



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

MEMORANDUM FOR: Distribution

FROM: W/OPS24 – Jerald J. Dinges

SUBJECT: Systems Test (ST) Plan for the National Weather Service Automated Surface Observing System (ASOS) All-Weather Precipitation Accumulation Gauge (AWPAG) LogoSense Version (V) 3.61 and orifice heater controller V2.1 Firmware (FW) upgrades.

Attached is the final ST plan for the AWPAG LogoSense FW V3.61 and the orifice heater controller Erasable Programmable Read-Only Memory (EPROM) V2.1. The AWPAG LogoSense FW V3.61 upgrade in conjunction with the new orifice heater controller EPROM V2.1 was developed to:

- Change the “hard-coded value” inside the current version of the LogoSense controller’s heater low temperature cut-off (18°F) to be programmable to any desired temperatures below 30°F.
- Eliminate false tips due to high temperature gradient algorithm problems.
- Improve overall reporting accuracy.
- Correct problem of heaters cycling on and off.

These changes were approved for operational testing on November 14, 2008, by the ASOS Test Review Board (ATRB) after presentation of the development test results by the ASOS Product Improvement (PI) project manager (W/OST11). The final development test report is available on the OPS24 Web page:

<http://www.weather.gov/ops2/ops24/documents/AWPAG%20Final%20Report%2007-08v3.pdf>

The project was put “on hold” pending an action given to the Observing Systems Branch (W/OPS22) to coordinate a policy decision on what temperature should be allowed set for the new programmable low temperature cut-off threshold for the orifice heater. W/OPS22 worked with the NWS regional ASOS focal points on this policy decision. The agreed upon low temperature threshold value will be 9°F.



The operational test phase is the responsibility of the NWS Office of Operational Systems and consists of both an ST and a Field Demonstration (Demo). After a successful ST, the firmware will be put in a limited number of operational sites to validate it has no negative affect on ASOS for a period of 2 weeks. After that, the AWPAG firmware/EPROM upgrade will be stocked at the National Logistic Support Center (NLSC) and will be available for any other sites as needed. . The ATRB approved the ST strategy at the March 12, 2009 meeting. The subject ST plan is available on the OPS24 web page:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_awpag_docs.htm

The ST plan describes the functional tests that will be performed to verify AWPAG and ASOS operations are not negatively affected by the changes in LogoSense controller FW V3.61 and orifice heater controller FW V2.1 (i.e., Particularly to ensure true AWPAG data is correctly reported in the one-minute observation, 5-minute page, 12- hour archive data, METAR/SPECIs and ADAS/ALDARS transmissions, and SYS LOG messages will be generated if anything that is abnormal with ASOS).

The ST Test Review Group (TRG) “Kick-off” meeting will be scheduled Thursday, August 13, at the ASOS Test Review Group meeting. The ST will be conducted on an ASOS test system (ST2) at the Sterling Field Support Center, Sterling, VA and is estimated to last 2 weeks. If successful, the ST Director will present the test results with the conclusions and a recommendation to the ATRB for approval of a Field Demo at limited national operational ASOS sites.

You may direct any comments or questions to the ST Test Director, Harry Tran, W/OPS24 at 301-713-0326 ext 105, (harry.tran@noaa.gov) or Jerald Dinges W/OPS24 at 301-713-0326 ext 160, (gerald.dinges@noaa.gov).

Attachment

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SYSTEM TEST PLAN

**For the
Automated Surface Observing System
(ASOS)**

**OTT All-Weather Precipitation Accumulation Gauge
(AWPAG) Firmware Version (V) 3.61 and Orifice
Heater Controller Erasable Programmable Read-
Only Memory (EPROM) V2.1 Upgrades**

August 2009



**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Test and Evaluation Branch**

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Executive Summary

This document describes the methods employed by the National Weather Service (NWS) in the System Test (ST) of the Automated Surface Observing System (ASOS), herein referred to as the ST. The objectives, methods, management, resource requirements, and schedule of the ST are presented.

The ST plan describes the functional tests that will be performed to verify All-Weather Precipitation Accumulation Gauge (AWPAG) and ASOS operations are not negatively affected by the changes in LogoSense controller firmware (FW) V3.61 and orifice heater controller Erasable Programmable Read-Only Memory (EPROM) V2.1 (i.e., Particularly to ensure true AWPAG data are correctly reported in the one-minute observation, 5-minute page, 12- hour archive data, METAR/SPECIs transmissions, and SYSLOG messages will be generated, if anything that is abnormal with ASOS).

The conduct of the ST will be overseen by a Test Review Group (TRG) comprised of NWS National Headquarters (WSH), NWS Training Center (NWSTC), NWS Regional Headquarters, Federal Aviation Administration (FAA), and U.S. Air Force (USAF) and U.S. Navy personnel. The TRG will monitor the status of the ST and adjudicate and prioritize problems documented during the test as to its potential affect on service operations and to the urgency of implementing a fix. The TRG may suspend the ST at any time, should the performance of the AWPAG FW upgrades be found unacceptable. If the ST is suspended, the TRG will authorize the resumption of tests when appropriate corrective actions have been taken. The TRG may recommend additional regression tests prior to the resumption of the ST to validate the fix. The TRG will meet weekly during the conduct of the ST. The TRG may also meet irregularly or on an emergency basis as needed. The TRG meetings will be conducted by teleconference calls and will be coordinated by the ST Director.

The 2-week ST for the AWPAG LogoSense V3.61 FW and orifice heater controller EPROM V2.1 upgrades is scheduled to begin on August 17, 2009 and to conclude on August 27, 2009 at the Sterling Field Support Center (SFSC), Sterling, VA. An ST TRG “kick-off” meeting will be held on Thursday, August 13, 2009 to confirm all test prerequisites have been satisfied to begin the ST.

The TRG will review the test results, including the status of all reported Test Trouble Report upon the completion of the ST, and will recommend to the ASOS Test Review Board (ATRB) whether the AWPAG FW are ready for a Field Demonstration (Demo) at a limited number of sites. These sites will be monitored for a short period of time to ensure the change does not negatively affect either the AWPAG or the ASOS. An ST report will be prepared to document the results of testing. The results will be presented to the ATRB as input into the decision to proceed with the Demo at field sites.

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Acronyms

ACE	ASOS Controller Equipment
ACU	Acquisition Control Unit
ADAS	AWOS/ASOS Data Acquisition System
ALDARS	Automated Lighting Detection and Reporting System
ASOS	Automated Surface Observing System
ATRB	ASOS Test Review Board
AWIPS	Advanced Weather Interactive Processing System
AWOS	Automated Weather Observing System (FAA)
AWPAG	All-Weather Precipitation Accumulation Gauge
DCP	Data Collection Platform
Demo	Demonstration
ET	Electronics Technician
EPROM	Erasable Programmable Read-Only Memory
FAA	Federal Aviation Administration
FAATC	FAA Technical Center
FSOC	Field Systems Operations Center
FW	Firmware
IDS	Integrate Data System
METAR	Meteorological Aviation Routine Weather Report
NAS	National Airspace System (FAA)
NWS	National Weather Service
NWSTC	NWS Training Center
OCWWS	Office of Climate, Water, and Weather Services
OID	Operator Interface Device
OOS	Office of Operational Systems
OS&T	Office of Science and Technology
PPI	Planned Product Improvement
SCA	Single Cabinet ASOS
SFSC	Sterling Field Support Center
SHEF	Standard Hydrometeorological Exchange Format
SIT	System Integration Test
SPAWARSYSCEN	Space and Naval Warfare System Center
SPECI	Aviation Selected Special Weather Reports
ST0	Sterling, VA ASOS System 2
ST1	Sterling , VA ASOS System 3
ST2	Sterling, VA SCA
SYSLOG	System Log
TRG	Test Review Group
V	Version
USAF	United State Air Force
WSH	National Weather Service Headquarters
WSP	Weather Systems Processor

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1. Introduction

The National Weather Headquarters (WSH) Office of Operational Systems (OOS), Field Systems Operations Center (FSOC), Test and Evaluation Branch (OPS24) will conduct a System Test (ST) of the proposed All-Weather Precipitation Accumulation Gauge (AWPAG) LogoSense controller firmware (FW) Version (V) 3.61 and orifice heater controller Erasable Programmable Read-Only Memory (EPROM) V2.1 upgrades.

The AWPAG LogoSense controller FW V3.61 upgrade in conjunction with the new orifice heater controller EPROM V2.1 was developed to:

- Enable the “hard-coded value” inside the current version of the LogoSense controller’s low heater cut-off (18°F) threshold temperature to be programmable to any desired temperatures below 30°F.
- Eliminate false tips due to temperature gradient algorithm problems.
- Improve overall reporting accuracy.
- Correct problem of heaters cycling on and off.

The National Weather Service Headquarters (WSH) Office of Science and Technology (OS&T) successfully completed development tests for these fixes, AWPAG LogoSense controller FW V3.61 along with orifice heater controller FW V2.1, and presented test results: “*Final Report for The Winter Test of Production AWPAG Winter 2007-2008*” to the ASOS Test Review Board (ATRB) on Thursday, November 14, 2008. The ATRB subsequently approved AWPAG LogoSense V3.61 and orifice heater V2.1 FW upgrades for the operational test phase. The final development test report is available on the OPS24 web page at:

<http://www.weather.gov/ops2/ops24/documents/AWPAG%20Final%20Report%2007-08v3.pdf>

The Observing Systems Branch (W/OPS22) was working with the NWS regional ASOS focal points on a policy decision for a low temperature threshold value requirement for the AWPAG orifice heater’s cut-off based on LogoSense controller FW V3.61 and the orifice heater controller FW V2.1. It’s determined the low threshold value should be set at 9°F.

The WSH Office of Operational Systems (OOS), Field Systems Operations Center (FSOC), Test and Evaluation Branch (OPS24) is responsible for the operational test phase. OPS24 will conduct a System Test (ST) to evaluate the AWPAG LogoSense FW V3.61 and orifice heaters V2.1 EPROM upgrades in a simulated operational ASOS configuration.

1.1 Background

The orifice heaters on the production version of the OTT AWPAG are activated and deactivated in response to changes in air temperature. These heaters are programmed to turn on when temperatures fall below 41°F (5 °C). Additionally, the heaters are programmed to be disabled when temperatures fall below 18 °F (-8 °C). Both of these temperature values are hard-coded inside the current version of the AWPAG’s LogoSense controller FW (version 3.59). The reason that heating is applied to the orifice is to melt freezing rain or wet snow that may stick to the

unheated surfaces and not be measured until the temperature rises above freezing. The rationale for the cut-off is that freezing rain and wet snow generally do not occur below 18°F so it is preferable to not heat the orifice at temperatures lower than around 18°F. An additional rationale is that heat will tend to melt snow or ice pellets falling at lower temperatures. This leads to evaporation or sublimation and results in lower catch than would occur if the orifice is left cold and the snow or ice pellets fall into the gauge naturally.

While this is in general a satisfactory approach, a problem can arise when precipitation is falling while the temperature is dropping below 18°F. In this case, snow that has been melted will freeze to the orifice. It has been observed at Johnstown, PA, and other ASOS locations that the melt water can form an icicle that comes in contact with the bucket and then refreezes. In one scenario, the icicle will reduce the force on the weighing mechanism in such a way that when the temperature rises above 18 °F the sudden increase in force on the weighing mechanism can sometimes lead to a substantial false measurement of precipitation. In a worst case scenario, it has been observed that if the temperature hovers around 18 °F, a sequence of melting and refreezing of the icicle can lead to multiple false precipitation increases that are completely erroneous.

The AWPAG LogoSense controller FW V3.61 upgrade modifies the “hard-coded value” inside the current version of the LogoSense controller’s heater low cut-off (18 °F) threshold temperature to be programmable to any desired temperature values below 30 °F, eliminates false tips due to temperature gradient algorithm problems, and improves the overall reporting accuracy. In addition, the orifice heater controller EPROM V2.1 upgrade corrects problem with the heaters cycling on and off.

1.2 Test Plan Organization

This ST Plan is comprised of three sections:

- Section 1 contains introductory materials;
- Section 2 describes the method of accomplishment; and
- Section 3 provides test recommendations and report.

Four appendices are provided with the ST Plan:

- Appendix A lists the ST schedule;
- Appendix B provides draft ASOS Modification Note 94 which contains installation instructions for the test FW;
- Appendix C specifies the regression tests that will be performed during the ST; and
- Appendix D includes ASOS TTR form for use by ST site personnel in reporting problems identified during the ST.

1.3 Prerequisites

The following conditions must be satisfied before entering the ST:

- a. The ST strategy for the ST of the AWPAG LogoSense controller FW V3.61 and orifice heater controller EPROM V2.1 upgrades is approved by the ATRB (OPS24);

- b. The ST Plan for AWPAG V3.61 and orifice heater V2.1 EPROM upgrades is signed after proper review and signature coordination (OPS24);
- c. The AWPAG LogoSense controller test FW V3.61, orifice heater controller test EPROM V2.1, and the draft ASOS Modification Note 94 (installation instructions for the test FW) are available (OPS12);
- d. Certify the ASOS test system ST2 (SCA) is functioning properly using the following software versions:
 - 1) Acquisition Control Unit (ACU) V2.79D;
 - 2) ACU V2.79X;
 - 3) ACU V3.0.1; and,
 - 4) The current AWPAG LogoSense controller FW V3.58 and orifice heater controller EPROM V2.0
- e. Conduct an ST TRG “Kick-off” meeting to validate the above stated prerequisites are met.

1.4 Test Assumptions and Limitations

The following assumptions and limitations define the scope of this ST:

- 1) System Integration Test (SIT) is not required based on development tests results presented at the ATRB. ASOS testing performed during the development test phase has shown that:
 - LogoSense controller FW V3.61 enabled the operator to program the controller’s heater low cut-off threshold temperature value to any desired temperature values below 30 °F. Especially, to 9 °F;
 - The false tips due to temperature gradient algorithm problems were eliminated;
 - The overall reporting accuracy was improved;
 - The problem of the heaters cycling on and off when the temperature is below freezing was corrected;
 - True AWPAG data were correctly verified in the ASOS OID one-minute observation, 5-minute page, 12-hour archive data, METAR/SPECIs and ADAS/ALDARS transmissions; and,
 - AWPAG data met all accuracy specifications.
- 2) No changes were made either to the ASOS ACU FW or the DCP EPROM as a result of the AWPAG LogoSense controller FW V3.61 and orifice heater controller ERPOM V2.1

upgrades. However, both the existing operational baseline ASOS software and the planned replacement to the ASOS operational software will be tested in conjunction with this ST to ensure compatibility of the fixes with both ASOS software versions. Specifically, the following ASOS ACU FW and DCP EPROM will be used in evaluating the LogoSense V3.61 and orifice heater V2.1:

- ACU V2.79X
- ACU V3.0.1
- ACU V2.79D

- 3) The procedural documentation (draft ASOS Modification Note 94) used to install the LogoSense controller FW V3.61, orifice heater controller EPROM V2.1, and test FW are provided (OPS12);
- 4) Because the limited changes affect only the AWPAG, the U.S. Navy Space and Naval Warfare System Center (SPAWARSYSCEN), Charleston, SC, and Federal Aviation Administration (FAA) National Airspace System support center, Oklahoma City, OK, will not participate in this ST;
- 5) The NWS Training Center (NWSTC), Kansas City, MO, participation is contingent on the availability of personnel and ASOS SCA;
- 6) Because the limited changes affect only the AWPAG, no FAA system interface tests [i.e., Weather Systems Processor (WSP), AWOS/ASOS Data Acquisition System (ADAS)/Automated Lightning Detection and Reporting System (ALDARS), and ASOS Communication Equipment (ACE) /Integrate Data System (IDS)] will be required;
- 7) Because the limited changes affect only the AWPAG, and due to the CT12K ceilometer is not configurable to the ST2. No ceilometers will be configured in ST2 during the ST; and,
- 8) ST2 (SCA) is the only test system available at SFSC for ST during the month of August for regression tests. ST0 and ST1 (control system) are being used to accomplish the ASOS V3.01 ST and support the V2.79X Operational Test and Evaluation, respectively.
- 9) AWPAG is fully calibrated and adjusted to meet all accuracy specifications.

1.5 Test Objectives and Evaluation Criteria

The specific test objectives and criteria are:

1. Verify the draft NWS ASOS Modification Note 94 for installing the LogoSense controller FW V3.61 and orifice heater controller EPROM V2.1.

Evaluation Criterion: The draft NWS ASOS Modification Note 94 for instructions to install the LogoSense controller FW V3.61 and orifice heater controller EPROM V2.1 is complete and accurate.

2. Verify the ASOS operation is not negatively affected (i.e., Particularly to ensure the interfaces between AWPAG/ASOS is working properly, the true AWPAG data are correctly reported in the one-minute observation, 5-minute page, 12-hr archive, METAR/SPECIs and ADAS/ALDARS transmissions, and system maintenance log (SYS LOG) messages will be generated if anything that's abnormal with ASOS.

Evaluation Criterion: True AWPAG data are correctly reported in the Operator Interface Device (OID) one-minute observation, 5-minute page, 12-hour archive page, METAR/SPECIs and ADAS/ALDARS transmissions, and SYS LOG messages will be generated, if anything that is abnormal with ASOS.

3. Verify the AWPAG operation is not negatively affected (i.e. AWPAG passes all diagnostic tests, AWPAG data meet all the accuracy specifications, and true AWPAG data are correctly reported in OID one-minute observation, 5-minute page, 12-hour archive data, and in METAR/SPECIs and ADAS/ALDARS transmissions.

Evaluation Criterion: The AWPAG passes all the diagnostic and stability tests, all the diagnostic parameter should fall within the specifications for the AWPAG, and AWPAG data meet all the accuracy specifications.

1.6 Test Review Group (TRG) Responsibilities

A Test Review Group (TRG) will oversee the conduct of the ST. The TRG is comprised of subject-matter experts selected from WSH, NWS Regional Headquarters, NWSTC, the FAA, and USAF and U.S. Navy. The role of the TRG is to evaluate each observed deficiency as documented by a TTR during the ST and assign a priority for fixing. The TRG will also ensure no deficiencies are introduced by the changes made to the AWPAG FW.

During the ST, the TRG Chair will convene the TRG weekly to:

- a) Review, clarify, and evaluate deficiencies documented in the TTRs;
- b) Prioritize, validate deficiencies, and recommend corrective actions to the ASOS Project Manager; and
- c) Coordinate the resolution of other test-related issues.

If a critical problem occurs between weekly meetings and requires a vote of the members whether to suspend the ST, the ST Director shall convene an emergency TRG meeting.

The TRG will be composed of the personnel identified in Table 1. The “voting” members will forward a recommendation to the ATRB Chair whether the ST for FW upgrade is successful.

Table 1 – ASOS Test Review Group

Name	Function	Voting Member	Phone
Jerald Dinges (OPS24)	Test Review Group Chair	Y	301-713-0326 x160
Harry Tran (OPS24)	System Test Director		301-713-0326 x105
Khien Nguyen (OPS24)	Test Support		301-713-0326 x 177
Richard Parry (OPS22)	Observing Systems		301-713-2093 x 109
Greg Dalyai(OPS12)	Maintenance Branch	Y	301-713-1833 x 147
ASOS Regional Focal Points	(6) NWS Regional Headquarters	Y	N/A
Tony Weiss (OCIO12)	AOMC	Y	301-713-0864 x 170
Robert Retzlaff	NWSTC	Y	816-880-9368
Laura Cook (OS7)	ASOS Requirements	Y	301-713-1792 x 126
Beth McNulty (OS23)	Aviation Weather	Y	
John Monte (OST11)	Project Manager (ASOS PPI)	Y	301-713-1975 x 160
Ron Heatherdale	U.S. Navy SPAWARSYSCEN, Charleston, SC	Y	843-218-4818
William “Mac” Lawrence	USAF HQ	Y	402-294-0866
Bing Huang (ATO-T)	FAA ATO-T	Y	202-385-8579

The following describes the major roles and responsibilities of the TRG personnel:

TRG Chair – The TRG Chair convenes the meetings of the TRG and works with the ST Director and the members of the TRG to ensure that tests are conducted efficiently. The Chair works to resolve any issues that may arise during the conduct of the ST.

System Test Director – The Test Director is the primary point of contact for the ST. The test Director manages the development and coordination of the ST Plan, oversees the conduct of the tests, and manages the development and coordination of the ST Report to document the test results and recommendations. As a voting member, the ST Director solicits inputs from the ASOS test team for any issues which require a decision among the voting members.

ASOS Product Improvement Manager – The ASOS Product Improvement Manager is responsible for providing technical support and information as required when ASOS questions arise, and schedules investigation and solution of ASOS discrepancies.

ASOS Test Team – The ASOS Test Team is comprised of subject experts from WSH. The ASOS Test Team installs the test AWPAG LogoSense controller V3.61 and orifice heaters controller V2.1 FW and conducts the ST.

1.7 Test Result Analysis

On Thursday of each test week, all TTRs will be collected and the TRG will meet to classify the problems. The TRG is a group of subject-matter experts and is chaired by the Chief, Test and Evaluation Branch (OPS24) or his designee. The TTRs will be assigned numerical scores to indicate the severity of the defect.

The TestTrack database will include, among other relevant problem information, the **Impact** and the **Priority** of each TTR.

The **Impact** field deals with how each problem affects the overall operations. The problem can be assigned (sorted in ascending severity):

- 1) Impact 1 – A repeatable problem, with no workaround, that prevents or may compromise the full delivery of products or services.

ACTION: The TRG will recommend the immediate suspension of ST, and the software will be turned over to the developer to resolve the problem. The ST may be resumed at the recommendation of the TRG after an appropriate fix or workaround has been developed. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the proposed solutions.

- 2) Impact 2 – A repeatable problem, with an acceptable workaround, that prevents or may compromise the full delivery of products or services.

ACTION: The TRG may recommend the ST continue with an approved workaround in place until an appropriate fix is developed. If a fix becomes available during the ST, the TRG may recommend the immediate implementation of the fix. The test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the fix.

- 3) Impact 3 – A repeatable problem that does not prevent or compromise the full delivery of products and services.

ACTION: The ST may continue at the discretion of the TRG. An approved workaround may be authorized until the problem is fixed, but this is not mandatory. Routine deficiencies are documented and prioritized by the proper authority for future fixes.

- 4) Impact 4 – Infrequent or poorly documented behavior of the System-Under-Test that may prevent or compromise the delivery of products or services.

ACTION: The TRG may recommend that the ST continue. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures in an attempt to reproduce the problem. Any further observations are documented and submitted to the TRG for review.

The **Priority** addresses how the problem is to be resolved and will be assigned as follows:

- Priority 1 – Immediate emergency action is required.

ACTION: All appropriate resources are directed to resolve the problem as soon as possible.

- Priority 2 – Include in the next interim release.

ACTION: The available resources are directed to resolve the problem.

- Priority 3 – Include in the future interim release.

ACTION: Resources are directed to resolve the problem as allowed.

- Priority 4 – Consider for the next major release.

ACTION: The item is deferred to future system improvements.

- Priority 5 – The priority has not yet been assigned.

ACTION: None.

No recommendation will be made to proceed to the deployment if any **Impact 1** and **Priority 1** deficiency remains open.

2. Method of Accomplishment

The following sections provide the test schedule, descriptions of the test facility, the test system configurations, the required test resources, and the methodology for how the ST will be conducted.

2.1 Schedule

The ST for the AWPAG LogoSense controller FW V3.61 and orifice heaters controller EPROM V2.1upgrades is scheduled to begin on August 17, 2009 and to conclude on August 27, 2009. The ST will start with a “kick-off” TRG meeting on Thursday, August 13 to discuss test strategies and schedules. The ST will be performed as specified in the ST Schedule (see Appendix A). The ST will conclude with a “wrap-up” meeting to finalize recommendations to the ATRB Chair.

Test team members will use test system ST2 as required. On Thursdays during the ST, a meeting will be convened by the Test Director to review the problems documented on TTR forms during the week and to assess the status of the ST. If the TRG deems deficiencies to be critical Impact 1/Urgent Priority 1, these TTRs will be forwarded to the ATRB Chair for review and approval. If the ATRB Chair agrees the deficiencies are “Urgent”, the Chair will task the ASOS Project Office (OST11) to correct them. Depending on the time required for deficiency correction, revisions to the test schedule will be required. At the end of the ST, the TRG will present the ST

results to the ATRB Chair and recommend whether the ST is successful.

The Observing Systems Branch (W/OPS22) was working with the NWS regional ASOS focal points on a policy decision for a low temperature threshold value requirement for the AWPAG orifice heater's cut-off based on LogoSense controller FW V3.61 and the orifice heater controller EPROM V2.1. It's determined the low temperature threshold value is set at 9 °F.

2.2 Test Facility

The Sterling Field Support Center (SFSC), Sterling, VA, and NWSTC will participate in the ST. The SFSC ASOS test system, ST2 (SCA) and NWSTC Single Cabinet ASOS (SCA) will be used to verify the fix, validate the ASOS Modification Note, and to ensure AWPAG is working properly with the new FW and ASOS.

2.3 Test Methodology

The following sections provide a description of how the ST will be conducted. It will be the responsibility of the Test Director to ensure the test is performed as outlined. Any deviation from the test methodology will be documented and provided to the ST testers prior to conduct of the affected tests.

2.3.1 Pre-ST Activities

Prior to ST conduct, OPS24 will develop the ST Plan and test procedures. The Test Director will conduct an ST TRG “kick-off” meeting for the ASOS TRG to ensure all prerequisites are in place (see Section 1.2), and to discuss details (see Appendix C) of what will be tested, how any discrepancies will be documented, and the test schedule. After the ST TRG “kick-off” meeting, the Test Director will commence the ST.

2.3.2 SFSC

The SFSC, an NWS facility for testing surface and upper air observation systems, is located in Sterling, Virginia. The SFSC has three test ASOSs: ST0, ST1, and ST2. However, during the ST, only ST2 (see Figure 1) will be used to evaluate the draft Engineering Modification Note 94 and to validate the AWPAG LogoSense V3.6 and orifice heater V2.1 FW upgrades; it is configured as an operational system.

- 1) Perform the standard “Baseline” procedure (Appendix E) on ST2 to certify the system is performing without critical defects and to note any departures in hardware and software performance.

- 2) The LogoSense V3.6 and orifice heater EPROM V2.1 will be installed into AWPAG. ST2 will be operated with ACU V2.79X. The following tests will be performed:

- a. Complete a 24-hour stability test;
 - b. Regression tests (see Attachment C) will be limited to the sensor input and ASOS output of AWPAG data, Maintenance /Diagnostic status reports, and SYSLOG error messages; and
 - c. METAR/SPECIs, ADAS/ALDARS transmissions will be verified on OID and in SYSLOG
 - d. Verify AWPAG data to ensure they meet all accuracy specifications
- 3) Repeat the above Steps (a), (b), (c), and (d) using ASOS ACU V3.0.1.
 - 4) Repeat the above Steps (a), (b), (c), and (d) using ASOS ACU V2.79D.

(NOTE: Due to the CT12K ceilometer is not configurable to the ST2, and to avoid system configuration conflicts, no ceilometers (CT12K and CL31) will be used throughout the ST.



Figure 1 – SFSC ASOS ST2 Configuration

2.3.3 NWSTC

The SCA at the NWSTC (see Figure 2) will be used to evaluate the Draft Engineering Modification Note 94 and to support “free-play” testing of the AWPAG LogoSense V3.61 and orifice heater controller V2.1 software. Briefly, the configuration of this SCA includes a Visibility sensor, AWPAG, DTS1, 1088, CT12K Ceilometer, IFW, and Present Weather sensor with 2 additional sensor pads.



Figure 2 – NWSTC Single Cabinet ASOS (SCA) Configuration

2.3.4 Personnel and Responsibilities

The following describes the major roles and responsibilities of the test personnel.

Test Director - Ensures all tests defined for the ST are completed and the results properly documented in the ST report. Responsible for collecting and presenting all test trouble reports to the TRG for classification. Following completion of the ST, the Test Director will call a “wrap-up” meeting for the TRG, detail to the ATRB Chair what was tested, report the ST conclusions, and recommend whether to proceed with the national deployment. The Director also ensures all test trouble reports documented and classified during the ST are forwarded to the proper WSH organization or board for resolution.

Test Coordinator - Responsible for the daily conduct of the ST to ensure testers assigned are present, test procedures are conducted, a log of all completed test procedures is kept (see Appendix C), test trouble report forms are provided to the testers on duty, and all completed forms are provided to the Test Director each day; informs the Test Director of any problems encountered not resolved and briefs the director on the status of the test; writes the ST report to document the test results and recommendations.

Test Team Member - Responsible for performing individual test procedures as assigned; documents the results of each test and completes trouble report forms when problems/discrepancies are observed. Provides the test coordinator with comprehensive technical information on how the tests were conducted and any problems encountered. For interface testing, the tester is responsible for the setup of the various FAA and NWS communication interfaces. Test Team Member also ensures that all observations are provided to the assigned WSH personnel for analysis.

Electronics Technician (ET) - Responsible for maintaining the ASOSs under test, installing software and other hardware as appropriate, and commenting on NWS ASOS Modification Notes used during the installation of software/hardware. Configures the ASOS test system(s) for individual tests, reports any problems observed to the test coordinator, and takes maintenance action when hardware failures occur.

Data Analyst - On request by the Test Director, responsible for reviewing all METAR/SPECI observations and Standard Hydrometeorological Exchange Format (SHEF) products for correctness.

The ST test team will consist of the following personnel:

Table 2 – Test Personnel

Name	Function	Phone
Harry Tran (OPS24)	Test Director, Primary	301-713-0326 x105
Khien Nguyen (OPS24)	Test Director, Alternate	301-713-0326 x177
Peggy Hoch (OPS23)	Software Manager	301-713-0191 x 165
Richard Parry (OPS22)	Data Analyst	301-713-0392 x 109
Chet Smith (OPS22)	Data Analyst	301-763-8000 x 7519
Joseph Devost (OPS12)	Maintenance Branch	301-713-1833 x 156
Greg Sikora (OPS12)	Maintenance Branch	301-713-1833 x 187
Jennifer Dover (OPS22)	Test Support	703-661-1259
Juan Montenegro (OPS22)	Test Support	703-661-1206
Dave Eckberg (SAIC)	Test Support (Electronics Technician)	703-661-1288
Paul Oosterhout (SAIC)	Test Support	703-661-1224
Brian Rice (SAIC)	Test Support	703-661-1209
Gregory Whitaker (SAIC)	Test Support	703-661-1244

2.3.5 Support Documentation

Updated support documentation and test procedures will be used in the ST. Reference to these documents will be made as required throughout the test. The list of documentation (with the office of responsibility in parenthesis) and procedures includes, but is not limited to, the following documents:

- a. ST Plan for AWPAG LogoSense controller FW V3.61 and orifice heater controller FW V2.1 upgrades (OPS24);
- b. System Test Procedures and ASOS Sensor Emulator (ASENSE) associated data sets (located at ASOS Test System ST2) (OPS24); and,
- c. Draft ASOS Modification Note 94 for installing instructions of AWPAG LogoSense controller FW V3.61 and orifice heater controller FW V2.1 (OPS12).

2.3.6 Problem Reporting

Testers will use the TestTrackPro software to enter the TTR's into database as soon as possible so that the information is available to the test team and the software developer in a timely manner. User accounts and passwords will be available for the test members to access the TestTrackPro by using either the work station located near ST0 and ST1 or the website:

<http://webdev1.weather.gov/ttweb/login.htm>

3. Test Recommendations and Report

At the conclusion of the ST, the TRG will convene an ST wrap-up meeting to review the findings of the ST and to recommend whether to proceed with the Field Demo of the AWPAG firmware and EPROM upgrades for a short evaluation period to determine if the change has any unforeseen negative affect on ASOS not captured during the ST. After the Field Demo, the ATRB will be briefed on the results as input into the decision to nationally deploy the AWPAG FW fixes to all operational ASOSs. The decisions of the TRG are based on consensus among the voting members. The voting members of the TRG are listed in Table 1.

A formal ST Report will be generated by OPS24 to document the TRG recommendation, the test status, and all problems found during the ST.

Appendix A – AWPAG Test Schedule

Dates	Duration Day	Action
8/17/09	1	ST TRG “kick-off” meeting
ACU V2.79X		
8/17/09	3	<ul style="list-style-type: none"> - Install LogoSense controller V3.61 and orifice heater controller V2.1 FW into AWPAG, verify the LogoSense controller’s heater low cut-off (18 °F) threshold temperature is programmable to any desired temperature values below 30 °F. - Verify the threshold temperature is programmable to 9 °F - Verify AWPAG passes all diagnostics tests. - Verify the AWPAG data meet all accuracy specifications using a volumetric flask. - Complete a 24-hour stability test. - Perform Regression tests; verify AWPAG data are correctly reported in the OID one-minute observation, 5-minute page, 12-hour archive data, METAR/SPECIs and ADAS/ALDARS transmissions. - Verify AWPAG operation with ASENSE associated data sets.
ACU V3.0.1		
8/20/09	3	<ul style="list-style-type: none"> - Verify the LogoSense controller’s heater low cut-off (18 °F) threshold temperature is programmable to any desired temperature values below 30 °F. - Verify the threshold temperature is programmable to 9 °F - Verify AWPAG passes all diagnostics tests. - Verify the AWPAG data meets all accuracy specifications using a volumetric flask. - Complete a 24-hour stability test. - Perform Regression tests; verify AWPAG data are correctly reported in the OID one-minute observation, 5-minute page, 12-hour archive data, METAR/SPECIs and ADAS/ALDARS transmissions. - Verify AWPAG operation with ASENSE associated data sets.
ACU V2.79D		

Dates	Duration Day	Action
8/25/09	3	<ul style="list-style-type: none"> - Verify the LogoSense controller's heater low cut-off (18 °F) threshold temperature is programmable to any desired temperature values below 30 °F. - Verify the threshold temperature is programmable to 9 °F - Verify AWPAG passes all diagnostics tests. - Verify the AWPAG data meets all accuracy specifications using a volumetric flask. - Complete a 24-hour stability test. - Perform Regression tests; verify AWPAG data are correctly reported in the OID one-minute observation, 5-minute page, 12-hour archive data, METAR/SPECIs and ADAS/ALDARS transmissions. - Verify AWPAG operation with ASENSE associated data sets.
8/27/09	1	- Wrap-up Meeting
8/28/09	14	- Prepare ST Report

Appendix B – Draft ASOS Modification Note 94**ASOS MODIFICATION NOTE 94**

Operations Division

W/OPS12: WR/JD/GLD

SUBJECT: ASOS AWPAG Firmware Loading

PURPOSE: To upload firmware version 3.61 into the AWPAG – All Weather Precipitation Accumulation Gauge

SITES AFFECTED: All ASOS Sites with AWPAG

AUTHORIZATION: This modification is authorized by Request for Change xxxx.

VERIFICATION STATEMENT: This procedure was tested for operational integrity and verified at the National Weather Service (NWS) Headquarters, Silver Spring, Maryland (SP2), Sterling Research and Development Center (SRDC), and National Reconditioning Center (NRC).

ESTIMATED COMPLETION DATE: Within 30 days of receipt of this modification note.

TIME REQUIRED: Approximately 1 hour on site.

ACCOMPLISHED BY: NWS Electronics Technicians

EQUIPMENT AFFECTED: ASOS

SPARES AFFECTED: None

PARTS/MATERIALS REQUIRED: Firmware version 3.61 files:
slw03m_AWPAG_V361.bin
slw03m_UPLOAD AWPAG_V.wax

SOURCE OF PARTS/MATERIALS: ASOS CPU Firmware & Sensor Software OPS1 Web Page
https://www.ops1.nws.noaa.gov/Secure/asos/cpu_firmware.htm

DISPOSITION OF REMOVED PARTS/MATERIALS: N/A

TOOLS AND TEST EQUIPMENT REQUIRED: Technicians DB-9 Male to DB-9 Female test cable S100-TE307
Technician's portable computer (PC) with Procomm Plus version 4.7 program

DOCUMENTS AFFECTED: ASOS S100 Manual Chapter 10A, AWPAG, paragraph 10A.4.5
Procomm Plus setup procedure

PROCEDURE: Attachment A - ASOS AWPAG Firmware Loading - script
Attachment B - ASOS AWPAG Firmware Loading - emergency
Attachment C - A completed EMRS report sample

TECHNICAL ASSISTANCE: For questions or problems pertaining to this modification note, contact NWS Headquarters (WSH) at 301-713-1833 x156, x120, or x147.

REPORTING
INSTRUCTIONS:

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in [EHB-4, Maintenance Documentation](#), Part 4, and Appendix D. Include the following information on the EMRS Report.

Maintenance Description (block 5):

ASOS Mod Note 94 – ASOS AWPAG Firmware Loading (Version 3.61)

Equipment Code (block 7): **AWPAG**

Serial Number (block 8): **AWPAG serial number**

Maint. Comments (block 15):

ASOS Mod Note 94 – Loaded ASOS AWPAG Firmware (Version 3.61)

Mod No. (block 17a): **94**

Mod Date (block 17b): **Enter firmware loaded date**

Block C (block 17c): **3.61**

A sample EMRS report is provided as attachment **C**.

Al Wissman (Acting)
Director, Operations Division

Attachment A – ASOS AWPAG Firmware Loading with script file

Attachment B – ASOS AWPAG Firmware Loading by emergency manual method

Attachment C – Sample EMRS Report

ASOS AWPAG Firmware Loading

This procedure assumes that:

- Procomm Plus version 4.7 is being used
- Procomm Plus uses the directory: C:\Program Files\Procomm Plus
- Portable computer (PC) serial communications uses COM 1 port
- Technician's PC has an operational AC power adapter

Retrieve AWPAG software (2 files) and NWS Coordination

1. Before leaving the office, retrieve the following two files from the *ASOS Technician* web page:

slw03m_AWPAG_V361.bin
slw03m_UPLOAD AWPAG_V.wax

2. In the C:\Program Files\Procomm Plus\Aspect folder, make a folder named:

AWPAG-3-61

3. Store the two retrieved files in the \AWPAG-3-61 folder (Figure 0-1), thus:

C:\Program Files\Procomm Plus\Aspect\AWPAG-3-61
slw03m_AWPAG_V361.bin
slw03m_UPLOAD AWPAG_V.wax

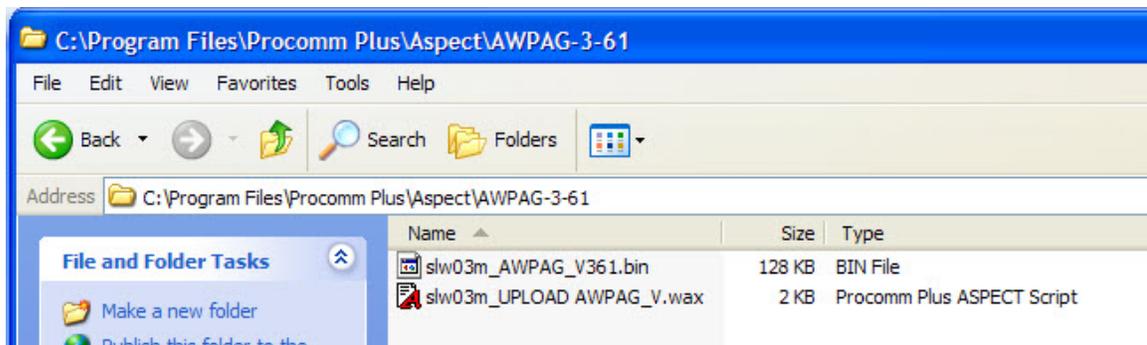


Figure 0-1

4. Twenty-four to 72 hours before the scheduled maintenance, notify by e-mail the ASOS Operations and Monitoring Center (AOMC) (aomc@noaa.gov), including the site location and identifier and a description of the work to be completed.

CAUTION

Do not start the installation during inclement weather, precipitation, Instrument Flight Rule (IFR) conditions, or if these conditions are expected to occur in the next 4 hours. The responsible meteorologist in charge (MIC)/Observer in Charge

(OIC) can confirm that these meteorological conditions are present or will be present during the day.

5. Dial into the site remotely 24 to 72 hours before the scheduled maintenance and use the following steps and upload the current system configuration to the AOMC:
 - a. At the operator interface device (OID), log on as Technician.

NOTE: Sites without a local OID (i.e., no RS232 connected for the primary OID) must attach a PC to the primary OID port (1A9J22).

- b. Proceed to the AOMC page (**REVUE-SITE-VERSN-AOMC**).
- c. Command an upload of all data files except VOICE AIRPORT NAME. Highlight each file (less the VOICE AIRPORT NAME file) using **NEXT** or **PREV** and then select **UP-LD**. After all files read UPLOAD REQ in the **STATUS** column, the task is complete.
- d. Wait for all of the lines to change from UPLOAD REQ to COMPLETE.
- e. When complete, select **Exit**.

Obtain approval from the MIC/OIC before starting the installation.

NOTE: Perform the installation on any day of the month immediately after an hourly observation has been transmitted. Do not start the installation at a time that conflicts with scheduled synoptic observations. At staffed sites, normal backup observing procedures will be activated.

6. Once on site, call the AOMC at 1-800-242-8194 or 8895 to provide the location and identifier of the ASOS and which upgrade is going to be installed. Confirm with the AOMC that access to the site-specific data base is available.
7. Upload the current configuration if not completed in step 5.
8. If performing routine maintenance, turn report processing off for affected sensors and continue with step 5.
9. If performing a modification, complete the following steps:
 - a. Select **MAINT-ACT-FMK** and type **FMK077A**. Editors Note: This is an example number.
 - b. Select **MAINT-ACT-FMK-START**.
10. At sites where there is no observer or Air Traffic Controller (ATC) logging into the ASOS, proceed to the **COMMS** page (**REVUE-SITE-CONFIG-COMMS**) and disable the sites long-line communications port (i.e., **ADAS, AFOS PHONE**). If the work is scheduled to take < 60 minutes, this step can be skipped.
11. Ensure any ATC on watch or Contract Weather Observer (CWO) logged into the system is provided an expected return-to-service time. This also includes ALL local users who have access to ASOS data using either a VDU or OID or local display.
12. Archive all required system data to a PC using the Direct Command Mode (DCM) as listed in Table 0-1 where:

MM indicates a month
 DD indicates a day
 HHMM indicates a time
 I indicates an archive index
 CODE 1 and CODE 2 indicate SYSLOG code

Table 0-1 DCM Commands

Command	Results
12HR	Outputs all 12-hour data.
5MIN	Outputs 5-minute observation data.
ARC5MIN 1,2,3	Outputs archived 5-minute observation data.
COMLOG	Outputs communications log data.
DAILY	Outputs daily data.
DSM	Outputs Daily Summary Message data.
EDITLOG	Outputs edit log data.
HELP	Outputs help information for the direct command mode.
LEDWI	ASOS maintains a 12-hour archive of present weather sensor (LEDWI) reports (C command responses). This archive is not available on normal OID screens, but is available remotely using this LEDWI command. Refer to Chapter 7 for format of LEDWI C data.
MONTH	Outputs monthly data.
MSM	Outputs Monthly Summary Message data.
OBS	Outputs observation data.
SHEF	Outputs SHEF observation data.
SYSLOG	Outputs system log data.
THUNDER	Outputs thunderstorm sensor data.
TREND D	Outputs rf communication trend data.

ASOS AWPAG Firmware Updating Procedures

Open the AWPAG electronics enclosure cabinet, see Figure 0-2.

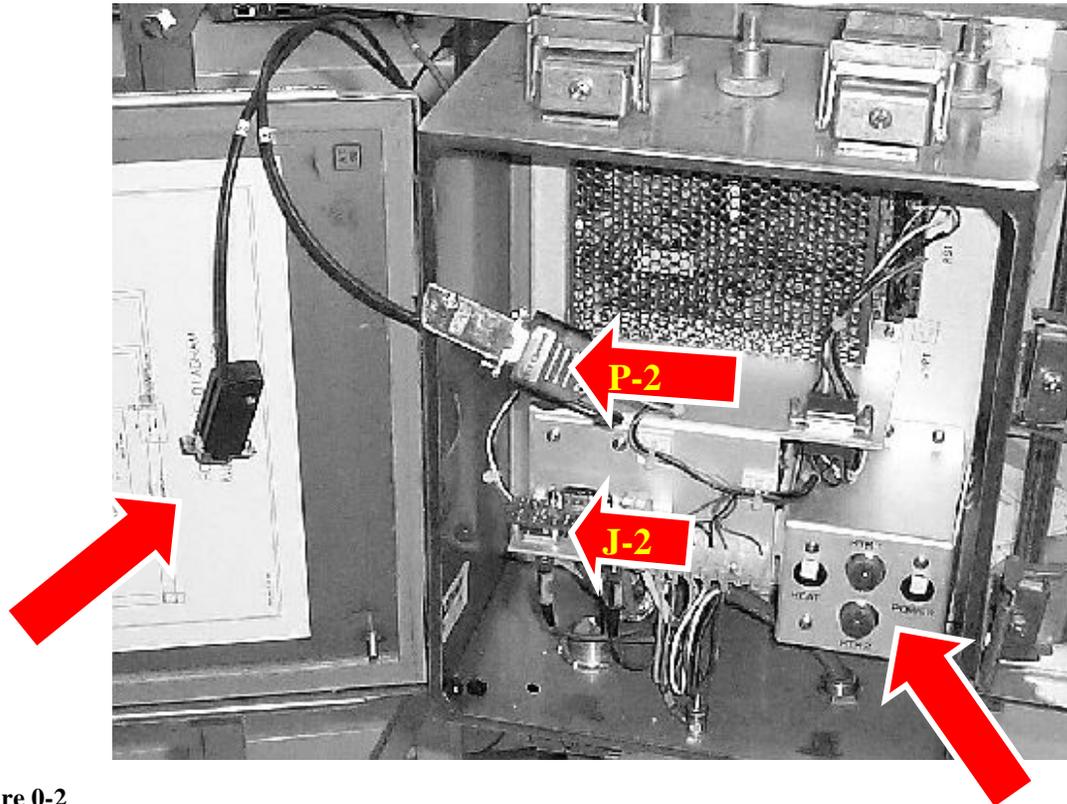


Figure 0-2

13. Set the **HEAT** and **POWER** switches to **OFF**.
14. Disconnect the serial DB-9 cable where it connects to the Fiber Optic module (P-2 and J-2). If the plastic shell comes off, it will easily snap in place.
15. With the technician's Y test cable S100-TE307, connect the **Y-end male connector to AWPAG P-2 that has just been removed** from the Fiber Optic module.
16. **Do not connect anything** to the Fiber Optic modem J-2.
17. Connect the PC end of the S100-TE307 cable to the PC **COM-1** port. A Null Modem Adapter is **NOT needed**.
This connection enables the PC to download data into the AWPAG electronics enclosure.
18. Confirm that the technician's **PC is turned on**.
19. Confirm that the technician's PC is being powered by the AC adapter and is **not on battery power**.
20. Confirm the S100-TE307 **Y cable male connector** is plugged into DB-9 **P-2** of the AWPAG, see Figure 0-2.
21. Confirm the S100-TE307 **Y cable female connector IS NOT plugged into anything**, see Figure 0-2.

22. Confirm that the PC end of S100-TE307 **Y cable** is plugged into the PC DB-9 serial port **COM 1**.
23. Confirm that the PC end of S100-TE307 **Y cable** is **not** using a Null Modem adapter.
24. Confirm that the PC is powered by the **AC adapter**.
25. On the PC, start the program **Procomm Plus**.
26. On the Menu Bar, click **File**, then **Connection Directory** (Figure 0-3).

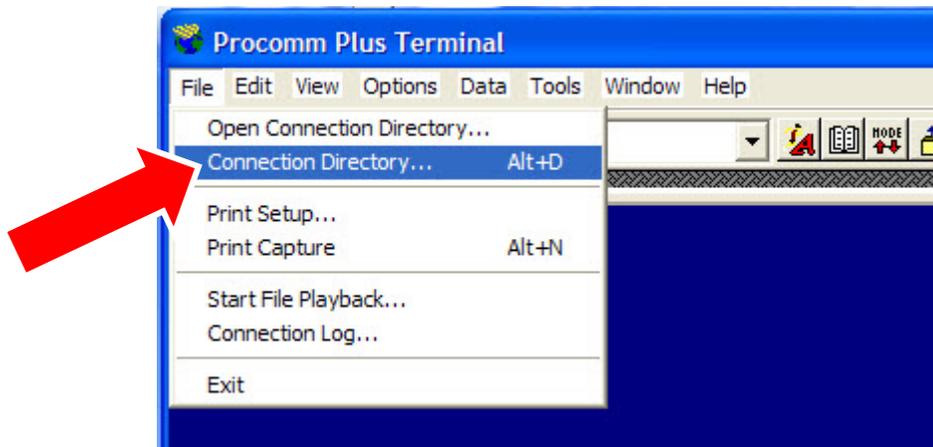


Figure 0-3

27. In the *Connection Directory* window, select **Connection**, then **New Entry** (Figure 0-4).

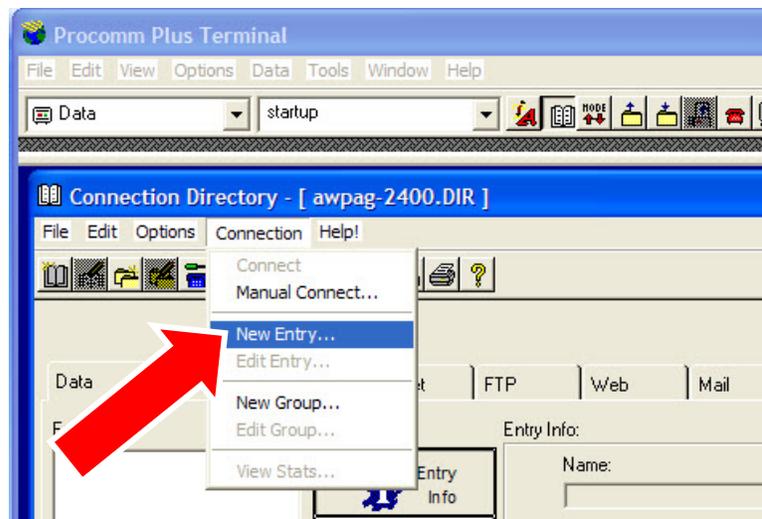


Figure 0-4

28. In the *Data* tab, *Add Directory Entry* window (Figure 0-5), complete as follows:

- a. Name: **awpag-3-61**
- b. Data Connection: **direct connect-Com 1**
- c. Terminal: **ANSI BBS**
- d. Protocol: **Xmodem**

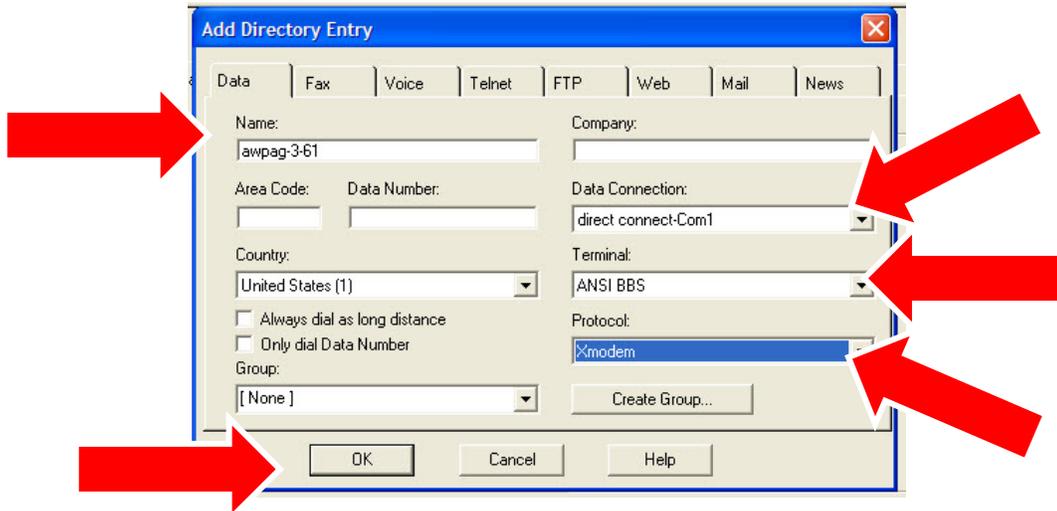


Figure 0-5

29. Confirm **steps a through d above** in the *Add Directory Entry* window.

30. Click **OK** on the *Add Directory Entry* window.

31. In the *Data* tab, *Connection Directory* window, select **Port Settings**, then **Modem/Connection Properties** (Figure 0-6).

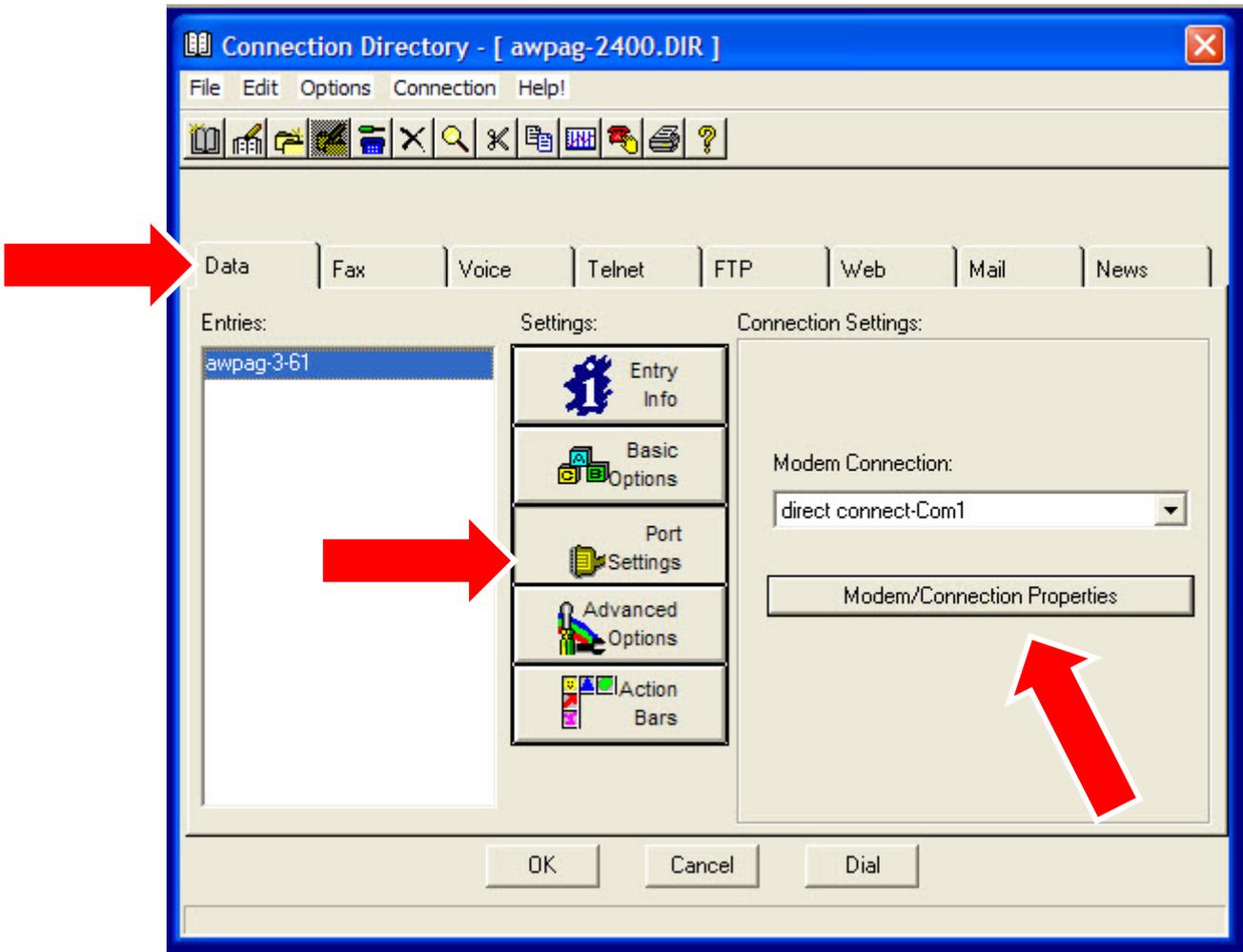


Figure 0-6

32. Confirm the **Modem/Connection Properties** window (Figure 0-7) as follows:
- Baud = **2400**
 - Parity = **None**
 - Data bits = **8**
 - Stop bits = **1**
 - NOT CHECKED** = Use hardware flow control
 - NOT CHECKED** = Use software flow control
 - NOT CHECKED** = Drop DTR to hangup

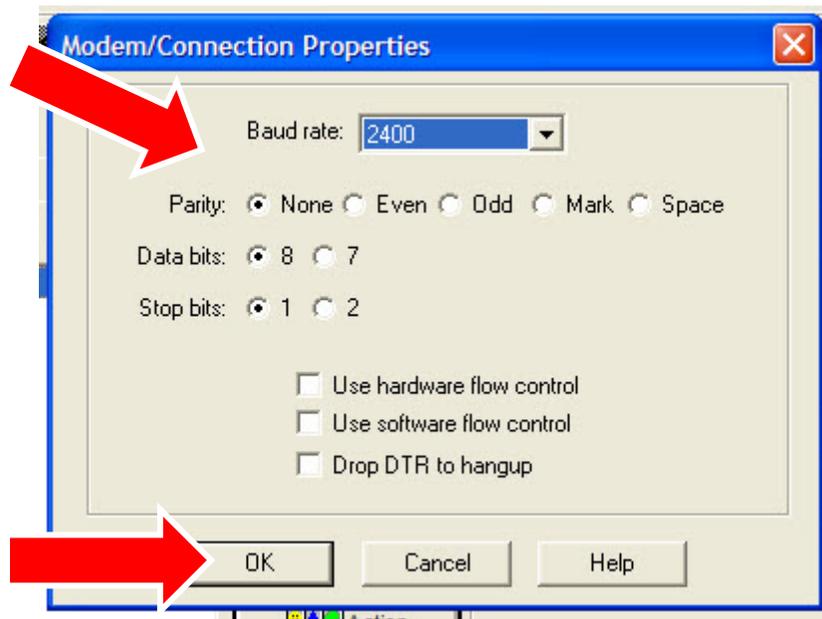


Figure 0-7

33. Confirm **steps a** through **g** above in the *Modem/Connection Properties* window.
34. In the *Modem/Connection Properties* window, click **OK**.

35. In the *Connection Directory* window (Figure 0-8), click **OK**.

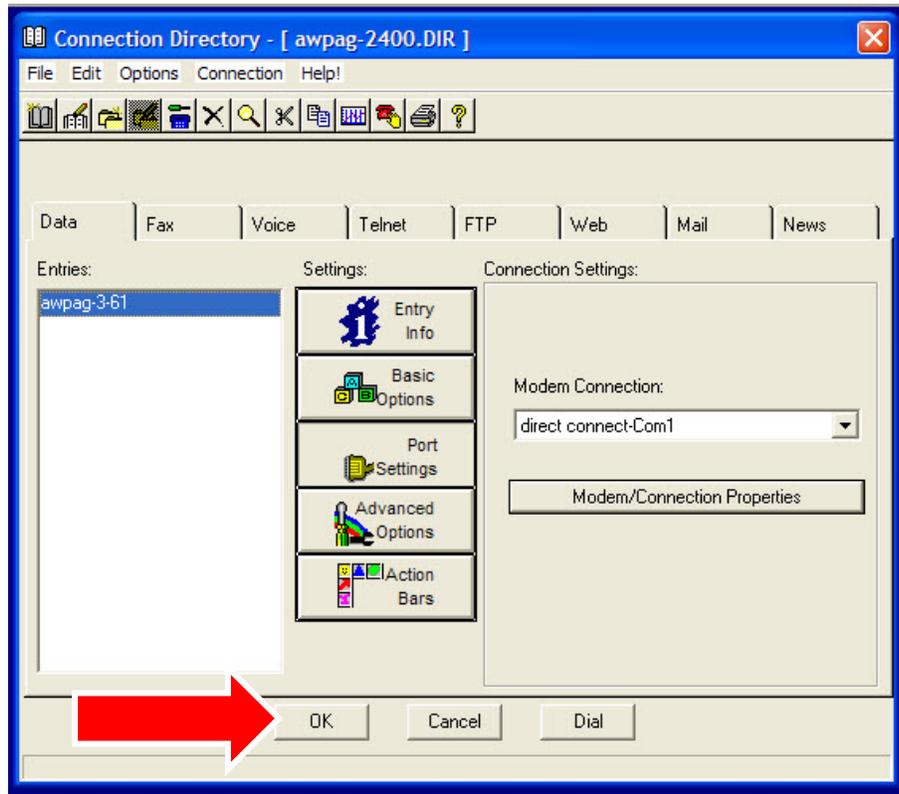


Figure 0-8

36. Procomm Plus is now setup for 2400, N, 8, 1, No Handshake mode.

37. The bottom of the PC screen should appear as shown in Figure 0-9, if not, click on each window and set to match.



Figure 0-9

38. The AWPAG *POWER* switch should now be **OFF**, if not, turn it off and wait 5 seconds.

39. Turn the AWPAG **POWER** switch **ON**.

Within 10 seconds, the Procomm Plus screen should appear as depicted in Figure 0-10:

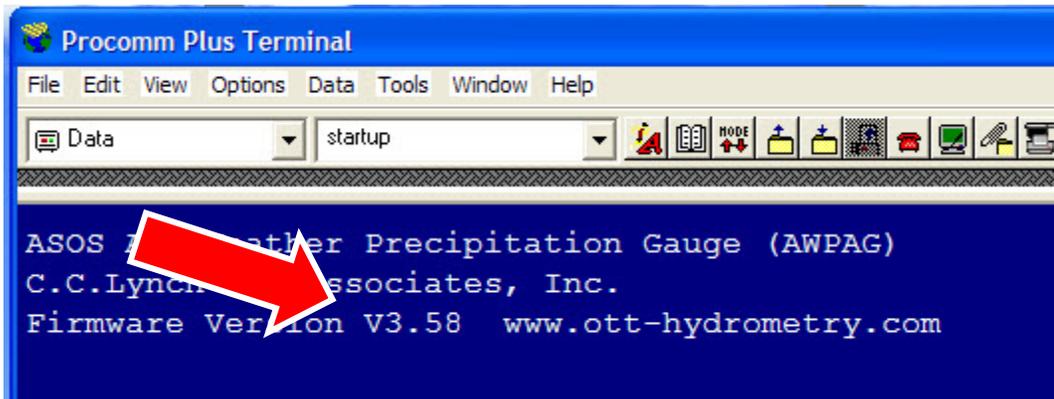


Figure 0-10

40. If the screen displays Firmware Version V3.58 continue; if not, check the cable connection and the PCPlus setup, or call the region ASOS specialist for assistance.
41. If the screen displays Firmware Version V3.61, this procedure is already completed. The loading of AWPAG firmware is finished, proceed to step 58.
42. On the keyboard, press **ALT** and **C** keys to clear the screen.
43. Turn the AWPAG **POWER** switch **OFF**.

CAUTION

During the following file transfer process (about 12 minutes), the S100-TE307 cable, PC, and all electronic components must be intact and not disturbed!

If the file transfer process is interrupted for any reason, the AWPAG will be disabled until the firmware is installed manually and not by the script file.

DO NOT disturb the S100-TE307 cable, PC or electronic components during the file transfer process!

DO NOT run PC off the battery!

44. Read the **CAUTION** note above.
45. Confirm the AWPAG **POWER** switch is **OFF**.

46. In the *Procomm Plus Terminal* menu bar (Figure 0-11), select **Tools**, then **Scripts**, and then **Run**.

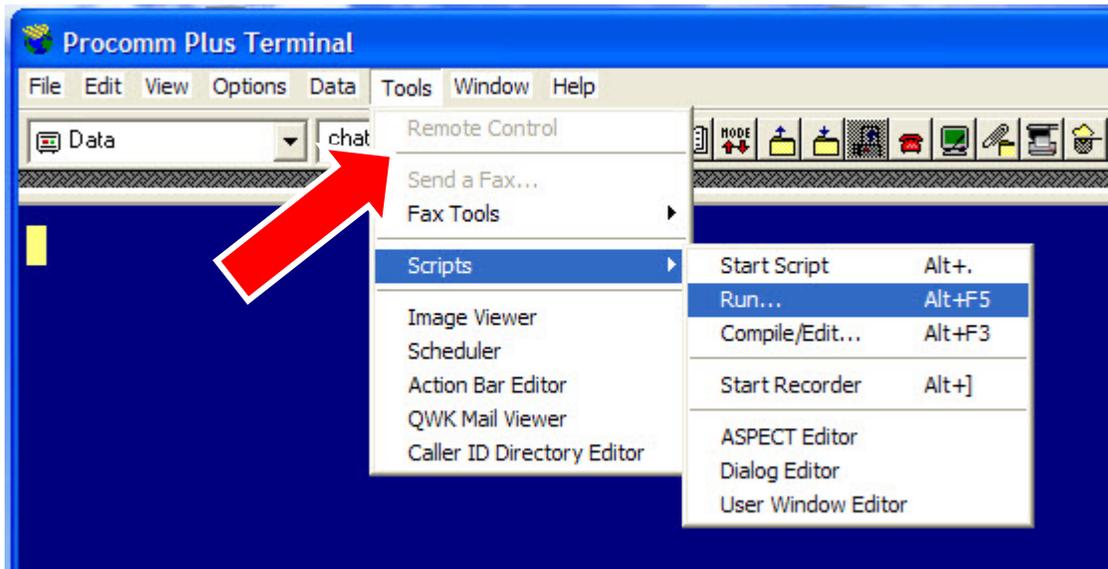


Figure 0-11

47. In the *Run ASPECT File* window (Figure 0-12), select the folder **AWPAG-3-61**, and then click **Open**.

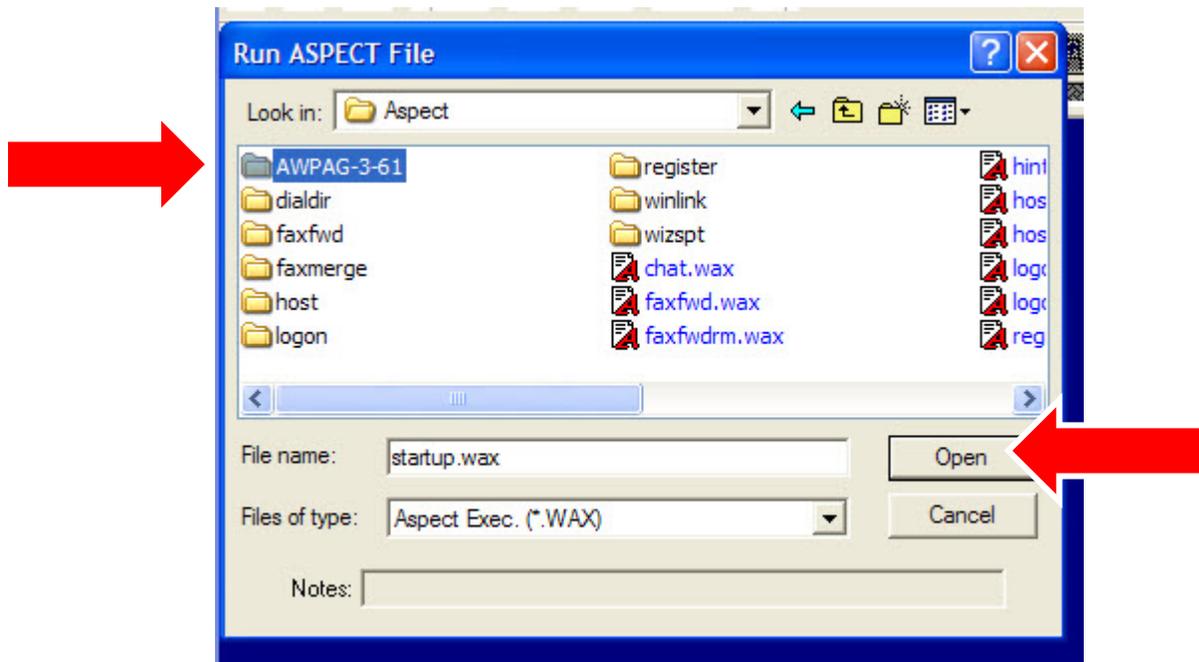


Figure 0-12

48. In the *Run ASPECT File* window (Figure 0-13), select the file:
slw03m_UPLOAD AWPAG_V.wax and then click **Open**.

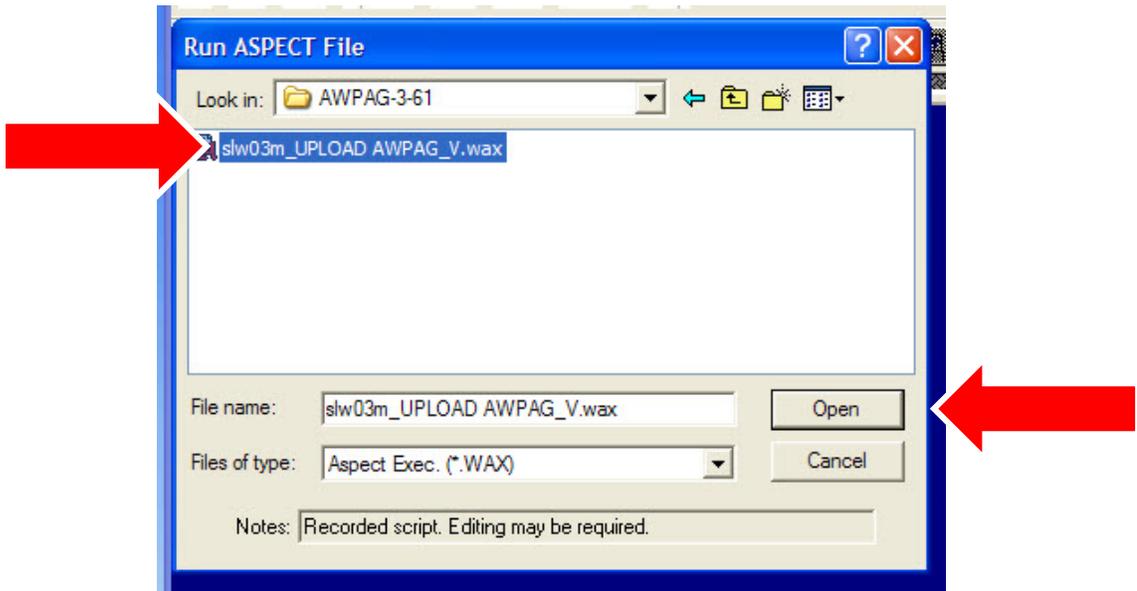


Figure 0-13

49. In the *Directory File List* window (Figure 0-14), select the file:
slw03m_AWPAG_V361.bin

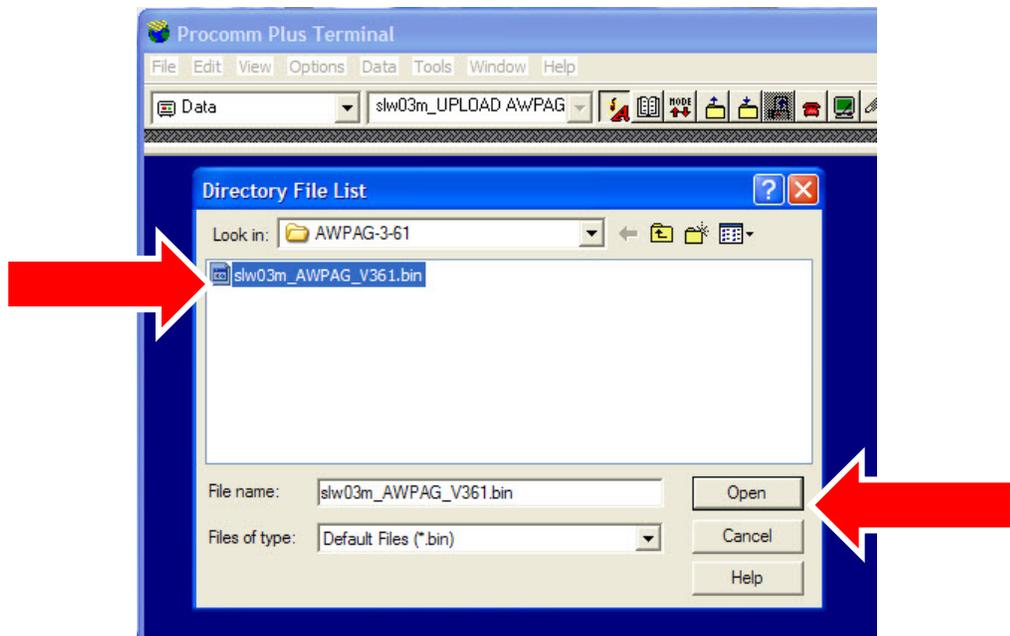


Figure 0-14

50. Click **Open**. The *ASPECT User Message* window (Figure 0-15) appears, click **OK** and **proceed IMMEDIATELY to the next step**.



Figure 0-15

51. Turn the AWPAG **POWER** switch **ON**. In the *Procomm Plus* window, a few characters display on the top line:

?, A?, CCCCC000 (This means the script file is running.)

After a few seconds, the Procomm Plus *Xmodem* file transfer window (Figure 0-16) appears, and the *Percent Complete* progress bar shows ascending numbers.

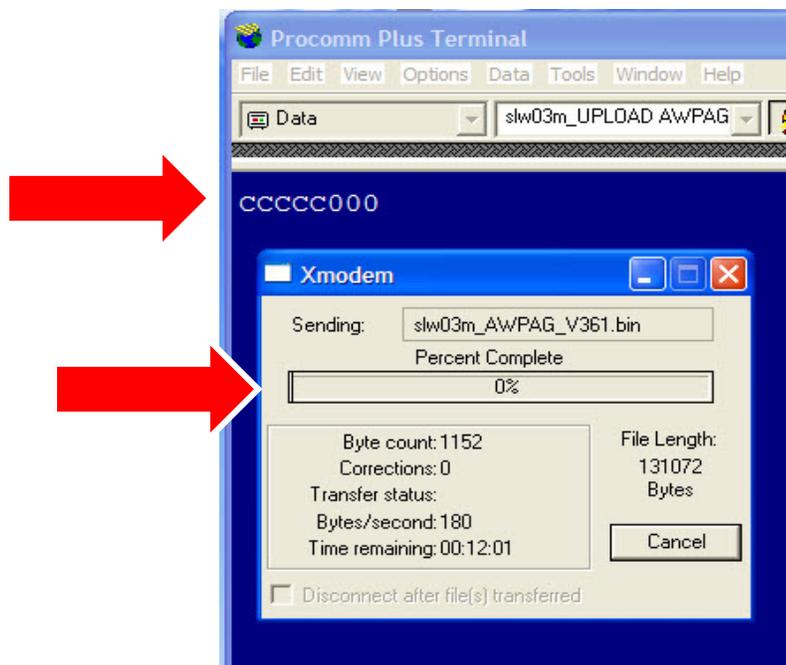


Figure 0-16

The file transfer into the AWPAG **takes about 12 minutes**. Remember the **CAUTION**.

CAUTION

During the file transfer process (about 12 minutes), the S100-TE307 cable, PC, and all electronic components must be intact and not disturbed!

If the file transfer process is interrupted for any reason, the AWPAG will be disabled until the firmware is installed manually and not by the script file.

DO NOT disturb the S100-TE307 cable, PC or electronic components during the file transfer process!

DO NOT run PC off the battery!

52. If the script and file transfer process does not run, check the S100-TE307 cable connections and Procomm Plus setup procedure. Start over at Section 0, step 0 of this Modification Note, or call the region ASOS specialist for assistance.
53. **DO NOT LEAVE the area.** When the file upload is complete, you will have 30 seconds to continue the execution of the script file (Read ahead to the next step).
54. When the file transfer is complete, the AWPAG reboots and Firmware **Version 3.61** displays with an *Aspect User Message* window (Figure 0-17). **Immediately click OK (within 30 seconds).**

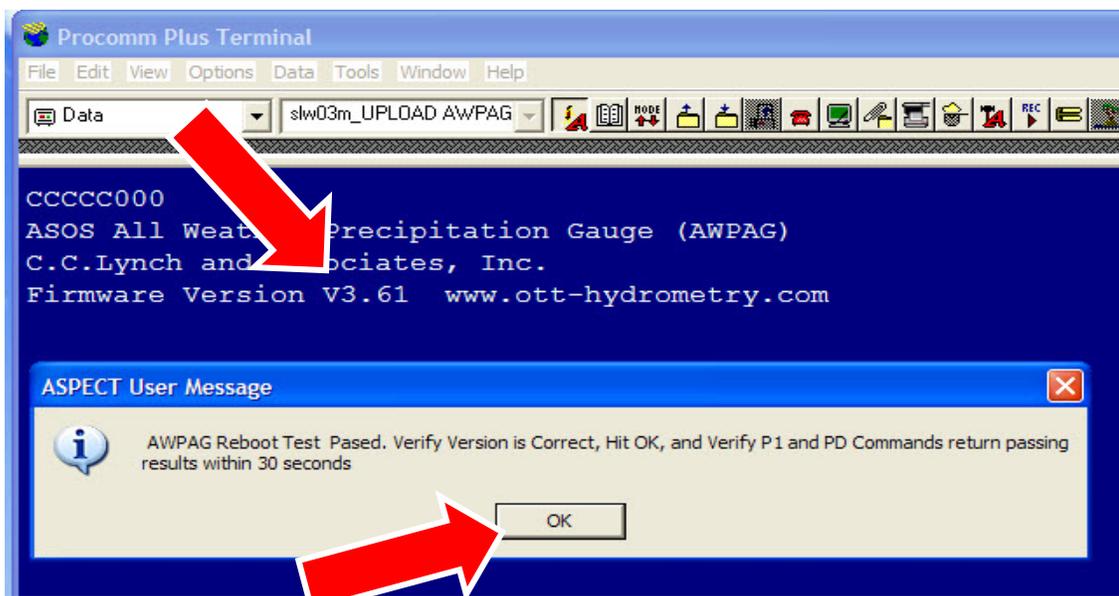


Figure 0-17

55. The script will run **P1** and **PD** commands, see Figure 0-18. It takes about a minute for the results to show up.

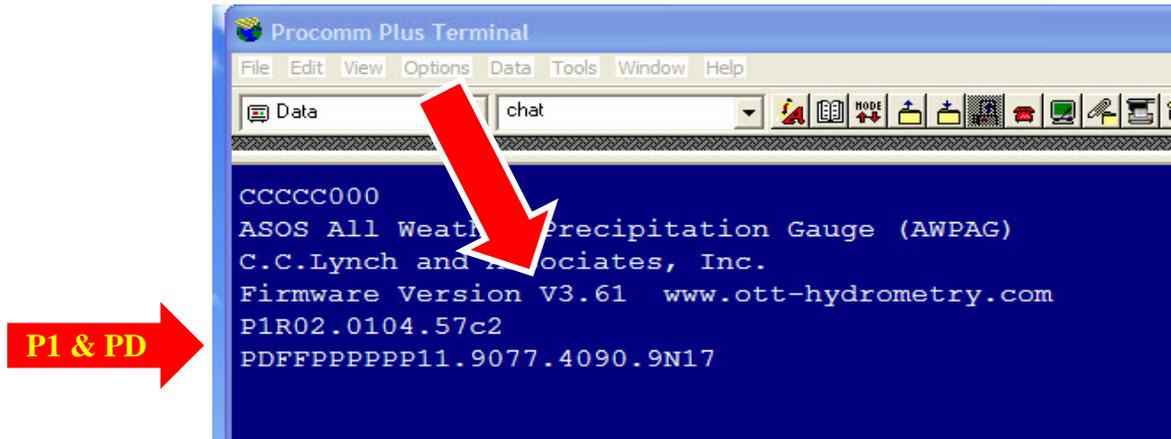


Figure 0-18

56. Refer to ASOS S100 Manual Chapter 10A, AWPAG, paragraph 10A.4.5, to decode the Pass (P) and Fail (F) codes in the PD command results.
57. The P1 and PD result codes on the screen will be somewhat different from those shown in Figure 0-18.
58. Firmware version 3.61 has been successfully loaded into the AWPAG.
59. Press the **Caps Lock** key on the PC.
60. Verify that the Caps Lock indicator is **ON**.

NOTE: The PHTEMP characters may not appear on the screen as the following characters are typed, depending on the setup of Procomm Plus, this is not an issue.

The character strings must be typed correctly as the backspace or delete keys can not be used to correct typing errors. If a typing error is made, press Enter and retype the command as shown.

61. Type the following command: **PHTEMP120** and then press **Enter**.

62. Verify the screen display as shown in Figure 0-19.

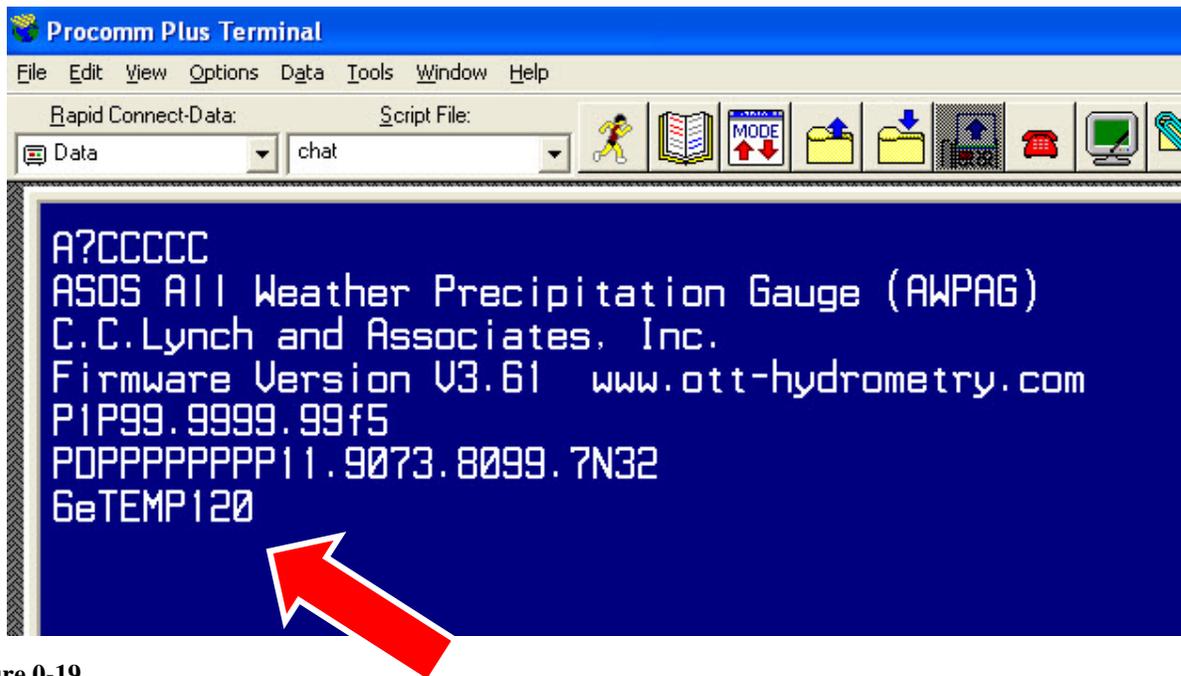


Figure 0-19

63. Type the following command: **PHTEMP** and then press **Enter**.

64. Verify the screen display as shown in Figure 0-20.

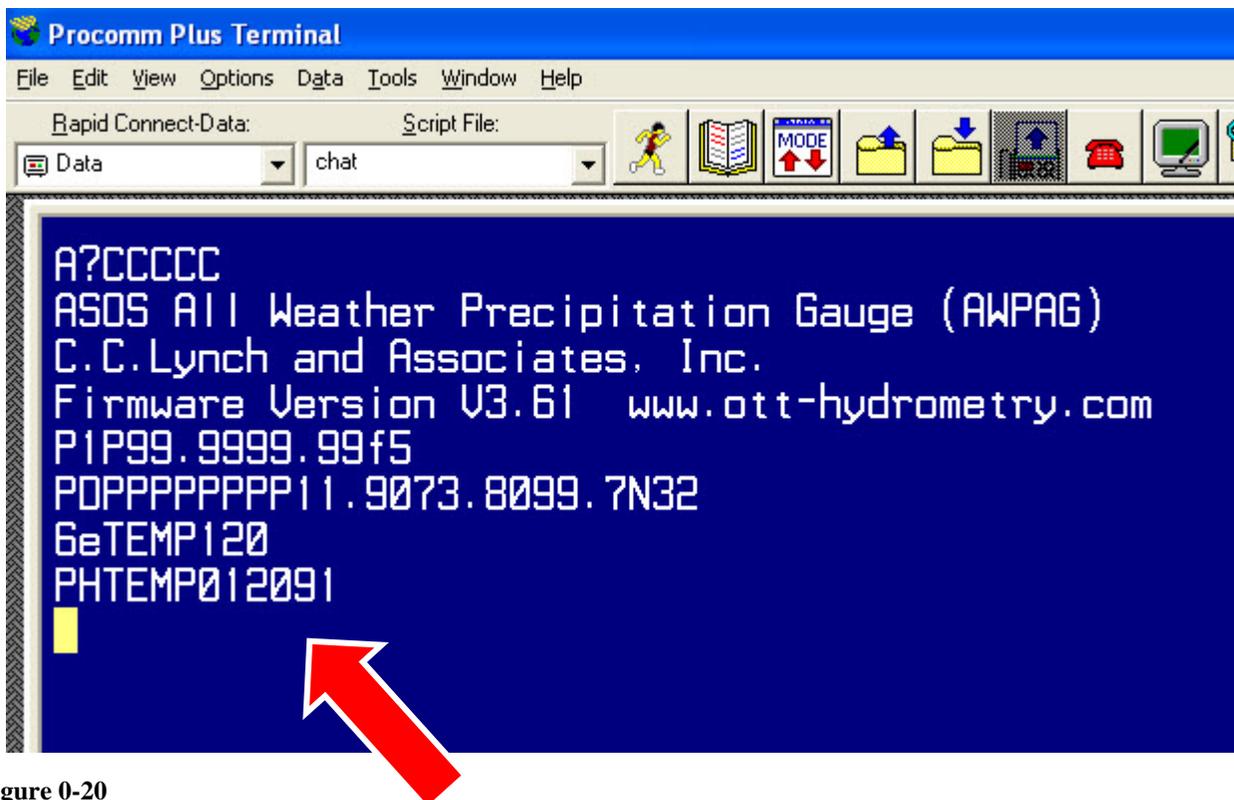


Figure 0-20

65. If the PHTEMP commands above do not work properly, do the following:
- Turn the *AWPAG Power* switch **OFF**.
 - Wait 5 seconds.
 - Turn the *Power* switch **ON**.
 - Wait 1 minute.
 - Repeat steps 59 through 63.
 - Verify that the screen displays as shown in Figure 0-21. If it still does not work, call the region ASOS specialist for assistance.

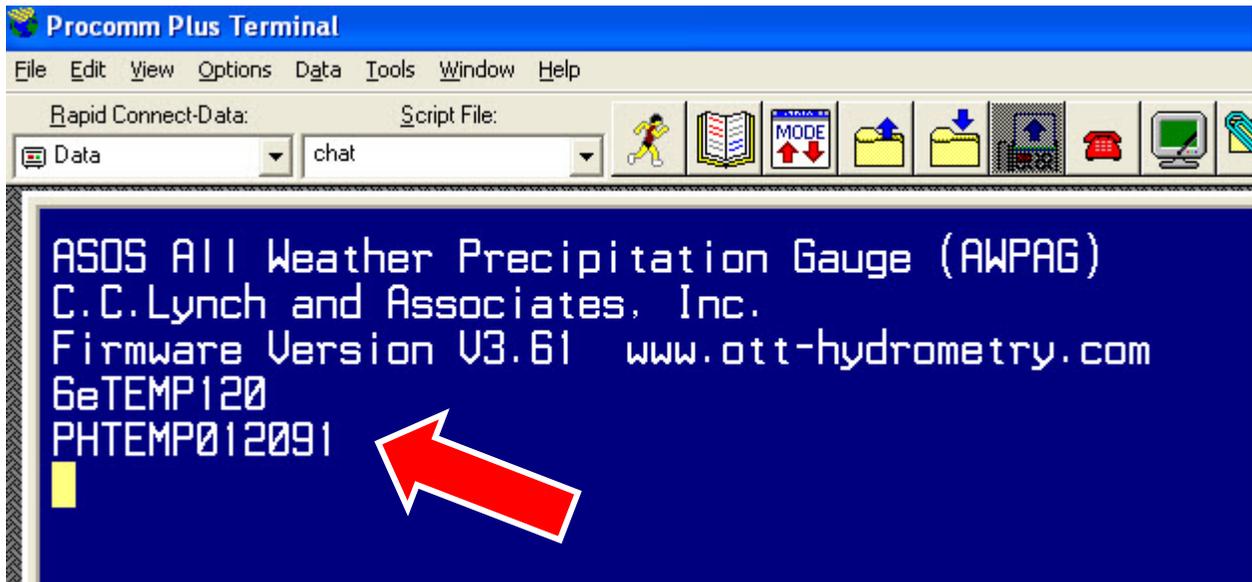


Figure 0-21

- Turn the AWPAG **POWER** switch to **OFF**.
- Disconnect the S100-TE307 cable from P-2 on the AWPAG.
- Re-connect AWPAG connector **P-2 to the Fiber Optic Modem** (normal configuration). Snugly tighten the DB-9 attachment screws, but do not over tighten.
- Turn the AWPAG **HEAT** and **POWER** switches **ON**.
- Restore the AWPAG and ASOS site to operational status.
- Steps to upload the AWPAG firmware version 3.61 using manual keyboard entries are described in Attachment B. Do not attempt to perform this manual process without calling for assistance at 301-713-1833 ext 156, ext 120 or ext 147.

Manual Upload of Firmware to AWPAG

Call for **301-713-1833 ext. 156, 120, 161 or 147**, for step by step assistance

In **Section 0**, perform steps **1** through **3**.

Only the binary file is used (**slw03m_AWPAG_V361.bin**). The file with the **-.wax** extension (the script file) will not be used here.

In **Section 0**, perform steps **0** through **37**.

Have Procomm Plus 4.7 set up and running:

Turn the AWPAG **Power** switch **ON**.

Immediately press **Enter**. The **?** prompt displays.

Immediately type the letters **sup** and press **Enter**. The **A?** prompt displays.

Immediately type the letters **FC0000** and press **Enter**. The prompt **CCCCC....** displays.

Click the menu bar **Data**, and then **Send File** (Figure 0-1).

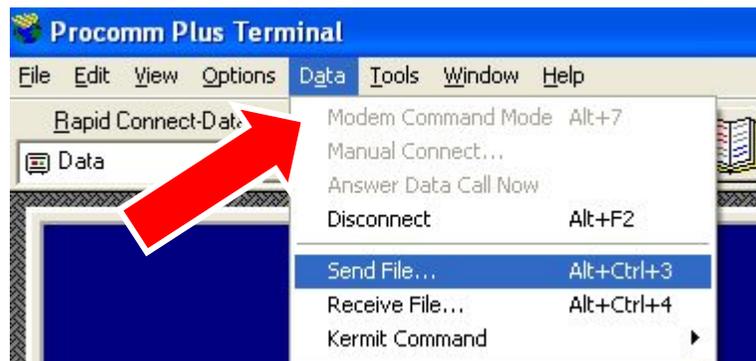


Figure 0-1

Browse to the folder:

C:\Program Files\Procomm Plus\Aspect\AWPAG-3-61

Select the file:

slw03m_AWPAG_V361.bin

Select **Xmodem** file transfer protocol.

Click **OPEN** to start the file transfer process.

Confirm the **Xmodem** file transfer progress as shown in Figure 0-2:

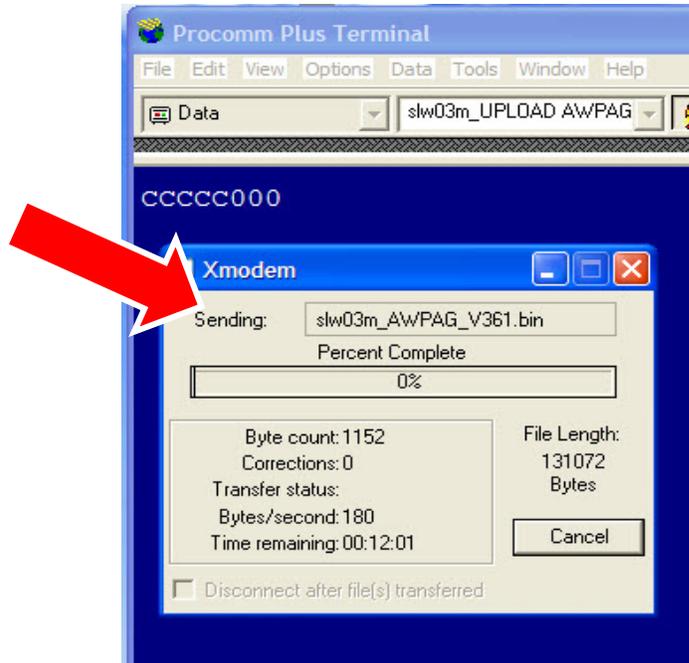


Figure 0-2

Wait **12 minutes** for the file transfer to finish.

Read the **Caution** note in Section 0, step **43**.

When the firmware upload is finished, the AWPAG will reboot and display the firmware version **3.61** on the PC screen (Figure 0-3).

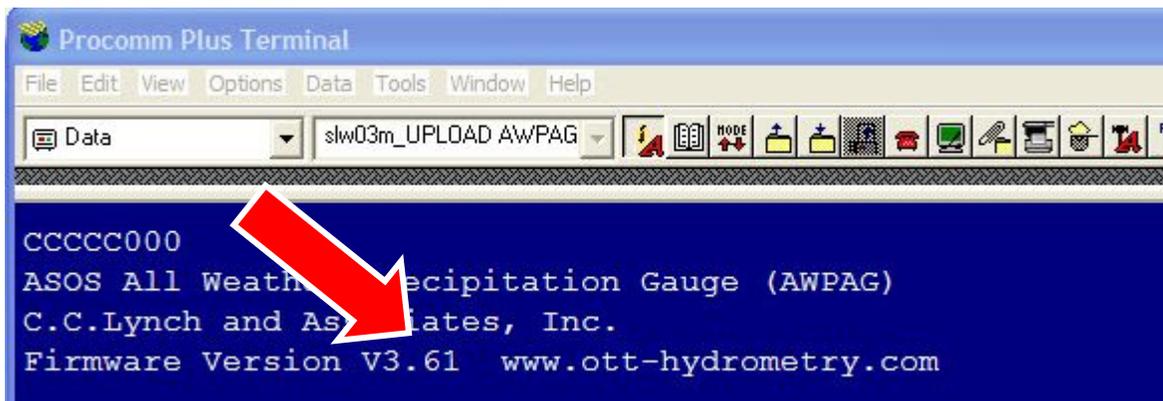


Figure 0-3

Continue with **Section 0, step 58**

Appendix C – AWPAG Regression Tests Checklist

#	TEST #	Test Description	Duration	Pass/ Fail	Date
1	02_14	Review-Sensor - This procedure tests the REVUE-SENSR function is available to all users except the Air Traffic Controller (ATC). The REVUE-SENSR function enables the user to view the 12 hour archive of raw sensor data, the last 10 minutes of algorithm processed sensor data, and sensor status information such as turning report processing on or off and whether the sensor is in automated or manual mode.	15 min		
2	02_15	Review SYSLOG - This procedure tests the ASOS System Logging capability.	15 min		
3	06_13	Review 5-MIN Screen - This procedure verifies characteristics of the REVUE RPT 5MIN Screen	20 min		
4	06_15	Review RPT OBS Screen Verification – This procedure is to verify valid data is properly displayed using keypads such as PRINT, DATE, BACK, etc.	20 min		
5	04_39	AWPAG Remark/Repro – This test procedure is to verify the operator is able to modify and edit AWPAG data	1 hour		
6	04_40p	AWPAG Edit Data Validation – This test procedure is to verify the operator can manually properly edit the AWPAG data, and ASOS will alert the operator when improper AWPAG data is entered in the ASOS.	30 min		

Appendix D – ASOS Test Trouble Report

TYPE OF DEFECT: <input type="checkbox"/> System Deficiency <input type="checkbox"/> Enhancement <input type="checkbox"/> Modify Current Feature <input type="checkbox"/> Documentation/Procedure <input type="checkbox"/> Hardware <input type="checkbox"/> Watch Item	PRIORITY: <input type="checkbox"/> Emergency <input type="checkbox"/> Urgent <input type="checkbox"/> Routine SUBSYSTEM/COMPONENT: <input type="checkbox"/> Algorithm <input type="checkbox"/> Comms <input type="checkbox"/> Sensor <input type="checkbox"/> Simulator <input type="checkbox"/> User interface <input type="checkbox"/> Voice <input type="checkbox"/> Other REPEATABILITY: <input type="checkbox"/> Could not repeat <input type="checkbox"/> Didn't try <input type="checkbox"/> One time occurrence <input type="checkbox"/> Sometimes <input type="checkbox"/> Always	SEVERITY: <input type="checkbox"/> No Impact <input type="checkbox"/> Cosmetic <input type="checkbox"/> Inconvenience <input type="checkbox"/> System Up -w/no workaround <input type="checkbox"/> System Up -w/workaround <input type="checkbox"/> CRASH - w/no workaround <input type="checkbox"/> CRASH -w/workaround
TEST ACTIVITY: <input type="checkbox"/> FAT <input type="checkbox"/> SAT <input type="checkbox"/> OT&E <input type="checkbox"/> Demonstration <input type="checkbox"/> Other	CONFIGURATION/TEST DATA: <input type="checkbox"/> Live data feed <input type="checkbox"/> Simulator	ATTACHMENT: <input type="checkbox"/> pages

TTR NO: *(Assigned by Test Track program)*

LOCATION (SID): _____ **SOFTWARE VERSION:**

TITLE/SUMMARY:

DATE/TIME DISCOVERED: _____ **ORIGINATOR:**

DESCRIPTION, CAUSE OF PROBLEM:

(References: ECPs/RCs/OTRs: _____ Test procedure/steps: _____)

Appendix E – ST 2 Baseline Procedure

NOTE: This checklist procedure assumes that ASOS ACU V2.79D has been installed and the system is stable before the start of testing. Also, the AWPAG LogoSense controller has V3.58 and EPROM V2.0 is in the AWPAG orifice heater controller. CT12K and CL31 are not configured in the ST2, and the DCP UPS is configured.

1. The CT12K and CL31 are not configured in the ST2. Sign on as TEC. Press REVUE-SITE-CONFIG-DEFIN page and make sure that no ceilometers are defined in the ST2. Press EXIT when done.
2. Deconfigure the CT12K or CL31 Test Sensor if needed. Press REVUE SITE CONFIG SENSR; enter “***” (in place of C1 or L1) on corresponding SIO Board Port Number where the CT12K and CL31 are configured. Hit EXIT to confirm changes.
3. Make sure report processing is “ON” for all sensors.
4. Make sure all fail counts are cleared on MAINT page and MAINT pages has “P” status for all components: ACU, DCP, ACU/DCP COMMS, and ACU & DCP processors are running.
5. Perform REVUE-SENSR-12HR to ensure no missing sensor data on any of the sensor pages.
6. Check SYSLOG for any error messages.
7. The Ceilometer “Test” sensor page will be displayed with just UTC times without any data. Press REVUE SENSR 12-HR TEST to verify there is no data on the CT12K or CL31 ceilometers page. Press EXIT. Generate SPECI or wait for 5-minute observation to make sure that “\$” sign is not present.
8. Similarly, ensure the correct AWPAG LogoSense firmware is V3.58 and the orifice heater controller EPROM is V2.0.
9. Allow 13 hrs for system stability test. NOTE: The 13-hour stability test must run through midnight.