

Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		<b>Page 1 of 6</b>
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

## **1.0 Purpose and Scope**

- 1.1.** The purpose of this procedure is to describe the process used by Vermont Forensic Laboratory (VFL) staff for the Annual Preventative Maintenance (APM) of the DataMaster DMT infrared breath alcohol analysis instruments designated for use as evidentiary breath testing devices.
- 1.2.** The scope of this procedure includes annual inspection and testing of evidentiary breath testing instruments currently in service at police agencies.

## **2.0 Responsibility**

- 2.1.** All instruments shall be tested annually by trained laboratory staff. Any instrument failing their APM shall be repaired or returned to VFL for service as necessary.
- 2.2.** It is the responsibility of staff performing this task to follow the procedure as written, to note any omissions, errors or unclear instructions in the procedure and bring them to the attention of the Alcohol Program Supervisor.
- 2.3.** This procedure will be reviewed periodically by Alcohol Program staff. Revisions of the procedure will be made when a need is identified.

## **3.0 Precautions**

- 3.1.** Appropriate caution must be taken to avoid electrical shock when working with or using any electrically charged equipment.
- 3.2.** All reports generated during this procedure must be retained; this includes those displaying error messages or failures. One copy of the report(s) will be retained by the agency in which the instrument is located. One copy of the reports will be returned to the VFL for review by the Alcohol Program Supervisor or their designee. The reviewed copy will be filed in the instrument's folder and an electronic copy placed in the instrument's DMT folder on the VFL intranet.

## **4.0 Procedure Steps**

### **4.1. Materials and Supplies necessary for procedure.**

- 4.1.1. DataMaster DMT Instrument with accompanying printer.
  - 4.1.2. NIST traceable thermometer.
  - 4.1.3. Simulator air pressure gauge.
  - 4.1.4. Handheld radio.
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Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		<b>Page 2 of 6</b>
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

- 4.1.5. DataMaster mouthpieces.
- 4.1.6. Field service tool kit.
- 4.1.7. Simulator jar O-ring.
- 4.1.8. Spare parts as necessary.

## **4.2. Hardware Inspection**

- 4.2.1. Unlock the arms surrounding the simulator and detach the simulator from the tower, including unplugging the BNC connector.
- 4.2.2. Unscrew the plug in the top of the simulator and insert the thermometer into the simulator solution. Allow thermometer to equilibrate. Ensure simulator temperature is  $34.0^{\circ}\text{C} \pm 0.2$ . Ensure DMT temperature display matches the NIST thermometer readout. Adjust as necessary. Reinstall the plug when finished.
- 4.2.3. Remove simulator head from jar. Inspect simulator jar for cracks and chips. Replace jar as necessary.
- 4.2.4. Replace the O-ring in the simulator head.
- 4.2.5. Thread the simulator head onto the simulator jar. Using the pressure gauge, check the simulator for leaks. If the simulator leaks, repair or replace as necessary.
- 4.2.6. Reconnect the simulator to the DMT.
- 4.2.7. Unscrew and open the top of the instrument. Inspect all tubing and wire connections. Ensure all are properly seated and free from kinks, cracks or other problems. Correct issues as necessary. Once complete, close the instrument.

## **4.3. Annual Preventative Maintenance Protocol**

- 4.3.1. On the touch screen, press the NPAS logo to open the drop down menu. Select: Protocols → Annual Preventative Maintenance. Enter password. Fill in all fields on the data entry screen as required. The instrument will now automatically complete the APM protocol. Follow all instructions on the screen. The instrument will only continue on to the next step once each check passes.
  - 4.3.2. The first step is a Diagnostic Check. The instrument will run a self check to ensure all temperatures, settings and components are functioning properly.
  - 4.3.3. The second step is the radio frequency detection test. When prompted to perform the RF test, if the agency has a console radio located in their building, have dispatch key all commonly used frequencies. The instrument should not react to dispatch frequencies.
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Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		<b>Page 3 of 6</b>
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

Key a handheld radio within two feet of the instrument. RF should be detected and reported. If the instrument's radio frequency sensitivity is incorrect, reset the sensitivity and begin the test again.

4.3.4. The instrument will then analyze the simulator solution.

4.3.5. The final step is a sample acceptance check.

4.3.5.1. Press "OK" when you are ready to start the test. The DMT will run through a series of quality control checks.

4.3.5.2. When prompted "Please Blow" and an intermittent tone is heard, insert a new mouthpiece into the breath tube.

4.3.5.3. Provide breath samples. The bottom left corner of the screen will display the type of breath to deliver.

4.3.5.3.1. **Shallow Breath:** Very lightly blow a small amount of air into the mouth piece, allowing some air to escape out the sides of your mouth. The air flow should be very slight, but strong enough to just register air flow (blue line) on the screen. Blow for a few seconds then stop. The instrument should **not** report an alcohol response (black line) and should **not** accept the sample.

4.3.5.3.2. **Intermittent Breath:** Strongly blow into the mouth piece for 1-2 seconds and stop a couple of times. Be careful not to suck back on the mouth piece between puffs of air. The instrument should **not** report an alcohol response (black line) and should **not** accept the sample.

4.3.5.3.3. **Suck Back Test: VERY GENTLY** suck back on the mouth piece just enough so you feel a one-way valve stop the air flow (less than one second of pressure). If you suck too hard, you may damage the one-way valve. Once you feel this one way valve hit, you are finished. **Do not continue to suck back on the breath tube. Once is enough.** The instrument should **not** report an alcohol response (black line) and should **not** accept the sample.

4.3.5.3.4. **1.5L Alcohol Free Sample:** While watching the total volume box in the bottom right corner of the screen, provide a sample of ~1.5L of air to the instrument. The instrument should accept a sample of 1.5L of air. The instrument should **not** report an alcohol response (black line).

4.3.5.3.5. Once the Sample Acceptance test is complete, the instrument will prompt "Did Instrument Pass All Sample Acceptance Checks? Yes/No". If all checks passed, select "Yes". If any of the checks failed, select "No". When prompted, type in which check failed and why.

Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		<b>Page 4 of 6</b>
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

#### **4.4. Record Keeping**

- 4.4.1. File one copy of the APM report with the onsite maintenance records. The second copy of the report will be returned to the laboratory, reviewed by the Alcohol Program Supervisor or their designee, and filed in the DataMaster files as described in Section 3.2.
- 4.4.2. In the DataMaster DMT Maintenance Log (F-ALC 203), document your name, date APM performed and note any corrective actions that may have been performed.
- 4.4.3. In the DataMaster Operators Log (F-ALC 204), if present, document your name, under the “subject” column write “test/APM” and enter the result of the simulator vapor.

#### **5.0 Emergency or High Priority Situations**

- 5.1. The Laboratory Director or Alcohol Program Supervisor may designate any DataMaster DMT Annual Preventative Maintenance to be a high priority and request service as soon as possible.

#### **6.0 Quality Criteria and Corrective Action**

- 6.1. The standard approach to correct a problem is to first repeat the test to confirm the problem. Consult the Technical Notes Binder or ask for technical support from the Alcohol Program Supervisor. Try to correct the problem and document the event. Write the problem and corrective actions taken on the failing APM reports and in the instrument’s maintenance log.
- 6.2. If the problem is not correctable in the field or a repair or technical evaluation is needed, a DataMaster Technical Support Inquiry (TSI) (F-ALC 202) must be started. The instrument shall be returned to the laboratory for further evaluation. Once the repair is complete, the TSI is finished and placed in the instrument’s file. This procedure may be begun again when the problem is resolved.

#### **7.0 Preventative Maintenance and Backup Procedures**

- 7.1. If a problem is encountered that cannot be resolved by Alcohol Program staff, the instrument manufacturer, National Patent Analytical Systems, Inc. (NPAS) will be contacted for technical support.
    - 7.1.1. Contact NPAS at 1-800-800-8143 or [service@npas.com](mailto:service@npas.com).
  - 7.2. If an agency’s instrument requires repair and cannot be returned to service in a timely manner, a replacement instrument may be installed at that site.
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Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		<b>Page 5 of 6</b>
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

## **8.0 References**

- 8.1.** DataMaster DMT Technical Notes Binder.
  - 8.2.** DataMaster DMT Site Evaluation Checklist (F-ALC-205)
  - 8.3.** DataMaster DMT Maintenance Log (F-ALC 203)
  - 8.4.** DataMaster Operator Logbook (F-ALC 204)
  - 8.5.** DataMaster Technical Support Inquiry (F-ALC 202)
  - 8.6.** Appendix A: Example of an Acceptable Annual Preventative Maintenance Report.
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Title: <b>DataMaster DMT Annual Preventative Maintenance</b>		Page 6 of 6
Doc. No. P-ALC 205 Version 2	Approved By: Margaret Schwartz, Lab Director	Date Effective: 1/1/2013

## Appendix A

### Acceptable Annual Preventative Maintenance Report

#### ANNUAL PREVENTATIVE MAINTENANCE



DataMaster DMT: 100147  
 Location: VFL  
 Calibration Date: 03/16/2012  
 Certification Date: 03/16/2012  
 Installation Date: 10/15/2012  
 APM Date: 12/04/2012  
 Performed by: ROBERT DRISCOLL

#### Diagnostic Results

**VERSIONS**  
 DMT: 1.01  
 PIC: 2.06  
 Modem: 2.4  
 Questions: 2.1

#### TEMPERATURES

Sample Chamber = 48.9°C  
 Breath Tube = 45.1°C  
 Digital Sim = 33.9°C

#### SETTINGS

Lamp Voltage = 1.52 V  
 Cooler Voltage = 1.50 V  
 Bias Voltage = 81 V  
 Chopper Freq = 534 Hz

#### PUMP INFO

Flow Rate = 6.144 L/M

#### DETECTOR INFO

PUMP	ON	OFF
MAX (V)	-0.0439	-0.0398
MIN (V)	-0.0453	-0.0409

#### FILTER INFO

Filter 1	-0.041	Zero = true
Filter 2	0.473	Zero = true
Filter 3	1.246	Zero = true

#### CALIBRATION CHECK

Xq = 0.115 2.78%

**APM PASSED**

#### Simulator Vapor Test

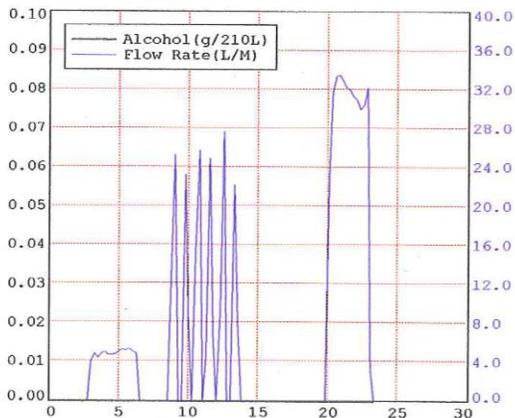
Concentration = 0.099 g/210L  
 Lot # = 12-77-100  
 Range = 0.094 - 0.104  
 Simulator Vapor = 0.098 g/210L

#### RF Detection Test

Passed

#### Sample Acceptance Test

Passed



Performed by RD-66

Date 12/04/2012

Reviewed by \_\_\_\_\_

Date \_\_\_\_\_