

## ASOS MODIFICATION NOTE 48 (for Electronics Technicians)

Engineering Division

W/OSO321:WW

SUBJECT	:	Installing Visibility Firmware Version 039.
PURPOSE	:	To eliminate the visibility sensor heater diagnostic problem.
EQUIPMENT AFFECTED	:	ASOS Visibility Sensor (AVIS).
PARTS REQUIRED	:	Visibility Firmware Version 039 (S100-2MT5A1A1-U2A).
MOD PROCUREMENT	:	Electronics Technicians (ET) should order part S100-2MT5A1A1-U2A for each visibility sensor and spare visibility processor.
EFFECTIVITY	:	All ASOS sites.
SPECIAL TOOLS REQUIRED	:	IC Extraction Tool (ASN:041-T-13) IC Insertion Tool (ASN:041-T-16) Electrostatic Discharge (ESD) Straps
TIME REQUIRED	:	2.0 hours.
EFFECT ON OTHER INSTRUCTIONS	:	Modification Note 37 and Errata Sheet 1 are superseded.
CERTIFICATION STATEMENT	:	This modification is authorized by Engineering Change Proposal (ECP) E94SM05F200. This modification was tested by the Engineering Division at Sterling Virginia, SMI, Belfort and the OT&E sites identified in appendix A.

**GENERAL**

This modification note provides instructions for the removal and replacement of the EPROM on the visibility sensor processor board. The updated firmware corrects the visibility heater diagnostics and eliminates the false heater failure(s). The EPROM on the visibility processor board changes from firmware version 037 to 039.

**PROCEDURE**

This procedure provides instructions for installing the EPROM (U2), firmware version 039, on the visibility sensor's processor board.

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## BEFORE INSTALLATION OF FIRMWARE VERSION 039

1. Contact the AOMC at 1-800-242-8194 and provide notification on which ASOS will have the new firmware installed.
2. Get approval of the responsible MIC/OIC/Observer before starting installation. The firmware may be installed on any day of the month if the restrictions in steps 3 and 4 are satisfied.
3. **Commissioned sites only:** Do not start installation during inclement weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions are expected within 3 hours. The responsible MIC/OIC/Observer will define those meteorological conditions.
4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 1.5 hours should be sufficient, allow 2.0 hours to complete installation and restart the ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/Observer will inform the Air Traffic Control Tower (ATCT) and any other critical users that the ASOS visibility sensor will be shut off for firmware upgrade (for unstaffed sites, the ET will inform the ATCT).
6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. The system voice function will automatically broadcast visibility missing messages when the visibility power is turned off.
8. Make the appropriate SYSLOG entries, (MAINT-ACT-FMK) Mod 48
  - a. Log on as **TECH**.
  - b. Key the **MAINT** screen.
  - c. Key the **ACT** page.
  - d. Key **START** - Stop here and perform Modification Note 48.  
Upon Completion of Modification Note 48, log onto the system.
9. Continue with "Visibility Sensor Firmware Removal and Replacement Procedure."

## VISIBILITY SENSOR FIRMWARE REMOVAL AND REPLACEMENT PROCEDURE

### WARNING

**Death or severe injury may result if power is not removed from the sensor before performing maintenance activities.**

1. At the DCP cabinet, set the visibility sensor circuit breaker module to the OFF (right) position.
2. At the sensor, open the visibility sensor electronics enclosure access door and locate the processor board A1A1 (32194-1). Remove the captive screw securing the processor board to the standoff. (This screw is on the bottom side of the board).
3. Carefully remove the processor board by pulling it free from the backplane connector, XA1.
4. Using Figure 1, locate microcircuit (or EPROM) U2.

### **CAUTION:**

**Follow all Electrostatic Discharge (ESD) procedures, found in EHB-5 Test Equipment and Techniques, while removing and installing EPROMs.**

5. Remove the EPROM, U2, from processor board.

### **CAUTION:**

**Observe the proper pin 1 orientation and ensure EPROM legs do not get bent during installation process.**

6. Install firmware version 039 EPROM onto the processor board and press firmly into socket.
7. Install and secure the processor board into the backplane connector, XA1.
8. Inside the DCP, disconnect the visibility sensor's DB-9 cable connector from the fiber optic modem on top of the Faraday box.
9. Connect the Personal Computer (PC) to the DB-9 cable connector in the DCP using the Y-shaped RS232 adapter cable. Turn on the PC, initialize PROCOMM Plus and press any key to enter the terminal mode. To set the correct communication protocol with the sensor, use the ALT-P command to set the PC to "2400, N, 8, 1." **Place CAPS LOCK to ON.**
10. At the DCP, turn the visibility sensor circuit breaker to the ON (left) position.

11. Verify that the PC displays the sensor initialization message shown below.

\*\*\* VIS VER 39.00 - 6220 \*\*\*

The "39.00" refers to the firmware version. For this procedure, the firmware version should be 39.00 or greater.

The "6220" refers to the sensor model number.

12. Perform "Heater Power Supply Check" (steps 1-5) and "Heater Calibration" (steps 6-15), as per Table 6.5.3 - Visibility Sensor Calibration, found on pages 6-45 of the Site Technical Manual.
13. At the PC, type **VG**. The sensor will enter the V mode (Extended Diagnostics) and verify the response:

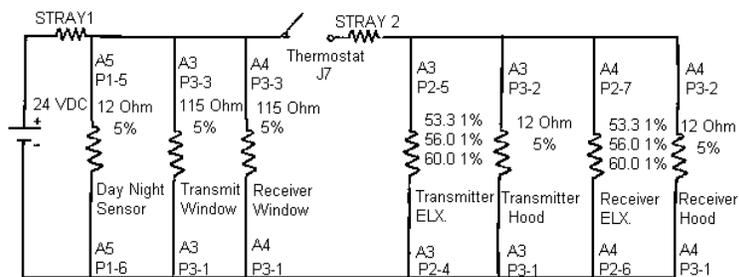
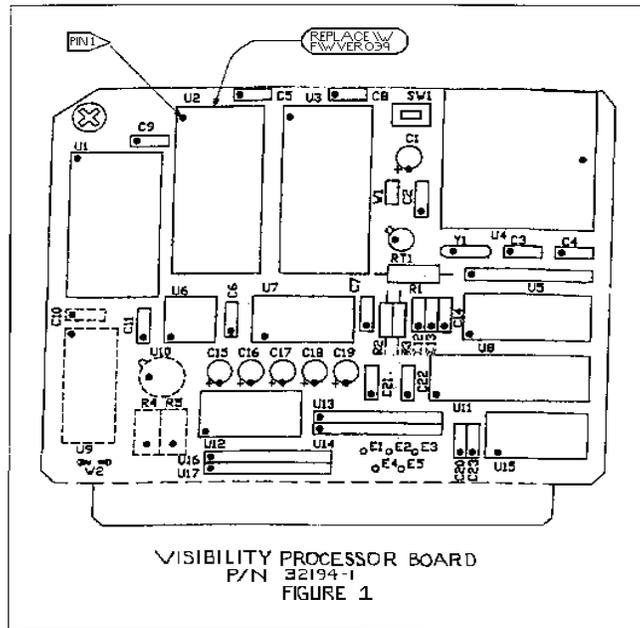
VPXXXXXXXXPPPP PPPOPP PPP PPPP XXXX XX

The sensor status bytes reported above should be all "P"s for pass with the exception of byte 22, which should be "0" or "1." A "1" indicates the "Heater Diagnostics" for the hood and electronics heaters are being used, a "0" indicates they are not. The values marked with an "X" are irrelevant to this procedure and should be ignored. If any "P" is reported as an "F", refer to the ASOS Site Technical Manual's (STM) Heater Troubleshooting Procedures, Chapter 6, Table 6.5.6, before proceeding.

14. At the PC, type **VF**. Enter password EIEIO. Press ENTER until the sensor serial number is requested. Enter the sensor serial number. Press ENTER until the VF command is completed, verifying that the correct data is present.
15. At the PC, type **VH**. Press enter until the "VH" command is completed, verifying that the correct data is present.

## **TEAR DOWN PROCEDURE**

1. At the DCP, turn the visibility sensor circuit breaker to the OFF (right) position.
2. Disconnect the PC DB-9 cable connector from the fiber optic modem and install the visibility sensor's DB-9 cable connector to the appropriate receptacle on top of the Faraday Box.
3. Close and secure the visibility sensor electronics enclosure access door.
4. At the DCP, turn the visibility sensor circuit breaker to the ON (left) position.
5. Continue with "After Installation of Firmware 039."



Heater Diagram  
Figure 2

### AFTER INSTALLATION OF FIRMWARE 039

1. When visibility is reinstated at unstaffed sites, inform the ATCT that the work is complete. (At staffed sites, the MIC/OIC/Observer will call the ATCT).
2. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted.
3. Inform office staff that the ASOS is again operational. The chart below indicates the time it should take after start up for the ASOS to report each observation element automatically.

#### Times Needed for Elements to be Reported Automatically

Sensor	Minimum Time (minutes)	Maximum Time (minutes)
Visibility	10	15
Obstruction to Visibility	10	**

\*\* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

4. Verify that the ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and inform the operator of:
  - a. The ASOS location;
  - b. The installation of firmware version 039 has been completed; and
  - c. The ASOS is operational.
5. Enter in the SYSLOG that maintenance has been completed.
  - a. Key the **MAINT** screen.
  - b. Key the **ACT** page.
  - c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 48**  
On the second line of the screen, verify that only Mod 48 is displayed. Complete by entering **Y** in the (Y / N) field if only Mod 48 is displayed. If Mod 48 is completed, make appropriate log entry.
  - d. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that Mod 48 has been installed. Clear any maintenance flags caused by installing this modification.
6. At an expansion site with the ATCT, the ET will contact the ATCT and supply information on the following:
  - a. The ASOS maintenance has been completed; and
  - b. The AVIS has been restored to service.

## SHIPPING INSTRUCTIONS

After Modification Note 48 has been completed, package the old EPROMs in an anti-static package and ship to the National Reconditioning Center (NRC), attention Roger Helphrey, ASOS repair. Items being returned should include the S100-2MT5A1A1-U2 (Rev. 037 EPROM) marked as S100-FMK0037.OLD.

## REPORTING MODIFICATION

Target date for completion of this modification is 30 days after the receipt of parts. Report completed modification on a National Weather Service (NWS) Form A-26 maintenance record, using the instructions in Engineering Handbook No. 4 (EHB-4) - Engineering Management Reporting System (EMRS), part 2, appendix F. Use reporting code **AVIS**.

In addition to the instructions in EHB-4, perform the following:

1. Document the Line Replaceable Unit (LRU) information in block 13 using TM=M, AT=M, and How Mal=999.
2. Record the modification note number in block 17a as 48.
3. Record the block number, agency stock number (ASN), and serial number of the modified board in Block 18 (see appendix B for a completed sample of NWS Form A-26).

### ***Original Signed***

John McNulty  
Chief, Engineering Division

Appendix A  
Appendix B

**ASOS Visibility Firmware 039 OT&E Sites**

<b>Alaska Region</b>	
5WW	Wainwright, AK
9Z1	Klawock, AK
A8L	St. George, AK
ADQ	Kodiak, AK
ANC	Anchorage, AK
ANN	Annette Island, AK
CDV	Cordova, AK
FAI	Fairbanks, AK
HNS	Haines, AK
JNU	Juneau, AK
KTN	Ketchikan, AK
PAQ	Palmer, AK
OME	Nome, AK
SCC	Deadhorse, AK
SGY	Skagway, AK
SIT	Sitka, AK
SNP	St. Paul, AK
SOV	Seldovia, AK
SWD	Seward, AK
YAK	Yakutat, AK

<b>Central Region</b>	
ABR	Aberdeen, SD
ATY	Watertown, SD
AXN	Alexandria, MN
DLH	Duluth, MN
GRB	Green Bay, WI
TOR	Torrington, WY
TVC	Traverse City, MI

<b>Western Region</b>	
BLU	Blue Canyon, CA
GEG	Spokane, WA
GGW	Glasgow, MT
GTF	Great Falls, MT
HVR	Havre, MT
MLP	Mullan Pass, ID
MSO	Missoula, MT

<b>Eastern Region</b>	
ABE	Allentown, PA
AVP	Wilkesbarre, PA
BGM	Binghampton, NY
BKW	Beckley, WV
BML	Berlin, NH
BUF	Buffalo, NY
CAK	Akron, OH

CAR	Caribou, ME
CLE	Cleveland, OH
CRW	Charleston, WV
ERI	Erie, PA
FVE	Frenchville, ME
HIE	Whitefield, NH
HTS	Huntington, WV
IZG	Fryeburg, ME
JST	Johnstown, PA
MLT	Millinocket, ME
N97	Clearfield, PA
PIT	Pittsburgh, PA
RDG	Reading, PA
SYR	Syracuse, NY
THV	York, PA
VAY	Mt. Holly, NJ
VSF	Springfield, VT
YNG	Youngstown, OH

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