Airport, OK., Tulsa International Airport, OK., Lincoln Municipal Airport, NE., Johnson County Airport, KS., St. Joseph Airport, MO., and Grand Island Airport, NE. Four of the named sites will be commissioned and the controller will be expected to use only that weather information generated by the ASOS and have the capability of inputting tower observed visibility when it falls below 4 miles. The remaining three sites will be noncommissioned sites where the controllers will undergo training and then evaluate the ASOS as they familiarize themselves with the system. Two of the three sites are also Limited Aviation Weather Reporting Station (LAWRS) which will permit the controller to augment the weather. Data will be collected via questionnaires completed by the air traffic control specialist (ATCS) at the seven sites and analyzed by FAA Technical Center personnel. The results of the evaluation will be used for consideration in making changes to the ASOS system prior to full production.					
17. Key Words Air Traffic Control Specialist (ATCS) Automated Surface Observing System (ASOS) Evaluation Air Traffic Control			18. Distribution Statement Document is on file at the Technical Center Library, Atlantic City International Airport, NJ 08405		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 35	22. Price

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EXECUTIVE SUMMARY

The Automated Surface Observing System (ASOS) is a weather collection and display system that will be installed in airport traffic control towers (ATCT). The system will be procured, installed, operated, and maintained by the National Weather Service (NWS) for the Federal Aviation Administration (FAA) under a Memorandum of Agreement (MOA). This plan outlines the FAA's operational evaluation of the ASOS system, which is being produced by the SMI Corporation. The FAA will conduct an operational evaluation on the ASOS at Will Rogers World Airport, OK., Wiley Post Airport, OK., Tulsa International Airport, OK., Lincoln Municipal Airport, NE., Johnson County Airport, KS., St. Joseph Airport, MO., and Grand Island Airport, NE.

Data will be collected via questionnaires completed by air traffic control specialists (ATCS) at the seven operational sites. The results of the evaluation will be used for consideration in making any necessary changes to the ASOS prior to full production.

INTRODUCTION

PURPOSE.

The purpose of this plan is to specify the approach and method to be used in obtaining an evaluation from air traffic control specialists (ATCS) on the operational suitability of the Automated Surface Observing System (ASOS) requirements.

The Federal Aviation Administration (FAA) previously conducted two evaluations of ASOS. The first evaluation was conducted on the preproduction ASOS at the Tulsa International Airport in May of 1990. Although this evaluation was conducted at an operational site, this was not the production system, and the evaluation only included controllers from Tulsa, Oklahoma.

A second evaluation, on the limited production ASOS, was conducted at the FAA Technical Center in the fall of 1991, with controllers from each of the nine regions. It is important to note, the second evaluation was conducted in a nonoperational setting.

The FAA Air Traffic Plans and Requirements Service (ATR-1) requested a third evaluation of ASOS be conducted on the limited production ASOS in an operational environment. The goal of this third evaluation is to provide ATCS with the opportunity to evaluate the ASOS in an operational setting and determine if the requirements/issues listed in appendix A are valid. Based on this third evaluation, these air traffic (AT) requirements/issues may be revised and new requirements may be identified. These modified/new requirements will be documented in the final report and presented to the Program Director for Weather and Flight Service Systems, ANW-1, who will in turn submit them to the National Oceanic and Atmospheric Administration (NOAA) Program Office. The incorporation of any new or revised requirements to the ASOS, as a result of this evaluation, will ensure the ASOS operational suitability as an integrated part of the National Airspace System (NAS).

If there are changes made to the ASOS as a result of this evaluation, the revised ASOS will be operationally evaluated for 30 days in a follow-on evaluation. This follow-on evaluation, if necessary, will be described in a separate plan.

REFERENCE DOCUMENTS

This section lists the applicable documentation and reference materials which relate to the contents of this plan.

DTF01-88-Z-02004

Memorandum of Agreement Federal
Aviation Administration/National
Oceanic and Atmospheric Administration

FAA-STD-024a

Preparation of Test and Evaluation
Documentation, August 17, 1987

FAA Order 1810.4a(b)

FAA NAS Test and Evaluation Program
February 14, 1989

DOT/FAA/CT-TN89/56

Plan for the FAA Air Traffic
Operational Evaluation of the
Automated Surface Observing System
(ASOS). November 1989

DOT/FAA/CT-TN90/4

FAA Air Traffic Operational
Evaluation of Automated Surface
Observing System (ASOS). May 1990

DOT/FAA/CT-TN91/1

Air Traffic Operational Evaluation
Plan for the Limited Production
Automated Surface Observing System
(ASOS). September 1991

BACKGROUND

The evaluation will cover the ASOS Operator Input Device (OID) and the Controller Video Display (CVD) equipment. It will pay particular attention to impact on workload, applicability of the Man Machine Interface (MMI) to AT personnel, readability of the displays, equipment fit in the tower cab and Terminal Radar Approach Control (TRACON), and the content/format of the CVD data. The previous evaluations were conducted at the Tulsa Airport Traffic Control Tower (ATCT) and the FAA Technical Center. This third evaluation will use data from four commissioned ASOS sites and three noncommissioned ASOS sites. The evaluation sites will include two Limited Aviation Weather Reporting Station (LAWRS) facilities and will represent four of the five tower levels and two regions. The commissioned sites will allow for the most realism, but will not allow the use of scripts to exercise the equipment. The noncommissioned sites will allow for the use of scripts to fully test out the OID interface, but will have a difference in system usage.

EVALUATION SITES.

The evaluation sites were chosen by AT from a list of 13 National Weather Service (NWS) towered sites and 10 FAA towered sites that are part of the ASOS Lot 1 procurement. The sensing equipment has been installed, and the tower equipment installation is currently scheduled to begin in August of 1992. AT selected the specific sites to incorporate the following characteristics: tower levels, region representation, TRACON, LAWRS, and commissioned and noncommissioned ASOS sites. All sites will evaluate one OID and a number of CVDs. The number of CVDs to be evaluated was determined by each region. The number of CVDs evaluated at each ASOS site is indicated below. There will be no Video Display Units (VDUs) or send and receive handsets installed at either noncommissioned or commissioned sites.

ASOS Sites

Commissioned Sites: The ASOS evaluation will be conducted at the following commissioned NWS sites:

<u>SITE</u>	<u>LEVEL</u>	<u>NO. OF CVDs</u>
Oklahoma City, OK. (OKC)	4	5 (2-cab; *3-TRACON)
Tulsa OK., (TUL)	3	5 (2-cab; *3-TRACON)
Lincoln Municipal. (LNK)	2	1 (cab)
Grand Island, NE. (GRI)	1	2 (2-cab; *1-flush mount)

Noncommissioned Sites: The ASOS evaluation will be conducted at the following noncommissioned FAA sites:

<u>SITE</u>	<u>LEVEL</u>	<u>NO. OF CVDs</u>
Olathe, KS. (OJC) LAWRS	2	1
Oklahoma City, OK. (PWA) CWO	1	2 (2-cab)
St. Joseph, MO. (SJT) LAWRS	1	*1 (flush mount)

*Note - Built into the surface of the console.

Initial coordination with the regions for these sites will be the responsibility of the FSS/Weather Branch, ATR-130. Follow-on coordination with the sites will be led by ATR-130 and ACW-200B. The Weather Sensors Branch, ANW-140, will coordinate the installation of tower cab equipment with NOAA and the FAA Regions.

EVALUATION APPROACH.

The evaluation approach for the commissioned and noncommissioned sites and the ad hoc team meeting, that will follow the evaluation, will be held at the FAA Technical Center and is described below.

COMMISSIONED SITES. The evaluations at the four commissioned sites will be conducted following the training of the ATCS participants on the use of the ASOS and the actual commissioning of the system. A 60-day evaluation period is planned. The ATCS participants will receive a briefing at the start of the evaluation and an evaluation form/questionnaire at the end of the 60 days. If the commissioned site has a TRACON, a TRACON supplemental questionnaire will be given to the ATCS participants to complete.

Since these systems are commissioned, and the ATCS participants will be utilizing the ASOS to obtain the operational weather data, operator scenarios will not be utilized.

In order to evaluate the CVD in both the table top and console mount installations, the sites will be encouraged to flush mount at least one of the CVDs, if this was not their original intention. (Note: The reason some sites do not wish to flush mount the CVDs, is that they are sensitive to cutting holes for a display that may drastically change in size.)

During the evaluation session, FAA Technical Center personnel will be on hand to administer the questionnaires, brief the ATCS participants, answer questions, and facilitate the completion of questionnaires. The time period for this on-site activity varies relative to the tower size, and can run from approximately 2 to 9 days.

NONCOMMISSIONED SITES. Three noncommissioned sites will participate in the evaluation, after the tower equipment is installed, and ASOS training given to controllers has been completed. At these sites, it is planned that controllers will be briefed on the evaluation, provided with scenarios, and will be given at least 2 weeks to use the system in a test mode. After this period, FAA Technical Center personnel will be on hand to administer the questionnaires, review the scripts, answer questions, and facilitate the completion of the questionnaires.

The questionnaires used for the noncommissioned sites will be identical to the questionnaires that were used for the commissioned sites and include a summary questionnaire. If the noncommissioned site is also a LAWRS, a LAWRS supplemental questionnaire will be given to the ATCS participants to complete as part of the evaluation. The time period for this on-site activity should not take more than 4 days at each of the three sites.

At those sites not planned for commissioning, the ASOS display equipment will be removed approximately 30 days after the evaluation is completed.

FAA TECHNICAL CENTER. Once the evaluations are completed at the seven operational sites, the questionnaire data will be analyzed by ACW-200B personnel to identify the issues/concerns. These issues will be addressed during the ad hoc team meeting. An integral part of meeting the goal of providing definitive ASOS requirements will be supported by an ad hoc team made up of selected ATCS evaluation participants, from each of the seven sites, along with headquarters AT personnel, SPO2/W/OSD14, ANW-140, and ACW-200B. This ad hoc team will meet for 1 week to review the issues/concerns resulting from the ASOS evaluation, provide insight into the problems, discuss proposed resolutions, and assist AT in drafting revised and/or newly specified ASOS requirements. The team will meet at the FAA Technical Center in order to have access to an operational ASOS during their discussions.

EQUIPMENT AND DATA ANALYSIS.

This section describes the components of the ASOS system that will be installed in the towers and the type of data analysis that will be performed.

OID. The OID consists of a color monitor which displays Surface Aviation Observations (SAOs), 1-minute observations, local observations, and archived data. A keyboard is associated with the monitor for entering remarks, tower visibility, and reviewing and/or archiving ASOS weather data. The OID has an audible alarm for alerts/specials. The weather element causing the alert/special is highlighted and/or blinking on the screen. The OID is intended to be located in the tower cab as close to the Flight Data Operator (FDO) position as space allows.

CVD. The CVD is an electroluminescent flat panel display that will be placed at selected controller positions in the tower cab and in the TRACON. It will display SAOs, Specials, winds (updated every 5 seconds), altimeter (updated each minute), and a limited set of remarks. The CVDs may be either mounted on (table top), or cut into the consoles (flush mounted).

DATA ANALYSIS. The wording of each questionnaire item is based on the AT requirements/issues listed in appendix A. The ATCS participants will be asked to determine the operational suitability of the functions and features of the ASOS. Four different questionnaires will be used for the evaluation.

The first questionnaire is titled the "ASOS Questionnaire for the Control Tower Cab" and will be administered at the end of the 60-day evaluation sessions at the commissioned sites, and at the end of the evaluation at the noncommissioned sites. The second questionnaire is titled the "TRACON Supplemental Questionnaire" and will be administered at the commissioned sites that are TRACONs. The third questionnaire is titled the "LAWRS Supplemental Questionnaire" and will be administered at the noncommissioned sites that are LAWRS facilities. The fourth questionnaire is the "Summary Questionnaire," and will be completed by all the ATCS participants at both the commissioned and noncommissioned sites at the end of the evaluation for the site.

The ASOS questionnaire for the Control Tower Cab will contain a variety of multiple choice questions and statements about the ASOS. Participants will be asked to agree or disagree with the statement and provide comments. Each multiple choice question will be analyzed to determine the overall choice of the participants. The positive statements contained on this questionnaire will be analyzed to determine the percentage of the participants that agreed or disagreed with the statement. These percentages will be plotted for each statement on a histogram. If the participants disagree with a statement and provide comments, the content of those comments will be analyzed and summarized.

The TRACON and LAWRS Supplemental Questionnaires will contain statements about the ASOS. Participants will be asked to agree or disagree with the statements and provide comments. These questionnaires will use the same methodology and data analysis techniques as the ASOS questionnaire for the Control Tower Cab.

The Summary questionnaire will be administered to all the participants requesting free-form comments on the operational suitability of the ASOS. These comments will be analyzed using content analysis. The Summary questionnaire will be analyzed to determine the overall responses for both the commissioned and noncommissioned sites.

The results from the data analysis will be documented in quick look and final reports.

ORGANIZATION ROLES AND RESPONSIBILITIES

The principal organizations which will be participating in the evaluation of ASOS include the following: the FAA Weather Sensors Program Office, ANW-400/140; Weather and Primary Radar Division, Weather Processors, ACW-200B; FSS/Weather Branch, ATR-130; Air Traffic Rules and Procedures, ATP-120; Office of Air Traffic System Management, ATM-120; two FAA Regional Air Traffic Divisions (Central and Southwest); National Oceanic and Atmospheric Administration ASOS Program Office (SPO2); NWS Transition and Implementation Branch (W/OSD14); ATCSs from Tulsa, OK., Grand Island, NE., Oklahoma City (OKC) and (PWA), OK., Lincoln, NE, and St. Joseph, MO., Olathe, KS.; FAA Technical Center support contractors, and the prime contractor, SMI Corporation.

RESPONSIBILITIES.

ANW-400/140. ANW-400/140 is the FAA ASOS Program Office and has the overall authority for the evaluation. This office will coordinate activities with NOAA/NWS, and review and approve documentation. The Weather Sensors Branch, ANW-140, will provide working level support.

ACW-200. The Weather and Primary Radar Division, Weather Processors, ACW-200B, has been designated by the program office to manage, coordinate, and conduct the ASOS evaluation. ACW-200B personnel will develop the operational plan and associated questionnaires. ACW-200B will provide the evaluation director and evaluation conductor(s) who will participate in the initial site visits to coordinate the evaluation, and will brief AT personnel at the designated sites on the questionnaires and logistics of the evaluation. ACW-200B will provide interim quick look reports to the program office and AT headquarters personnel following each evaluation. At the conclusion of the overall evaluation, ACW-200B will lead the ad hoc team meeting of selected AT evaluation participants, ANW-140, and AT headquarters personnel.

ATR-130. ATR-130 has been designated as representing AT during the evaluation and will review the operational evaluation plan and questionnaires, coordinate AT comments, monitor the evaluation, and participate in the ad hoc team meeting. ATR-130 personnel will coordinate with regional AT division offices concerning support from the seven evaluation sites.

ATP-120. ATP-120 will review the operational evaluation plan and questionnaires and provide comments through ATR, monitor the evaluation, and participate in the ad hoc team meeting.

ATM-120. ATM-120 will review the operational evaluation plan and questionnaires and provide comments through ATR, monitor the evaluation, and participate in the ad hoc team meeting.

NOAA(SPO2)/NWS(W/OSD14). NOAA (SPO2)/NWS (W/OSD14) are responsible for ensuring that the prime contractor (SMI Corporation) is tasked to install ASOS control tower equipment and to provide the necessary controller training.

REGIONAL AIR TRAFFIC DIVISION OFFICES. The Central and Southwest Regional Offices will serve as the liaison for the evaluation sites within their regions.

AIR TRAFFIC FACILITIES PARTICIPATING IN THE EVALUATION. Each facility will be responsible for training the ATCS participants that were not previously trained by SMI Corporation. Facility managers will provide the necessary meeting/briefing facilities and space to accommodate the evaluation conductors. The ATCSs, at these facilities, will participate in the ASOS evaluation and complete the questionnaires. After all the evaluations have been completed, each facility will be requested to provide one ATCS participant to represent their facility at the FAA Technical Center as a member of the ad hoc team.

FAA TECHNICAL SUPPORT CONTRACTORS. FAA Technical Center support contractors will provide personnel to support the development of the operational evaluation plan and questionnaires, participate in site visits, reviews, and briefings. They will serve as evaluation conductors and assist in the data analysis, and in the preparation of the quick look and final reports.

PRIME CONTRACTOR. The SMI Corporation will install the limited production ASOS units at the designated sites, prior to the evaluation. The SMI Corporation personnel will provide the training, as detailed in their statement of work (up to a maximum of 6 people) to operational air traffic control personnel at the evaluation sites.

ROLES.

EVALUATION DIRECTOR. The evaluation director is a member of the FAA Technical Center and will oversee all aspects of the evaluation including preparation of the quick look reports and final report.

EVALUATION CONDUCTORS. The evaluation conductor(s) will be the on-site evaluation coordinators. They will participate in all site visits, reviews, and briefings. The conductors will brief the ATCS participants on the purpose of the evaluation and the questionnaires, and conduct the evaluation. The evaluation conductors will support the data analysis, prepare the quick look reports, participate in the ad hoc team meeting, and prepare the final report.

EVALUATION PARTICIPANTS. The ATCS participants at Tulsa, Grand Island, Oklahoma City (OKC), and Springfield ATCTs will evaluate the ASOS as a commissioned system, and the ATCS participants at Olathe, Oklahoma City (PWA), and St. Joseph ATCTs will evaluate the ASOS as a noncommissioned system with the use of scenarios prepared by the FAA Technical Center. St. Joseph and Oklahoma City (PWA) ATCTs, being LAWRS facilities, will also evaluate additional functions associated with LAWRS and complete the LAWRS supplemental questionnaire.

DOCUMENT REQUIREMENTS AND CONTROL

AIR TRAFFIC OPERATIONAL SITE EVALUATION OF THE ASOS - PLAN.

This plan describes the method, approach, and responsibilities for conducting the operational evaluation of ASOS. It provides a method for AT to obtain data to be utilized in revising and/or specifying new operational requirements for the ASOS.

EVALUATION QUESTIONNAIRES.

ACW-200B, in conjunction with AT, will develop questionnaires to be utilized in collecting data from the ATCS participants relative to the operational suitability of ASOS.

QUICK LOOK REPORTS.

ACW-200B will prepare quick look reports for each evaluation site. These reports will be provided to AT and ANW within 5 working days following the completion of the two evaluations at the commissioned and the noncommissioned sites. There will be seven quick look reports. These reports will be used to structure the discussions of the ad hoc team meeting.

DRAFT FINAL REPORT.

The data from the seven quick look reports, along with any resolutions from the ad hoc team meeting, will be incorporated into the draft final report. This report will be provided to the AT organizations and ANW, within 15 working days following the ad hoc team meeting.

FINAL REPORT.

The final report will contain comments from the review of the draft, along with final recommendations resulting from the AT requirement analysis. This report will be sent to the AT organizations and ANW within 20 working days of receiving comments on the draft.

TRAINING

ASOS TRAINING.

The SMI Corporation will provide ASOS training to up to six personnel at each of the seven sites. The Office of Air Traffic Program Management (ATZ) will be responsible for monitoring the contractor training at the evaluation sites. Training staffs at each site having more than the original six personnel trained by the contractor will be responsible for training the remainder of the personnel taking part in the ASOS evaluation.

REVIEWS AND MEETINGS

The visits, briefings, and meetings described below are necessary to conduct the operational evaluation of ASOS.

INITIAL SITE VISITS.

An initial visit to each of the seven evaluation field sites is needed to coordinate with the facilities, develop a working relationship, and obtain site specific data. This site visit will be coordinated by ATR, via the regional representative, and will include representatives from ATR, ATP, ATM, ACW, and ANW.

EVALUATION BRIEFINGS.

An evaluation briefing will be given by ACW-200B to the ATCS participants at the seven sites, prior to the start of the evaluation at each site.

AD HOC TEAM MEETING.

An ad hoc team consisting of representatives from the seven operational sites, the headquarters AT organizations, SPO2/W/OSD14, ANW-140, and ACW-200B will meet to discuss the evaluation results, discuss discrepancies, offer possible solutions, and, if necessary, revise the requirements/issues in appendix A, and/or draft new requirements in support of AT. This meeting will be held for 1 week at the FAA Technical Center.

SCHEDULE

The evaluation schedule, listed below, may be updated based on the installation of tower display equipment.

Develop Evaluation Plan	5/92 to 7/92
Develop Questionnaires	5/92 to 7/92
Incorporate Comments to Plan and Questionnaires	7/92 to 8/92
Initial Site Visits (7)	8/92
Operational Evaluations (7)	10/92 through 12/92
Quick Look Reports (7)	5 working days after each evaluation
Ad Hoc Team Meeting	12/92
Draft Final Report	15 working days after Ad Hoc Team Meeting
Final Report	20 working days after comments on the draft are received

ASOS EVALUATION REQUIREMENTS MATRIX

The ASOS evaluation requirements matrix in appendix A contains the requirements/ issues for the ASOS, resulting from the operational evaluation that was conducted at the FAA Technical Center from October 7 through November 6, 1991. These requirements/issues are documented in a memorandum, dated February 6, 1992, from the Program Manager for Weather Sensors, ANW-400, regarding the subject of the "Review of Proposed Changes to Automated Surface Observing System (ASOS)" and addressed to the Director, Air Traffic Plans and Requirements Service, ATR-1. ACW-200B has not received a copy of a response to that memorandum. Consequently, this matrix contains the requirement/issues and the evaluation questionnaire category under which the ASOS will be evaluated. These requirements may be revised or new requirements/issues may be specified as a result of this evaluation.

ACRONYMS AND ABBREVIATIONS

ASOS	Automated Surface Observing System
AT	Air Traffic
ATCS	Air Traffic Control Specialist
ATCT	Airport Traffic Control Tower
CVD	Controller Video Display
FAA	Federal Aviation Administration
FDO	Flight Data Operator
LAWRS	Limited Aviation Weather Reporting Station
MMI	Man Machine Interface
MOA	Memorandum of Agreement
NAS	National Airspace System
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OID	Operator Interface Device
SAO	Surface Aviation Observation
TRACON	Terminal Radar Approach Control
VDU	Video Display Unit

APPENDIX A

ASOS EVALUATION REQUIREMENTS MATRIX

REQUIREMENT FROM 2/6/92 MEMO	REQUIREMENT	FAA AIR TRAFFIC ASOS QUESTIONNAIRE	ISSUES
1.	<p>The OID display and keyboard should be designed in a smaller size so that it can be more easily incorporated into the ATCT operational space. The OID display should be comparable to the VDU display, and that laptop size keyboards would be appropriate.</p>	ASOS Questionnaire for the Control Tower Cab	The OID, which consists of computer display and keyboard is too large for the available space in the ATCT.
2.	Have two versions of the ASOS menu: current menu for NWS & LAWRS, and a new abbreviated version for general AT use.	ASOS Questionnaire for the Control Tower Cab & LAWRS Supplemental Questionnaire	Many NWS functions that are not available for ATCT usage are presented on the OID. This adds to the complexity of the system and results in AT function being accessed several layers down in the menus.

A-1

REQUIREMENT FROM 2/6/92 MEMO	REQUIREMENT	FAA AIR TRAFFIC ASOS QUESTIONNAIRE	ISSUES
3.	Discontinue the password procedure for OIDs installed in FAA facilities.	ASOS Questionnaire for the Control Tower Cab	ASOS requires passwords and initials at sign-on, a minimum every 9 hours. Since current AT procedures already provide for accountability, the password process is a duplication of efforts.
4.	Compare the two alarms. If they are the same, ASOS alarm should be changed, and should not be the same as any existing alarm in use in ATCTs.	ASOS Questionnaire for the Control Tower Cab	The ASOS alarm may be the same as the existing ICSS alarm. This could lead to confusion.
5.	Discontinue use of the term "NOTAM". Suggest other terms of 5 characters or less could be utilized. ("ATIS" may be appropriate.)	ASOS Questionnaire for the Control Tower Cab	The ASOS uses the term "NOTAM" to refer to airport information voiced by the controllers. This is not consistent with the meaning of this term.

REQUIREMENT FROM 2/6/92 MEMO	REQUIREMENT	FAA AIR TRAFFIC ASOS QUESTIONNAIRE	ISSUES
6.	Reduce the number of steps required to append a voice message. If the voice function is on the main screen, the controller could access it and then immediately start recording the message. A secondary screen could give options to "abort", "record", "replay", and "exit".	ASOS Questionnaire for the Control Tower Cab	The process of appending a voice message to the ASOS broadcast takes 8 individual steps and is significantly more complicated than the current ATIS procedure. This procedure will have to be accomplished a min. of 24 times per day.
7.	Obtain an explanation from NWS as to why a PTT type handset, as requested previously, can not be utilized with ASOS. If a PTT type handset is not compatible, require a standard handset with no base or dialing capability.	ASOS Questionnaire for the Control Tower Cab	The ASOS handset is a Princess type phone set. It does not have PTT capability and includes electronics in the handset. The durability and lack of consistency with current operations has been questioned.

REQUIREMENT FROM 2/6/92 MEMO	REQUIREMENT	FAA AIR TRAFFIC ASOS QUESTIONNAIRE	ISSUES
8.	The AT discussion on the CVD ranged from a different display technology, to reducing the size of 5X7 to changing the requirement for the displayed data to winds and altimeter only. The TDWR display was noted for its readability in the tower cab. This area requires strong direction from AT.	ASOS Questionnaire for the Control Tower Cab & TRACON Supplemental Questionnaire	The CVD has problems with glare, readability, size and general design.
9.	Requirements CVD Reset Delay need to be determined.	ASOS Questionnaire for the Control Tower Cab	There is a delay in receiving data, other than winds and altimeter, when the reset button is accessed on the CVD. The button is designed and located in a way that accidental activation may occur.

APPENDIX B
EVALUATION QUESTIONNAIRE

**AIR TRAFFIC OPERATIONAL SITE EVALUATION
OF THE
AUTOMATED SURFACE OBSERVING SYSTEM
(ASOS)**

EVALUATION QUESTIONNAIRE

TOWER _____ DATE _____

ATCS OPERATOR INITIALS _____

ASOS QUESTIONNAIRE FOR THE CONTROL TOWER CAB

OPERATOR INPUT DEVICE (OID) PHYSICAL CHARACTERISTICS

1. How would you complete the following statement? (check one)
"The size of the OID monitor is _____ too large, _____ too small, _____ satisfactory."

2. If your answer to question 1 was **too large** or **too small**, what size monitor would you recommend? (i.e. 9", 11", 13", etc.)

3. How would you complete the following statement? (check one)
"The size of the keyboard is _____ too large, _____ too small, _____ satisfactory."

4. If your answer to question 3 was **too large** or **too small**, what size keyboard do you recommend? (i.e. special design, laptop, etc.)

5. "The glare from sunlight/light on the OID has little or no effect on its readability".
_____ agree _____ disagree

If you disagree, please explain why.

6. "The swivel and tilt of the OID monitor provides all the adjustment necessary for good viewing angle and reduction of glare".
_____ agree _____ disagree

If you disagree, please explain why.

OID FUNCTIONS

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement)

1. "There is no requirement or necessity for an ASOS password in FAA facilities."
_____ agree _____ disagree

If you disagree, please explain why.

2. "An ASOS alarm sounds the same as other alarms already in the control tower cab."
_____ agree _____ disagree

If you disagree, please explain why.

3. "The message displayed on the OID indicating that the alarm is disabled is a necessity."
_____ agree _____ disagree

If you disagree, please explain why.

4. "The weather data is presented in an acceptable format for AT use."
_____ agree _____ disagree

If you disagree, please explain why.

OID FUNCTIONS (continued)

5. "The steps required to input tower visibility are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

6. "The steps required to view archived data are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

7. "The steps required to recover from an input error are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

8. "The steps required to save data for a mishap are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

CONTROLLER VIDEO DISPLAY (CVD) PHYSICAL CHARACTERISTICS

How would you complete statements 1 thru 5? (check one)

1. "The window size of the CVD is _____."
_____ too large _____ too small _____ satisfactory
2. If your answer to question 1 was **too large** or **too small**, what size CVD window do you recommend? (i.e. 4" x 6", 3" x 5", etc.)

3. "The overall size (outside dimension) of the CVD is _____."
_____ too large _____ too small _____ satisfactory
4. "The glare from sunlight/light on the surface mount CVD _____."
_____ has little or no effect on its readability
_____ somewhat affects its readability
_____ affects its readability quite a bit
_____ completely inhibits its readability

NOTE: RESPOND TO QUESTIONS 5 AND 6 ONLY IF YOU HAVE A FLUSH MOUNT IN YOUR TOWER.

5. "The glare from sunlight/light on the flush mount CVD _____."
_____ has little or no effect on its readability
_____ somewhat affects its readability
_____ affects its readability quite a bit
_____ completely inhibits its readability

CVD PHYSICAL CHARACTERISTICS (continued)

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement)

6. "The night readability of the CVD alphanumerics on a flush mount is satisfactory."
_____ agree _____ disagree

If you disagree, please explain why.

7. "The night readability of the CVD alphanumerics on a surface mount is satisfactory."
_____ agree _____ disagree

If you disagree, please explain why.

8. "The size of the alphanumerics on the CVD is satisfactory."
_____ agree _____ disagree

If you disagree, please explain why.

9. "The adjustability of the surface mount CVD for viewing is satisfactory."
_____ agree _____ disagree

If you disagree, please explain why.

CVD PHYSICAL CHARACTERISTICS (continued)

10. "The surface mount CVD easily stays in an adjusted position."
_____ agree _____ disagree

If you disagree, please explain why.

11. "The CVD reset button is used quite frequently to re-display weather data."
_____ agree _____ disagree

If you disagree, please explain why.

12. "The CVD reset button contrast and brightness controls are correctly located."
_____ agree _____ disagree

If you disagree, please describe where you would locate them.

CVD DISPLAY

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement).

1. "The weather parameters as presented on the CVD, are in a satisfactory format."
_____ agree _____ disagree

If you disagree, please explain why.

2. "The weather parameters as presented on the CVD, are all that are necessary to provide to the pilot."
_____ agree _____ disagree

If you disagree, please explain why.

3. "The wind direction and velocity, and altimeter are all that are necessary to be highlighted on the CVD."
_____ agree _____ disagree

If you disagree, please explain why.

4. "The CVD offers sufficient adjustability for brightness and contrast."
_____ agree _____ disagree

If you disagree, please explain why.

5. "The background color of the display is appropriate for the tower cab."
_____ agree _____ disagree

If you disagree, please explain why.

TELECOMMUNICATIONS:

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement).

1. "The menu (number of steps) for voice input and record capability is reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

2. "The OID handset can withstand normal operational use in the tower."
_____ agree _____ disagree

If you disagree, please explain why.

3. There is adequate visual indication that "voice record" is activated."
_____ agree _____ disagree

If you disagree, please explain why.

TRACON SUPPLEMENT

CONTROLLER VIDEO DISPLAY (CVD) - TRACON:

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement)

1. "The CVD is easily readable from the normal working positions in the TRACON."
_____ agree _____ disagree

If you disagree, please explain why.

2. "The background of the display is appropriate for the TRACON."
_____ agree _____ disagree

If you disagree, please explain why.

3. "The CVD offers sufficient adjustability for brightness and contrast."
_____ agree _____ disagree

If you disagree, please explain why.

4. "Highlighted messages are readable."
_____ agree _____ disagree

If you disagree, please explain why.

OBSERVER NOTIFICATION DEVICE (OND) (Olathe & St. Joseph)

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check on for each statement)

1. "The OND provides an excellent visual signal to gain the controller's attention."
_____ agree _____ disagree

If you disagree, please explain why.

2. "The OND is not a distraction when lighted."
_____ agree _____ disagree

If you disagree, please explain why.

3. "The brightness of the OND is satisfactory."
_____ agree _____ disagree

If you disagree, please explain why.

4. "The OND is a necessary option."
_____ agree _____ disagree

If you disagree, please explain why.

LAWRS SUPPLEMENT

LAWRS-TOWER CAB SUPPLEMENTAL QUESTIONS-OID:

DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? (check one for each statement)

1. "The steps required to enter remarks are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

2. "The steps required to edit the present weather are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

3. "The steps required to augment the present weather are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

4. "The steps required to generate an urgent special are reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

LAWRS-TOWER CAB
SUPPLEMENTAL QUESTIONS - OID
(continued)

5. "The use of hot keys would make keyboard entry for augmenting, and editing more reasonable."
_____ agree _____ disagree

If you disagree, please explain why.

6. "The layout of the menu/functions are designed to facilitate quick and efficient use."
_____ agree _____ disagree

If you disagree, please explain why.

SUMMARY QUESTIONNAIRE:

1. Do you view ASOS as a help or hindrance in performing the weather observations and reporting functions associated with your job? Explain.

2. Do you feel that the ASOS, as presented here, is ready for operational use in an ATCT? Please list any changes you feel should be made other than noted in your questionnaire.

3. General Comments:

NOTE: Should additional space be required, please use the back of the paper and additional sheets as necessary.