

BAC DataMaster Basic Operator Guide



Please read
"Unpacking and Set up procedures" on page 2 before proceeding

 National Patent
Analytical Systems, Inc.

2340 North Main Street, Mansfield, Ohio 44903 419-589-8378

Basic Operator Guide Index

Page	Contents
1.	DataMaster Overview
2.	Unpacking and Set up (Read Me First)
3.	Front Cover
3.	Rear Panel
4.	Conducting a Subject Test
4.	Use of the Keyboard
5.	Starting the Subject Test and Data Entry
6.	Administering the Test
6.	Additional Considerations
7.	Messages, Prompts and Display Codes

Welcome to the BAC DataMaster Infrared Electronic Breath Alcohol Measuring Instrument. This basic operator guide is designed to provide the information necessary to permit a trained operator to conduct a breath alcohol test. It will cover an overview of the BAC DataMaster, the subject test and certain additional information.

The information contained in this guide is generic for the Standard DataMaster (with external keyboard) and the BAC DataMaster Option "K" (built in keyboard.). The software, internal hardware, test sequences and data entries may or may not be the same as that used by any particular law enforcement agency. For this information it is necessary to contact that particular agency as most law enforcement agencies print customized guides based on the software and hardware configurations chosen.

The BAC DataMaster operates on the scientifically accepted principal of absorption of infrared energy. The technology has been in use in the art of breath alcohol testing for over 20 years and is judicially accepted in every state in the union. The instrument has been in production since 1987 and is in use or approved in over 30 states.

The BAC DataMaster is approved by the National Highway Traffic Safety Administration and is listed on the Conforming Product List.

Copyright

©1994 National Patent Analytical Systems Inc. All rights are reserved. No part may be reproduced in any manner without the explicit consent of National Patent Analytical Systems Inc.

Trademarks

The term "DataMaster" and "BAC DataMaster" are trademarks of National Patent Analytical Systems Inc. All rights are reserved.

Unpacking and Setting up your New BAC DataMaster

Please read the following completely before setting up your new DataMaster.

1. Select a room or location for your new instrument keeping the following in mind.

- A. The room or area should be reasonably clean.
- B. The room should not be accessible by inmates or unauthorized persons on an unsupervised basis.
- C. The room should have adequate ventilation to facilitate cooling of the instrument.
- D. The room should not be so warm or cool as to be uncomfortable for use. We suggest a temperature range of 65°F to 78°F.

2. Select a table, desk or stand for your instrument.

- A. Optimally the desk or table should be at least 20" deep by 30" long and at a comfortable working height. This will allow for access to the instrument, space for a simulator, and cover removal if necessary.
- B. The table or stand surface must be flat and firm and there must be an unobstructed clearance to the underside of the DataMaster for proper cooling. You may wish to mark the position of the rubber feet of your instrument after you have positioned it where it will stay and then screw 4 bottle caps to the table surface at these positions. Place the feet of the DataMaster into these caps. This will keep the instrument from easily being shoved out of position.
- C. Arrange to have the subject retention area to the right of the instrument as the operator would face it, if possible.
- D. Arrange for an accessible area for storage of tickets and mouthpieces.
- E. If the DataMaster is to be kept in an enclosed cabinet adequate ventilation must be provided or the instrument must be turned off when not in use.

3. Consider the power requirements for the instrument.

- A. A dedicated outlet is preferable, but not essential *providing there are no large appliances also on the same line*. Be sure no refrigerators, coffee makers, drinking fountains, air conditioners or the like are on the same line as your BAC DataMaster.
- B. Surge protection is suggested although not mandatory. While the BAC DataMaster is protected internally against surges and brown outs, additional dedicated protection is helpful.
- C. For the benefit of your new DataMaster and all your other computers and computer driven instruments, have your electrician check your emergency generator system. When it turns on, the system should not be immediately "on line." The low voltage condition that is present as a generator comes up to power can be damaging to your equipment. Your generator should turn on, come up to speed and then switch into your main system. The difference is only a few seconds, but can save your equipment from damage by low

voltage conditions.

4. Making your DataMaster operational.

- A. Unpack your new DataMaster and place the instrument on the table you have selected. Inspect the instrument for any possible shipping damage.
- B. Remove the RF Antenna, Breath Tube and Power Cord from the accessory bag. (Refer to Figure 2 "Rear Panel" for the following)
 1. Install the RF Antenna by screwing it into the antenna mounting bracket on the rear panel. Hand tighten only.
 2. Install the breath tube by pushing the elbow fitting at the lower end of the breath tube into the receptacle marked "Breath Tube" on the rear panel.
 3. Connect the breath tube heater plug at the base of the breath tube into the receptacle immediately below the receptacle marked "Breath Tube" on the rear panel.
 4. Connect the AC power cord into the instrument and the other end into the selected surge protection device or into the nearest wall outlet.
 5. If your DataMaster is an Option "K" model, go directly to item 6 below. Locate the keyboard cable and plug one end into the port marked "Keyboard" on the rear panel of the DataMaster and the other end into the rear of the keyboard. Secure the holding screws on the keyboard side of the cable.
 6. Position the instrument and keyboard on the table as desired.
- C. Save the shipping carton and interior packing supplies.
- D. Turn the instrument on at the Switch on the rear panel. The display should read "Please Wait" while the instrument warms up.

5. Should you leave your DataMaster on or turn it off between tests?

Whether you leave your instrument on or turn it off between tests should depend on the frequency of tests. It will take about 10 minutes for the instrument to warm up, so by the time you complete your subject observation time, the DataMaster will be ready to run a test. It is also true that if the Instrument is off, it cannot be damaged by electrical strikes, power outages and janitors that want to play with equipment. An instrument that is off also consumes no power.

One good approach is to turn it on and off as needed during the week and leave it on over Friday and Saturday or those evenings that are typically the high usage times.

Generally speaking, Instruments that are turned off between tests stay cleaner and require less maintenance than those that are left on continuously.

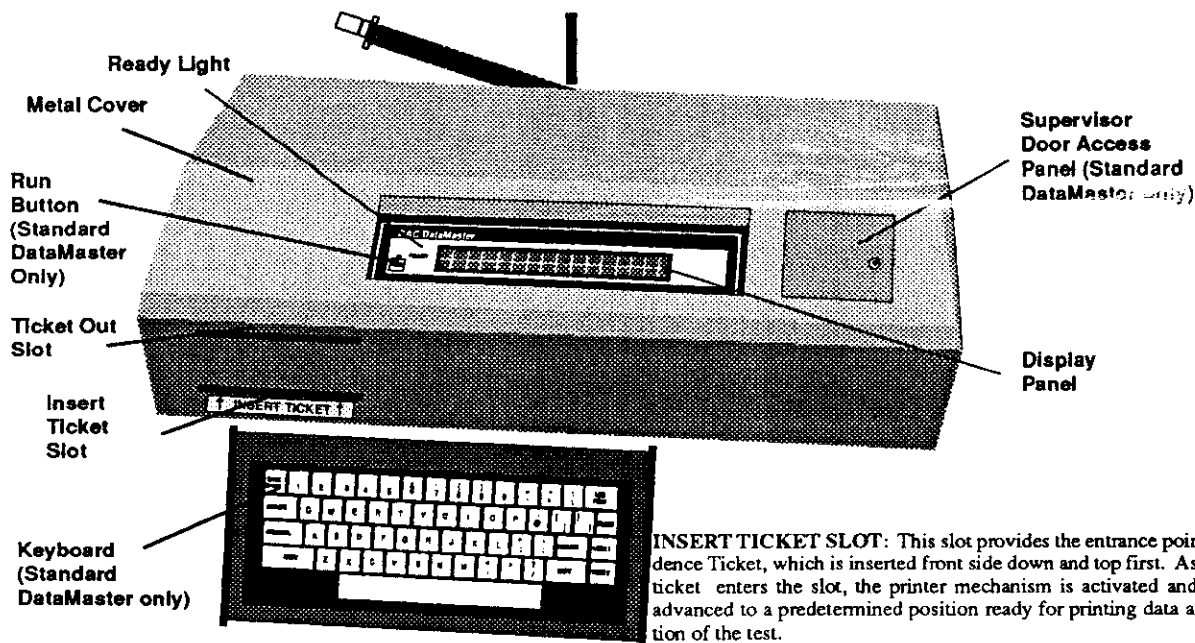


Figure 1: DataMaster Front and Cover

Refer to Figure 1.

DISPLAY PANEL: The display panel provides instructions and messages for operation of the DataMaster.

READY LIGHT: When illuminated, the green ready lamp indicates the instrument is ready to begin a test.

KEYBOARD: The keyboard allows the operator to provide input data for subject and simulator testing. The keyboard on the option "K" model is an integral part of the cover.

BREATH TUBE: The breath tube is used to provide test samples to the instrument. It is heated to prevent condensation and must be used with a sanitary mouthpiece.

INSERT TICKET SLOT: This slot provides the entrance point for the Evidence Ticket, which is inserted front side down and top first. As the evidence ticket enters the slot, the printer mechanism is activated and the ticket is advanced to a predetermined position ready for printing data at the completion of the test.

TICKET OUT SLOT: This unlabeled slot above the Insert Ticket Slot is the exit port for the Evidence Ticket at the completion of printing.

METAL COVER: The cover is 18 gauge steel and may be cleaned using a mild window cleaner such as "Windex". The cover is attached by 4 1/4 turn screws on the back panel along with 2 grounding screws. The cover should not be removed unless under a technician's direction.

RUN BUTTON: This button is located on the display on the Standard DataMaster, and on the upper left of the keyboard on the Option "K" model. This button will initiate the subject test sequence. It may be protected by a password.

SUPERVISOR PANEL DOOR: This locked panel houses the "Special Operations" buttons used by supervisory personnel. These "Special Operations" buttons are located along the top row of the keyboard on the Option "K" Model.

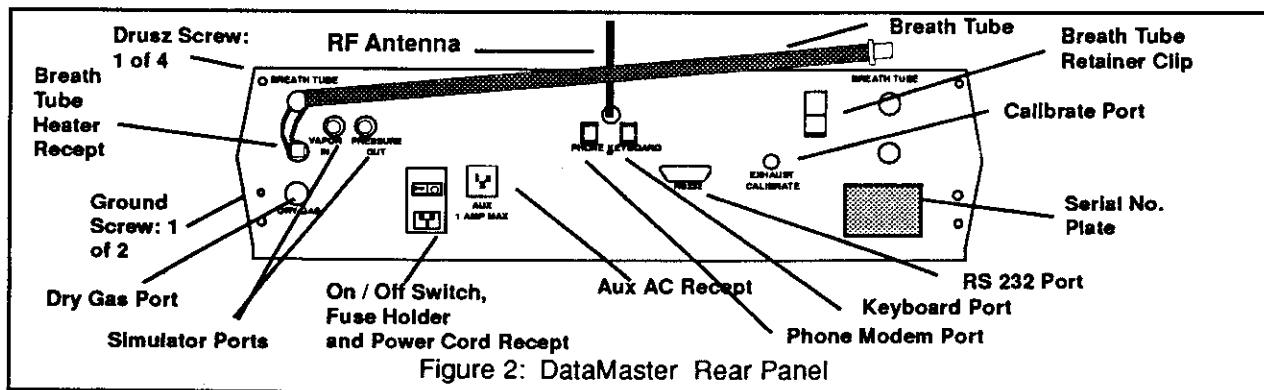


Figure 2: DataMaster Rear Panel

DataMaster Rear Panel: Figure 2

BREATH TUBE: Two Breath Tube ports are identified on the rear panel, one in each upper corner, although only one position will be installed. This breath tube is not to be removed except for possible cleaning.

HEATER PLUG: This plug provides a source of power for the Breath Tube heater.

RADIO FREQUENCY DETECTION (RF) ANTENNA: The antenna will detect the presence of RF in the vicinity of the instrument. If the level is excessive, the instrument will abort a test in progress. **CAUTION: PORTABLE RADIO TRANSMITTERS, IF USED DURING TESTING WILL CAUSE THE INSTRUMENT TO ABORT ANY TEST IN PROGRESS. DO NOT USE RADIOS FOR TRANSMITTING DURING A TEST.**

ON/OFF SWITCH: This switch controls power to the DataMaster. The instrument may be turned off during periods of prolonged inactivity. A battery backup system will maintain correct time and date.

IN THE EVENT OF SEVERE THUNDERSTORM ACTIVITY AND GENERATOR TESTING, THE INSTRUMENT MUST BE TURNED OFF AND PREFERABLY UNPLUGGED. THE INSTRUMENT SHOULD NOT BE PLUGGED INTO THE SAME ELECTRICAL OUTLETS AS HEAVY USE APPLIANCES SUCH AS REFRIGERATORS, AIR CONDITIONERS, COFFEE MAKERS AND DRINKING FOUNTAINS.

POWER CORD RECEPTACLE: Use only the grounded power cord furnished with the instrument. This receptacle also houses the fuse for incoming power. Remove the power cord before attempting to access the fuse portion of the assembly.

AUXILIARY AC RECEPTACLE: This grounded outlet may be used to power the simulator only. Do not use for any other purposes. 120 volt AC, 1 amp max. (May not be active.)

PHONE MODEM RECEPTACLE This receptacle is used to connect to a phone line when data transmission is being utilized.

KEYBOARD CABLE RECEPTACLE : This receptacle is used to connect

the keyboard cable to the DataMaster on those models using an external keyboard.

CALIBRATE PORT: This port is used to vent the sample cell during purge and subject testing and is also used to provide recirculation during the process of instrument factory calibration. It is never used while conducting a simulator test.

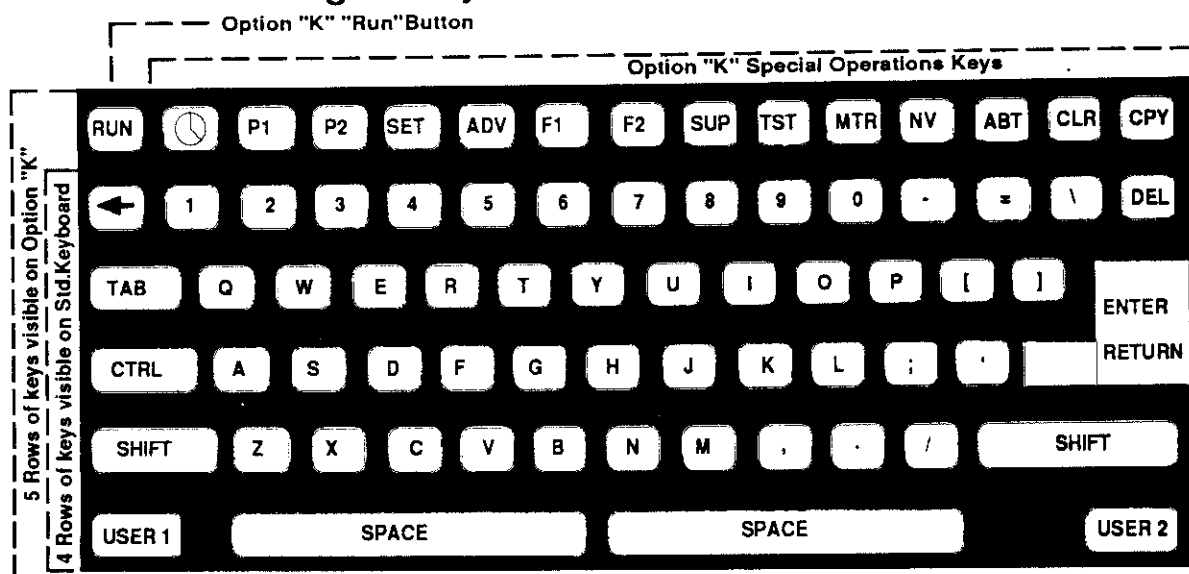
SIMULATOR PORTS: "VAPOR IN" AND "PRESSURE OUT": These ports are used when conducting a recirculating simulator test. The simulator may remain connected to these ports as long as desired. These ports are not installed in all style DataMasters.

DRY GAS PORT (optional): This port is optionally used to test the DataMaster using a Dry Gas Standard.

BREATH TUBE CLIP: This clip is used to cradle the heated "Breath Tube" when not in use.

SERIAL NUMBER PLATE: The serial number of the instrument is found on this plate.

Conducting a Subject Test with The BAC DataMaster.



A. Use of the Keyboard

DataMaster Keyboard

Note: The actual password privileges, functions and accessibility of these keys may vary depending on the software installed in your DataMaster. See your supervisor for specific questions.

The keyboard supplied with the DataMaster is generic. Some of the keys are inactive and have no function. Other keys may be bifunctional. Data entry is composed of two parts - initial entry and review of entered information. Several keys have different functions depending upon whether data is being entered or being reviewed.

Note: The keys listed below "RUN" Through "CPY" are called "Special Operations Keys". They are located along the top row of keys on the Option "K" Model, and under the locked Supervisor Panel on the Standard DataMaster. (Exceptions: The Run, Clock, P1 and P2 see below.)

"RUN" key - This button is located on the display of the Standard DataMaster, and on the left top row of keys on the Option "K" Model.

(Optionally Password Protected) Initiates the subject test sequence. If it is password protected and the password is not used or an incorrect one is used, it will show "ACCESS DENIED" momentarily on the display screen and then will return to "READY PUSH RUN" status.

"CLOCK", "P1" and "P2" keys: Inactive and not available on the Standard DataMaster.

"SET" key: Password Protected. The use of the correct password will permit access time and date functions.

"ADV" key: This key is used to change the criteria accessed by the "Set" Key.

"F1" key: Password Protected. This key is used by service personnel only. Pressing it will cause the instrument to request a password. To return to a normal display, press "Enter." The message "ACCESS DENIED" will appear momentarily, then the normal standby display will reappear.

"F2" key: This key is used in conjunction with and initiates the

functions accessed via password using the "F1" key.

"SUP" key: Password Protected. This key will initiate a simulator test sequence.

"TST" key: Password Protected. This key is used by service personnel to conduct a diagnostic test of the DataMaster. If it should be pressed, press "ENTER" key. The message "ACCESS DENIED" will appear on the display momentarily, and the normal standby display will reappear.

"MTR" key: Password Protected. This key is used by service personnel during certain diagnostic routines. If it should be pressed, press "ENTER" key. The message "ACCESS DENIED" will appear on the display momentarily, and the normal standby display will reappear.

"NV" key: This key allows the operator to interrupt and override the normal sample criteria of the instrument and force acceptance of the test results as of the time it is pressed. **ANY TEST RESULT OBTAINED USING THIS METHOD WILL RESULT IN A LOWER THAN ACTUAL SUBJECT TEST UNLESS THE SUBJECT IS ALCOHOL FREE.**

"ABT" key: This key will interrupt any instrument operation and will return the DataMaster to "READY-PUSH RUN".

"CLR" key: This key may be used in conjunction with the "Set" and "Adv" keys to save the new settings and return the instrument to the normal standby display.

"CPY" key: This key permits the operator to reprint a copy of the last test provided the instrument has not been turned off.

"LEFT ARROW" key: A bifunctional key. On Data Entry will delete one character at a time right to left. On Review Data will move the cursor one (1) space to the left, but will not delete any characters.

"DEL" key: On Review Data will delete the character at the cursor and and removes that space.

"TAB" key: On Review Data will move cursor one (1) space to the right at a time, but does not delete any characters.

"CONTROL" key: This key is used in conjunction with the "X" key to clear entire line during Data Entry, allowing for reentry of information. (Hold down "CONTROL" key and press "X" key).

"ENTER/RETURN" key: Allows computer to accept entered data into memory.

"SHIFT", "USER 1 AND USER 2" Keys: All keys inactive.

"SPACE" KEY: A bifunctional key. On Data Entry it adds one space at a time from left to right. On Review Data will delete the character at the cursor, leaving that space blank.

The use of all other keys will vary depending on the data requested. Some entries accept only alpha characters, other will accept only numbers. Some will accept either.

B. Starting the Test and Entering Keyboard Data

Step 1. Be certain the instrument is turned on, if it is not, turn it on. (About a 10 Minute warm up period will be necessary from a cold start.)

- b. Check mouth of subject for food, gum, tobacco, or any other foreign substances.
- c. Observe subject for at least 15 minutes to be sure no food or drink is ingested.

d. Record observation start time on Evidence Ticket if your procedure requires same.
Use the time displayed on the instrument panel only.

Step 2: Verify the normal "Ready" display configuration below is showing on the DataMaster display.

"MONTH DAY TIME"
"READY - PUSH RUN"

Step 3: Push "RUN": This button is located on the display of the Standard DataMaster, and on the left top row of keys on the Option "K" Model. Instrument will ask for a Password (Type in password, press <Return> key.)

Step 4: *Display:* "INSERT TICKET": Insert evidence ticket into "insert ticket" slot frontside down following the arrows on ticket.

Step 5: Enter Data per the following instructions as prompted by the DataMaster: Note: The actual questions may vary depending on your software configuration.

Display: "SUBJECT'S NAME (L/F/M)": Type in Subject's last name/first name/middle name. 38 characters are allowed for the entire name. They may be:

1. A letter.
2. A slash (/). Use only to separate last, first and middle names.
3. A hyphen (-). Use only when part of a name.
Example: Smith-Jones/Lucille/S
4. An apostrophe ('). Use only when part of a name.
Example: O'Leary/Dan/M
5. If the subject's name is unknown, type "UNKNOWN".

Press <Return> key when name is typed correctly.

Display: "DATE OF BIRTH": Type in Date of Birth: (month / day / year.) Press <Return> key when complete.

Display: "DRIVER'S LICENSE OR SOCIAL SECURITY NUMBER": Type appropriate information and press <Return> key.

Display: "ARRESTING OFFICER (L/F/M)" Type appropriate information and press <Return> key.

Display: "TEST OPERATOR (L/F/M)": Type appropriate information and press <Return> key.

Display: "COMMENTS": Type in appropriate information in a short statement of 30 characters or less. Press <Return> key when complete.

Display: "REVIEW DATA? <Y/N>": If you wish to review entered data items press "Y". The first display entry will reappear for review and the "Enter" key will step through each entry. Corrections can be made via the keyboard.

Left Arrow key - moves cursor to left one space.
Tab key - moves cursor to right one space.
Letter or Number key - replaces existing character (type over character to replace it.)
DEL key - deletes character and removes space.
Space Bar - deletes character and leaves space.

After data is reviewed, display "REVIEW DATA? (Y/N)" will reappear. If data is correct press "N" key.

The DataMaster will now proceed to the Automatic Test Sequence.

C. Administering the Subject Test

Automatic Test Sequence

Display: "PURGING":

All chambers and internal plumbing are cleansed of any residual substances by ambient (surrounding) air which is pulled through the inlet (Breath) tube and pumped throughout the instrument by an internal pump. ".00" or ".000" will appear on the display if the chamber is clear. **CAUTION:** Be sure the breath tube is not lying in a position on the table top where it will suck in dust.

Note: If there is a strong odor of alcohol from the subject, remove him from the immediate test area until this cycle is completed. Alcohol purged into the DataMaster from the ambient air will cause an "Ambient Failure."

Display: "AMBIENT ZEROING"

After the pump stops, the DataMaster determines zero references based on ambient air in the Sample Chamber. Two different filters with unique and known Infrared bandwidths are used to separate ethanol from potential interference such as acetone. During this cycle both the alcohol and Interference filters are inserted into the Infrared path to establish zero references at each wavelength.

Display: "BLANK TEST"

A measurement is taken after the "Ambient Zeroing". ".000" will appear on the display if no contaminant was detected. A "Blank" test is conducted prior to any subject or simulator test.

Display: "INTERNAL STANDARD CHECK". This indicates the internal standard was checked.

During this cycle a quartz plate is inserted into the Infrared path to assure that the accuracy of the DataMaster has not changed since the last calibration. Each DataMaster stores in memory the exact Infrared absorption value of this quartz standard at the time of calibration. The instrument measures the absorption of the quartz plate and compares this measured value with the value obtained at calibration. The two values must agree within prescribed limits or the operation will be aborted.

Display: "PLEASE BLOW": ".00" or ".000" will appear in lower right corner. A beeping signal indicates the DataMaster is ready to accept a subject sample. There is a 2 minute window of time in which to complete the sample.

Step 6: Insert a mouthpiece into the Breath Tube. Each mouthpiece is individually wrapped and can be removed from the plastic wrapper without touching it by pushing one end of the mouthpiece partially through the plastic bag. Check the opening of the mouthpiece for any plastic residue from the plastic bag. Use the plastic bag to avoid touching the mouthpiece as you insert the mouthpiece into the Breath Tube.

Step 7: Position the subject to the right of the instrument. Communicate with the person taking the test. Give clear instructions so that the subject will understand how to provide an adequate breath sample. **Do not tell the subject to blow "hard".**

The operator should advise the subject as follows: "Place your mouth on the mouthpiece and blow long and steady into the tube until I tell you to stop."

Once the subject starts to blow through the Breath Tube, the instrument's beeping tone will change to a steady tone which indicates that the instrument is receiving an adequate sample. You may tell the subject to stop blowing when you hear a single "Beep". If an

acceptable sample is not provided within the allotted time, the DataMaster will display the message "Subject Refuse?"

Display: "SUBJECT REFUSE? <Y/N>": Type "N" for "No" if the subject is not refusing to take the test and you wish to restart the sequence. The DataMaster will begin another purge and continue into a test cycle. Type "Y" for "Yes" if the subject is refusing to take the test and the instrument will complete the sequence by printing a ticket with a notation that the test has been refused.

Display: "TEST RESULTS"
"ALCOHOL .XX":

The display will show the results of the subject's first test, if the test was completed. After the results are displayed momentarily, the instrument will automatically continue the test sequence in preparation for a second test if your software is so designed.

Step 8. Remove the mouthpiece from the Breath Tube and discard it before the "PURGE" cycle begins. **Failure to remove the mouthpiece can result in a "Blank Error" as a result of alcohol condensate in the mouthpiece being drawn into the instrument during the purge.**

The DataMaster will repeat the automatic sequence in preparation for the second test if your software requires such while the operator will repeat steps 6 thru 8.

Step 9: Remove the completed evidence ticket at the end of the printing cycle on completion of the tests.

This concludes the subject test portion of this Guide.

Additional Considerations

1. **TWO MINUTE TIME-OUT:** When the display "PLEASE BLOW" appears, the subject has two (2) minutes to provide a breath sample. If no sample is completed, the test will terminate. **Depending on software, the DataMaster will either print "INCOMPLETE TEST" on the evidence ticket, or ask if "SUBJECT REFUSED? <Y/N>"** Type "Y" or "N" as appropriate. If "Y" (subject refuses to take test again) the Evidence Ticket will automatically be printed, documenting the refusal for that test. If "N", the instrument will automatically repurge itself and display: "PLEASE BLOW" (flashing) The subject may now try to provide another breath sample.

2. **INVALID SAMPLE:** If the DataMaster detects some interference substance in the "Mouth" (ie: mouth alcohol), while the subject is blowing into the instrument, the test will be aborted. Both the display and the printout will indicate "INVALID SAMPLE".

3. **INTERFERENCE:** If the DataMaster detects a chemical substance other than ethanol (acetone, methanol, isopropyl, etc.), the instrument will display and printout "INTERFERENCE". Depending on your software, the test may or may not be aborted and a print of the results may or may not be done.

4. **RADIO FREQUENCY INTERFERENCE:** If the DataMaster detects any radio transmissions in the area that could interfere with test result, the test will be aborted. Both the display and the printout will indicate "RADIO INTERFERENCE". After the interference has been eliminated, press the "RUN" key to initiate a new test. The display will show "USE PREVIOUS DATA? <Y/N>". Enter "Y" or "N" and proceed with test.

Data prompts, Sequence Advisories and Status messages.

Normal Display Ready Mode (flashing)

"MONTH DAY TIME"
"READY - PUSH RUN"

Data Prompts: (Require some action or data input on the part of the operator.)

"SUBJECT'S NAME (L/F/M)"
"LICENSE NUMBER"
"SUBJECT'S DOB" (Enter as "MM/DD/YY")
"INSERT TICKET"
"REVIEW DATA? <Y/N>"
"SUBJECT REFUSED? <Y/N>"
"USE PREVIOUS DATA? <Y/N>"

Sequence Advisories: (No Action required from the operator.)

"PURGING"
"PLEASE WAIT"
"AMBIENT ZEROING"
"BLANK TEST"
"INTERNAL STANDARD CHECK"
"EXTERNAL STANDARD"
"PLEASE BLOW" (flashing)
"TEST RESULTS"
"ALCOHOL .NN"

Status Messages: (Action required is noted)

"ACCESS DENIED" Will appear if wrong password is entered.

DATAMASTER STATUS CODES

If any of these messages appear on the display do not take the DataMaster out of service. Contact your supervisor and seek advise from DataMaster service personnel by calling 1-800-800-8143. They will advise a course of action. Note: this is a complete listing of Status Codes, not all of which are applicable to all models of the BAC DataMaster.

SYSTEM WON'T ZERO Instrument is unable to zero detector voltage.

TEMPERATURE LOW Sample cell temperature fails to reach or falls below 45°C.

TEMPERATURE HIGH Sample cell temperature rises to 55°C or above.

RADIO INTERFERENCE Radio frequencies of excessive strength have been detected.

FATAL SYSTEM ERROR At(XXXX) RAM, ROM OR PIA not responding properly.

CALIBRATION ERROR Internal standard is not within 10% of stored value.

PRINTER ERROR Printer not responding properly

RAM ERROR (Address) RAM check does not match the calculated value.

PUMP ERROR Flow detector does not detect pump operation.

BLANK ERROR The instrument obtains a reading greater than .003 during blank test.

DETECTOR OVERFLOW The detector output exceeds that readable by the instrument A/D converter.

FILTER ERROR The filter solenoid not activating properly

INVALID SAMPLE A downward slope detected in alcohol profile.

SIMULATOR OUT OF RANGE The simulator reading outside acceptable limits (limits set by user).

SIMULATOR TEMPERATURE Simulator temperature outside acceptable limits (limits set by user).

DATA MEMORY BATTERY LOW The RAM battery backup is failing.

INTERFERENCE DETECTED A substance other than ethanol has been detected.

AMBIENT FAIL Ethanol or other substance detected in the ambient air during the purge.

SOLUTION CHANGE RECORD (SC) Contains information collected during solution change. C o n -

DIAGNOSTIC RECORD (AR) Contains information collected during diagnostic test.

FLOW DETECTOR ERROR The instrument is unable to detect the flow of breath across the flow thermistor.