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Microwave Radiometer Moisture Diagnostics

I. Purpose:

This document describes the local diagnostic procedures that are performed when problems are encountered with the moisture detector or heater.

II. Cautions and Hazards:

- There are two power supplies for the MWR assembly:
 - UPS 110V/60hZ/130W to MWR and Blower
 - Non-UPS 110V/50-60Hz/750W to heater

III. Requirements:

- Slot head screw driver

IV. Procedure:

A. Heater Fails to Turn ON:

Note that when the heater is ON, the air exiting the blower is only slightly warmer than ambient air; it is not hot. On MWRs built for the TWP, a red LED on the blower housing is illuminated when the heater is ON.

1. Determine whether the detector circuit is working properly. To do this, touch the sensor on top of the MWR with your finger or wet the sensor. Did the heater turn ON?
 - a) YES: Adjust the sensitivity of the detector circuit. Refer to Step 2.: **Adjusting the moisture detector sensitivity.**
 - b) NO: Continue with diagnostic procedure step 3.
2. Adjusting the moisture detector sensitivity:
 - a) Loosen the locking nut, then turn the adjustment potentiometer clockwise until the moisture detector is continuously ON (until warm air is felt exiting the blower or the light-emitting diode (LED) lights on the unit.)
 - b) Turn the adjustment potentiometer backward slightly until the heater turns OFF.
3. Have one person check the MWR display while another touches or wets the sensor. Does the moisture detector ("Dew Flag") indicate ON (=1) or OFF (=0)?

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- a) ON: The moisture detector is working properly; continue with diagnostic procedure.
 - b) OFF: The moisture detector is not working properly; try adjusting the detector sensitivity until the circuit turns ON.
4. Check the power line to the heater; this line is separate from the line powering the MWR. Make sure it is tight. Check for power at source. Check for AC power.
 5. If this fails to isolate the problem, schedule a service call.

FOR RESET TEAM ONLY:

- a) **Change circuit card.**
- b) **Remove the blower (4 screws).**
- c) **Pop out the box inside with the circuit card and pop in a new one.**

B. Heater Fails to Turn OFF:

1. Adjust the moisture detector sensitivity until the heater turns OFF.
2. If the heater fails to turn OFF, there is a problem in the detector circuit. Remove power from the heater circuit by first disconnecting the plug connector outside the MWR. Schedule a service call.

FOR RESET TEAM ONLY:

- a) **Change circuit card.**
- b) **Remove the blower (4 screws).**
- c) **Pop out the box inside with the circuit card and pop in a new one.**

C. Heater Turns OFF before Teflon window is dry:

1. On MWRs built for TWP, move the moisture sensing element to an attachment point farther from the blower outlet. The sensing element is attached to the MWR using four screws for easy removal and reattachment.
2. If heater still turns OFF before Teflon window is dry, repeat step 1, move detector further away. Adjust sensitivity again (see step A2). If problem persists, record problem in site data log.

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D. Recording Changes for any of the Above Diagnostic Checks:

1. Indicate the date, start-time, end-time, and comments on any changes made on the MWR in the site data log.

V. References:

1. "Instrument Operation and Maintenance Procedure Development Checklist," Jim Liljegren.

VI. Attachments:

None.