



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric  
Administration  
NATIONAL WEATHER SERVICE  
1325 East-West Highway  
Silver Spring, Maryland 20910-3283

MEMORANDUM FOR: Distribution

FROM: W/OPS2 – John Van Kuren (signed March 13, 2007)

SUBJECT: Initiation of the Operational Acceptance Test (OAT) for  
Automated Surface Observing System (ASOS) Software  
Version (V) 2.79D

Massachusetts Institute of Technology Lincoln Laboratories is investigating the feasibility of using data from the ASOS One-Minute Observations (OMO) to support the Federal Aviation Administration's (FAA) next Generation Air Transport System. While reviewing the OMOs received on the AWOS/ASOS Data Acquisition System and the Integrated Terminal Weather System, data from the Vaisala Model 425NWS Ice-Free Wind (IFW) sensor, the All-Weather Precipitation Accumulation Gauge (AWPAG), and the Vaisala Model DTS1 dewpoint sensor were found missing. The ASOS Configuration Control Board (ACCB) judged this problem warrants immediate attention and revised software (V2.79D) has now been developed. With the exception of a fix for missing data in the OMOs, V2.79D is identical to V2.79C, the software version most recently issued to field sites.

A V2.79D System Test (ST) has been successfully completed using test ASOS systems at Weather Service Headquarters (WSH) and at the Sterling Research and Development Center, Sterling, VA. During the ST, the OMO fix was confirmed in cooperation with the FAA's Technical Center (FAATC) in Atlantic City, New Jersey. The ST report recommends V2.79D for OAT.

The V2.79D OAT plan is attached and is also posted at:

[http://www.nws.noaa.gov/ops2/ops24/documents/asos\\_V2-79D.htm](http://www.nws.noaa.gov/ops2/ops24/documents/asos_V2-79D.htm)

Installation at the first OAT site, Atlantic City, (ACY), New Jersey, will allow the FAATC to confirm the FAA interfaces for an operational site. If no problems are noted, installation at the remaining OAT sites will be authorized by the Test Director. Evaluation of ASOS performance by NWS Headquarters, on-site, or nearby staff will continue for approximately four weeks.



During the OAT, a Test Review Group, made up of representatives from Observing Services Division (OS7), Observing Systems Branch (OPS22), Maintenance Branch (OPS12), and Aviation Services Branch (OS23) will evaluate any reported problems as well as overall performance. If no problems are noted during the OAT, a recommendation for release of V2.79D to field sites as deemed appropriate by the ACCB.

If you have any questions or comments, please contact the Test Director:

Bryan Moore OPS24  
301-714-0326 x176

**Operational Acceptance Test (OAT) Plan  
for  
Automated Surface Observing System (ASOS) Software Version (V) 2.79D**

**Introduction and Background**

Massachusetts Institute of Technology (MIT) Lincoln Laboratories is investigating the feasibility of using data from the ASOS One-Minute Observations (OMO) to support the Federal Aviation Administration's (FAA) next Generation Air Transport System. While reviewing the OMOs received on AWOS/ASOS Data Acquisition System (ADAS) and the Integrated Terminal Weather System (ITWS), Lincoln Labs noted wind data was missing in the OMOs from sites where the Vaisala Model 425NWS Ice-Free Wind (IFW) sensor is installed. Further investigation has revealed missing precipitation data for sites with the All-Weather Precipitation Accumulation Gauge (AWPAG) and missing dewpoint for sites with the Vaisala Model DTS1 dewpoint sensor as well.

This problem is present in V2.79C and all previous software versions (as well as V2.83) which support the IFW, DTS1, and AWPAG sensors. The ASOS Configuration Control Board (ACCB) judged this problem warranted immediate attention and revised Acquisition Control Unit (ACU) software – V2.79D (01/11/07) - is now available for evaluation. With the exception of a fix for missing data in the OMOs, V2.79D is identical to V2.79C (10/05/06), which added a fix for erroneous Ice-Free Wind sensor maintenance flags (\$) noted in V2.79B.

**Previous Testing and OAT Schedule**

The V2.79D System Test (ST) began on February 7, 2007, using test ASOS systems at Weather Service Headquarters (WSH) and at the Sterling Research and Development Center (SRDC) in Sterling, Virginia, and was completed successfully on March 7, 2007. The proper inclusion of wind, dewpoint, and precipitation data in the ADAS OMOs was confirmed during the ST both locally (at WSH) and through communication with the ADAS simulator at the FAA's Technical Center in Atlantic City, New Jersey. Regression testing also confirmed general ASOS functionality (operator interfaces, generation/transmission of observations, etc.).

The V2.79D OAT will begin during the week of March 12, 2007, with the installation of V2.79D at Atlantic City (KACY), NJ, for evaluation of FAA interfaces by the FAA Technical Center. Once the interfaces are confirmed, installation of V2.79D at the remaining OAT sites will be authorized by the Test Director:

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The OAT will last approximately four weeks.

## OAT Objectives

During the OAT, the following must be verified with V2.79D installed at operational field sites

Stable ASOS operation - The availability of ASOS observations/products and the frequency of warmstarts must be consistent with or improved over performance with previous software versions. There must be no spontaneous coldstarts.

Operator interfaces - ASOS must respond properly to operator commands.

Production, transmission, and archiving of observations/products - Observations must be representative of conditions (within the limitations of the ASOS sensors), correctly formatted, transmitted successfully, and archived by ASOS. **The ADAS OMOs must be complete and properly formatted.**

Interfacing with both NWS and non-NWS systems - ASOS must correctly transmit information for display on the FAA ASOS Controller Equipment (ACE). ASOS must correctly incorporate Runway Visual Range (RVR) information from the FAA New Generation RVR (NGRVR) system into the ASOS METAR/SPECI reports. ASOS must correctly incorporate thunderstorm information from the FAA Automated Lightning Detection and Reporting System (ALDARS) system into the ASOS METAR/SPECI reports.

## Methodology

Since all field ASOSs are operational, testing will be limited to performance monitoring during normal operations. No on-site test activities other than the routine monitoring of observations/products and reporting/documenting of any ASOS problems are required.

ASOS Electronics Technicians (ET) will install the V2.79D software (which is posted on the ASOS ET website) when authorized by the Test Director.

Since all OAT sites have V2.79B, V2.79C, or V2.83 installed, and there will be no changes to the Operator Interface Device (OID) displays or observer procedures with V2.79D, no FAA training of observers is required before installation of the software.

During the OAT, the NWS site Focal Point will monitor ASOS, reporting any problems to the Test Director. For sites with FAA or contract staff, the responsibility for evaluation may be assigned to the on-site staff (at the discretion of the NWS Region and with the agreement of the FAA) but the NWS site Focal Point remains responsible for reporting problems to the Test Director.

The AOMC will report, to the Test Director, any cases when test site ASOS observations/products are not received at the NWS Telecommunication Gateway as expected.

The Lincoln Laboratories representative will monitor the ADAS OMOs and report any instances of missing data to the Test Director.

At any time during the OAT, if the test site Focal Point judges ASOS performance to be unacceptable, he/she is authorized to have the ET re-install the previous software version to ensure continued satisfactory support of NWS and FAA operations.

At the conclusion of the evaluation, the Test Director will provide test results and an implementation recommendation to the ACCB Chair. If the OMOs are transmitted correctly and no new problems are noted during the OAT, a recommendation will be made for the release of V2.79D to field sites as deemed appropriate by the ACCB.

### **OAT Sites and Site Focal Points**

With the exception of Atlantic City (KACY), NJ, which will be used for FAA interface evaluation, the OAT sites were selected from those for which Lincoln Laboratories is using OMO data. The OAT sites and Site Focal Points are:

KACY	Atlantic City, NJ	Keith Pugh (at PHI)	609-261-6602
KBOS	Boston, MA	Alan Dunham (at TAN)	508-823-1900
KBWI	Baltimore, MD	Jim Teklinski (at LWX)	703-260-0107
KDCA	Washington (Reagan), DC	Jim Teklinski (at LWX)	703-260-0107
KIAD	Washington (Dulles), VA	Jim Teklinski (at LWX)	703-260-0107
KIGX	Chapel Hill, NC	Ron Simpson (at RAH)	919-515-8210
KAPA	Denver, CO	Robert Ladd (at BOU)	303-494-3210 x372
KDEN	Denver, CO	Robert Ladd (at BOU)	303-494-3210 x372
KEYE	Indianapolis, IN	Curt Tweed (at IND)	317-856-0360 x372
KICT	Wichita, KS	Kenneth Thompson	316-942-8483 x372
KMCI	Kansas City, MO	John Tatum (at EAX)	816-540-5147 x372
KMKE	Milwaukee, WI	Curt Backlund (at MKX)	262-965-5061 x372
KMSP	Minneapolis, MN	Bruce Aslesen (at MPX)	952-361-6670 x372
KSTL	St. Louis, MO	Neil Hill (at LSX)	636-447-1876 x372
KNEW	New Orleans, LA	Mark Hall (at LIX)	985-645-0441
NWS Eastern Region Headquarters		Hector Machado	631-244-0145
NWS Central Region Headquarters		Bob Brashears	816-268-3161
NWS Southern Region Headquarters		Martin Garcia	817-978-7777 x137
FAA Technical Center		Jim Brand James.ctr.brand@faa.gov	609-485-8185
MIT Lincoln Laboratories		Dave Clark davec@11.mit.edu	781-981-3684

Specific site characteristics and interfaces are listed in the table below.

### ASOS V2.79D OAT Site Characteristics and Interfaces

SID	Name	FAA Service Level	Staffing	DCPs	Multiple Sensors	Comms	ZR	TSTM/ALDARS	GTA/ATIS	ACE	RVR	WSP	IFW	AWPAG	Current Software Version
KACY	Atlantic City, NJ	C	PT	1	---	DIAL	ZR	---	ATIS	ACE	---	WSP	IFW	AWPAG	2.83
KBOS	Boston, MA	A	FT	3	M/B	ADAS	ZR	ALDARS	ATIS	ACE	NGRVR	---	IFW	AWPAG	2.83
KBWI	Baltimore, MD	A	FT	1	M	ADAS	ZR	ALDARS	ATIS	ACE	RVR	---	IFW	AWPAG	2.79C
KDCA	Washington, DC	A	FT	1	B	ADAS	ZR	ALDARS	ATIS	ACE	NGRVR	---	IFW	AWPAG	2.79C
KIAD	Washington, DC	A	FT	3	M/B	ADAS	ZR	ALDARS	ATIS	ACE	---	---	IFW	AWPAG	2.79C
KIGX	Chapel Hill, NC	D	---	1	---	ADAS	ZR	ALDARS	GTA	---	---	---	IFW	---	2.79B
KAPA	Denver, CO	A	FT	1	---	ADAS	ZR	ALDARS	ATIS	---	---	---	IFW	---	2.79C
KDEN	Denver, CO	A	FT	2	B	ADAS	ZR	ALDARS	ATIS	---	RVR	---	IFW	AWPAG	2.79C
KEYE	Indianapolis, IN	D	---	1	---	ADAS	ZR	ALDARS	---	---	---	---	IFW	---	2.79C
KICT	Wichita, KS	A	FT	1	---	DIAL	ZR	TSTM	ATIS	---	RVR	---	IFW	AWPAG	2.79C
KMCI	Kansas City, MO	A	FT	2	B	ADAS	ZR	ALDARS	ATIS	---	RVR	---	IFW	AWPAG	2.79C
KMKE	Milwaukee, WI	A	FT	2	B	ADAS	ZR	ALDARS	ATIS	---	RVR	---	IFW	AWPAG	2.79C
KMSP	Minneapolis, MN	A	FT	2	B	ADAS	ZR	ALDARS	ATIS	---	RVR	---	IFW	AWPAG	2.79B
KSET	Saint Charles, MO	D	---	1	---	ADAS	ZR	ALDARS	GTA	---	---	---	IFW	---	2.79C
KSTL	Saint Louis, MO	A	FT	2	B	ADAS	ZR	ALDARS	ATIS	ACE	RVR	---	IFW	AWPAG	2.79C
KNEW	New Orleans, LA	C	---	1	---	ADAS	---	ALDARS	ATIS	---	RVR	---	IFW	---	2.79B