Present Weather Detector (PWD) Calibration Procedure

I. Purpose:

This procedure describes how to calibrate the Vaisala Present Weather Detector (PWD22) deployed at the ARM Mobile Facility.

II. Cautions and Hazards:

- Use of tall ladder (higher than 6 ft)

III. Requirements:

- Tall ladder
- Small screw driver
- Female 9-pin connector with bare leads (to pins 2, 3, 5)
- Laptop with HyperTerminal
- PWA11 Calibrator Kit
- PWD Cal Check Sheet (see Attachment 1)
- 12-V power supply capable of handling 10 W – if the PWD is not connected to a power supply

IV. Procedure:

A. Calibrating PWD22

1. Turn off power to the PWD.

2. Disconnect the PWD wiring harness GRN wire from the CR23X datalogger (C8).

3. Twist together the GRN wire and the bare lead wire going to pin 2 on the 9-pin connector.

4. Disconnect the PWD wiring harness YEL wire from the CR23X datalogger (C7).

5. Twist together the YEL wire and the bare lead wire going to pin 3 on the 9-pin connector.

6. Disconnect the PWD wiring harness GRY wire from the CR23X datalogger (G).

7. Twist together the GRY wire and the bare lead wire going to pin t on the 9-pin connector.

8. Connect the 9-pin connector to the comm port on the laptop and start HyperTerminal.

9. Ensure the following settings on HyperTerminal (factory settings in parenthesis):

   a) Baud: 4800 (9600)

   b) Data bits: 8 (7)

   c) Parity: None (Even)

   d) Stop Bit: 1 (1)

10. Turn on power to the PWD.

11. Hit the "ENTER" button a few times to get the attention of the PWD.

12. Type "OPEN" enter. Failing to do so will not allow com with PWD. No "echoing" of commands will occur until "OPEN" is typed.

13. Clean the lenses using established procedures.

14. Type "CLEAN" enter. Type "STA" enter. Copy down the receiver and transmitter backscatter change values. This value should be close to zero. If not continue this step until the values become close to zero.

15. Clean the RAINCAP using established procedures.

16. Insert the blocking plate from the PWA11 Calibrator Kit and wait 30 seconds.

17. Type "ZERO" enter. The PWD should respond with:

    a) ZERO SIGNAL: ok>

    If not, adjust blocking plate until you get the "ok."

18. Remove the blocking plate and install the calibrator plates on each hood and wait 30 seconds. See pg 87, figure 19 of the manual for further instructions.

19. Type "CHEC" enter. Wait one minute or until the values are fairly stable. Note the value.

20. Hit "ESC" to terminate. If the value returned from step 19 is within 5% of the signal value of the plates, no calibration is necessary go to step 25.

21. If the value is greater than 5 % continue with step 22.

22. Type "CAL (signal value of plates)" enter. If the value in step 19 is greater than 20% of the signal value "FCAL" will be required because CAL command will be ignored. Before using FCAL attempt to adjust the plates and re-doing step 19 again.

23. Type "CHEC" enter. The returned value should now be close the signal value on the calibration plates. If not, redo step 22.

24. Hit "ESC" to terminate.

25. Disconnect HyperTerminal.

26. Turn off power to the PWD.

27. Disconnect the PWD leads from the 9-pin connector.

28. Reconnect the three PWD wires to the CR23X:

    a) Grn to C8

    b) Yel to C7

    c) Gry to G

29. Turn power on to the PWD.

30. Wait 6 minutes and make sure that the PWD id is not 0 and the CumH20 and CumSnow variables are no longer –6999. If these do not clear after 6 minutes there is a power or serial communications problem.

V. References:

None.

VI. Attachments:

1. PWD Cal Check Sheet, FM(PWD)-001.

Attachment 1: PWD Cal Check Sheet, FM(PWD)-001

	Command	Response	Reference
1	Complete the cleaning of the lenses		pg 84 of manual
2	type **CLEAN**		
3	type **STA**		pg 85 of manual
4	"Backscatter Change" receiver	_____	
	"Backscatter Change" transmitter	_____	
5	Complete the cleaning of the RAINCAP		
6	Insert blocking plate into receiver hood		pg 86 of manual
7	type **ZERO**	_____	
8	Remove blocking plate		
9	Insert calibrator plates		pg 87 of manual
10	**Signal Value of Calibrator Plates**	**532**	
11	type **CHEC**	_____	
		100.0	
12	Is the CHEC value within 5% of Signal Value		Hit "ESC" to teminate
13	Is the CHEC value within 20% of Signal Value		Hit "ESC" to teminate
14	type **CAL 532**		pg 88 of manual
15	type **CHEC**	_____	Hit "ESC" to terminate