

SYSTEM TEST REPORT FOR THE ASOS VERSION (V)2.79D SOFTWARE LOAD

(Dated 01/11/2007)

INTRODUCTION - The Office of Operational Systems, Field Systems Operations Center, Test and Evaluation Branch (OPS24), with support from the test personnel at Sterling Research and Development Center (SR&DC), Sterling, VA, has completed a System Test (ST) for the Automated Surface Observing System (ASOS) Acquisition Control Unit (ACU) software load 2.79D, dated 01/11/07. This new load is based on the V2.79C (10/05/06) and includes three fixes: 1) a fix for the missing ASOS wind data in FAA AWOS/ASOS Data Acquisition System (ADAS) 1-minute message when Ice-Free Wind (IFW) sensor is configured as the official ASOS wind sensor; 2) a fix for the incorrect dew-point temperature in ADAS 1-minute message when DTS1 is configured as the official ASOS dew-point sensor; and, 3) a fix for the missing precipitation data in ADAS 1-minute message when All-Weather Precipitation Accumulation Gauge (AWPAG) is configured as the official ASOS precipitation sensor. The ST was conducted in accordance to the System Test Plan for ASOS Software V2.79D (01/11/07), issued by email on February 1, 2007. The ST began on January 30 and ended March 7, 2007.

OBJECTIVES - To verify the efficacy of the new corrections in V2.79D (01/11/07) on test ASOS systems using the latest weather sensors configured as in the field. Also, to ensure the ASOS system stability is maintained and the existing ASOS functions are not negatively affected by the new changes.

TEST METHODOLOGY - The new software was installed on the ASOS Test Systems SP1 at the National Weather Service Headquarters (WSH), Silver Spring, MD, and ST0 at SR&DC, Sterling, VA, on Jan. 30, and Jan. 31, 2007, respectively. The SP1 ASOS has a single Data Collection Platform (DCP) configuration and the ST0 ASOS has a three-DCP configuration.

After the software was installed on the SP1 and ST0 test systems, checkout tests were performed. Subsequently, all planned regression tests (see Attachment 1) were performed to ensure the new fixes have no adverse effect on the existing ASOS system in both functionality and accuracy.

TEST RESULTS - Both the ASOS test system SP1 and ST0 were stable. All conducted regression tests were successful. In addition, OPS24 developed a special test procedure involving the ASOS Sensor Simulator (ASENSE) on SP1 and associated data sets to confirm the recent fix for the systematic missing of 1-minute data from ASOS to ADAS. At the NWS, ASOS outputs to the Operator Interface Device (OID) and to the ADAS port (both before and after the CODEX Modem) were both monitored in real-time and recorded to files. Similarly, ADAS data arriving at the FAA Technical Center, Atlantic City, NJ (FAATC) were also monitored and recorded there. After the test, the FAATC used a program to decode the recorded data and verified precipitation, temperature, dew point, and wind direction and speed against the expected results provided by OPS24 (see Attachment 2). This special test was successful. In addition to verifying the FAATC's ADAS simulator, SP1 was interfaced to an ACE/IDS simulator at WSH, as well as the FAATC's Automated Lightning Data Acquisition and Reporting System and the Weather System Processor simulators. All FAA system interfaces were validated for V2.79D.

RECOMMENDATIONS - It is recommended the software version V2.79D be installed at the first Operational Acceptance Test (OAT) site, the ASOS at Atlantic City Airport, Atlantic City, NJ (ACY). Once installed, the FAATC will validate their FAA system simulators using ACY.

POINT OF CONTACT - Khien Nguyen is the OPS24 lead for the ST. Khien can be contacted by e-mail, khien.nguyen@noaa.gov, or by telephone at 301-713-0326 x177.

ATTACHMENT 1

**ASOS V2.79D (01/11/07) SYSTEM TEST CHECKLIST
(REGRESSION TESTS)**

#	TEST #	Test Description	Scenarios: Either ASENSE or LIVE Sensor	Durati on	Pass /Fail	Date	Site
1	01_01	Pre-Installation Routines		4 hrs		02/07/07	ST0
2	04_40p	Wind Edit Data Validation		30 min		02/22/07	SP1
3	04_39p	Wind Remark/REPRO		1 hr	P	03/01/07	ST0
4	15_01	Wind Algorithm Regression Test - Tests basic functions of the wind algorithm by performing a combination of manual data entry and running on-line data sets [<u>Stop after Step 61</u>].	ASENSE	2 hrs	P	03/01/07	ST0
5	02_08	Command-Time - Verifies or corrects the ASOS site's time. The TIME function calls the AOMC and synchronizes the site's time to the AOMC's time.		15 min	P	02/08/07	ST0
6	03_01	SPECI Generation during hourly edit time and during edit time of another SPECI.	Either	45 min		02/22/07	SP1
7	03_07	Editing Present Weather during hourly	Either	½ hr	P	02/22/07	SP1

8	04_27p	Ceiling Special (Falling Below Threshold)	Either	½ hr	P	02/20/07	ST0
9	04_31p	Visibility Special (Falling Below Threshold)	Either	1 hr	P	02/20/07	ST0
10	04_33p	Present Weather Edit/Augment Test Procedure	Either	1 ½ hrs	P	02/08/07	ST0
11	14_02p	15-Min PX Counter Verification	ASENSE	1 hr	P	02/28/07	SP1
12	14_05p	Obstruction to Vision Procedure - Tests the generation of HZ, BR, FG, and FZDZ.	ASENSE	30 min	P	02/08/07	ST0
13	14_06p	PWINO, FZRANO, TSNO, AND PNO Special Notice Remarks		15 min	P	02/08/07	ST0
14	20_2	NGRVR Testing -Verifies edited and automated RVR data, encoding in METAR/SPECIs, SPECI generation.	ASENSE	3 hrs	P	02/08/07	ST0
15	20_4	Ground to Air (GTA) Radio Verification - Verifies the GTA radio is operational by checking that all values on the maintenance page are “P”.	Live	15 min	P	03/06/07	SP1
16	20_5	ASOS to AWIPS Interface Verification - Verifies AWIPS ingests and stores ASOS products and these products can be displayed on AWIPS and that AWIPS distributes ASOS products appropriately.		20 min	P	03/07/07	SP1
17	20_6	Navy ATC Interface Test - Checks ASOS/Navy ATC interface for proper output to the ATC monitor.	Live	1 hr	P	03/06/07	SP1
18	11_06	Tornado Hot Key - Tests generation of tornado through different methods and combinations.	Live	20 min	P	03/06/07	SP1
19	20_3	ACE Interface Test - Checks ASOS ACE interface for proper output to the ACE simulator		10 min	P	03/06/07	SP1
20	20_1	ADAS/ALDARS Interface to ASOS Test - Checks ASOS response to ALDARS data.		4 hours	P	02/15/07	SP1

21	20_10	Verification of ADAS 1-Minute Data for IFW, DTS1, and AWPAG		1 hour	P	02/14/07	SP1
22	02_15	Review SYSLOG – This procedure tests the ASOS System logging capability		15 min	P	02/21/07	ST0
23	04_30p	VIS Data Validation		25 min	P	02/21/07	ST0
24	13_06	SKY SPECIALS Checkout		30 min	P	02/21/07	ST0
25	14_01	FROZEN PRECIPITATION Combination Verification		2 ½ hrs	P	02/21/07	ST0
26	14_08	SQUALL SPECIAL Verification		15 min	P	02/08/07	ST0
27	20_09	WSP Interface Test		1 hours	P	02/27/07	SP1

ATTACHMENT 2

Expected Contents of ADAS 1-Minute Data Messages for Given ASOS Inputs

This table describes the expected outputs of the ADAS 1-Minute data messages in response to a set of inputs of ambient temperatures, dewpoint temperatures, and wind directions and speeds, to the ASOS. This table is used to verify proper data formatting and transmission of the ADAS 1-minute data messages when ASOS is interfaced with the ADAS of the FAA. This table is used with ASOS Test Procedure 20_10, which describes the test setup and required data sets.

Time from Start of Test (minutes)	ASOS OID Precip. Remarks (in)	ASOS OID Temp/Dew (Cel. deg.)	ASOS OID 1-Min Wind	ADAS Precip. (in)	ADAS Temp/ Dewpoint (scaled Cel. Deg.)	ADAS 1-Min Wind True/Magnetic/ Average/Gust
T=0:30		-5.0/-10.0	030/05	0	95 90	3 3 5 0
T=1:30		-5.0/-10.0	030/05	0	95 90	3 3 5 0
T=2:30		-5.0/-10.0	030/05	0	95 90	3 3 5 0
T=3:30		-4.4/-9.4	M/M	0	96 91	255 255 255 255
T=4:30		-3.3/-8.3	M/M	0	97 92	255 255 255 255
T=5:30		-2.2/-7.2	020/05	0	98 93	2 2 5 0
T=6:30	P0001	-1.1/-6.1	VRB/05	1	99 94	3 3 5 0
T=7:30	P0002	1.1/-3.9	VRB/05	2	101 96	5 5 5 0
T=8:30	P0003	2.8/-2.2	070/05	3	103 98	7 7 5 0
T=9:30	P0004	3.9/-1.1	090/05	4	104 99	9 9 5 0
T=10:30	P0005	6.1/1.1	VRB/06	5	106 101	12 12 6 0
T=11:30	P0006	7.8/2.8	150/12G20 120V180	6	108 103	15 15 13 20
T=12:30	P0007	8.9/3.9	180/19	7	109 104	18 18 20 0
T=13:30	P0008	10.0/5.0	180/20	8	110 105	18 18 20 0
T=14:30	P0009	10.0/5.0	200/20 110V240	9	255 255	20 20 20 0

T=15:30	P0010	10.0/5.0	240/21G26 110V270	10	255 255	24 24 21 28
T=16:30	P0011	10.0/5.0	270/25G30	11	255 255	27 27 25 30
T=17:30	P0012	10.0/5.0	290/21G30	12	255 255	30 30 21 0
T=18:30	P0013	10.0/5.0	320/16G30	13	255 255	32 32 16 24
T=19:30	P0014	10.0/3.9	340/15G30	14	110 104	34 34 15 20
T=20:30	P0015	7.2/1.7	360/10G30	15	107 102	36 36 10 0
T=21:30	P0015	6.1/1.1	360/07G30	15	106 101	36 36 7 0
T=22:30	P0015	3.9/-1.1	010/07G30	15	104 99	36 36 7 0
T=23:30	P0015	2.2/-2.8	010/08G30	15	102 97	1 1 8 0
T=24:30	P0015	1.1/-4.4	010/23G66	15	101 96	1 1 25 66
T=25:30	P0015	-1.1/-6.1	010/40G66 SQ	15	99 94	1 1 42 53
T=26:30	P0015	-2.8/-7.8	010/47G66 SQ	15	97 92	1 1 47 56
T=27:30	P0015	-3.3/-8.9	010/53G66 SQ	15	97 91	36 36 52 57
T=28:30	P0015	-4.4/-9.4	010/36G66 SQ	15	96 91	1 1 34 0
T=29:30	P0015	-5.0/-10.0	020/11G66 SQ	15	95 90	2 2 10 0
T=30:30	P0015	-5.0/-10.0	030/05G66 SQ	15	95 90	3 3 5 0