

Automated Weather Observing System (AWOS)

Maintenance Manual

903-027



CONTENTS

Overview	
System Description	1
System Performance Parameters	1
Maintenance Procedures	1
Data Recording Forms	1
Installation & Checkout Manual	1
Operating Instructions	2
Training Program	2
Annual Revalidation Test Equipment	2
Annual Revalidation Tools and Supplies	3
Optional Sensor Simulator	3
Radio Annual Revalidation	3
AWOS Lowest Replaceable Units (LRUs)	4
Warranty	7
Forms	7

Overview

This manual provides instructions for maintaining and revalidating All Weather Inc. AWOS systems. It includes forms for recording the results of monthly, quarterly, and annual maintenance procedures, the complete instructions for which are provided in the individual sensor and system component manuals. The following sections explain the requirements for maintenance of an AWOS system, and direct the user to where the appropriate information can be found.

System Description

A full description of the AWOS system can be found in the Model 2090 Central Data Platform (CDP) Manual (2090-001), which includes system drawings, descriptions of software operation and operator terminal screens, and the possible sensor and component configurations of an AWOS.

System Performance Parameters

System performance parameters are given in the individual sensor and component manuals. Detailed specifications are provided for each component, along with the maintenance and corrective action procedures required. An overall description of the AWOS system's performance parameters can be found in the Model 2090 Central Data Platform (CDP) Manual (2090-001).

Maintenance Procedures

Monthly, quarterly, and annual maintenance procedures for all AWOS components are found in the individual sensor and component manuals. Maintenance procedures for the Model 2020 Wind Vane, for example, are found in the Model 2020 User's Manual (2020-001). The Technical Performance Records and the Comprehensive Facility Performance and Adjustment Data Form included in this manual are used in conjunction with these instructions to record the results of the specified tests and procedures.

Data Recording Forms

Three data recording forms are included in this manual: The Comprehensive Facility Performance and Adjustment Data Form is to be completed at system commissioning, after major repair work, and during annual revalidation. The Monthly Technical Performance Record, Quarterly Technical Performance Record, and Annual Technical Performance Record are used during periodic maintenance, and include space to record the results of the monthly, quarterly, and annual maintenance procedures described in the individual sensor and component manuals.

Installation & Checkout Manual

Rather than a system-wide Installation & Checkout Manual, each sensor and AWOS component manual includes specific installation and checkout procedures for that instrument. This provides a simple means of easily locating the required procedures for a given component or sensor.

Operating Instructions

Operating instructions for each sensor and AWOS component are found in their respective manuals. The *Operation* chapter of each manual provides full instructions for using a component and interpreting the data, where applicable, for that instrument.

Training Program

AWOS technicians are fully qualified in electronic and electrical applications, with a comprehensive knowledge of the operations, testing, and maintenance of the AWOS down to the board component level. They have the capabilities to evaluate and make recommendations for system component changes that would enhance the reliability or functionality of the AWOS. All Weather Inc. provides a comprehensive training and certification program for all AWOS technicians to ensure thorough knowledge and competence in working with AWOS systems.

Annual System Revalidation Plan

Annual system revalidation is carried out by following the instructions for annual maintenance provided in the individual manuals, taking any required corrective action, and recording the results on the Comprehensive Facility Performance and Adjustment Data Form.

Annual Revalidation Test Equipment

The following list gives the test equipment required during validation and annual revalidation of the AWOS.

Description	Part/Model No.	Specifications
Visibility calibrator	M104744	
Psychrometer	5211 (Sling) or 5230 (Assmann)	°C
Psychrometric calculator	5282-A	°C
Pressure standard	Z003919	600-1000 mb
Wind Speed Calibrator	1231	
Vis. Sensor Handheld Terminal	M403321	required for all vis. sensors but 8364-E
Zero Wind Chamber	M105548-00	required for 2040 Ultrasonic Wind Sensor

Annual Revalidation Tools and Supplies

The following list gives the tools and supplies required during validation and annual revalidation of the AWOS.

Description	Part/Model No.	Specifications
Assorted hand tools		
Extension cord, 50'		18-3
Digital voltmeter, 4-1/2 digit		
Clean dry cloth		Lint free
Lens cleaning solution		Non-ammonia-based
Lightweight greaseless oil		(e.g., 3-in-1 or equivalent)
8329 Ceilometer desiccant cartridge	M028113	
8329 Ceilometer blower filter (fine)	M028121	
8329 Ceilometer blower filter (coarse)	M103966	
8339 Ceilometer desiccant cartridge	M028181-00	
Black component bag		
RTV sealant	RTV 162	
Paint		
Sandpaper		

Optional Sensor Simulator

An optional Sensor Simulator (11920) is available from All Weather Inc. that connects directly to the DCP and can be used to simulate sensor outputs during maintenance of the AWOS.

Radio Annual Revalidation

The procedures required for annual revalidation of UHF and VHF radios should be performed by a qualified radio shop equipped with the necessary test equipment and staffed by FCC certified technicians.

AWOS Lowest Replaceable Units (LRUs)

The following list shows the lowest replaceable units (LRUs) for the 900 Series AWOS. When a sensor is replaced, the annual procedure for that sensor should be performed.

NOTES:

** Indicates Optional Equipment

Descrip	tion	Model #
AUTOM	MATED WEATHER OBSERVING SYSTEM	900 Series
DATA	COLLECTION PLATFORM	1100
DATA	PCB AWOS Data Collection	1190 M404804
	DCP Firmware	
		M469050
	Sensor Interface Controller	M404806
	Ceilometer Interface Firmware	M469052
	Visibility Interface Firmware	M469051
	Present Weather Interface Firmware	M469053
	Freezing Rain Interface Firmware	M469066
	Power Supply Assembly	M403318
	Fuse 1/2A Slow Blow	M442060
	Fuse 10A Slow Blow	M442071
	Fuse 5A Slow Blow	M442070
	AC Power PCB Assembly	M404802
**	Data Link Radio	20980-A
	Barometric Pressure Sensor	7190
	Quad Plate Pressure Port	M105037
CENTR	AL DATA PLATFORM	2090
	System Unit	20901
	Software	20908
	Display	20902
	Voice Synthesizer PCB	20903
	Speakers	20904
	Telephone Voice PCB	20905
	Time Standard PCB	20907
	Peripheral Interface Unit	20909
**	NADIN Interface Processor	M404806
	NADIN Interface Firmware	M469054
**	Data Link Radio	20980-A
**	Ground-to-Air Radio	1791

Description	Model #
AWOS SENSORS	2020
Wind Direction Sensor	2020
Tail Vane	T802000
Pot, 5K	M480114
Bearings (1)	T710100
Wind Speed Sensor	2030
Cup Assembly	T800303
Photon Chopper Assembly	T801600
Bearings (2)	M025057
Skyvane Wind Sensor	2100
Transducer, H.F. Tach., Sky	
Propeller, Skyvane	M104500
Pot., 5K, Skyvane	M480114
Ultrasonic Wind Sensor (unheated)	2040
Ultrasonic Wind Sensor (heated)	2040-Н
Heater Kit	M488274-00
Motor Aspirated Radiation Shield (M	MARS) 8190
Temperature Sensor/RH Sen	sor 5190-D
Fan	M444021
Rain Gauge (heated)	6021-A
Rain Gauge (unheated)	6011-A
Day/Night Detector	
(with 8364-C Vis.)	83339-A
(with 8364-E Vis.)	M403326
Visibility Sensor	8364-C
Emitter Assembly	M104863
Detector Assembly	M104864
Controller Assembly	M403261
Firmware	M596031
Fuse 1/4A Slo Blo	M442027
Fuse 5A Slo Blo	M442059
Fuse 4A	M442058
Visibility Sensor	8364-E
Emitter Assembly	M105061
Detector Assembly	M105060
Controller Assembly	M403322
Firmware	M469058
Fuse 10A Slo Blo	M442071
Fuse 5A Slo Blo	M442070
Fuse 2A	M442046
Fuse 4A	M442048
Fuse .5A	M442057
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Description	Model #
8329 Cloud Height Sensor	8329-A
Transmitter	M403194
Receiver	M403197
Electro-Optics Assy w/laser	M403200
CPU PCB	M404602
Master Firmware	M595060
Slave Firmware	M595061
Control PCB	M404601
Signal Detector PCB	M404605
•	141404003
8329 Cloud Height Sensor (Cont.)	M429105
Power Supply	M438105
Blower Fan/Heater Assy	83291-C
Blower Filter-Coarse	M103966
Blower Filter-Fine	M028121
Desiccant Cartridge	M028113
Fuse 2A	M442046
Fuse 3.15A	M442047
Fuse 4.0A	M442048
Fuse 25A	M442062
Outer Shield	M103950
Inner Cover	M103951
8339 Cloud Height Sensor (CE version)	8339-F
Optical and Laser Module	M403434-01
DAC & Power PCB	M404848-02
Blower 320 CFM, 110 Vac	M403414-00
Fuse 5x20mm, 5A, 250V	M442088-00
Fuse 5x20mm, 10A, 250V	M442089-00
Desiccant	M028181-00
Battery	83395-00
8339 Cloud Height Sensor (non-CE version)	8339-D
Optical and Laser Module	M403434-00/M403434-01
DAC & Power PCB	M404848-01/M404848-02
Blower 320 CFM, 110 Vac	M403414-00
Fuse 5x20mm, 5A, 250V	M442088-00
Fuse 5x20mm, 10A, 250V	M442089-00
Desiccant	M028181-00
Battery	83395-00
Present Weather Sensor	6490
Sensor Head Assembly	M482105
Transmitter Modulator (TXM) Card	M406053
Automatic Gain Control (AGC) Card	M406053
Signal Processor 1 (SP1) Card	M406055
Signal Processor 1 (SF1) Card Signal Processor 2 (SP2) Card	M406056
Microprocessor (MPU) Card	M406057
Electronics Power Supply	M438150
Electronics Fower Suppry	W143013U

Description	Model #
Heater Power Supply	M438151
PCB Sensor Interface	M404806
Present Weather Firmware EPROM	M469053
Lightning/Thunderstorm Sensor	6500
Freezing Rain Sensor	6495

MISCELLANEOUS EQUIPMENT

**	Printer Ribbon	20911
**	Printer	20910-A
**	Microphone	20906
**	Speakers	20904
**	UHF/VHF Antenna	M489103
**	VHF Radio	1791
**	UPS, 10 Min CDP	20913-A
**	UPS, 60 Min CDP	20913-C
**	UPS, 5 Min CDP	20913-E

Warranty

This equipment has been manufactured and will perform in accordance with requirements of FAA Advisory Circular 150/5220-16C. Any defect in design, materials, or workmanship which may occur during proper and normal use during a period of 1 year from date of installation or a maximum of 2 years from shipment will be corrected by repair or replacement by All Weather Inc..

Forms

The following pages contain the Comprehensive Facility Performance and Adjustment Data Form and the Monthly and Quarterly Technical Performance Records. These master forms should be copied and sufficient copies stored at a convenient location in each site's Facility Reference Data File (FRDF). The Comprehensive Facility Performance and Adjustment Data Form is to be completed at system commissioning, after major repair work, and during annual revalidation. The Technical Performance Records are used during periodic maintenance, and include space to record the results of the monthly and quarterly maintenance procedures described in the individual sensor and component manuals.

Page 1 of 5



				Date		
					Accom	plished
I	Notify local users			_		
Ш	Complete monthly	tasks and log		_		
Ш	Power up pressure	e standard		_		
V	Apply touch-up pa	aint where needed	d	_		
V	Inspect Data Colle	ection Platform		_		
	a. Drain and cleab. Check reference			_		
	14	0 1 -	Acceptable		D	F - 11
	+5.0V Reference	Counts	Range 4090-4095		Pass	raii
	-5.0V Reference					
/I	slash, with "pass" Inspect tower and a. 8518-A Foldov	noted. tower lights	ew values noted, sep rease and oil			
/II	Wind Direction	SN	2100	2020	20)40
	a. Align to bench				Pass	
			lulerance		เ	Ган
	Benchmark direct	ion	Visually aligned			———
	b. Direction linear Display wind direct	rity test (2020 & 2 ction on LCD disp	Visually aligned	v		
	b. Direction linearDisplay wind directAny dropouts obs	rity test (2020 & 2 ction on LCD disp erved?	Visually aligned 2100)	Y		
	b. Direction linear Display wind direct	rity test (2020 & 2 ction on LCD disp erved?	Visually aligned 2100)	Υ	N	
	b. Direction linear Display wind direct Any dropouts obs Any sudden change	rity test (2020 & 2 ction on LCD disp erved?	Visually aligned 2100) olay; rotate full 360°	Y Y Observed Observed	N N	
	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360°	rity test (2020 & 2 ction on LCD disp erved?	Visually aligned 2100) slay; rotate full 360° ±10°	YObserved Observed Observed	N N dd	
	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270°	rity test (2020 & 2 ction on LCD disp erved? ges observed?	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3°	Y Observed Observed	N N dd	
	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270° c. Bearing wear to	rity test (2020 & 2 ction on LCD disp erved? ges observed?	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3° eeely (2020 & 2100)	Observed Observed Observed Observed	N N dd	
/11	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270°	rity test (2020 & 2 ction on LCD disp erved? ges observed?	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3° eeely (2020 & 2100)	YObserved Observed Observed Observed	N	
√III	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270° c. Bearing wear to	rity test (2020 & 2 etion on LCD disperved? ges observed? est: Vane turns from run-up motor, E 2030)	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3° 2eely (2020 & 2100) 2100	YObserved Observed Observed Observed	N	
/11	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270° c. Bearing wear to the Wind Speed SN a. Using 1800 rpn 79-81 knots (78-80 knots (rity test (2020 & 2 ction on LCD disperved? ges observed? est: Vane turns from run-up motor, [2030]	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3° 2eely (2020 & 2100) 2100	YObserved Observed Observed Observed	N	
/11	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270° c. Bearing wear to the Wind Speed SN a. Using 1800 rpn 79-81 knots (78-80 knots (rity test (2020 & 2 ction on LCD disperved? ges observed? est: Vane turns from run-up motor, [2030) 2100) eest: Cups/Propel	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±2° 2100 DCP LCD reads:	YObserved Observed Observed Observed	N	Fail
/11	b. Direction linear Display wind direct Any dropouts obs Any sudden chang 360° 90° 180° 270° c. Bearing wear to the sum of the sudden chang Wind Speed SN a. Using 1800 rpm 79-81 knots (78-80 knots (b. Bearing wear to the sum of t	rity test (2020 & 2 ction on LCD disperved? ges observed? est: Vane turns from run-up motor, E 2030) 2100) rest: Cups/Propel vasher (2100)	Visually aligned 2100) play; rotate full 360° ±10° ±3° ±3° ±3° reely (2020 & 2100) 2100 DCP LCD reads: ler turn freely (2020 A	YObserved Observed Observed Observed 2020	N	Fail

Page 2 of 5



IX	Temperature/H	lumidity Si	N			
		Psychrometer Temperature	Temperature		Psychrometer Wet Bulb	AWOS Dew Point
	3.0 min 4.5 min 6.0 min 7.5 min					
	Average Withi	n A	В	Dew Point	C	D
	B-A	Acceptable ±2°F (±1.	Tolerance 1°C)			Tolerance 1.7°C)
		Pass on of 8190 MAR		Dew Point	Pass Pass	
X	•	SNto avoid direct s	-			· · · · · · · · · · · · · · · · · · ·
	Calibration	Initial Value calibration if pass		% Diff Tol ±3%		Fail
	•	to original positi	•	-	ccomplished_	
ΧI		sor SN				
		Indication (A)	Reference (B Night	A=B	Pass	Fail
XII	a. Check for I	nternal damage ters		Accom Accom	nplished nplished nplished	
	Item 1 cycle	Measured Value (A)	Reference Value (B) 2 counts	Accept A-B Tolerar ±0		Fail
XIII	Cloud Height	Sensor SN	l			
	Model 8329 Item Check Desicci Laser Indicato		(Color) (Cycles)	Tolerance Blue On/Off	Acceptable e Pass I	Fail
	Check Blower		, , ,	me) 3 Minutes		

Page 3 of 5



Name and Location		Date	
XIII Cloud Height Sensor (cont.) CDP Maintenance Menu: Status errors Clouds detected when rainfall reported? Any ceilometer pilot reports logged? If yes, note report(s): Minimum ceiling check (white paper over	lens) Expected: 10	Yes Yes 0 feet Reported	No
Model 8339 Item Value Check Blower (Turns of Blower cleared of debris Desiccant replaced	on) Yes Accompl	ble e Pass ishedshedshed	
XIV Barometric Pressure Serial Reference Number Standard (A) Reading BP1 BP2 Note: Adjustment is required if A-B is green Altimeter Setting Check Calculate Control Control	g (B) A-B Tolera 0.00 0.00 0.00 eater than the acce	5 YN_ 5 YN_ ptable tolerance	A-B
XV Present Weather Checks	Acceptable		
Status (Sssss)	Tolerance Empty if no precip S0000 405-420 -30 to 50 0 to 150 40 to 120 Ambient ±5° F	Pass	
XVI Lightning/Thunderstorm Sensor SN a. Check antenna for damage/corrosion b. Check antenna sealant c. Clean all surfaces d. Check hardware and cable connection	Accon	nplished nplished nplished	
XVII Freezing Rain Sensor SN a. Check sensor and mast for damage/control b. Check cables and hardware connection c. Clean all surfaces XVIII Hardware Inspection Accomplished	orrosion Accon ons Accon Accon	nplished	
All rust, corrosion, etc. has been sanded and touch-up paint applied Defects:		mplished	
System Checked and Verified By:		Date/Time:	

Page 4 of 5



	UHF Radio at the S Parameter	Measured	Standard Value (B)	Acceptable Tolerance (A-B)	Pass	Fail
	Radio Pwr (at Xmtr)		1.0W	±0.5W		
	VSWR (at Xmtr)		1.0:1	Initial value 2.0:1 (max.)		
				Operating value		
	Frequency			3.0:1 (max.) ±1.5 kHz		
	Deviation		3 0 kHz	2.4-3.8 kHz		
ΥX	Central Data Platforn	n	0.0 10 12	2. 1 0.0 KHZ		
	Perform monthly pro			Accomplished		
	Barometric pressure		t			
	Sensor Cor	rection	Accomplished			
	BP1	····	-			
						
	Voice check (listen t	o telephone	e or radio messa	ge)		
	Voice check (listen t Voice data is clear,	•		Pass	Fail	
;.	•	no data mis	sing	ge) Pass Accomplished	Fail	
	Voice data is clear,	no data mis	sing	Pass	Fail	
	Voice data is clear, Record observations Voice data check Estimate the weather	no data mis s on monthl er condition	ssing ly form s, and compare	PassAccomplished he manual observation	 1	
	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the	no data mis s on monthl er condition e AWOS ob	sing ly form s, and compare to tained above.	PassAccomplished he manual observatior Agree Di	 1	
	Voice data is clear, Record observations Voice data check Estimate the weather	no data mis s on monthl er condition e AWOS ob	sing ly form s, and compare to tained above.	PassAccomplished he manual observatior Agree Di	 1	
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l.	Voice data is clear, Record observation: Voice data check Estimate the weathe with the output of th If observations disagnose Voice remark check	no data mis s on monthl er condition e AWOS ob gree, log an	ssing ly form s, and compare to stained above. and correct the fail	PassAccomplished he manual observation Died condition.	 1	
_	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnotes are the voice remark check Input a test remark of the Record of the Input at the control of the Input at the Inpu	no data miss on monthler conditions e AWOS obgree, log an	ssing ly form s, and compare to tained above. and correct the fail	PassAccomplished he manual observation Agree Died condition.	n isagree _	
	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the life observations disagrammed voice remark check linput a test remark of Acceptable if the sa	no data miss on monthler conditions e AWOS of gree, log an using the mme.	ssing ly form s, and compare to tained above. and correct the fail	PassAccomplished he manual observation Agree Died condition. using the speakers. Acceptable U	n isagree _ naccepta	ble
l.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the life observations disagrammed voice remark check linput a test remark of Acceptable if the sa	no data miss on monthler conditions e AWOS obgree, log an using the mme.	sing ly form s, and compare totained above. and correct the fail sicrophone, verify sing the speaker	Pass Accomplished he manual observation Agree Di ed condition. using the speakers. Acceptable Uss. Accomplished	n isagree _ naccepta	ble
l.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the lift observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark of UHF Radio at the Control of Co	no data miss on monthler conditions e AWOS of gree, log an using the mme. ark. Verify u DP (perform	ssing ly form s, and compare to tained above. Ind correct the fail discrephone, verify sing the speaker med by FCC cert to Standard	PassAccomplished he manual observation Agree Di ed condition. using the speakers. Acceptable Us. Accomplished fied shop) Acceptable	n isagree _ naccepta	ble
	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark UHF Radio at the Comparameter	er conditions e AWOS obgree, log an using the me. ark. Verify u DP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail dicrophone, verify sing the speaker med by FCC cert d Standard Value (B)	Pass Accomplished he manual observation Agree Di ed condition. using the speakers. Acceptable Us. Accomplished fied shop) Acceptable Tolerance (A-B)	n isagree _ naccepta	ble
i.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the lift observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark of UHF Radio at the Control of Co	er conditions e AWOS obgree, log an using the me. ark. Verify u DP (perform Measured Value (A)	ssing ly form s, and compare to tained above. Ind correct the fail discrephone, verify sing the speaker med by FCC cert conditions and the speaker walle (B) 1.0W	Pass Accomplished he manual observation Di ed condition. using the speakers. Acceptable Us. Accomplished fied shop) Acceptable Tolerance (A-B) ±0.5W Initial value	n isagree _ naccepta	ble
l.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark of UHF Radio at the Comparameter Radio Pwr (at Xmtr)	er conditions e AWOS obgree, log an using the me. ark. Verify uDP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail sicrophone, verify sing the speaker med by FCC cert Standard Value (B) 1.0W	Pass	n isagree _ naccepta	ble
i.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark of UHF Radio at the Comparameter Radio Pwr (at Xmtr)	er conditions e AWOS obgree, log an using the me. ark. Verify uDP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail sicrophone, verify sing the speaker med by FCC cert Standard Value (B) 1.0W	Pass	n isagree _	ble
l.	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark of UHF Radio at the Comparameter Radio Pwr (at Xmtr)	er conditions e AWOS obgree, log an using the me. ark. Verify uDP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail sicrophone, verify sing the speaker med by FCC cert Standard Value (B) 1.0W	Pass	n isagree _ naccepta	ble
	Voice data is clear, in Record observations. Voice data check Estimate the weather with the output of the If observations disagnostic voice remark check Input a test remark in Acceptable if the sa Delete the test remark UHF Radio at the Comparameter Radio Pwr (at Xmtr) VSWR (at Xmtr)	er conditions e AWOS obgree, log an using the me. ark. Verify uDP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail sicrophone, verify sing the speaker med by FCC cert Standard Value (B) 1.0W	Pass Accomplished he manual observation Agree Di ed condition. using the speakers. Acceptable Us. Acceptable Tolerance (A-B) ±0.5W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.)	n isagree _	ble
	Voice data is clear, Record observations Voice data check Estimate the weather with the output of the If observations disagnormal voice remark check Input a test remark of Acceptable if the sand Delete the test remark UHF Radio at the Comparameter Radio Pwr (at Xmtr) VSWR (at Xmtr) Frequency	er conditions e AWOS obgree, log an using the me. ark. Verify uDP (perform Measured Value (A)	ssing ly form s, and compare stained above. nd correct the fail sicrophone, verify sing the speaker med by FCC cert d Standard Value (B)	Pass Accomplished he manual observation Di ed condition. using the speakers. Acceptable Us. Acceptable Us. Acceptable Us. Acceptable Us. July Acceptable Tolerance (A-B) ±0.5W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.) ±1.5 kHz	n isagree _	ble

Page 5 of 5



XXII UHF Radio at the C shop)		for cables long		d by FCC	
Parameter	Measured Value (A)	Standard Value (B)	Acceptable Tolerance (A-B)	Pass	Fail
Radio Pwr (at ant.)		0.20 W	±0.15 W		
VSWR (at ant.)		1.0:1	Initial value 2.0:1 (max.)		
			Operating value		
			3.0:1 (max.)		
Frequency			±1.5 kHz		
Deviation		3.0 kHz	2.4-3.8 kHz		
XXIII VHF Radio (perfor	med by FCC (certified shop)			
votiii viii rtaalo (polioi	Measured	Standard	Acceptable		
Parameter	Value (A)	Value (B)	Tolerance (A-B)	Pass	Fail
Radio Pwr (at Xmtr)		2.5 W	±1.0 W		
VSWR (at Xmtr)		1.0:1	Initial value		
			2.0:1 (max.) Operating value		
			3.0:1 (max.)		
Frequency			±1.0 kHz		
. ,					
Modulation		80%	65-95%		
XXIV VHF Radio at the A Parameter Radio Pwr (at ant.) VSWR (at ant.)	Antenna - for o			Pass	Fail
XXIV VHF Radio at the A Parameter Radio Pwr (at ant.)	Measured Value (A)	cables longer th Standard Value (B) 1.0 W	nan 50' (performed by Acceptable Tolerance (A-B) ±0.5 W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.)	Pass	Fail
XXIV VHF Radio at the A Parameter Radio Pwr (at ant.) VSWR (at ant.) Frequency	Measured Value (A)	cables longer the Standard Value (B) 1.0 W 1.0:1	nan 50' (performed by Acceptable Tolerance (A-B) ±0.5 W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.) ±1.0 kHz	Pass	Fail
Parameter Radio Pwr (at ant.) VSWR (at ant.) Frequency Modulation XXV NADIN Interface (as Operation of the link	Measured Value (A) s applicable) confirmed erly Logs Rev	Standard Value (B) 1.0 W 1.0:1	nan 50' (performed by Acceptable Tolerance (A-B) ±0.5 W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.) ±1.0 kHz 65-95%	Pass	Fail



Name and Location Date	
Data Collection Platform I Toggle maintenance switch II Inspect system and: a) Clean cloud height, Day/Night, Visibility Sensor, and Present Weather Sensor optics b) Remove debris from system c) Check for mechanical damage d) Check for movement of wind speed and direction sensors e) Check obstruction lights f) Check operation of fan on Temperature/RH enclosure Central Data Platform I Inspect system and: a) Check display operation b) Check keyboard operation c) Check printer operation; check and replace ribbon and paper as necessary d) Check microphone operation e) Check dial-up telephone operation f) Check VHF radio operation g) Check system clock; adjust if error >1 minute h) Check speaker operation i) Check UPS operation, if installed II Listen to and view the observation III Record observation	
Location Time Wind Visibility Present Weather Sky Condition Temperature Dew Point Alt. Setting	-
Remarks General I Note any "missing" parameter or any other obvious failures. II Inform AWI of any discrepancies above. (Note: Failures must be logged on Facilities Maintenance Log) System Checked and Verified By: Date/Time:	-



N	ame and Locati	on			Date		
						Accomp	olished
1	Notify local u	sers			_	_	
П	Complete mo	onthly tasks and	og		_		
III	Apply touch-u	up paint where n	eeded		_		
١٧	Drain and cle	an pressure por	t		_		
V	Perform CDF	monthly proced	ures		_		
V	Inspect Data	Collection Platfo	rm		_		
V	II Sensor Interf	ace Processor					
	Item +5.0V Refere	Counts ence		9		Pass	Fail
	When any value and the new val	s are out of acceptal ues noted, separate	ble range, the origingly of the original of th	nal value shall s by a slash,	l be noted, the a	adjustment ed.	s performed,
V	III Wind						
		cedures perform	ed per sensor	manual	Υ	_ N	
IX	(Temperature/				A	ام م ما ما	
	Clean probe		AVMOS				- AWOS
	Time 1.5 min 3.0 min 4.5 min 6.0 min 7.5 min	Psychrometer Temperature		• - - -	Wet B		Dew Point
	Average With	nin		Average	Within		
	±1 F (±.55 C) A	В	Dew Poi			D
	B-A	Accepta ±2°F (±1	ble Tolerance .1°C)		A		e Tolerance °C)
		Pass		Dew Poi			Fail
	•	tion of MARS far	1		Pass ₋		Fail
X		. (P. L.C.		Δ	. P . L J	
	Rotate senso	r to avoid direct	sunlight on rece	eiver optics		_	
	Item Calibration	Initial Value	New Value	% Diff	Acceptab Tolerance ±3%		Fail
	Note: Accept	calibration if pas	ssed. Report no	on-acceptar	nce to AWI.		
	Rotate senso	or to original posi	tion		Accomp	olished	· · · · · · · · · · · · · · · · · · ·
S	ystem Checked	d and Verified By	:		Da 	te/Time:	



Name and Location		Da	ate	
Number Sta BP1 BP2 Note: Adjustment is re	performed per sensor of Se	Acceptable B) A-B Tolerance 0.005 0.005	Required Y N_ Y N_	
Check Desiccant	/alue (Color) (Cycles) (Turn-On T		Pass	
	/alue (Turns on) utput Data	Acceptable Tolerance Yes Accomplished	Pass	
Item AWOS Sky Condition* Visibility Temperature—Measure Dew Point—Measure Wind Direction Wind Speed * If observation is clear If observation has clou	red Value I Value (no clouds), AWOS mulds below 12,000, AWO	Tolerance Consistency ±2 Increments ±30° ±5 Knots ust be CLR.		
Field Present Weather (W) Status (Sssss) Xnnn Lnnn Knnn Hnnn Tnnn	Display To So 40 -30 0 t 40	cceptable lerance npty if no precip. 000 5-420 0 to 50 o 150 to 120 nbient ±5° F	Pass	Fail
System Checked and Veri	ified By:		Date/Time:	





_	Name and Location	Date
	XVII Lightning/Thunderstorm Sensor Quarterly procedures performed per sensor manual XVIII Freezing Rain Sensor Quarterly procedures performed per sensor manual	
	System Checked and Verified By:	Date/Time:



					Accom	plished
l	Notify local users			_		
II	Complete monthly	y tasks and log		_		
Ш	Power up pressur	e standard		_		
IV	Apply touch-up pa	aint where needed		_		
V	Inspect Data Colle	ection Platform		_		
	a. Drain and cleab. Check reference			_		
	14 a ma	Counts	Acceptable		Daga	Fa:I
	tem +5.0\/ Reference	Counts	Range 4090-4095		Pass	Fall
	-5.0V Reference		0-5			
/I	slash, with "pass" Inspect tower and	noted.	v values noted, sep ease and oil	— — —	are origin	
/	Wind Direction	SN	2100	2020	20	40
		mark (2020 & 210				
			Tolerance		Pass	Fail
	Benchmark direct	ion			Pass	Fail
	b. Direction linea	rity test (2020 & 2	Tolerance Visually aligned 100)		Pass	Fail
	b. Direction linea Display wind direc	rity test (2020 & 2 ction on LCD displ	Tolerance Visually aligned 100)	V		
	b. Direction lineaDisplay wind directionAny dropouts obs	rity test (2020 & 2 ction on LCD displacer erved?	Tolerance Visually aligned 100)	Y	N	
	b. Direction linea Display wind direc Any dropouts obs Any sudden chan	rity test (2020 & 2 ction on LCD displacer erved?	Tolerance Visually aligned 100) ay; rotate full 360°	Υ	N N	
	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360°	rity test (2020 & 2 ction on LCD displacer erved?	Tolerance Visually aligned 100) ay; rotate full 360° ±10°	Y Observed	N N I	
	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360° 90°	rity test (2020 & 2 ction on LCD displacer erved?	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3°	YObserved	N N I	
	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360°	rity test (2020 & 2 ction on LCD displacer erved?	Tolerance Visually aligned 100) ay; rotate full 360° ±10°	Y Observed Observed	N N ii	
	b. Direction linea Display wind direct Any dropouts obst Any sudden chant 360° 90° 180° 270°	rity test (2020 & 2 ction on LCD displayerved? ges observed?	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3°	Observed Observed Observed	N N I I I	
/11	b. Direction linea Display wind direct Any dropouts obst Any sudden chant 360° 90° 180° 270°	rity test (2020 & 2 ction on LCD displayerved? ges observed?	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100)	YObserved Observed Observed Observed	N N ii ii	
√III	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360° 90° 180° 270° c. Bearing wear to see the	rity test (2020 & 200 tion on LCD displayerved? ges observed? test: Vane turns free m run-up motor, D (2030)	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100) 2100	YObserved Observed Observed Observed	N N ii ii	
∕ 111	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360° 90° 180° 270° c. Bearing wear to the sum of the sudden chan Wind Speed St. a. Using 1800 rp. 79-81 knots (78-80 knots (rity test (2020 & 2: ction on LCD displayerved? ges observed? test: Vane turns free m run-up motor, D (2030) (2100)	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100)	YObserved Observed Observed Observed	N	
√ 11	b. Direction linea Display wind direct Any dropouts obst Any sudden chan 360° 90° 180° 270° c. Bearing wear to the sudden sudden sudden chan 360° 90° 180° 180° 270° c. Bearing wear to the sudden sud	rity test (2020 & 2: ction on LCD displayerved? ges observed? test: Vane turns free N	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100) 2100 CP LCD reads:	YObserved Observed Observed 2020	N	Fail
/11	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360° 90° 180° 270° c. Bearing wear to the second	rity test (2020 & 20 ction on LCD displayerved? ges observed? test: Vane turns free m run-up motor, D (2030) (2100) test: Cups/Propelle washer (2100)	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100) 2100 CP LCD reads: er turn freely (2020 & A	YObserved Observed Observed Observed	N	Fail
/ 111	b. Direction linea Display wind direct Any dropouts obs Any sudden chan 360° 90° 180° 270° c. Bearing wear to the second	rity test (2020 & 2: ction on LCD displayerved? ges observed? test: Vane turns free N	Tolerance Visually aligned 100) ay; rotate full 360° ±10° ±3° ±3° ±3° eely (2020 & 2100) 2100 CP LCD reads: er turn freely (2020 & A	YObserved Observed Observed 2020	N	Fail



	Temperature/l	Humidity S	N			
	Time 1.5 min	Psychrometer Temperature	Temperature		Psychrometer Wet Bulb	Dew Point
	3.0 min 4.5 min 6.0 min 7.5 min					
	Average Within ±1°F (±.55°C)	n A	В	Dew Point	C	D
	B-A	Acceptable ±2°F (±1.	e Tolerance 1°C)		Acceptable ±3°F (±1	Tolerance I.7°C)
		Pass on of 8190 MAR				Fail
X		SN to avoid direct s		ver optics	Accomplished _	
	Calibration	Initial Value		% Diff Tole ±3%		Fail
	•	to original posit	•	•	.ccomplished	
ΧI		nsor SN				
		Indication (A)	Reference (B Night	Acceptable) Tolerance A=B	Pass I	Fail
	Daytime		Day	A=B		
XII	Precipitation S	Sensor SN	Day	A=B		
ΧII	Precipitation S a. Check for I b. Check for i c. Check hea	Sensor SN evel nternal damage ters	Day	Accom Accom		
ΧII	Precipitation S a. Check for I b. Check for i	Sensor SN evel nternal damage ters	Day Reference	Accom Accom Accom	plished plished plished able	
	Precipitation S a. Check for I b. Check for i c. Check hea d. Switch test	Sensor SN evel nternal damage ters Measured Value (A)	Reference Value (B)	Accom Accom Accom Accept A-B Tolerar	plished plished plished able	
	Precipitation S a. Check for I b. Check for i c. Check hea d. Switch test Item 1 cycle	Sensor SN evel nternal damage ters Measured Value (A) Sensor SN Value ant	Reference Value (B) 2 counts	Accom Accom Accom Accept A-B Tolerar	plished plished plished able ace Pass I	



Name and Location	Date	
XIII Cloud Height Sensor (cont.) CDP Maintenance Menu: Status errors Clouds detected when rainfall reported? Any ceilometer pilot reports logged? If yes, note report(s): Minimum ceiling check (white paper over	Yes No Yes No lens)Expected: 100 feet Reported: fe	et
Model 8339 Item Value Check Blower (Turns o Blower cleared of debris Desiccant replaced	Acceptable Tolerance Pass Fail	
BP1 BP2 Note: Adjustment is required if A-B is greater.	0.000 11	
XV Present Weather Checks Field Display Present Weather (W) Status (Sssss) Xnnn Lnnn	Acceptable Tolerance Pass Fail Empty if no precip. S0000	
b. Check antenna sealant c. Clean all surfaces d. Check hardware and cable connection XVII Freezing Rain Sensor SN a. Check sensor and mast for damage/co b. Check cables and hardware connection c. Clean all surfaces XVIII Hardware Inspection Accomplished	Accomplished Accomplished s Accomplished arrosion Accomplished accomplished Accomplished Accomplished	
All rust, corrosion, etc. has been sanded and touch-up paint applied Defects: System Checked and Verified By:	Accomplished Date/Time:	



Nai	me and Location			Date	
XX a.	Parameter	tform	Standard Value (B) 1.0W 1.0:1	certified shop) Acceptable Tolerance (A-B) ±0.5W Initial value 2.0:1 (max.) Operating value 3.0:1 (max.) ±1.5 kHz 2.4-3.8 kHz Accomplished	
	Sensor BP1 BP2	Correction Acc		_ _)	
0.	Voice data is cle	ear, no data missing tions on monthly for		Pass F Accomplished _	-ail
d.	Estimate the we with the output of	ather conditions, an	ed above.	e manual observation Agree Dis condition.	sagree
e.	Input a test rema	ark using the micrope same.	<i>F</i>	sing the speakers. Acceptable Un Accomplished _	
XX	I UHF Radio at th	e CDP (performed	by FCC certifie	ed shop)	
	Parameter Radio Pwr (at Xr VSWR (at Xmtr)	,	Standard Value (B) 1.0W 1.0:1	Acceptable Tolerance (A-B) ±0.5W Initial value 2.0:1 (max.) Operating value	Pass Fail
	Frequency Deviation		3.0 kHz	3.0:1 (max.) ±1.5 kHz 2.4-3.8 kHz	
Sy:	stem Checked ar	nd Verified By:		Date/T	ime:



Name and Location			Date		
XXII UHF Radio at the C shop)	DP Antenna - f	for cables long	er than 50' (performed	by FCC	certified
Parameter	Measured Value (A)	Standard Value (B)	Acceptable Tolerance (A-B)	Pass	Fail
Radio Pwr (at ant.)		0.20W	±0.15W		
VSWR (at ant.)		1.0:1	Initial value 2.0:1 (max.)		
			Operating value		
Frequency			3.0:1 (max.) ±1.5 kHz		
Deviation		3.0 kHz	2.4-3.8 kHz		
20114.1011		0.0 11.12	2. 7 0.0 10.12		
XXIII VHF Radio (perfor	med by ECC o	ertified shop)			
77 till Ttadio (porior	Measured	Standard	Acceptable		
Parameter	Value (A)	Value (B)	Tolerance (A-B)	Pass	Fail
Radio Pwr (at Xmtr)		2.5 W	±1.0 W		
VSWR (at Xmtr)		1.0:1	Initial value 2.0:1 (max.)		
			Operating value		
_			3.0:1 (max.)		
Frequency		900/	±1.0 kHz		
Modulation		80%	65-95%		
XXIV VHF Radio at the		•		FCC cer	tified shop)
Parameter	Measured Value (A)	Standard Value (B)	Acceptable Tolerance (A-B)	Pass	Fail
Radio Pwr (at ant.)	7 (7 1)	1.0 W	±0.5 W		
VSWR (at ant.)		1.0:1	Initial value 2.0:1 (max.)		
			Operating value		
			3.0:1 (max.)		
Frequency		000/	±1.0 kHz		
Modulation		80%	65-95%		
\0.04\12\ - \12\12\12\12\12\12\12\12\12\12\12\12\12\					
XXV NADIN Interface (a	,				
Operation of the link with CLH	confirmed		Accomplished _		
XXVI Monthly and Quart	erly Logs Revie	ew			
Review all monthly a	and quarterly lo	g sheets	A a a a man lia h a d		
for compliance with	manual		Accomplished _		
Cychone Charles I and M	onified Dec		D-1-T		
System Checked and Vo	erified By:		Date/Ti	me:	

TEMPERATURE/DEW POINT WORK SHEET

		VERIFICATION EXPERIMENT NUMBER	:	DATE:	OBSERVER:
--	--	--------------------------------	---	-------	-----------

TABLE I, EXPERIMENTAL DATA							
		AWOS TEM	PERATURE /		CORRECTE	D VALUES	
PROCEDURE STEP	TIME	I INDICATIONS I		REFERENCE PSYCHROMETER #1 IDENTIFICATION:		REFERENCE PSYCHROMETER #2 IDENTIFICATION:	
		TEMP Tind (°F)	DEW POINT DPind (°F)	T _{dry} (°F)	T _{wet} (°F)	T _{dry} (°F)	T _{wet} (°F)
AFTER 1.5 MIN.							
AFTER 2.5 MIN.							
AFTER 3.5 MIN.							
AFTER 4.5 MIN.							
AFTER 5.5 MIN.							

TABLE II, REFERENCE VALIDITY CHECK					
IS T _{dry} FROM REFERENCE #1 WITHIN 1°F OF REFERENCE #2° (YES/NO)	IS Twet FROM REFERENCE #1 WITHIN 1°F OF REFERENCE #2? (YES/NO)	IS T _{wet} FROM REFERENCE #1 WITHIN 0.5°F OF FOLLOWING T _{wet} ? (YES/NO)	IS Twet FROM REFERENCE #2 WITHIN 0.5°F OF FOLLOWING Twet? (YES/NO)	IF ALL 'YES' ENTER 'PASS', OTHERWSE ENTER 'FAIL'	NUMBER EACH 'PASS' CHECK *

*NOTE:
IF NUMBER OF PASS CHECKS IN
TABLE II IS LESS THAN 3, DO NOT
CONTINUE WITH EXPERIMENT. IF
PASS CHECKS NUMBER 3 OR MORE,
CONTINUE ON TO TABLE III, AND
COMPUTE DEW POINT TEMPERATURE
FROM CORRESPONDING WET/DRY
TEMPERATURE DATA. (USE
STANDARD PSYCHROMETRIC
TABLES).

TABLE III, DEW POINT CALCULATION					
NUMBER OF PASS	REFERENCE PSYCHROMETER #1		REFERENCE PSYCHROMETER #2		
CHECK	TEMP T _{dry} (°F)	DEW POINT (°F)	TEMP T _{drv} (°F)	DEW POINT (°F)	
	'ary \ ' /	(' /	ary ()	(' /	
1					
2					
3					
4					

TABLE	IV , TEMPER	RATURE	ANALYSIS
AVERAGE REFERENCE TEMP T ref (°F)	CORRESPONDING AWOS SENSOR TEMP. INDICATION T ind (°F)	T _{ref} -T _{ind}	(T _{ref} -T _{ind}) ²

TABLE V, DEW POINT ANALYSIS				
AVERAGE REFERENCE DEW POINT DP ref (°F)	CORRESPONDING AWOS SENSOR DEW PT. INDICATION DP ind (°F)	DP _{ref} -DP _{ind}	(DP _{ref} -DP _{ind}) ² (°F)	

TABLE i, UNCORRECTED VALUES				
REFERENCE PSYCHROMETER #1 IDENTIFICATION:		REFERENCE PSYCHROMETER #2 IDENTIFICATION:		
T _{dry} (°F)	T _{wet} (°F)	T _{dry} (°F)	T _{wet} (°F)	

ADD ALL (T _{ref} -T _{ind}) ² VALUES	
DIVIDE ABOVE VALUE BY NUMBER OF 'PASS' CHECKS	
CALCULATE SQUARE ROOT	°F RMSE

ADD ALL (DP _{ref} -DP _{ind}) ² VALUES	
DIVIDE ABOVE	

DIVIDE ABOVE VALUE BY NUMBER OF 'PASS' CHECKS

CALCULATE	
SQUARE ROOT	

°F RMSE

AWOS-WS.DWG



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