



VERMONT

DEPARTMENT OF HEALTH

↑ High Rez

BAC DATMASTER

INSTRUMENT SUPERVISOR MANUAL



# VDHL BAC DataMaster Instrument Supervisor Manual

The Information that is provided in this manual is not designed to make the ~~DataMaster Instrument Supervisor~~ an expert on the BAC DataMaster. This manual will familiarize the ~~DataMaster Instrument Supervisor~~ with the instrument in order to perform simple maintenance and repairs. An understanding of mechanics, optics, and electronics is not required ~~to perform simple maintenance and repairs on the BAC DataMaster.~~

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**Appendices**

- A BAC DataMaster Routine Performance Check Worksheet [ALC 627]
- B Instructions for BAC DataMaster Routine Performance Check [ALC 435] *Not included?*
- C BAC DataMaster Simulator Solution Change Worksheet [ALC 630]
- D Instructions for Changing Simulator Solution in the BAC DataMaster [ALC 437]
- E Sample Default Options Ticket *not included?*
- F Resource List

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**SECTION 1**

**DATAMASTER LOCATION REQUIREMENTS  
&  
DUTIES OF THE BAC DATAMASTER SUPERVISOR**

## DATAMASTER LOCATION REQUIREMENTS

Before an instrument can be installed for evidentiary use at a location, the host agency must agree to:

- Provide personnel to be trained as and available to perform the duties of ~~A~~ DataMaster Supervisor.
- Keep a complete record of use, maintenance, and on-site service with the instrument at all times and, when required, filed with the Vermont Department of Health Laboratory (VDHL) DataMaster Technical Services.
- Maintain the instrument and surrounding area in which it is installed according to the initial specifications and any subsequent modifications required by the VDHL DataMaster Technical Services.

The Vermont Department of Health may withdraw approval of the use of the BAC DataMaster if it determines that at anytime:

- The host agency has failed to adhere to Vermont Department of Health conditions listed above.
- The instrument is being underutilized.
- *There are* Reason(s) which makes the site unsatisfactory for continued DataMaster use.

### ACCESS

- The ~~BAC~~ DataMaster should <sup>*unbold*</sup> **not** be accessible by unsupervised, unauthorized persons at any time.
- Access by appropriate VDHL personnel and certified law enforcement officers for maintenance and processing DUI subjects should be allowed 24 hours a day seven days a week.
- Only VDHL trained DataMaster Supervisors and designated VDHL personnel <sup>*may*</sup> ~~should~~ perform maintenance on the DataMaster.

### CLEANING and VENTILATION

- The instrument and surrounding area should be kept clean with little ~~or no~~ dust or dirt accumulation.
- The instrument cover and supporting surface may be cleaned with window cleaner.

- Cleaning supplies, paint, paint supplies and other chemicals should not be stored near the instrument.
- The room should have adequate ventilation to facilitate cooling of the instrument and minimize the presence of potentially interfering substances.
- Nothing should be placed ~~behind~~ or around the instrument that would obstruct ventilation of the instrument.
- Beverages or ~~other~~ liquids should not be placed on or in the immediate area of the instrument.

### **MOVING <sup>AN</sup> INSTRUMENT**

- Contact VDHL DataMaster Technical Services.

### **POWER REQUIREMENTS**

- Power to the instrument should be provided from a dedicated 15 amp minimum, grounded 120 VAC  $\pm$  5% line which operates at a frequency of 60HZ.
- The DataMaster should not be plugged into the ~~same~~ electrical circuit as heavy use appliances such as refrigerators, air conditioners, vending machines, coffee makers, copiers, etc. to minimize instrument service needs. *unnecessary*
- The BAC DataMaster is to be plugged into the VDHL supplied line conditioner or an approved uninterruptible power supply (UPS).

### **SUPPORTING SURFACE**

- The supporting ~~surface~~ should be *solid and level and at* a comfortable working height for all operators.
- Minimum surface dimensions should be 36 inches wide by 24 inches deep to support the instrument.
- ~~The surface must be solid and level.~~
- ~~The~~ VDHL may require that the instrument be bolted to the supporting surface.

### **STORAGE SPACE**

- Adequate storage space for logbooks and processing supplies should be provided close to the instrument.

### **TELEPHONE ACCESS TO THE DATAMASTER**

- ~~The VDHL Alcohol Program highly recommends that a dedicated phone line or an existing phone line be connected to the DataMaster to allow telephone access to the DataMaster at your site. This would allow VDHL DataMaster Technical Services if your DataMaster Supervisors are not available, to run diagnostic tests. The existing phone line can not go through dispatch, a switchboard, or be transferred. Contact the VDHL DataMaster Technical Services for more information and specifications.~~

## TEMPERATURE

- The room temperature should be maintained between 65°F and 78°F while using the BAC DataMaster.
- A fan, heater or air conditioner may be placed in the room to control the room temperature, however nothing should be blowing directly on the instrument.
- ~~The instrument should be site certified by VDHL personnel only.~~

## DUTIES OF THE BAC DATAMASTER SUPERVISOR

### COPIES OF TICKETS

- If no other tests have been run, memory was not full, memory was not lost or the instrument was not turned off, an exact duplicate of the DUI subject's evidentiary ticket may be obtained by pressing the "CPY" button. This button is available to any officer.

### DISCOVERY REQUESTS

- All discovery requests submitted to the Vermont Department of Health must be requested in writing. Send written request to: Laboratory Administrator or Alcohol Program Chief.

### ~~Interact effectively with VDHL DataMaster Technical Services staff~~

- ~~Communicate with VDHL DataMaster Technical Services staff regarding reoccurring conditions or errors that may be taking place with the DataMaster.~~

### Instrument Security

*ALL CAPS (Same as above)*

- The BAC DataMaster should not be accessible to unsupervised or unauthorized persons at any time.
- Do not give out password or key.

### Maintain Records and Logs

*ALL CAPS*

- The DataMaster Supervisor will complete the following forms (list not inclusive) provided by the VDHL Alcohol Program:

- Routine Performance Checks Worksheets [ALC 627].
- Operator Use Logbook [ALC 603]
- Check Up and Maintenance Logbook [ALC 803]
- All tickets and <sup>logbooks</sup> logs produced are to be kept by the responsible agency.

Perform <sup>Simple</sup> Routine Maintenance such as: ALL CAPS

- ~~Routine Performance Checks.~~
- Replace printer ribbons.
- Simulator out of range.
- Incorrect Date and or Time.
- Others as needed.

PERFORM ROUTINE PERFORMANCE CHECK PROCEDURES.

- For additional instructions concerning the Routine Performance Check (RPC) see "Instructions for the BAC DataMaster Routine Performance Check" [ALC 435].

ROUTINE PERFORMANCE CHECKS SCHEDULE

- The DataMaster Supervisor shall perform Routine Performance Checks during the months of **February, June, and October of each year.**
- Reminders will be sent for the RPC's of February, June and October. <sup>unbold</sup>
- Any Routine Performance Checks performed more than 30 days before a designated RPC month will not be accepted.
- Follow the "Instructions for BAC DataMaster Routine Performance Check" [ALC 435] as written.
- You do not need to complete a Routine Performance Check if you are only changing the simulator solution during any month except February, June, and October. See Section 6: "Simulator Out of Range."
- In <sup>January</sup> of each year, each DataMaster location will receive a shipment of simulator solution that should be used for the Routine Performance Checks. Open the box upon receipt. Each shipment will include bottles of simulator solution, "BAC DataMaster Routine Performance Checks Worksheets" [ALC 627], any revision updates to "Instructions for BAC DataMaster Routine Performance Checks" [ALC435], VDH addressed postage paid envelopes, mouthpieces, and evidence tickets.

move this to the Maintaining Supplies section

- After completing the October Routine Performance Check all empty or expired bottles of solution should be returned to VDHL using the pre-addressed label, provided.

**SUPPLIES**

- Evidentiary DataMaster tickets and mouthpieces may be obtained by contacting VDHL DataMaster Technical Services. After determination of need, a shipment will be sent within 5 working days.
- DO NOT stockpile evidentiary DataMaster tickets and mouthpieces.  
*caps not necessary*
- Store excess evidentiary DataMaster tickets in a zip lock plastic bag. Evidentiary DataMaster tickets will absorb moisture from the air, eventually causing printer jams.
- Store ALL evidentiary DataMaster tickets flat. DO NOT stand on end or side. Curling edges and bends in the tickets will cause printer jams.

**Support DataMaster Operators** *ALL CAPS*

- Instructing DataMaster Operators: Refer to the *Infrared Breath Testing Device Student Manual*.

**START UP PROCEDURE (if needed)**

- If the DataMaster is unplugged, switch the line conditioner and DataMaster power switches to the off "O" position, then plug the DataMaster AC power cord into a VDHL-supplied line conditioner or VDHL-
- Push the \_\_\_\_\_ to the on "I" position.
- Push the "WAIT" will \_\_\_\_\_ position. The date and time and "PLEASE" \_\_\_\_\_ ment is in the warm-up period.
- The warm-up the instrument \_\_\_\_\_ 20 minutes. More time will be required if \_\_\_\_\_ factors: The instrument is protected from \_\_\_\_\_ and line conditioner. No action should be \_\_\_\_\_
- Power failure \_\_\_\_\_ power re \_\_\_\_\_ necessar \_\_\_\_\_
- Extended \_\_\_\_\_ winter months: If extended power failure is likely to result in th \_\_\_\_\_ DataMaster being exposed to freezing temperatures THE SOLUTION IS TO BE REMOVED FROM THE SIMULATOR.
- Flooding: If possible the VDH supplied line conditioner and DataMaster should be turned off and unplugged.

*Is this whole section necessary?*

**VDHL DataMaster Technical Services notification time frames:** *ALL CAPS should be notified as soon as possible*

- Service needs: The VDHL DataMaster Technical Services **must** be promptly notified of any service needs in order to insure prompt service.
- Need to move instrument *two (2) weeks advance notice.*  
*beyond length of power cord.*
- Building renovations: Prior to any planned modification to an existing DataMaster location: two (2) weeks advance notice.
- Personnel changes: i.e. Commanding Officer, DataMaster Supervisor: within 4 weeks.
- Supplies: Monitor and order DataMaster mouthpieces and evidentiary tickets as needed. Supplies will be provided within one (1) week. *you already said this.*

**SUPERVISOR FUNCTIONS**

SET	ADV	CLR
SUP	TST	F1
NV	CPY	F2
ABT		MTR

Figure 1-1: 88XXXX Supervisor Panel Keys (Special Operation Keys)

**SUPERVISOR OPERATION KEYS**

The following specialized operation keys, found along the top of the internal keyboard (on 95XXXX, 97XXXX and 20XXXX instruments) and in the supervisor panel (on 88XXXX and 92XXXX instruments), provide access to special operational sequences administered by DataMaster supervisors. All but the "CPY" key requires a password.

*Put this FP above fig 1-1*



**Figure 1-2: Special Operation Keys on Internal Keyboard (95XXXX, 97XXXX and 20XXXX Instruments)**

**CLOCK** (time dial), **P1** and **P2** Not used for Vermont Instruments.

**SET** is used to select the date and time options.

**ADV** (advance) is used to change the date and time, once selected by the “SET” key.

The “SET” key selects the option you wish to change. For example: day of week, month, date, year, hour, minutes. The “ADV” key changes the option displayed on the LCD display. Each time the “ADV” key is pressed the next available selection for that option will be displayed. For example: If the option to change the minutes is displayed, pressing “ADV” once will advance the time by one minute. Holding down the “ADV” key will cause the minutes to keep advancing. When the option selection is complete press the “CLR” key to return to a normal display.

Display Shows:

Set and Advance Functions:

MONTH DATE HR: MIN  
READY – PUSH RUN

From this normal display, press “SET” once to begin options displays.

**MONDAY** 13:30  
READY – PUSH RUN

Day of week can be changed by pressing “ADV”.

AUGUST 31 **08**  
READY – PUSH RUN

Month number (1-12) can be changed by pressing “ADV”.

AUGUST 31 **31**  
READY – PUSH RUN

Day of month (1-31) can be changed by pressing “ADV”.

AUGUST 31 **1999**  
READY – PUSH RUN

Year (1980-2079) can be changed by pressing “ADV”.

AUGUST 31 **13:**  
READY – PUSH RUN

Hour of the day (00 – 23) can be changed by pressing “ADV”.

AUGUST 31 **:30**  
READY- PUSH RUN

The minute of the hour (00-59) can be changed by pressing “ADV”.

**Figure 1-3: SET and ADV Sequence**

**ABT** (abort) Interrupts any on-going supervisor function. The display will return to normal operation mode. This key is the **only** key that will stop the "purge sample chamber" function. See **LOG OFF** later in this Section.

**CLR** (clear) returns the display to normal operation from supervisor functions and error messages. This does not log off the DataMaster Supervisor, See **LOG OFF** later in this Section.

**CPY** (copy) Will print a copy of the last test run providing the power has not been turned off, or no other buttons or keys have been pressed. This key is not password protected.

**SPACE** → **F1** is used to select the following functions on the display:

**RESET OPTIONS:** sets all options to default mode.

**PRINT OPTIONS:** prints the default options.

**PRINT CAL. FACTORS:** prints the calibration factors.

**CLEAR MEMORY:** permanently removes stored data from memory chip. **DO NOT INITIATE THIS FUNCTION.** ← Do we still need to say this if the memory is turned off?

**LOG OFF:** Locks all supervisor function keys.

**REMOVE FROM SERVICE:** The instrument will display "OUT OF SERVICE" after logging off. No DUI Subject tests can be run.

**RETURN TO SERVICE:** The instrument is returned to service (unlocked). DUI subject tests can be run.

**PURGE SAMPLE CHAMBER:** This feature operates the pump continuously. The air is replaced with room air. ? rework

**F2** is used to initiate the displayed function selected by "F1".

**MTR** (meter) Will allow you to view the detector voltage and simulator temperature. <sup>display</sup>

**NV** is not used for Vermont Instruments.

**SUP** (Supervisor) initiates a supervisor <sup>test</sup> mode (also referred to as Accuracy and Precision), <sup>check</sup> test. This test checks the accuracy and precision of the instrument by running the simulator through five (5) test cycles then calculating an average and standard deviation.

**TST** <sup>(test)</sup> initiates a self-diagnostic test and prints the results on an evidence ticket. This test checks software, hardware, optics and mechanical functions of the instrument.

**FACE THIS SIDE DOWN – THIS EDGE IN FIRST**



STATE OF VERMONT  
BAC DataMaster 950164

APRIL 30, 2008

OPERATOR'S NAME:  
LAST/FIRST/MI

SOLUTION LOT NUMBER: 08-06-100  
SOLUTION CONCENTRATION: .1010

--- SUPERVISOR MODE ---

BLANK TEST	.000	08:36
INTERNAL STANDARD	VERIFIED	08:36
EXTERNAL STANDARD	.099	08:36
BLANK TEST	.000	08:37
EXTERNAL STANDARD	.099	08:37
BLANK TEST	.000	08:38
EXTERNAL STANDARD	.099	08:38
BLANK TEST	.000	08:39
EXTERNAL STANDARD	.099	08:40
BLANK TEST	.000	08:40
EXTERNAL STANDARD	.099	08:41
BLANK TEST	.000	08:41

SIM. = .1  
NUM. = 5  
S.D. = 0

TMP. = 34.03  
AVG. = .099  
S.E. = -.9999

Simulator  
Temperature

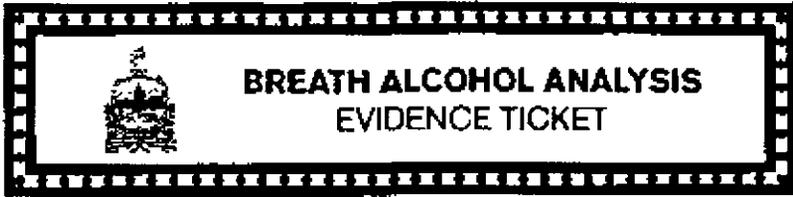
(AVG.) Average  
Concentration  
Up to 4 Digits

(S.D.) Standard Deviation  
Acceptable Range 0 – 0.002

White – States Attorney • Yellow – Arresting Officer • Pink – Subject

Figure 1-4: Supervisor Mode Test Sample Ticket w/ Acceptable Ranges

**FACE THIS SIDE DOWN - THIS EDGE IN FIRST**



STATE OF VERMONT  
BAC DataMaster 950164

APRIL 30, 2008  
TIME 08:43

--- DIAGNOSTIC CHECK ---

COMPUTER: OKAY  
PROGRAM: OKAY  
  
HEATERS  
SAMPLE CHAMBER: 49c  
SIMULATOR: 34.2c  
  
FLOW DETECTOR: OKAY  
  
PUMP  
HIGH SPEED: OKAY  
  
DETECTOR: OKAY  
  
FILTERS: OKAY  
  
QUARTZ STANDARD: OKAY  
  
CALIBRATION: OKAY

Acceptable Sample Chamber  
Temperature Range  
47°C to 53°C

Acceptable Simulator Temperature  
Range  
33.5°C - 34.5°C

PRINTER TEST

!"#\$%&'()\*+,-./0123456789:;<=>?@ABCDEFGHIJ  
KLMNOPQRSTUVWXYZ[\]^\_`abcdefg hijklmno  
pqrstuvwxyz{|}~

White - States Attorney • Yellow - Arresting Officer • Pink - Subject

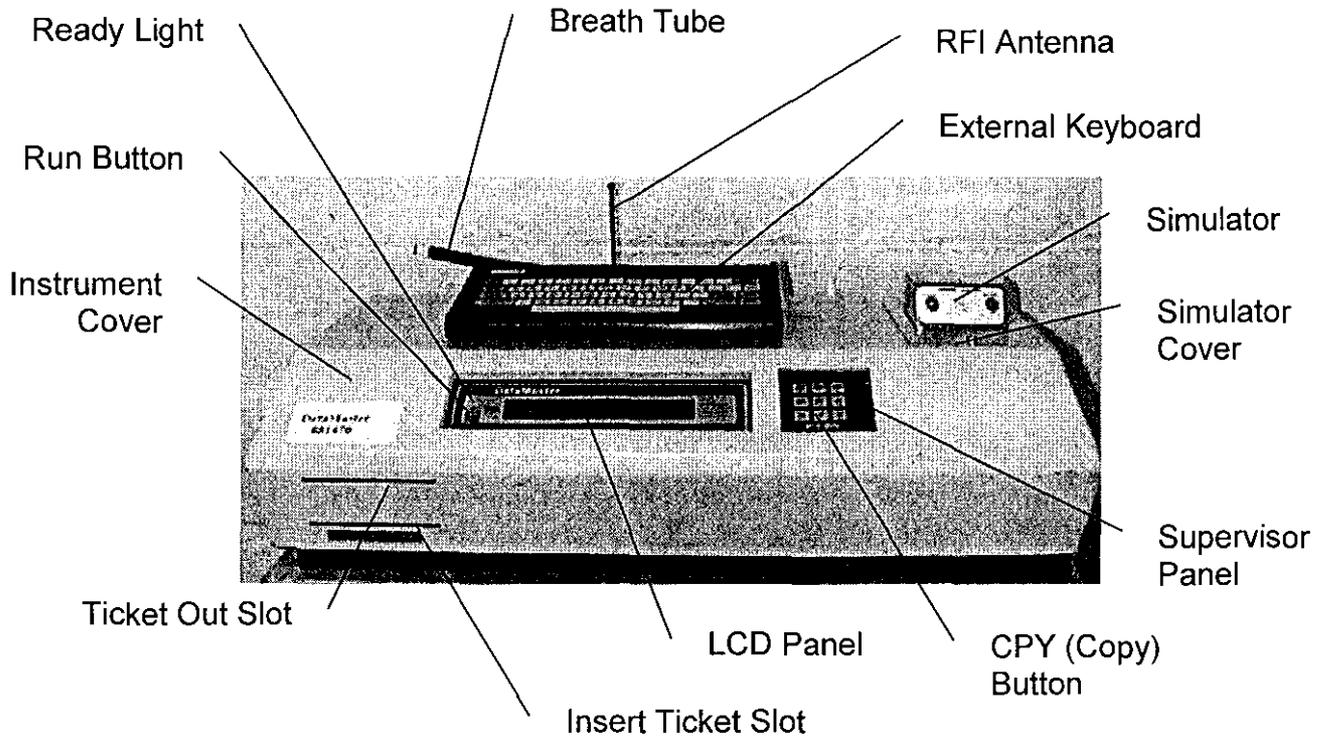
**Figure 1-5: Diagnostic Test Sample Ticket with Acceptable Temperature Ranges**

## SECTION 2

### COMPONENTS OF THE BAC DATAMASTER

This section  
would make more  
sense if you  
grouped all the  
figures together  
at the end.

## COMPONENTS External



**Figure 2-1: 88XXXX DataMaster Front and Cover**

*92xxx*

**INSTRUMENT COVER:** The cover is 18 gauge steel and may be cleaned with a mild window cleaner such as "Windex". The cover is attached by 4 (Drusz) ¼ turn screws on the back panel along with 2 grounding screws (if applicable). Only trained personnel should remove the cover.  
*on some units*

**LCD PANEL:** The liquid crystal display (LCD) panel identifies each part of the test sequence as it occurs and provides information to the operator to complete the test. The LCD displays 24 characters, which can be letters, numbers, or symbols.

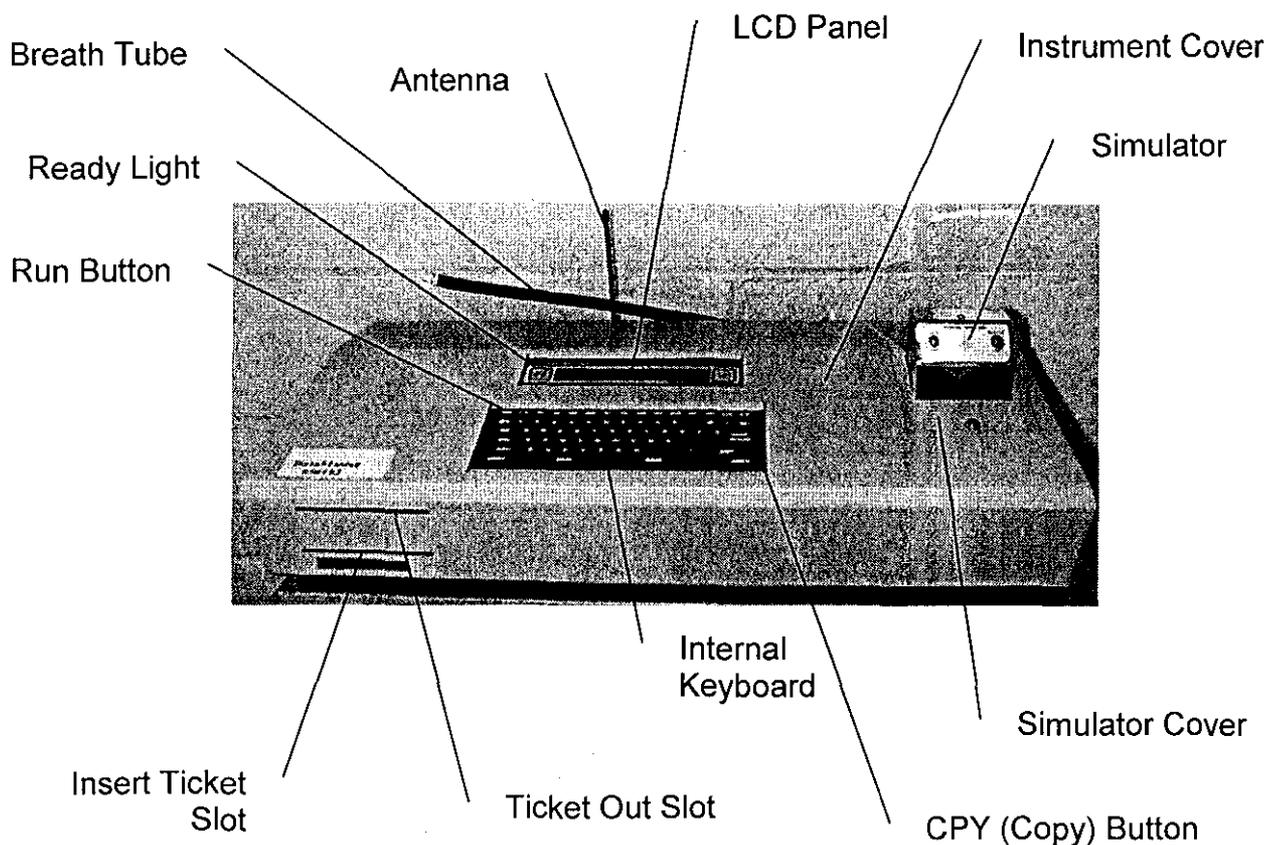
**READY LIGHT:** When illuminated, the green ready light indicates the instrument is ready to begin a test. The instrument should be left with power ON continuously.

**RUN BUTTON:** ~~is~~ used to initiate a subject test. This button is located on the LCD display or the on the upper left of the internal keyboard. Refer to the ~~Infrared Breath Testing Operator Training Manual~~ for an explanation of the subject test.

**SIMULATOR COVER:** ~~The locked cover is 18 gauge steel and may be cleaned with a mild window cleaner such as Windex™.~~ Houses the simulator. Kept locked etc...

**SUPERVISOR PANEL:** This panel contains a set of buttons or pads including the copy button, which control special functions, on instruments starting with serial number 88XXXX through 92XXXX.

*This note  
this pannel is only on*



**Figure 2-2: 95XXXX DataMaster Front and Cover**

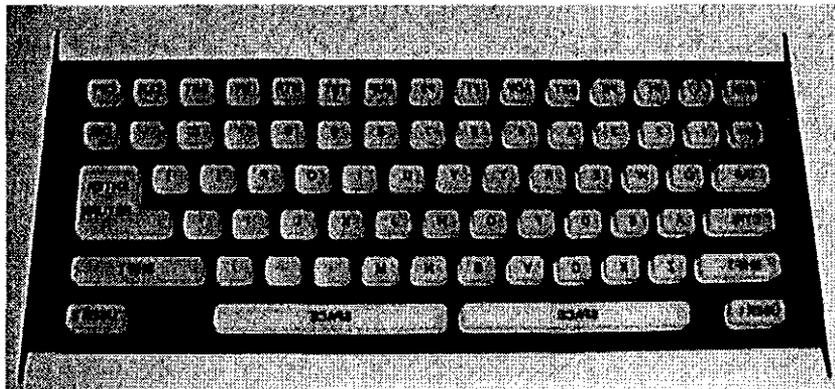
97XXXX 20XXXX

**INSERT TICKET SLOT:** This slot provides the entrance point for the evidence tickets, which is inserted *front side down and top first*. The ticket will advance to a predetermined position for printing data at the completion of the test. Tickets should not be pulled out from this slot, Damage to the printer may occur.

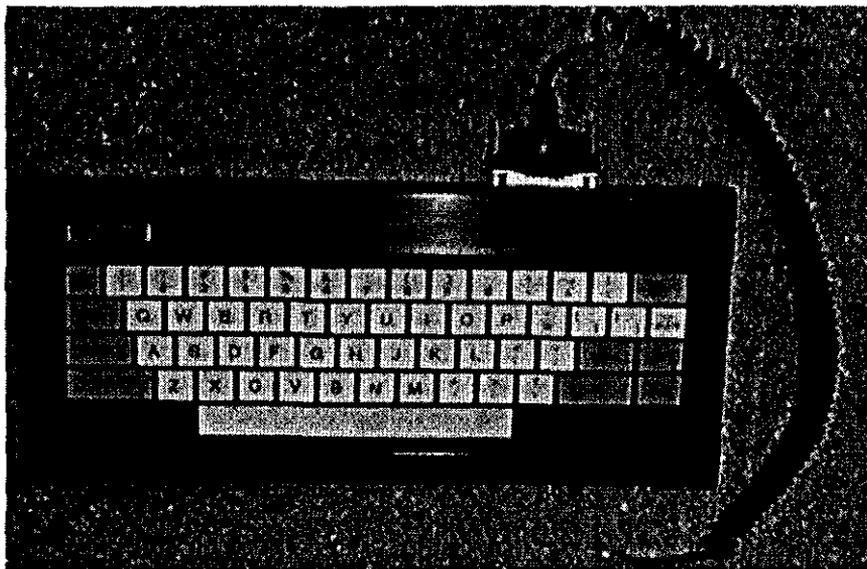
**TICKET OUT SLOT:** This unlabeled slot above the Insert Ticket Slot is the exit port for the evidence ticket at the completion of the test. Operators should allow the printer to come to a complete stop before removing the ticket.

**KEYBOARD:** The keyboard allows the operator to input data for subject and supervisor tests. The keyboards on instruments starting with serial numbers 95XXXX are part of the instrument cover. They are referred to as internal keyboards. 88XXXX instruments use an external keyboard. They plug into the keyboard port on the instrument backpanel.

external keyboard



**Figure 2-3: Internal Keyboard**



**Figure 2-4: External Keyboard**

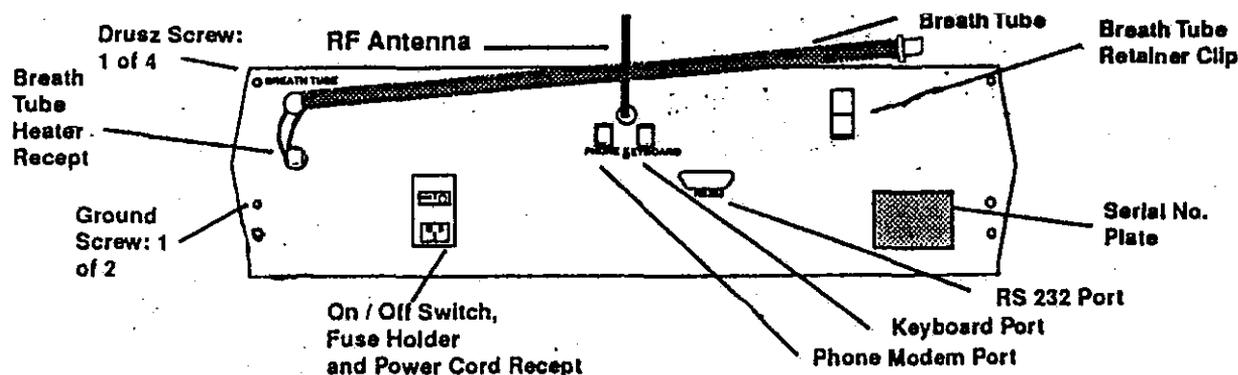


Figure 2-5: DataMaster Backpanel

**BREATH TUBE:** The breath tube is used to provide breath samples to the instrument. It is heated to prevent condensation, and must be used with a new mouthpiece each time a breath sample is delivered to the DataMaster.

**HEATER PLUG:** This <sup>receptacle</sup> plug provides a source of power for the breath tube heater.

**RFI ANTENNA:** The Radio Frequency Interference (RFI) antenna will detect the presence of radio frequency (RF) in the vicinity of the instrument. If RF is detected the instrument will abort a test in progress.

**CAUTION:** <sup>are</sup> portable radio transmitters <sup>they may</sup> if used during testing, will cause the instrument to abort any test in progress. ~~DO NOT USE RADIOS FOR TRANSMITTING DURING A TEST.~~  
*TURN OFF*

**ON/OFF SWITCH:** The power ON/OFF switch is located on the rear panel. Always make sure the power switch is in the OFF position (0) before unplugging and/or plugging the instrument in. ~~The instrument must be plugged into the VDH supplied line conditioner or a VDH approved Uninterruptible Power Supply (UPS). The instrument must not be plugged into the same electrical outlets as heavy-use appliances such as refrigerators, air conditioners, vending machines, computers, coffee makers, soda machines, copiers, drinking fountains, etc.~~ *You already said this*

**POWER CORD RECEPTACLE:** Use only the grounded power cord furnished with the instrument. This receptacle also houses the fuse for incoming power.

**KEYBOARD PORT:** This receptacle is used to connect the keyboard cable to those DataMasters using an external keyboard.

**PHONE MODEM PORT:** This receptacle is used to connect the instrument to a phone line for data transmission (~~downloading~~).

**BREATH TUBE RETAINER CLIP:** This clip is used to cradle the ~~heated~~ breath tube when not in use.

**GROUND SCREWS:** (if applicable) These must be removed along with loosening the 4 Drusz screws to remove the cover. **It is very important that these be replaced when refastening the cover.**

**RS 232 PORT:** This receptacle is used by VDH Technical services staff, ~~to download memory while onsite.~~

Again, it would be more clear if you put all the explanations and all the figures together instead of mixing the figures within the text.

## COMPONENTS INTERNAL

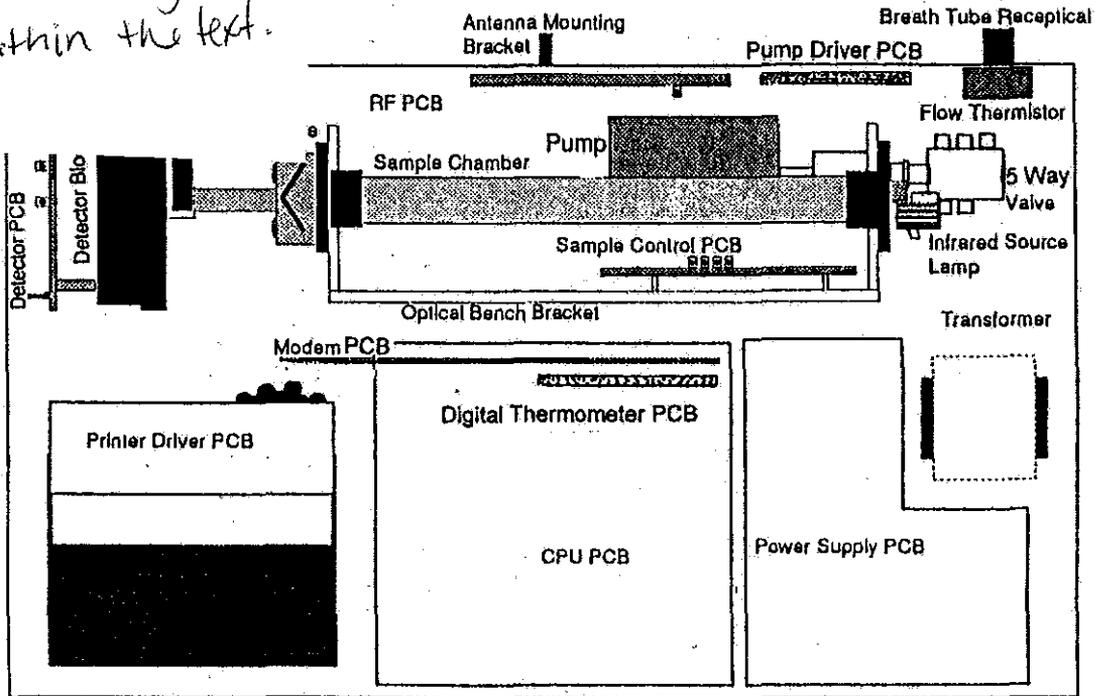


Figure 2-6: DataMaster Internal Components Block Diagram

**Check Valve:** Is a one-way valve that does not allow room air to be sucked back into the sample chamber by a DUI subject.

*Printed Circuit Board (PCB):*

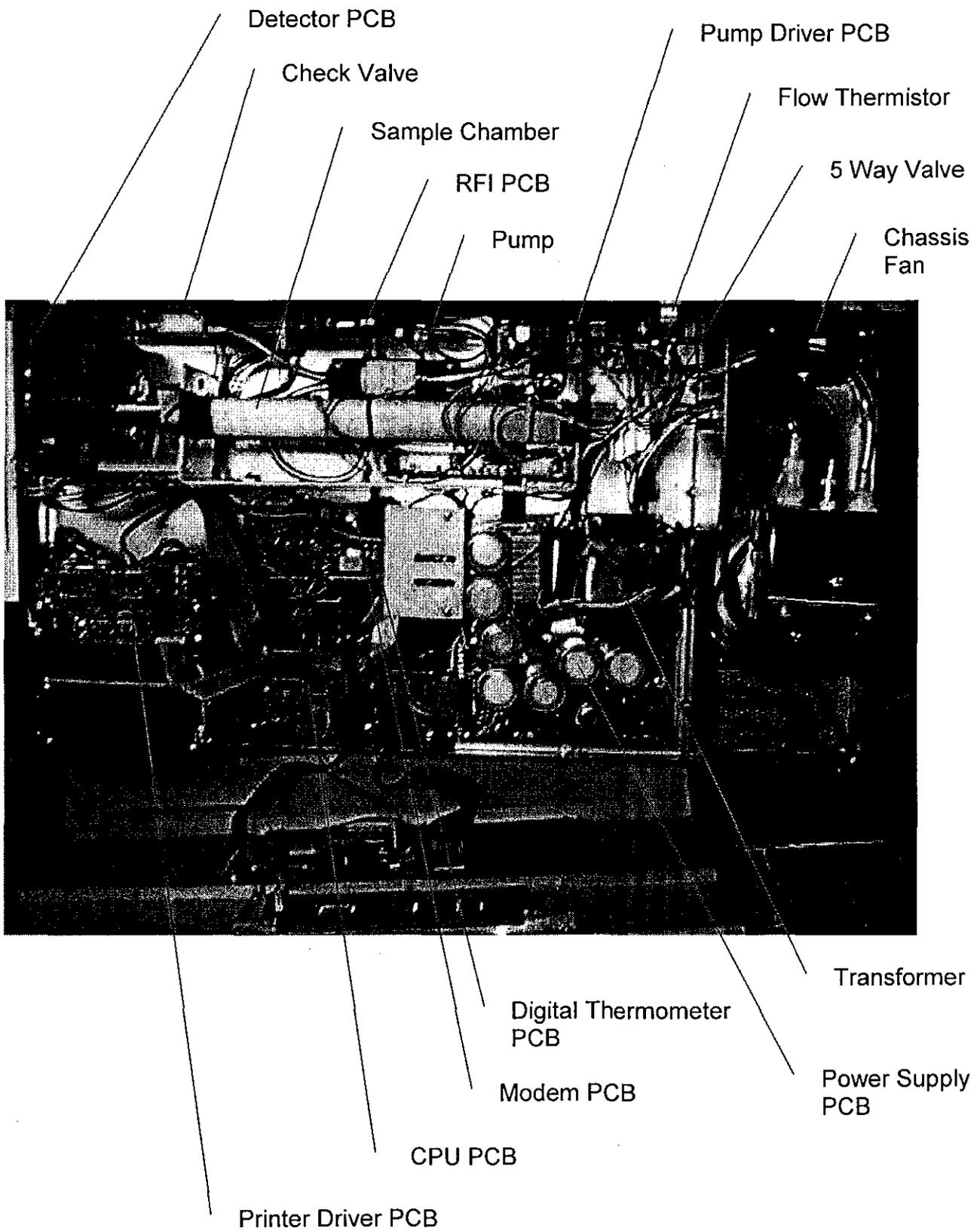
**CPU PCB:** The CPU Printed Circuit Board (PCB) controls the test sequence and instructs the electronic components to automatically perform the various functions during the analysis. It also provides the instructions for storing the data collected on each test.

**Digital Thermometer PCB:** Is the interface between the simulator and the CPU. It monitors the simulator solution temperature.

**Detector Block:** Houses the quartz standard, filters, chopper wheel, and infrared (IR) detector.

**Flow Thermistor:** Monitors the breath flow from the DUI subject.

**Infrared (IR) Source Lamp:** A lamp that emits infrared energy.



**Figure 2-7: DataMaster Internal Components Photo**

**Modem PCB:** Is the interface between the Instrument and the phone line. It ~~assists the Vermont Department of Health DataMaster Technical Services to download stored data memory.~~

**Power Supply PCB:** Converts <sup>(AC)</sup> ~~(AC)~~ alternating current to <sup>(DC)</sup> ~~(DC)~~ direct current. It filters and is a distribution point for the various voltages required by the instrument.

**Printer Assembly:** The printer is a dot matrix printer. This assembly prints the multi-layer evidence tickets.

**Pump:** Pushes and pulls the air ~~sample~~ from the sample chamber.

**Pump Driver PCB:** Is an interface between the CPU PCB and the pump.

**RF PCB:** Monitors for radio frequencies in the vicinity of the instrument.

**Sample Chamber:** The volume of the sample chamber is approximately 50 cc. The sample chamber is composed of three parallel sections with a total length of 1.1 meters through which the infrared energy passes. Mirrors are used to reflect the light through the entire length of the chamber.

**5-Way Valve:** A multi-port valve that directs or expels an air sample to or from the sample chamber. ~~For example: DUI subject's breath sample to the sample chamber, from the simulator to the sample chamber, and from the sample chamber to the room air.~~

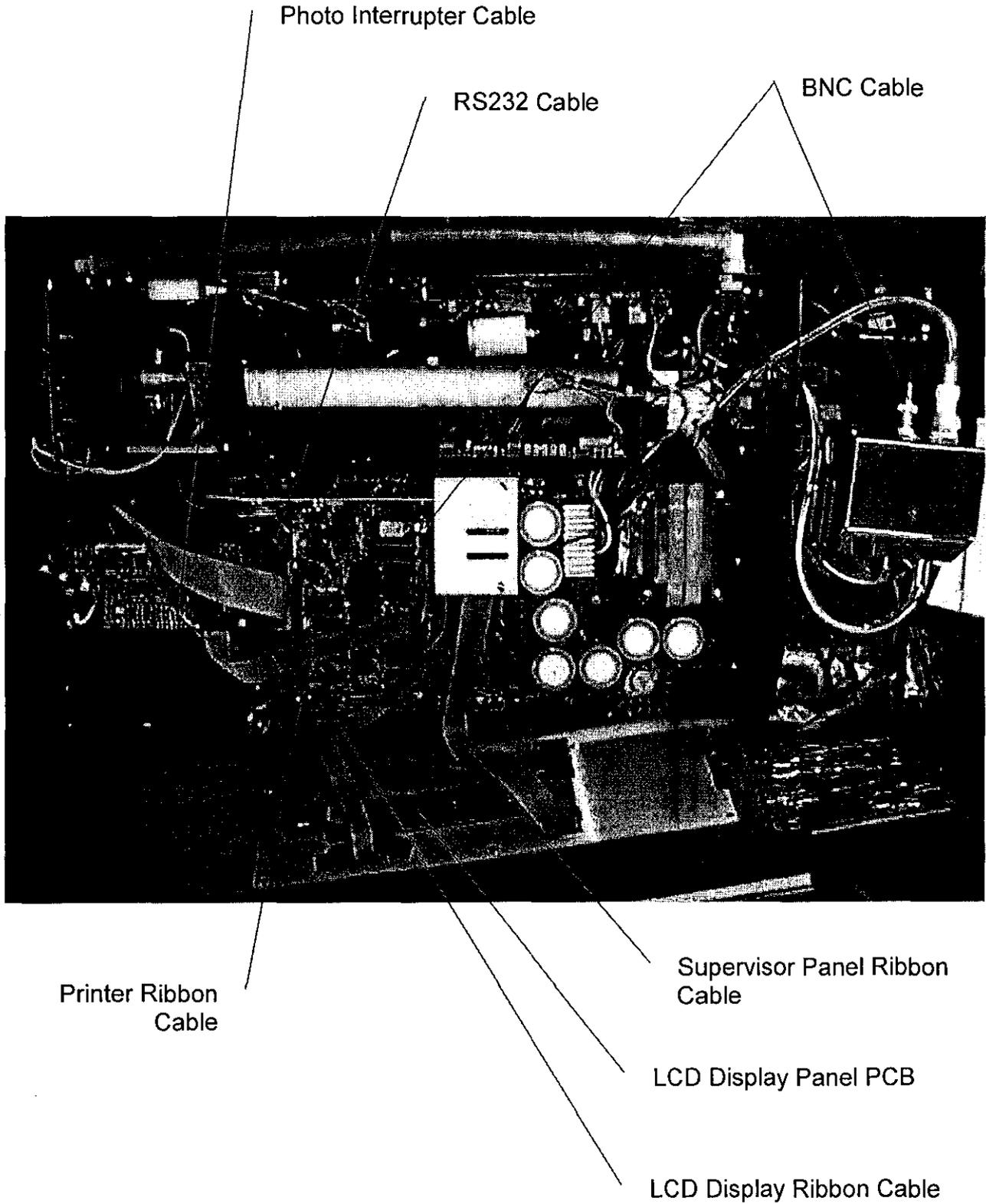


Figure 2-8: 88XXX DataMaster Cables Photo

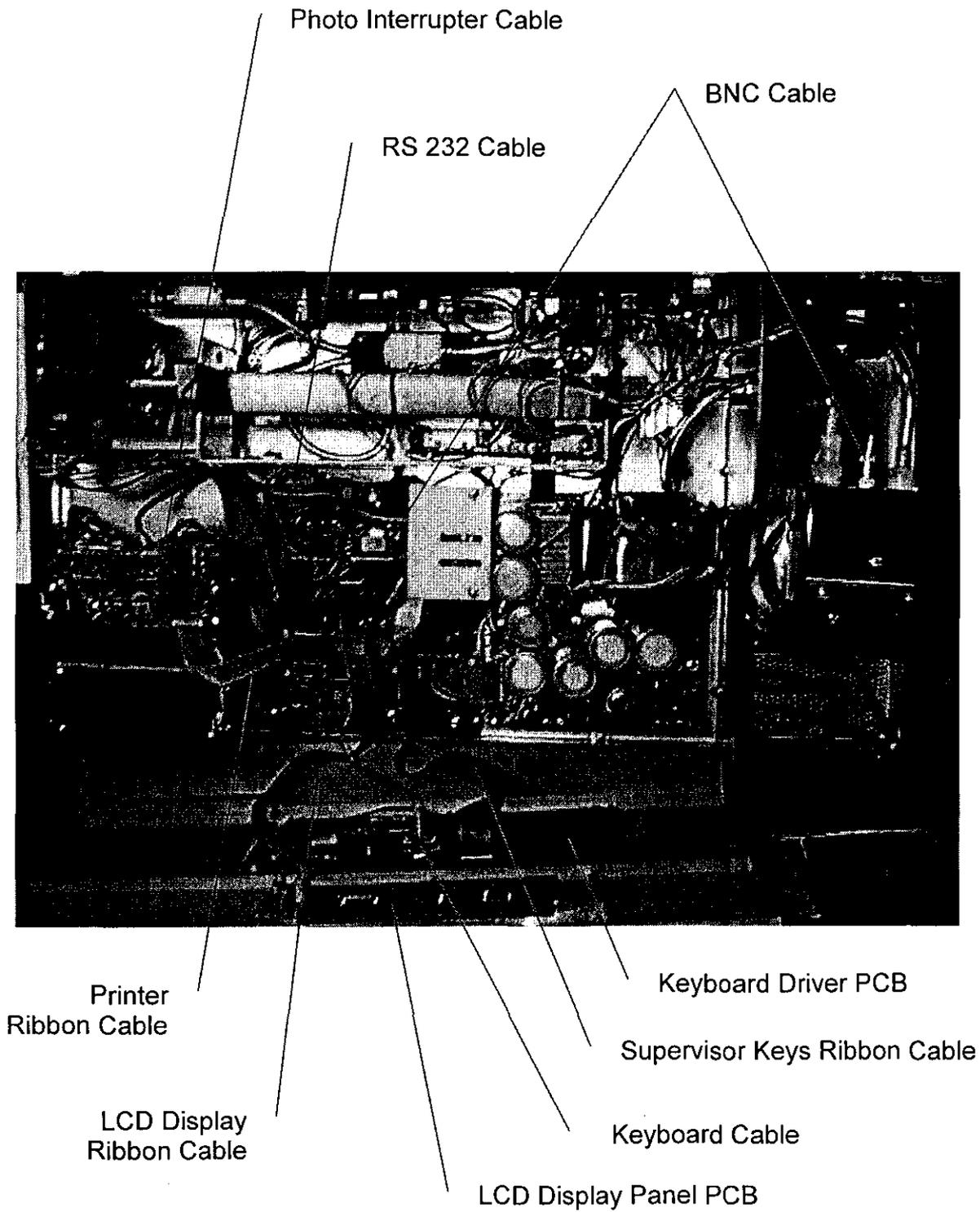


Figure 2-9: 95XXX DataMaster Cables Photo

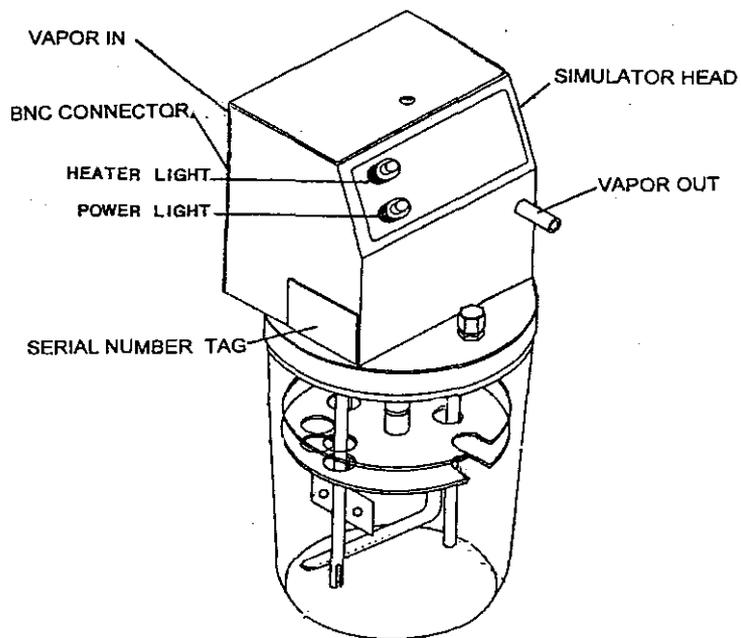
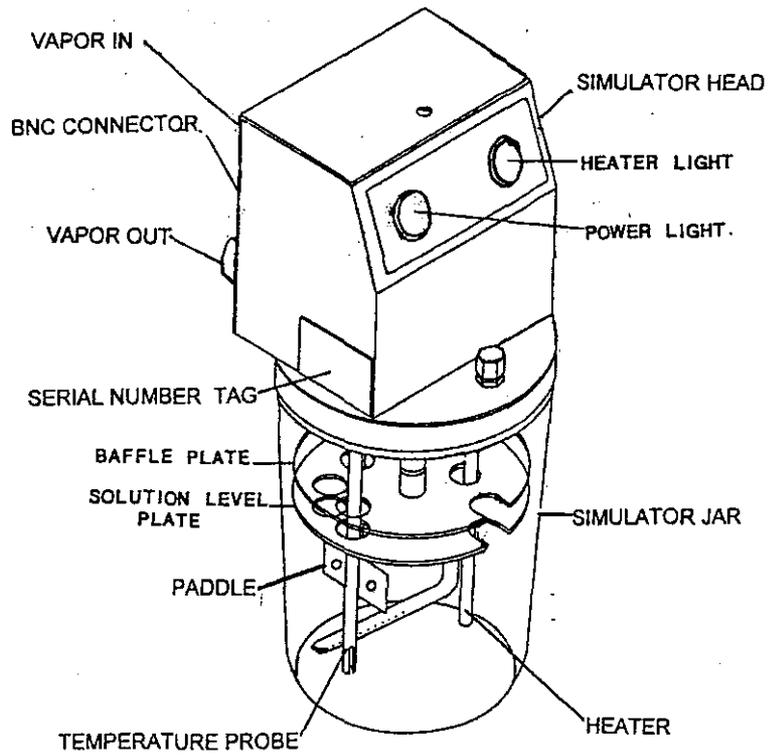


Figure 2-10: Simulator

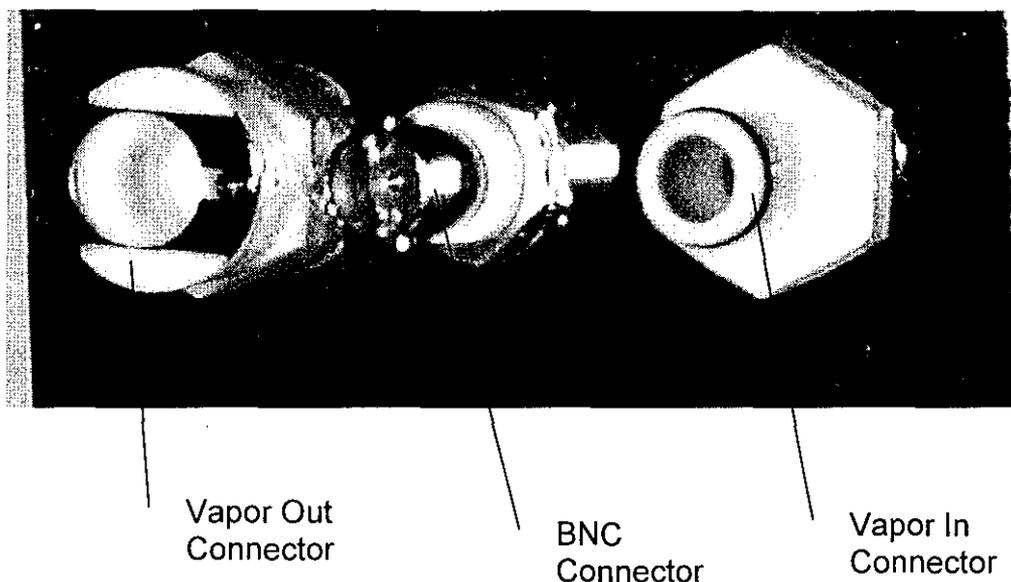


Figure 2-11: Simulator Backpanel Connectors

**SIMULATOR:** The simulator is ~~designed to contain a water-alcohol solution~~ <sup>an aqueous ethanol</sup> and is attached to the BAC DataMaster via two tubes (Vapor In and Vapor Out) and a BNC cable. ~~The simulator is a constant temperature instrument that provides a high precision alcohol-air standard. The solution in the simulator is maintained at a constant temperature range of 33.5° to 34.5° Celsius by an internal heater. The pump pushes room air into the simulator through the Vapor In connection. The alcohol and water vapor is expelled through the Vapor Out connection.~~

The simulator is run as a continuing check sample as part of the instrument's quality control procedure.

**SECTION 3**

**DATAMASTER SUPERVISOR MAINTENANCE/REPAIR**

## DATAMASTER SUPERVISOR MAINTENANCE/REPAIR

If any of the following error messages or conditions occurs, follow the procedures as described. These procedures are to be performed by the DataMaster ~~Instrument~~ Supervisor only.

Law enforcement officers that are not DataMaster Supervisors should refer to the Infrared Breath Testing Device Student Manual. *Italics*

If you are temporarily able to remedy the situation, but the situation ~~continues to occur~~ <sup>reoccurs</sup> contact VDH DataMaster Technical Services ~~by phone, fax, email, or mail~~. Refer to "RESOURCE LIST" in ~~Appendix F~~.

All actions taken on a DataMaster to remedy a condition or error message should be documented in the "Checkup and Maintenance Logbook" [ALC 803].

If you are unable to remedy a condition or error, this ~~needs to be~~ <sup>the problem</sup> documented in the "Checkup and Maintenance Logbook" [ALC 803], in ~~addition to~~ placing the instrument "Out Of Service" and contacting ~~the~~ VDH DataMaster Technical Services.

## INFORMATION NEEDED WHEN CONTACTING VDH DATAMASTER TECHNICAL SERVICES

Please Provide:

- ✚ Your Name
- ✚ Your Contact Number
- ✚ Time you would like to be contacted
- ✚ The DataMaster Location
- ✚ The DataMaster Serial Number
- ✚ The Error Message or Condition that occurred
- ✚ Test Results during and after error message or condition
- ✚ The Detector Voltage
- ✚ The Simulator Temperature
- ✚ What has been done to remedy the problem
- ✚ Results of anything that has been done

← **AMBIENT FAIL**

The instrument analyzes the ambient air being drawn into the instrument during the purge cycle. If the air is contaminated with alcohol or another detectable substance, an ambient fail error is generated.

Common causes of this include:

- A contaminated mouthpiece left in the breath tube during the purge cycle.
  - The breath tube inlet in close proximity to a subject heavily contaminated with alcohol.
  - Recent use of ~~certain~~ <sup>Some</sup> cleaning products with volatile components in the room.
- 1) Remove the mouthpiece.
  - 2) Move the subject away from the instrument.
  - 3) Ventilate the room by opening a window or turning a fan on in the room.
  - 4) Restart the subject test.
  - 5) If situation continues, purge sample chamber for a minimum of 5 minutes.

**AVERAGE CONCENTRATION NOT IN ACCEPTABLE RANGE**

The average concentration is not within the range printed on the simulator solution label after performing the Accuracy and Precision Check. *During RPC*

Common causes of this include:

- The simulator jar is not <sup>properly</sup> tightly threaded. *Damaged jar or O-ring*
  - Tubing is restricted by a kink.
  - The test was run before waiting at least 30 minutes after replacing the solution.
- 1) ~~Check the simulator jar.~~ *ENSURE the simulator jar is properly threaded*
    - a) ~~Is it properly threaded?~~ →
    - b) ~~Is it tight?~~ *The jar should turn approximately 1-¼ turns. DO NOT OVER TIGHTEN.*
  - 2) Check tubing for restrictions.
    - ↑ what tubing? open cover?*

- 3) Wait at least 30 minutes.
- 4) Restart "Accuracy and Precision Check".

## BLACK BAR

The display shows a solid black bar usually across the top portion of the display. No buttons will respond to the touch during this condition. This is a fairly rare condition in the field. This condition usually only happens after a severe electrical disturbance of some nature.

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute <sup>then</sup> and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) When DataMaster <sup>returns to</sup> is in "Ready – Push Run" mode, perform a diagnostic test. Compare parameters from sample ticket <sup>in</sup> Appendix. **E**

If unable to remedy;

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Reseat LCD Display Ribbon Cable at CPU PCB. See Figure 4-8.
- 4) Check LCD Display Ribbon Cable on LCD Display Panel PCB (instrument cover). Reseat connector, <sup>if</sup> necessary. See Figure 4-8, 4-9.
- 5) Install instrument cover.
- 6) Turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 7) When DataMaster <sup>returns to</sup> is in "Ready – Push Run" mode perform a diagnostic test. Compare parameters from sample ticket <sup>in</sup> Appendix. **E**.

## BLANK ERROR

Prior to each test, the DataMaster performs a blank test to verify a near zero reading. If this reading is 0.004 or higher, a "BLANK ERROR" is reported.

Common causes of this include:

- A contaminated mouthpiece left in the breath tube during the purge cycle.
- The breath tube inlet is in close proximity to a subject heavily contaminated with alcohol.

- Recent use of ~~certain~~ cleaning products with volatile components in the room.

- 1) Remove the mouthpiece.
- 2) Move the subject away from the instrument.
- 3) Ventilate the room by opening a window or turning a fan on in the room.
- 4) Restart the subject test.
- 5) If situation continues, purge sample chamber for a minimum of 5 minutes.

### CALIBRATION ERROR

At the time of calibration, <sup>the absorbance</sup> ~~value~~ value of the quartz standard is stored in memory. This value is checked prior to each test sequence. If it is not found to be within 10% of the original value a calibration error will occur.

- 1) Restart the subject test.

### COLD BREATH TUBE/ NOT WARM TO THE TOUCH

The breath tube is warmed to prevent condensation. It is heated with an internal heater wire powered from the receptacle immediately below the breath tube. *Tests may still be run if tube cold, however VDH should be notified.*  
Common causes of this condition include:

- Breath tube heater connector is unplugged
- The heater wire is broken.

*occasionally check*  
**The DataMaster Supervisor should be checking that the Breath Tube is warm to the touch on a regular basis.**

1) Reseat the breath tube heater connector into the breath tube heater receptacle on the back panel. See figure 4-5.

2) After 5 minutes: The breath tube should be warm to the touch.

If yes,

1) Document action taken on Check-Up and Maintenance Log [ALC 803].

If no,

- 1) You may continue to use the instrument.
- 2) Contact VDH DataMaster Technical Services.

*You don't need to say all this again.*

## DAY LIGHT SAVING TIME

Intervention by the DataMaster ~~Instrument Supervisor~~ is required <sup>to</sup> check and ~~Adjust~~ the DataMaster clock.

- 1) Change the time.

## DETECTOR OVERFLOW

The detector output exceeds that readable by the instrument A/D converter. This error will usually happen during a subject or supervisor test.

Possible causes of this include:

- A contaminated mouthpiece left in the breath tube during the purge cycle ,
- Recent use of certain cleaning products with volatile components in the room ,
- ~~Simulator solution or foreign substances from subject's mouth~~ <sup>Contamination in</sup> the sample chamber,
- Subject with a reading greater than 0.6 g/210L <sup>BAC</sup>

- 1) Purge sample chamber for a minimum of 5 minutes.
- 2) Restart the subject test.

## DETECTOR TOO HIGH or DETECTOR TOO LOW

Do you mean <sup>T°</sup>  
or V?

High positive numbers or Low negative numbers will be seen using the "MTR" button.

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) When DataMaster is in "Ready - Push Run" mode perform a diagnostic test. Compare parameters from sample ticket in ~~Appendix~~ <sup>E.</sup>

## DOES NOT ACCEPT BREATH SAMPLE

"PLEASE BLOW" appears, but instrument does not accept sample

- 1) <sup>New mouthpiece</sup> Attempt to provide a sample to the instrument.
- 2) Clear any obstructions from breath tube.

- a) Remove breath tube from back panel
  - b) Blow through breath tube
  - c) Reinstall breath tube on back panel
- 3) Run a subject test when DataMaster displays "Ready – Push Run".

If unable to remedy

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) Run a subject test when DataMaster displays "Ready – Push Run".

If still unable to remedy;

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Carefully clear any obstructions from flow thermistor: *See figure —*
  - a. Remove the clear tubing from the thermistor.
  - b. If black, pull the flow thermistor towards you.
  - c. If white, unscrew the flow thermistor, Use caution screen and wires are fragile.
  - d. Blow through the end that was facing the front of the instrument. **DO NOT** use any objects to ~~pull or push~~ *remove* obstructions ~~out of the~~ *from the* flow thermistor. *should face*
- 4) Reinstall the flow thermistor on the backpanel, *The screen side facing the* **BACKPANEL** and reconnect any tubing removed during above process. *caps not necessary*
- 5) Install instrument cover.
- 6) Turn instrument ON.
- 7) Run a subject test when DataMaster displays "Ready – Push Run".

## DOES ACCEPT <sup>a</sup>INAPPROPRIATE BREATH SAMPLE

The instrument accepts <sup>a</sup>the breath sample during the shallow, intermittent, or suck back tests, performed during the Routine Performance Check.

- 1) Place the instrument <sup>“</sup>out of service.<sup>”</sup>

**FATAL SYSTEM ERROR AT (NNNN) (N= Number)**

Some portion of the software or memory is not responding correctly to the computer.

- 1) Record number indicated by “FATAL SYSTEM ERROR AT ...” message.

**FILTER ERROR**

The instrument is ~~unable to detect~~ <sup>ing incorrect</sup> differences in voltages at the time the optical filters are switched into the light path.

**FLOW DETECTOR ERROR**

The diagnostic test has indicated that the flow thermistor is unable to detect airflow. <sup>[</sup> If, during a diagnostic test the flow detector is determined to be inoperative the pump will not activate. This does not indicate there is a problem with the pump since the computer will not attempt to run the pump if there is no means to sense it running. <sup>]</sup> ~~Unnecessary~~

Common causes include:

- ~~The diagnostic test is attempted after the instrument is just turned on & The DataMaster has not had sufficient time to warm up after being in a cold environment~~
- ~~The instrument has not had sufficient time to warm up prior to attempting a diagnostic test.~~
- There is an obstruction in the breath tube or flow thermistor.
- The flow thermistor is <sup>damaged</sup> broken.

- Allow sufficient time for*
- 1) ~~Wait~~ for instrument to warm up. *(30 mins).*
  - 2) Verify breath tube is warm to the touch.
  - 3) Verify area on back panel near breath tube connector is warm to the touch.
  - 4) Clear any obstructions from breath tube.
    - a) Remove breath tube from back panel
    - b) Gently blow through breath tube
    - c) Reinstall breath tube on back panel
  - 5) Run <sup>subject</sup> test.

If unable to remedy

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) Run a subject test when DataMaster displays "Ready – Push Run".

If still unable to remedy;

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Carefully clear any obstructions from flow thermistor: See Figure 4-6, 4-7.
  - a) If black, pull the flow thermistor towards you.
  - b) If white, unscrew the flow thermistor. Take care of screen and wires.
  - c) Gently blow through the end that was facing the front of the instrument. **DO NOT** use any objects to ~~pull or push~~ <sup>remove</sup> obstructions <sup>from</sup> out of the flow thermistor.

4) → d) Reinstall the flow thermistor on the backpanel. The ~~SCREEN~~ <sup>uncap</sup> side ~~FACING~~ <sup>should</sup> the ~~BACKPANEL.~~ <sup>face</sup>

5) → e) Reconnect any tubing removed during above process.

4) Install instrument cover.

3) Turn instrument ON.

← 6) Run a subject test when DataMaster displays "Ready – Push Run".

### INCORRECT DATE or INCORRECT TIME

- 1) Press **SET** button until the month, day, hour and / or minute is displayed.
- 2) Press **ADV** button until the correct month, day, hour and / or minute is displayed.
- 3) <sup>When finished</sup> "LOG OFF" ~~if no further corrective action required.~~

## INK LINES ACROSS TICKET

Common causes include:

- If the printer ribbon has been installed incorrectly
- The printer head pins are sticking.

1) ~~Visually verify that it is installed properly.~~ <sup>the ribbon is</sup> See Printer ribbon replacement. ~~page~~ \_\_\_\_\_

*You may* Continue to use the instrument, realizing ticket jams and/or printer errors may occur.

## INTERFERENCE DETECTED

*The instrument is detecting a*  
~~There is apparently some substance other than ethanol (ethyl alcohol) present in the sample.~~

1) ~~Start 15-minute observation period again.~~

2) Restart the subject test.

If situation continues,

- 1) Remove the mouthpiece.
- 2) Move the subject away from the instrument.
- 3) Ventilate the room, by opening a window or turning a fan on in the room.
- 4) Restart the subject test.
- 5) If situation continues, purge ~~the~~ <sup>the</sup> Sample Chamber for a minimum of 5 minutes.

## INVALID SAMPLE

The instrument has detected a negative alcohol concentration slope during ~~the~~ <sup>a subject</sup> test.

Common causes include:

- Liquid alcohol in the mouth contaminating the breath sample
- Improper technique in providing a breath sample.

*3)* ~~Remove the mouthpiece.~~ <sup>Use a new</sup>

*If error continues*

- 4) Move the subject away from the instrument.
- 5) Ventilate the room, by opening a window or turning a fan on in the room.
- 4) Restart the 15 minute Observation Time
- 5) Restart the subject test. *Instruct subject on proper delivery of spl*
- 6) If situation continues, purge Sample Chamber for a minimum of 5 minutes.

**KEYBOARD DOES NOT FUNCTION**

**DATA ENTRY KEYS WILL NOT RESPOND** *Usually the supervisor function keys will respond. ~~will~~ may still*

**EXTERNAL KEYBOARD:**

- 1) Disconnect keyboard cable from back panel of instrument.
- 2) Reconnect keyboard cable into *the keyboard* appropriate receptacle (~~keyboard port~~ *the*) on back panel ~~to the left of the antenna (while facing front of instrument)~~. See Figure 4-5.
- 3) Press any key on the external keyboard. There should be a beep for each press of the keys.
- 4) *Retry keys* ~~Run a subject test.~~

~~**KEYBOARD DOES NOT FUNCTION**~~

~~**DATA ENTRY KEYS WILL NOT RESPOND** Usually the supervisor function keys will respond.~~

**INTERNAL KEYBOARD:**

- 1) Remove instrument cover.
- 2) Check Keyboard Cable (Yellow, blue, green cable) to assure that it is properly seated and in correct location on the Keyboard Driver PCB on instrument cover and the CPU PCB. See Figure 4-9.
- 3) Install the instrument cover.
- 4) *Retry keys* ~~Run a subject test.~~

## ~~KEYBOARD DOES NOT FUNCTION~~

### ~~SUPERVISOR FUNCTION KEYS WILL NOT RESPOND~~

#### EXTERNAL KEYBOARD:

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) Run a diagnostic test.

If unable to remedy;

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Reseat Supervisor Panel Ribbon Cable at CPU PCB. See Figure 4-8
- 4) Check Supervisor Panel Ribbon Cable on LCD Display Panel PCB (instrument cover). Reseat connector, if necessary. See Figure 4-8
- 5) Install instrument cover.
- 6) Turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 7) Run a diagnostic test.

## ~~KEYBOARD DOES NOT FUNCTION~~

### ~~SUPERVISOR FUNCTION KEYS WILL NOT RESPOND~~

#### INTERNAL KEYBOARD:

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Check Supervisor Keys Ribbon Cable to assure that it is properly seated and in correct location on the Keyboard Driver PCB (instrument cover) and the CPU PCB. See Figure 4-9.

- 4) Install the instrument cover.
- 5) Turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 6) Press any key on the internal keyboard.
- 7) Run a diagnostic test.

## LEAP YEAR

No intervention by the DataMaster Instrument Supervisor should be required. The instrument will automatically advance to the required day when appropriate.

If it does not change automatically:

- 1) Change the date

## LOCKED OR FROZEN DISPLAY

No buttons will respond to the touch during this condition.

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) Run a diagnostic test. Compare parameters from sample ticket in Appendix *E*.

If unable to remedy;

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove instrument cover.
- 3) Reseat LCD Display Ribbon Cable at CPU board. See Figure 4-8, 4-9.
- 4) Check LCD Display Ribbon Cable on LCD Display Panel PCB (instrument cover). Reseat connector, if necessary. See Figure 4-8, 4-9.
- 4) Install instrument cover.
- 5) Turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 6) Run a diagnostic test. Compare parameters from sample ticket in Appendix *E*.

## LOG OFF

This feature locks all Supervisor Function keys. Once you have initiated the Log Off option, a password is required to perform any supervisor function.

To Log Off instrument:

- 1) Press the **F1** key until "LOG OFF" is blinking on the LCD Display.
- 2) Press **F2** to initiate.

## MEMORY FULL

The memory chip, which stores the test data, is full.

- 1) Contact VDHL/DataMaster Technical Services.

## MEMORY NEAR END

The memory chip that stores the test data is almost full.

- 1) Contact VDHL/DataMaster Technical Services.

## NOT CALIBRATED

The calibration factors have been lost due to memory failure.

- 1) *Remove instrument from it*  
Take ~~instrument~~ out of service by turning off with switch at back of ~~instrument~~.

## NOT SET UP

The stored default options have not been established.

- 1) Press **F1** until "RESET OPTIONS" appears on instrument display.
- 2) Press **F2** to reset options.
- 3) Press **F1** until "PRINT OPTIONS" appears on instrument display.
- 4) Press **F2** to print options.
- 5) Compare parameters to sample default options ticket in ~~an~~ appendix.?
- 7) Run a subject test. ← ?

*\* Sup  
MUST  
Contact  
VDHL if  
default  
options are  
reset!*

## PRINTER ERROR

The printer is unable to respond to the computer.

Common causes include:

- There may be a stuck ticket,
- There may be a loose or disconnected cable.
- The printer head may be stuck in mid travel. If attempts are made to insert a ticket without freeing the printer head, the Printer Driver PCB will be damaged. *Do not insert a ticket.*

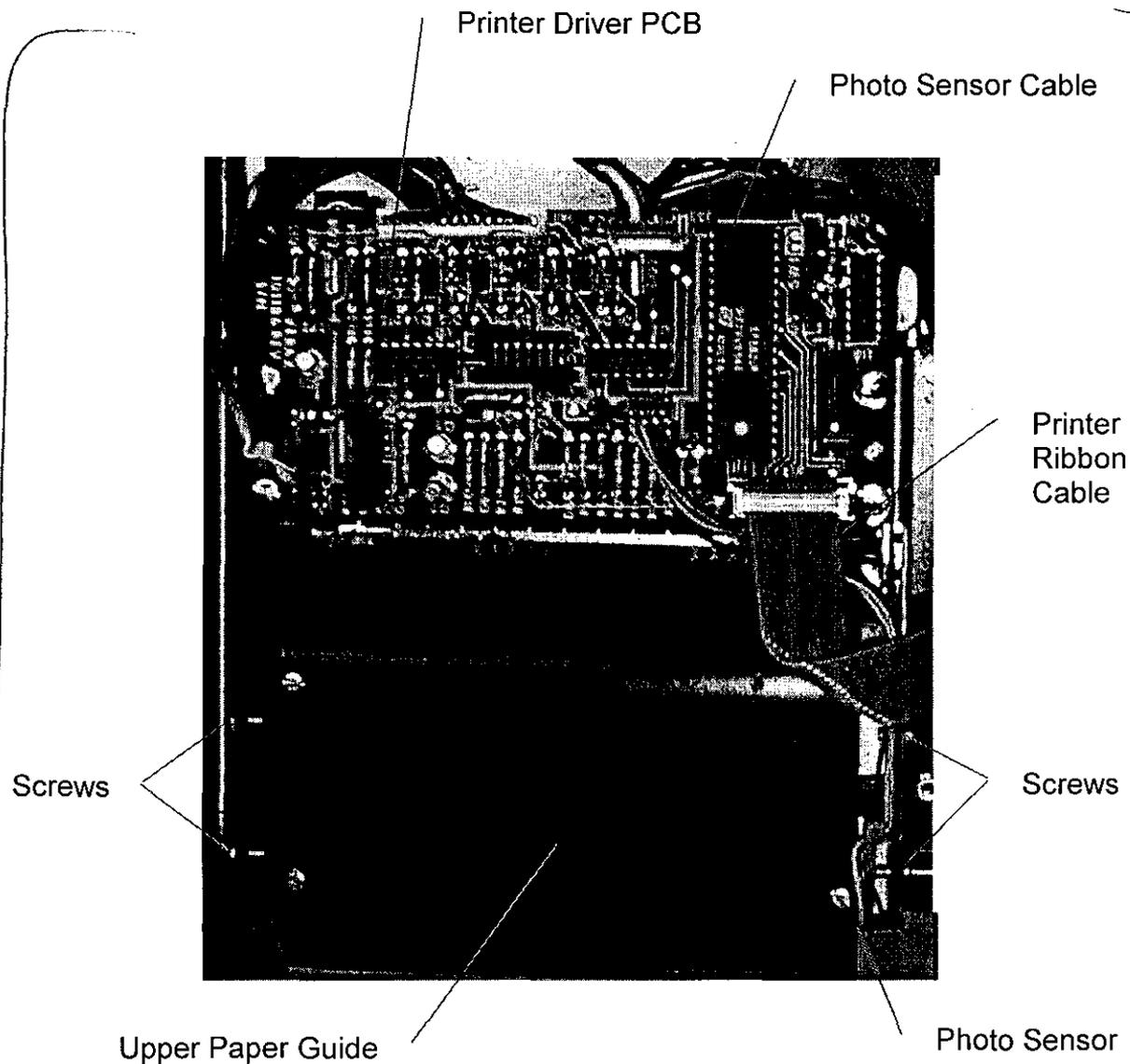


Figure 3-1: Printer Assembly

*this fig should be in the components section, not here.*

**PRINTER ERROR**

**EVIDENCE TICKET HAS JAMMED IN PRINTER**

- 1) Attempt to remove jammed ticket. Use extreme care. If the ticket is pulled from the bottom slot the printer ribbon may be pulled into the printer head and worm gear. If possible, pull from the Ticket Out Slot (top). If unable to remove ticket, proceed to 2.
- 2) Remove instrument cover.

- 3) Remove jammed ticket.
- 4) Ensure that the printer ribbon is clear of worm gear. See Figure 6-2.
- 5) Manually reposition the printer head by turning the white drive gear located on the lower left side of the printer chassis in either direction. See Figure 6-2.

If mechanism does **not move freely**,

- 1) ~~Take instrument out of service~~ by turning off with switch at back, ~~of instrument~~.  
*Remove instrument from*

If mechanism **moves freely**,

- 1) Check Printer Ribbon Cable to assure that it is seated properly. See Figure 4-8, 4-9.
- 2) Test the printer by pressing the **CPY** key. If instrument prints the ticket correctly (title lines only), then you have completed the task.
- 3) Install the instrument cover.

*There is no fig 6-2?*

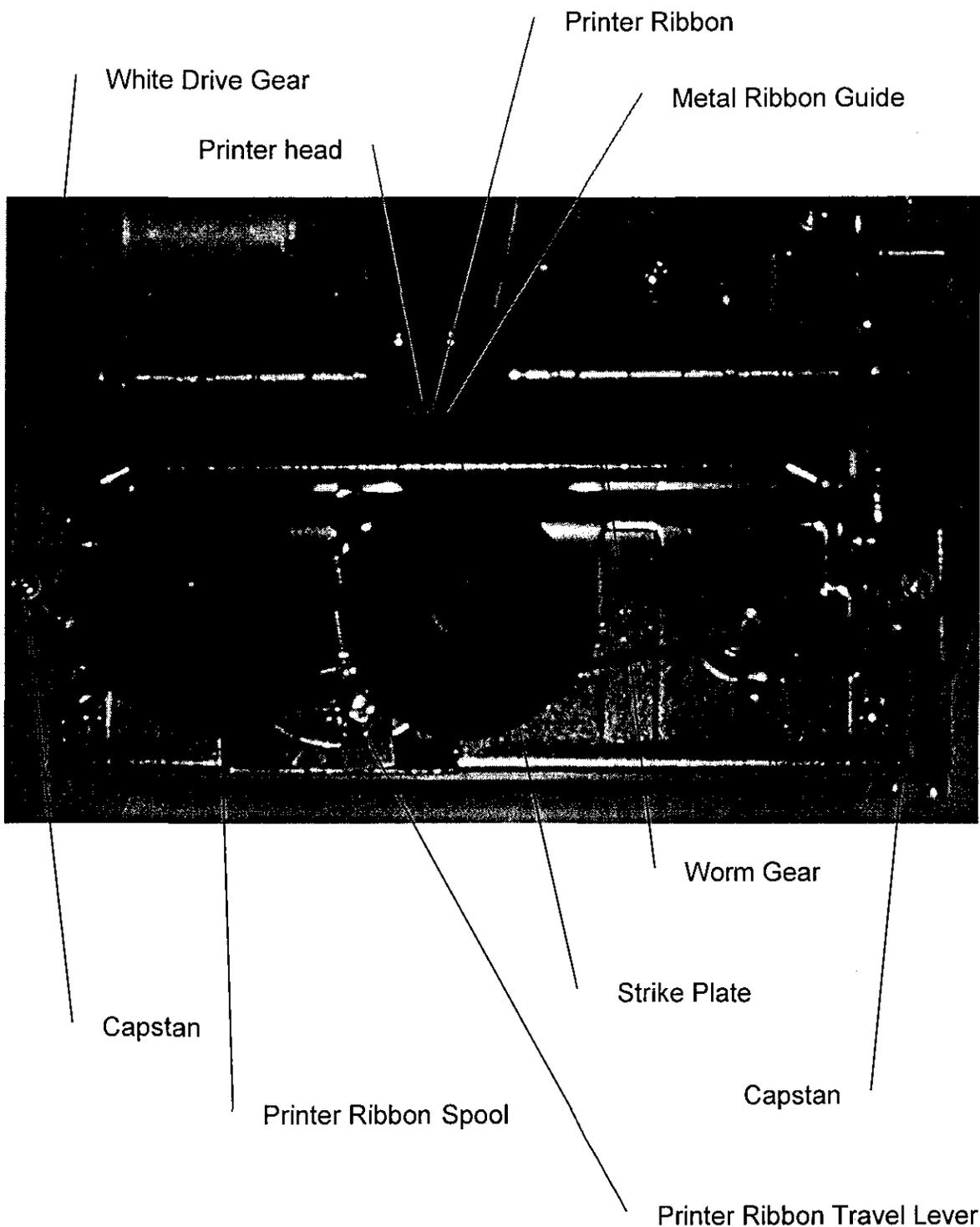


Figure 3-2: Printer Ribbon Path

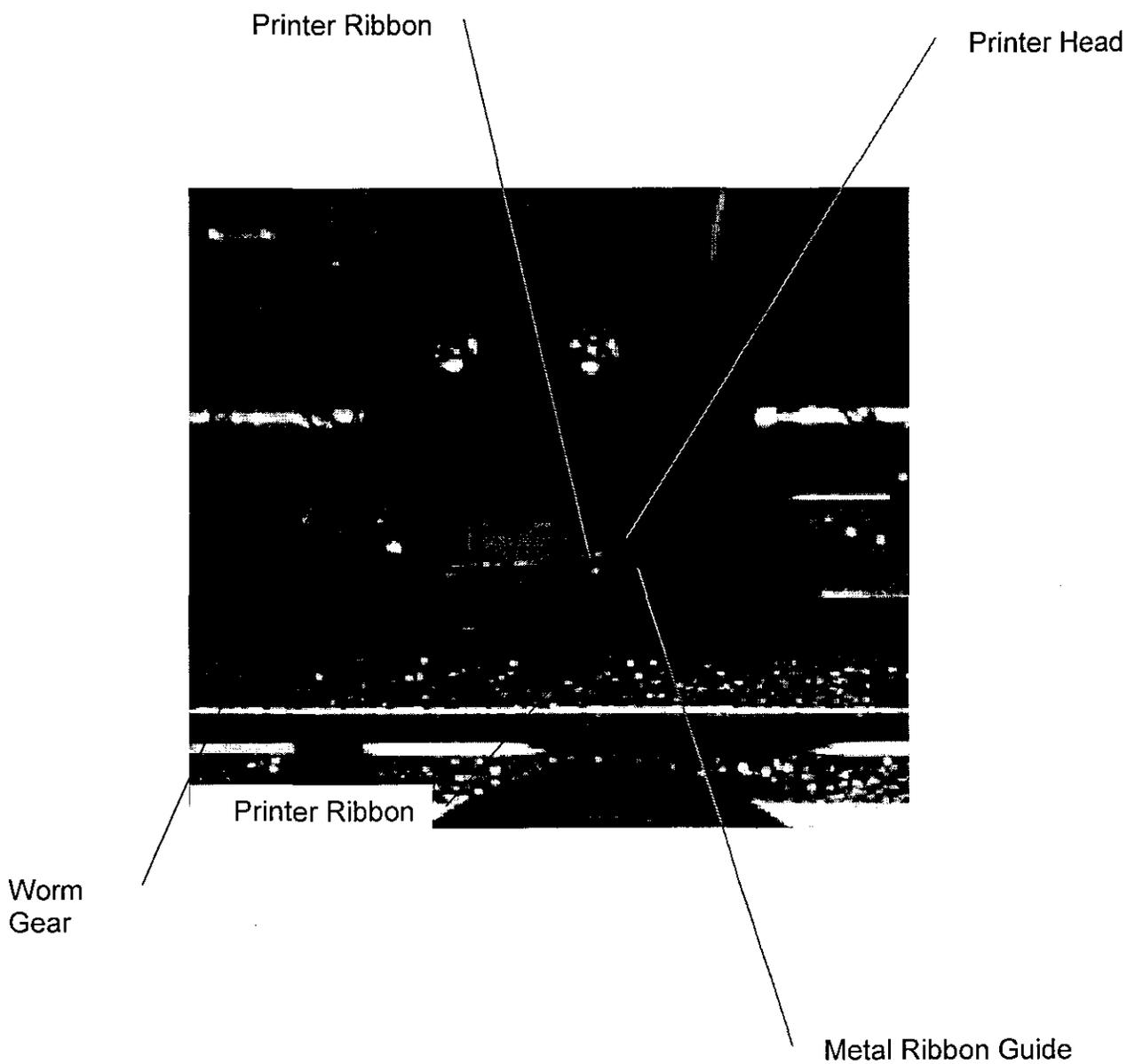
*Move to components section*

**PRINTER RUNS CONTINUOUSLY**

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON.
- 3) Test the printer by pressing the **CPY** key. ~~If instrument prints the ticket correctly (title lines only) then you have completed the task.~~

If unable to remedy,

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Remove the instrument cover.
- 3) *Remove any* ~~Look for~~ debris interfering with photo-sensor ~~and clear, if found.~~ See Figure *6-1.*
- 4) Remove Printer Ribbon Cable between CPU PCB and Printer Driver PCB. See Figure 4-8.
- 5) Reconnect Printer Ribbon Cable between CPU PCB and Printer Driver PCB. See Figure 4-8.
- 6) Check all ribbon cables to ensure that they are firmly seated. See Figure 4-8.
- 7) Install instrument cover.
- 8) Turn instrument ON.
- 9) Test the printer by pressing the **CPY** key. ~~If instrument prints the ticket correctly (title lines only) then you have completed the task.~~



*move to  
components  
section*

**Figure 3-3: Printer Head**

**PRINTER RIBBON REPLACEMENT**

Replace printer ribbon when the print is light, non-uniform or ribbon is damaged.

- 1) ~~Contact VDH DataMaster Technical Services for replacement printer ribbon.~~
- 2) Turn instrument OFF with switch at rear of instrument.
- 3) Remove the instrument cover.
- 4) Remove one screw on right-hand side and one screw on left-hand side at rear of upper paper guide. See Figure 6-1.
- 5) Loosen one screw on right-hand and one screw on left-hand side at front of printer housing. See Figure 6-1.
- 6) Swing rear of upper paper guide toward front of instrument to expose printer ribbon spools. See Figure 6-1.
- 7) Remove printer ribbon by lifting both printer ribbon spools straight up and sliding printer ribbon from between metal ribbon guide and printer head. See Figure 6-2.
- 8) Manually reposition the printer head <sup>to the center of the printer assembly</sup> by turning the white drive gear located on the lower left side of the printer chassis. ~~in either direction, to the center of the printer assembly.~~ See Figure 6-2.
- 9) Unwind <sup>approximately</sup> about 6 inches of new ribbon.
- 10) <sup>Slide</sup> Place ribbon between metal ribbon guide and printer head. See Figure 6-3.
- 11) Place ribbon on outside of capstans on left and right side of printer. See Figure 6-2.
- 12) Drop spools down onto spindles and seat by rotating spools. See Figure 6-2.
- 13) Swing rear of upper paper guide down into place. See Figure 6-1. <sup>↑? do you mean tighten ribbon?</sup>
- 14) Replace both screws at rear of paper guide. See Figure 6-1.
- 15) Tighten all four screws at front and rear of paper guide. See Figure 6-1.
- 16) Install instrument cover.
- 17) Turn instrument ON.
- 18) Test the printer by pressing the **CPY** key. ~~If instrument prints the ticket correctly (title lines only) then you have completed the task.~~

**PRINTER WON'T TAKE TICKET**

The LCD display prompts the Operator <sup>to insert</sup> for a ticket, but the ticket will not feed through the printer.

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) ~~Run a diagnostic test after instrument reaches "Ready- Push Run". Compare parameters from sample ticket in Appendix. E~~ <sup>When instrument returns to "Ready- Push Run", perform a diagnostic test</sup>

**PUMP ERROR**

<sup>is operating</sup> The flow thermistor does not detect airflow. Any situation that stops the airflow while the pump ~~should be working~~ will create this condition. ~~Look for obstructions that prevent air from coming into the breath tube, loose or disconnected tubing inside the DataMaster.~~ <sup>may</sup>

- 1) Place fresh mouthpiece on breath tube.
- 2) Alternately blow into and suck back strongly and rapidly on breath tube 5-6 times.
- 3) Clear any obstructions in breath tube. (How?)
- 4) Clear any obstructions in flow thermistor. See "Flow Detector Error" <sup>page #</sup> for instructions.
- 5) <sup>Perform</sup> ~~Run~~ a diagnostic test. Compare parameters to sample ticket in Appendix. E
- 6) ~~Document action taken on Check-Up and Maintenance Log [ALC 803].~~

If unable to remedy,

- 1) Remove instrument cover.
- 2) Check all tubing connections to assure that they are properly connected. See figure 6-4.
- 3) Check Pump Driver PCB cable connections for proper seat. See Figure 4-8, 4-9.
- 4) Check CPU PCB cable connections for proper seat. See figure 4-8, 4-9.
- 5) Install instrument cover.
- 6) <sup>Perform</sup> ~~Push TST~~ to run a diagnostic test.

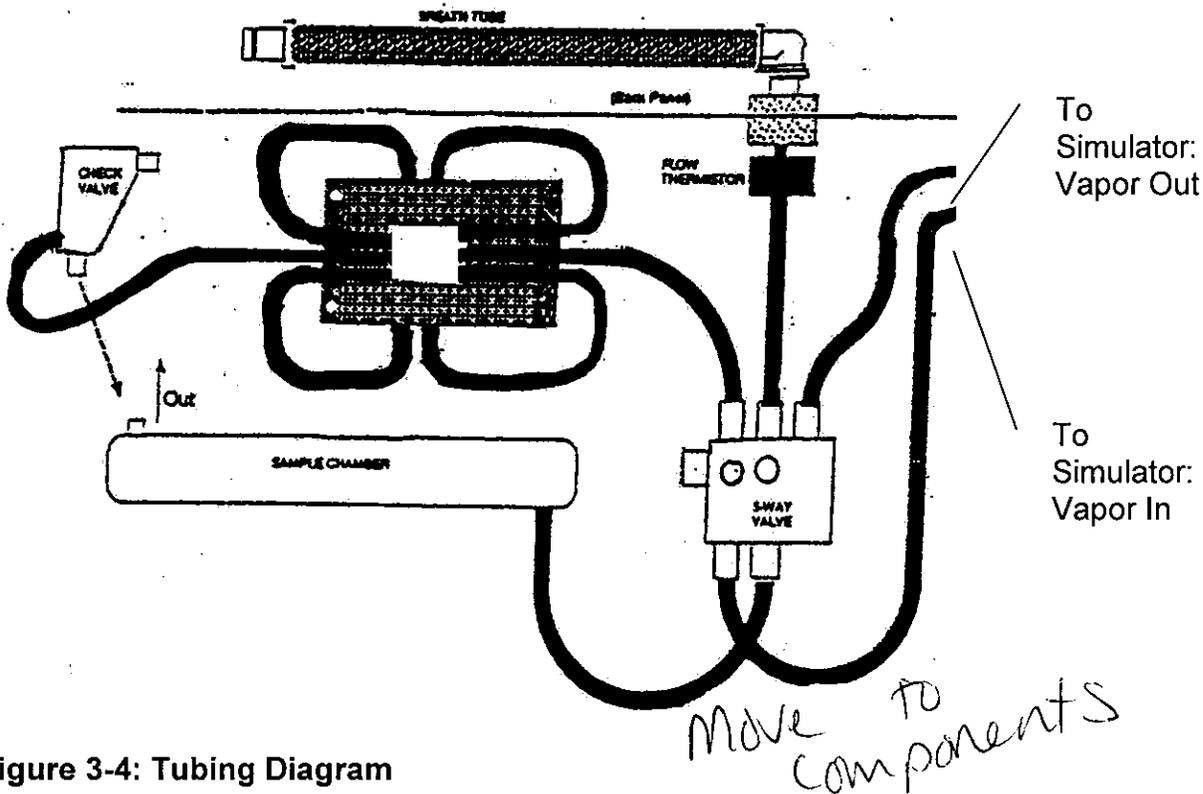


Figure 3-4: Tubing Diagram

### RADIO INTERFERENCE

When a "RADIO INTERFERENCE" message is displayed, it means that the RF (radio frequency) detection circuit has been activated.

Common causes include:

- A handheld radio may have been keyed for transmission near the instrument.
- The RF antenna may have been touched.

- 1) Restart subject test.
- 2) Make sure nothing is touching the antenna.
- 3) Make sure all hand-held radios are turned off or not keyed for transmission in the vicinity of the instrument.

**RAM ERROR AT (NNNN) (N=Number)**

Random access memory (RAM) bit check does not match the calculated value.

1) Record number indicated by "RAM ERROR AT" message.

2) Remove instrument from service by turning it off w/ switch on back.

**SIMULATOR OUT OF RANGE**

The expected external standard simulator value is outside of the acceptable range of 0.090 to 0.110.

If the external standard is **less than 0.90**:

1) Replace simulator solution.

- You have already said this 2x*
- a) ~~If you replace the simulator solution anytime other than February, June, and October complete the "BAC DataMaster Simulator Solution Change Worksheet" [ALC 630] while following the "Instructions for Changing the Simulator Solution in the BAC DataMaster" [ALC 437]. DO NOT perform a Routine Performance Check.~~

If unable to remedy,

- 1) Did you wait 30 minutes before performing test?
- 2) Check Simulator Temperature is between 33.5°C and 34.5°C.
- 3) Check that Simulator Jar is tight.
- 4) Check tubing connections for kinks and connections <sup>are</sup> properly seated.
- 5) Run subject test. Respond Y (yes) to second test requested. ← ? huh?
- 6) Verify that the first and second tests external standards printed on the ticket fall within the range printed on the simulator solution bottle label. Retain the ticket.
- 7) ~~Record subject test in Operator Log in DataMaster Instrument Logbook.~~

If the external standard is **greater than (above) 0.110**:

- 1) Check Simulator Temperature is between 33.5°C and 34.5°C.
- 2) Check simulator paddle. Is it turning? If not, see Section 6; "SIMULATOR TEMPERATURE ERROR"

*there  
is no  
Sec 6*

- 3) Run subject test. Respond **Y** (yes) to second test requested. ?
- 4) Verify that the first and second tests external standards printed on the ticket fall within the range printed on the simulator solution bottle label.
- 5) Record subject test in DataMaster Operator Logbook.

## SIMULATOR TEMPERATURE ERROR

Appears when the monitoring system reports that the simulator temperature is outside of the acceptable range of 33.5°C to 34.5°C.

- 1) Check simulator temperature by pressing **MTR**.

If simulator temperature <sup>reads</sup> is **5.01**,

The BNC cable may be disconnected at the Simulator or the Digital Thermometer PCB. See Figure 4-6, 4-7, 4-8, 4-9.

- 1) Remove simulator cover.
- 2) Reseat the BNC cable connector on the simulator head. See Figure 4-11.
- 3) Check simulator temperature by pressing **MTR**.

If simulator temperature **returned to acceptable range**,

- 1) Install simulator cover.
- 2) Run diagnostic test.
- 3) Document action taken on Check-Up and Maintenance Log [ALC 803].

If the simulator temperature is **still 5.01**,

- 1) Remove instrument cover.
- 2) Reseat BNC cable connector on Digital Thermometer PCB. (Connector on upper left corner of board). See Figure 4-6, 4-7.
- 3) Check simulator temperature by pressing **MTR**.

If simulator temperature **returned to acceptable range**,

- 1) Install instrument cover.

*fix font*

*This section can be condensed and better organized.*

- 2) Install simulator cover.
- 3) Run diagnostic test.

If the simulator temperature is **still 5.01**,

- 1) Install instrument cover.
- 2) Install simulator cover.

If simulator temperature is **34.5°C or higher**,

- 1) Remove simulator cover.
  - 2) Disconnect BNC connector and tubing connections from Simulator. See Figure 4-11.
  - 3) Remove simulator from simulator compartment.
  - 4) Visually check the simulator paddle. If simulator **paddle is turning**, See Figure 4-10.
- 1) Check room temperature for acceptable operating temperature range (65°F to 85°F). If room is too warm, Simulator cannot cool properly.

If **room is NOT** in acceptable operating temperature range,

- 1) Adjust room temperature to acceptable operating temperature range.

If **room is in acceptable** operating temperature range,

- 2) Is the chassis fan working? Fan is controlled by thermostat. When chassis interior temperature warm, fan will turn on. Should exhaust away from backpanel. See Figure 4-7.

**If fan is not working,**

- 1) Place instrument in "OUT OF SERVICE" mode.

**If fan is working,**

- 1) Check for objects around and under instrument that may inhibit proper cooling. e.g.: plastic bags, boxes behind or under instrument.

Remove objects around instrument.

- 2) Run diagnostic test.

**If simulator paddle is not turning,**

PLEASE READ 1 – 4 COMPLETELY BEFORE PROCEEDING.

Attempt to start paddle turning.

- 1) Carefully unscrew simulator jar from simulator head. DO NOT completely separate jar from head yet. The heater can be damaged if removed from the solution, with power on, for more than 30 seconds. See Figure 4-10.
- 2) Carefully lift the simulator head till the simulator paddle is just above the surface of the solution.
- 3) Using your finger, gently turn the paddle.
- 4) If it begins to turn, immediately replace the simulator head. Be sure the simulator head and jar are properly seated. The jar should turn approximately 1¼ turns. It should be snug. DO NOT OVERTIGHTEN.

If simulator paddle is **still not turning**,

- 1) Unplug simulator.
- 2) Place simulator in simulator compartment.
- 3) Replace simulator cover.

If simulator paddle **is turning**,

- 1) After approximately 10 minutes, check simulator temperature by pressing **MTR**.
- 2) Run diagnostic test.

If simulator temperature is **33.5°C or less**,

- 1) Verify the power light is on.
- 2) Is the Heater light on and/or blinking.

If **power and heater lights are on**, See Figure 4-10.

- 1) Place instrument in “OUT OF SERVICE” mode.

If **power and heater lights are NOT on**,

- 1) Place instrument in “OUT OF SERVICE” mode.

**STANDARD DEVIATION IS NOT ACCEPTABLE**

The standard deviation is <sup>reported</sup> greater than or equal to <sup>0.002</sup> ~~after performing~~ <sup>on</sup> the Accuracy and Precision Check <sup>results</sup> during the Routine Performance Check.

Common causes include:

- The simulator jar is not <sup>properly threaded</sup> tight to the simulator head.
  - Tubing is loose or restricted by a kink,
  - The test was run before waiting 30 minutes after replacing the solution.
- 1) Check the simulator jar.
    - a) Is it properly threaded?
    - b) Is it tight? The jar should turn approximately 1 ¼ turns. DO NOT OVER TIGHTEN.
  - 2) Check tubing for restrictions.
  - 3) Restart "Accuracy and Precision Check".

*O-Ring?  
Chipped jar?*

**SYSTEM WON'T ZERO**

Prior to each analysis for alcohol the instrument determines its zero reference point. ~~Should it be unable to do this, a "SYSTEM WONT ZERO" message occurs.~~ *If the instrument is unable to purge the sample chamber to reach a zero*

Common causes of this include: *reference point, the instrument will display "System won't zero".*

- A contaminated mouthpiece left in the breath tube during the purge cycle.
  - The breath tube inlet <sup>is</sup> in close proximity to a test subject with <sup>a</sup> high alcohol concentration,
  - Recent use of ~~certain~~ cleaning products with volatile components in the room <sup>processing</sup>.
- 1) Remove the mouthpiece.
  - 2) Move the subject away from the instrument.
  - 3) Ventilate the room, by opening a window or turning a fan on in the room.

- 4) Restart the subject test.
- 5) If situation continues, purge sample chamber for a minimum of 5 minutes.

### TEMPERATURE HIGH

The sample chamber temperature has risen to 55°C or above. This is typically a maintenance problem although unusually warm room conditions ~~can~~ <sup>may</sup> also cause this ~~error~~.

- 1) Turn the instrument off and allow it to cool for 15 minutes.
- 2) ~~Check~~ <sup>Adjust</sup> room temperature <sup>to</sup> for acceptable operating temperature range. If room is too warm, instrument cannot cool properly.

If ~~room is NOT~~ in acceptable operating temperature range, (65°F to 85°F)

- 1) ~~Adjust room temperature to acceptable operating temperature range.~~

If ~~room is in acceptable~~ operating temperature range,

- 1) ~~Place instrument in "OUT OF SERVICE" mode.~~ <sup>If error remains,</sup>

~~Remove~~ <sup>Remove</sup> ~~from~~ <sup>from</sup>

### TEMPERATURE LOW

The sample chamber temperature fails to reach 47°C or falls below 45°C. Normally this occurs if the instrument is in a cold environment and has just been powered up. If the proper temperature is not reached within the warm-up mode time, this message will be ~~seen~~ <sup>displayed</sup>.

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) ~~Run a diagnostic test after~~ <sup>when</sup> instrument ~~reaches~~ <sup>returns to</sup> "Ready- Push Run" <sup>mode, perform</sup>. ~~Compare~~ <sup>a</sup> parameters from sample ticket ~~in Appendix E~~ <sup>diag test</sup>.

### TICKETS WON'T PRINT

The instrument prompted the Operator to "INSERT TICKET". The ticket fed properly but the printer will not print the ticket. **If you run another test or shut the instrument off, you can NOT <sup>print</sup> get a copy of the ticket for the test that was run. DO NOT run another test until you have tried the following.**

**CAUTION:** Care must be taken when <sup>removing</sup> pulling the ticket from the bottom slot. The printer ribbon may be pulled into the worm gear and printer head causing ~~major~~ damage to the printer assembly.

- 1) Carefully pull the ticket out approximately 2 to 3 inches from the bottom slot.
- 2) Press the **CPY** button. The ticket should start to print.
- 3) ~~Document action taken on Check-Up and Maintenance Log [ALC 803].~~

If unable to remedy,

- 1) Carefully pull the ticket completely out from the bottom slot.
- 2) Press the **CPY** button.
- 3) Insert the ticket at the prompt. The ticket should start to print.
- 4) ~~Document action taken on Check-Up and Maintenance Log [ALC 803].~~

If still unable to remedy,

- 1) Remove simulator cover.
- 2) Remove instrument cover.
- 3) Verify the printer ribbon is positioned properly. ~~It must not be around the printer head and worm gear.~~
- 4) Press the **CPY** button. The ticket should start to print.
- 5) Install the instrument cover.
- 6) ~~Install the simulator cover.~~
- 5) ~~Document action taken on Check-Up and Maintenance Log [ALC 803].~~

If still unable to remedy,

- 1) Turn instrument OFF with switch at rear of instrument.
- 2) Wait one (1) minute and turn instrument ON. Instrument should return to "PLEASE WAIT" mode.
- 3) ~~Run a diagnostic test after~~ <sup>when</sup> instrument <sup>returns to</sup> reaches "Ready- Push Run". Compare <sup>mode, perform diag</sup> parameters from sample ticket <sup>in</sup> appendix. <sup>E.</sup>  
~~parameters from sample ticket in appendix.~~  
*Previous test will be lost.*

## **SECTION 4**

## **APPENDICES**



### BAC DataMaster Routine Performance Check Worksheet

Agency (Location) \_\_\_\_\_

DataMaster Serial Number \_\_\_\_\_

For RPC Cycle (Please circle): **Feb**    **Jun**    **Oct**

Date Completed: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

*Please Note: Section Numbers refer to those in the "Instructions for BAC DataMaster Routine Performance Check"(Alc 435) in your DataMaster Supervisor Manual.*

*If the DataMaster fails any check, please refer to the instructions in your DataMaster Supervisor Manual.*

#### SECTION 1: Replace Simulator Solution

[Place label here]

Simulator solution replaced : \_\_\_\_\_  
Time

#### SECTION 2: Diagnostic Check

Passed:     Failed:

Notes: \_\_\_\_\_

#### SECTION 3: Accuracy and Precision Check

Standard deviation from ticket (S.D.) = \_\_\_\_\_

If less than or equal to 0.002: .....Passed

If greater than 0.002: .....Failed

Average concentration from ticket (AVG) = \_\_\_\_\_

If within range on label above: .....Passed

If outside range on label above: .....Failed

Notes: \_\_\_\_\_

#### SECTION 4: Sample Acceptance/Alcohol-Free/Radio Interference Tests

Shallow Breath .....	Passed	<input type="checkbox"/>	Failed	<input type="checkbox"/>
Intermittent Breath.....	Passed	<input type="checkbox"/>	Failed	<input type="checkbox"/>
Suck Back Test .....	Passed	<input type="checkbox"/>	Failed	<input type="checkbox"/>
Sample Acceptance.....	Passed	<input type="checkbox"/>	Failed	<input type="checkbox"/>
Alcohol-free.....	Passed	<input type="checkbox"/>	Failed	<input type="checkbox"/>

**Radio Frequency Interference:**    If no console radio in building, check here:

Console Radio .....No interference (passed)     Interference (Failed)

Handheld Radio.....Radio Interference (passed)     No Interference (Failed)

Notes: \_\_\_\_\_



**Vermont Department of Health Laboratory**

195 Colchester Avenue, P.O. Box 1125, Burlington VT 05402-1125  
DataMaster Technical Services (ph) 802-863-7641; (fax) 802-863-7632

**SECTION 5: Logs**

DataMaster passed all checks: Yes

No  Removed from service: \_\_\_/\_\_\_/\_\_\_  
Date

Contacted DM Tech Services: \_\_\_/\_\_\_/\_\_\_  
Date

Entries made in all logs: Yes

No

Comments: \_\_\_\_\_

\_\_\_\_\_  
DataMaster Supervisor Signature \_\_\_/\_\_\_/\_\_\_  
Date

Please Print: DataMaster Supervisor

▶▶ Mail or fax a **photocopy** (white) of this worksheet and **photocopies** of all tickets or the **pink copy of all tickets** produced during this process to DataMaster Technical Services ◀◀

**\*\*\*\* DO NOT WRITE BELOW THIS LINE. FOR DATAMASTER TECHNICAL SERVICES ONLY \*\*\*\***

**DataMaster Technical Services Review**

Reviewed worksheet and all tickets: Yes No

DataMaster passed all checks: Yes No \_\_\_/\_\_\_/\_\_\_  
Removed from service

Follow-up action needed: No Yes

Follow-up action taken:  
Phone Call  Letter  Email  Fax  Service Call

Comments: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

# BAC DataMaster Simulator Solution Change Worksheet

Agency (Location) \_\_\_\_\_

DataMaster Serial Number \_\_\_\_\_

**Please Note:** Section numbers refer to those in the "Instructions for Changing the Simulator Solution" (Alc 437) in the BAC DataMaster Supervisor's Manual.

If the DataMaster fails any check, please refer to your DataMaster Supervisor Manual.

## SECTION 1: Replace Simulator Solution

[Place label here]

Simulator solution replaced: \_\_\_\_\_  
Time

## SECTION 3: Alcohol-free Subject Test

### 1<sup>st</sup> Breath Test.

External Standard result from first test = \_\_\_\_\_

If the external standard is within the range on the Simulator solution label, .... Passed

If the external standard is **NOT** within the range on the simulator label, ..... Failed

### 2<sup>nd</sup> Breath Test.

External Standard result from second test = \_\_\_\_\_

If the external standard is within the range on the Simulator solution label, .... Passed

If the external standard is **NOT** within the range on the simulator label, ..... Failed

Notes: \_\_\_\_\_

## SECTION 4: Record-Keeping

DataMaster passed all checks Yes  No

Removed from service: \_\_\_/\_\_\_/\_\_\_  
Date

Contacted DM Tech Services \_\_\_/\_\_\_/\_\_\_  
Date

Entries made in all logs Yes  No

Comments: \_\_\_\_\_

\_\_\_\_\_  
DataMaster Supervisor Signature

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date

\_\_\_\_\_  
Please Print: DataMaster Supervisor Name

**Please File this form (Alc 630) with your DataMaster Records.  
Do not send this form or a copy of this form to the Vermont Department of Health.**

## Instructions for Changing the Simulator Solution in the BAC DataMaster

---

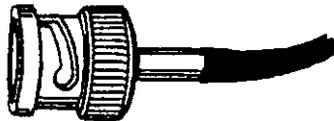
These instructions are intended for use by the DataMaster Supervisor.

These instructions are to be followed when there is a need to change the simulator solution, other than during the Routine Performance Check.

### SECTION 1:

#### A: REPLACE SIMULATOR SOLUTION

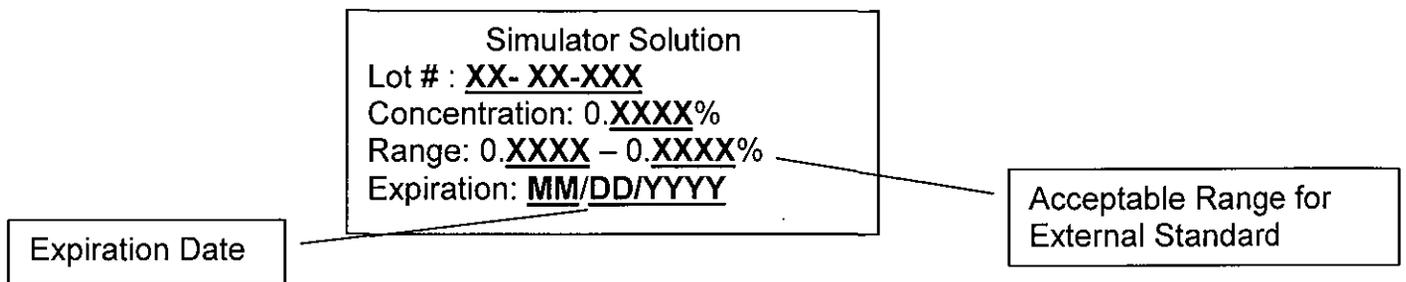
1. Remove instrument from service by placing in "Out of Service" mode.
  - a. Press <F1> until "Remove From Service" is displayed. Press <F2> to initiate.
2. Log off.
  - a. Press <F1> until "LOG OFF" appears on the display. Press <F2> to initiate.
3. Remove simulator cover from instrument cover.
4. Disconnect BNC connector (see Figure 1) and tubing connectors from simulator head.



**Figure 1: BNC Connector**

5. Remove the simulator from simulator compartment.
6. Unplug the simulator from the electrical socket at the left rear of the simulator compartment.
7. Unscrew the simulator head from the simulator jar.
8. Discard the used simulator solution.
9. Using a clean paper towel carefully wipe the simulator head mechanism.
10. Inspect the Simulator O-ring and jar for damage.
  - a. If damaged, contact VDH DataMaster Technical Services for a replacement. In the mean time continue with process.
11. Using a clean paper towel wipe the simulator jar dry.
12. Check the expiration date on the Simulator Solution bottle label that you intend to use. Use only solution that has not expired.

## Instructions for Changing the Simulator Solution in the BAC DataMaster



**Figure 2. Simulator Solution Label**

13. Pour the entire contents of a new simulator solution bottle into the simulator jar.
14. Immediately replace the simulator head. Be sure the simulator jar is properly seated. The jar should turn approximately 1¼ turns. It should be snug. **DO NOT OVERTIGHTEN.**
15. Plug electrical cord into socket at left rear of simulator compartment.
16. The paddle will be rotating.
  - a. If not, refer to VDH BAC DataMaster Instrument Supervisor Manual.
17. Arrange excess cord to side and front of compartment. **DO NOT OBSTRUCT FAN.**
18. Place simulator in simulator compartment.
19. Attach BNC connector and tubing connectors.
20. Replace simulator cover.

### **B. ALLOW 30 MINUTES WARM-UP TIME BEFORE PERFORMING ANY TESTS.**

1. While waiting for warm-up,
  - a. Attach a simulator solution label to the Check up & Maintenance Log [ALC 803] in the DataMaster Logbook.
  - b. Attach the remaining simulator solution label to the BAC DataMaster Simulator Solution Change Worksheet [ALC 630] in the space provided.
  - c. Check (√) the "Simulator solution replaced" box on the worksheet.
  - d. Fill out the top portion of the worksheet with Agency (location) and DataMaster Serial Number.

# Instructions for Changing the Simulator Solution in the BAC DataMaster

## C. CHECK SIMULATOR TEMPERATURE

1. After 30 minutes, press <MTR> and enter password at prompt.
  - a. If simulator temperature is **between 33.5°C to 34.5°C**, continue to Section 2: RETURN TO SERVICE.
  - b. If the simulator temperature is **above 34.5°C or less than 33.5°C**, **STOP**.
  - c. Refer to the VDH BAC DataMaster Instrument Supervisor Manual.
  - d. If able to remedy, repeat Check Simulator Temperature.

## SECTION 2: RETURN TO SERVICE

1. Place instrument in Return to Service mode.
  - a. Press <F1> until "Return to Service" is displayed. Press <F2> to initiate.
2. Log Off
  - a. Press <F1> until "LOG OFF" appears on the display. Press <F2> to initiate.

## SECTION 3: ALCOHOL-FREE SUBJECT TEST

1. Push <RUN> and insert ticket. Enter data at prompts as follows:

<u>DISPLAY</u>	<u>ENTER ON KEYBOARD</u>
CASE NUMBER:	"000"
TOWN CODE:	"0000" (must be four digits)
SUBJECT'S NAME:	"TEST/SOLUTION/CHANGE"
SUBJECT'S D.O.B:	(today's date)
SUBJECT'S SEX:	"M" or "F"
LOCATION OF STOP:	(instrument location)
TIME OF STOP:	(current time as military time)
ACCIDENT?:	"N"
TEST OPERATOR'S NAME:	(your name: Last Name/First/MI)
OFFICER ID #:	(your VTC number)

## Instructions for Changing the Simulator Solution in the BAC DataMaster

---

DEPARTMENT: (your agency)

REVIEW DATA? "Y". Review information displayed, and correct it if necessary.

2. Provide an alcohol-free breath sample.
3. Respond "Y" to "2<sup>nd</sup> test requested?"

### DISPLAY

### ENTER ON KEYBOARD

2<sup>ND</sup> TEST REQUESTED <Y/N>

"Y"

4. Provide an alcohol-free breath sample for 2<sup>nd</sup> test.
5. Write the External Standard result from the first test on the worksheet.
  - a. If the External Standard result is within the range listed on the simulator solution label
    1. Check (√) the External Standard "passed" first test box on the worksheet, and continue to 6.
  - b. If the External Standard result is outside the acceptable range, STOP.
    1. Check (√) the External Standard "failed" first test box.
    2. Refer to the VDH BAC DataMaster Instrument Supervisor Manual.
    3. If able to remedy, repeat Section 3: Alcohol-Free Subject Test.
6. Write the External Standard result from the second test on the worksheet.
  - a. If the External Standard result is within the range listed on the simulator solution label
    1. Check (√) the External Standard "passed" second test box on the worksheet, and continue to Section 4: RECORD-KEEPING.
  - b. If the External Standard result is outside the acceptable range, STOP.
    1. Check (√) the External Standard "failed" second test box.
    2. Refer to the VDH BAC DataMaster Instrument Supervisor Manual.

## Instructions for Changing the Simulator Solution in the BAC DataMaster

3. If able to remedy, repeat Section 3: Alcohol-Free Subject Test.

### **SECTION 4: RECORD-KEEPING**

1. Write "Change Simulator Solution" under attached simulator solution label in the Checkup and Maintenance Log [ALC 803].
2. Write "TEST/SOLUTION/CHANGE" in the Operator's log [ALC 603] under "SUBJECT'S NAME".
3. Check (√) appropriate box on worksheet if DataMaster passed all checks or not, and whether or not all log entries have been made.
4. Sign and date the worksheet.
5. Attach all of the tickets to the **colored** (original) worksheet [ALC 630], and file with your on-site DataMaster records.
6. **DO NOT RETURN** worksheet [ALC 630] or a copy to Vermont Department of Health Laboratory.

**RESOURCE LIST**

Mailing Address: VDHL DataMaster Technical Services  
Vermont Department of Health Laboratory  
PO Box 1125  
Burlington, Vermont 05402-1125

Shipping / Physical Address: VDHL DataMaster Technical Services  
Vermont Department of Health Laboratory  
195 Colchester Avenue  
Burlington, Vermont 05402

Telephone: VDHL DataMaster Technical Services  
  
(802) 863 7641 24 x 7 Voice mail  
(802) 863 7335 ext. 7641 24 x 7 Voice mail  
1 800 660 9997 Ext 7641 24 x 7 Voice mail  
(802) 863 7632 24 x 7 FAX

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Staff: ~~Steven Harnois Public Health Electronics Technician  
Amanda Bolduc Chemist  
Darcy Richardson Senior Chemist  
Robert Drawbaugh Toxicology Program Chief  
Mary Cellotti Laboratory Director~~