Defending Drinking Drivers

Second Edition

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About the Author

Patrick T. Barone is the principal and founding member of The Barone Defense Firm, whose practice is limited exclusively to defending drinking drivers. The Firm is headquartered in Birmingham, Michigan.

Patrick T. Barone is an adjunct professor at the Thomas M. Cooley Law School where he teaches "Drunk Driving Law and Practice" at their Auburn Hills campus. Mr. Barone lectures nationally on various DUI defense topics, and he has appeared in newspapers, on television and on radio as a drunk driving defense expert.

Patrick T. Barone is the executive editor of The DWI Journal: Law & Science (Whitaker Newsletters, Inc.), a nationally circulated legal periodical dedicated to improving the knowledge and success rate of defense attorneys in drunk driving cases. In addition to Defending Drinking Drivers, Mr. Barone is also the co-author of "The DUI Book."

Patrick T. Barone authors a monthly column for the Criminal Defense Newsletter, published by the State of Michigan's State Appellate Defender's Office. Mr. Barone has written dozens of articles on trial practice and drunk driving defense tactics for various legal journals and periodicals.

Patrick T. Barone has been certified as an instructor and practitioner of the Standardized Field Sobriety Tests in accordance with the standards set forth by the International Association of Chiefs of Police (IACP) and the National Highway Traffic Safety Administration (NHTSA). Partly as a result of this training, Mr. Barone has been judicially qualified as a court expert allowing him to give opinion testimony before a jury regarding issues relating to DUI investigations and police officers' field sobriety testing protocols. He is believed to be the only attorney in Michigan who has been so qualified.

Patrick T. Barone has also attended a 24-hour certification course at National Patent Analytical Corporation (the manufacturer of the DataMaster) and has thereby been deemed competent by the manufacturer to operate, perform essential diagnostic verifications and calibration checks on the BAC DataMaster.

Patrick T. Barone moderates a statewide network and participates in a national network of other DUI practitioners in order to exchange and share information about new and existing DUI laws, national and local trends in the law, and trial tactics.

Patrick T. Barone is a member of the Michigan and Illinois Bar Associations, The Criminal Defense Association of Michigan, The National Association of Criminal Defense Lawyers and is a Sustaining Member of College for DUI Defense.

Chapter 2

Chemical Evidence

§230 BREATH ANALYSIS: THE MACHINES

Breath analysis is the most common method used by law enforcement officials to determine blood alcohol content in drunk driving cases. For many years, all evidential breath testers (EBT's) utilized some form of wet chemical analysis and operated on a principle known as photometrics. The best known examples of photometric analyzers are the Breathalyzer Models 900 and 900A. Photometry measures the intensity of a light that a lamp casts on the surface area. Photometers, which are devices used for such measurement, compare light of an unknown intensity with that of a standard, or known intensity.

Within the last 10 to 15 years, the technology in breath testing has improved and photometers have given way, for the most part, to infrared analyzers. Some machines also use fuel cells for primary or secondary quantititave analysis or distinguish beverage alcohol for possible interferants.

The following sections deal with the various infrared and fuel cell analyzers currently used for chemical testing by law enforcement agencies.

§233 THE DATAMASTER

The DataMaster predecessor was the BAC Verifier, which was originally manufactured by Verax Systems, Inc. of Fairport, New York. Verax sold the rights to the BAC Verifier to National Patent Analytical Systems (NPAS), who then moved their business, including the actual manufacturing processes, to Mansfield, Ohio.

The operation of both the Verifier and the DataMaster is the same, but the exterior casing of the machine, the printer, the layout of the printed circuit boards, the software, the mounting of the breath tube, the circuitry, and the simulator are all different. For example, the casings for the Verifier are plastic and impregnated with metal, whereas, DataMaster casings are all metal. Because the DataMaster casings are metal, it allegedly provides electrical continuity throughout the entire enclosure, which supposedly alleviates certain radio frequency interference (Plastic is a good insulator, but not a good conductor. Metal, on the other hand, is a good conductor.). Therefore, if the manufacturer wants to remove or lessen the effect of RFI on a machine, a metal enclosure will help.

The printers are different for the BAC Verifier and the DataMaster, as are the circuit board layout and the chemistry. The Verifier has a central processing unit (CPU) board underneath the machine. This board caused some maintenance problems because it was difficult to examine. The DataMaster has changed that design to nine printed circuit boards. The advantages are supposedly easier maintenance and isolation of problems with the board. It is also more convenient and easy to remove the boards and replace them. Furthermore, it is alleged that the printed circuit boards are a superior electrical design because the different circuits are isolated. The power supply circuits are not located near the signal-carrying circuits, so there is less possibility for interference. The original Verifier had problems with electrical interference within the circuitry of the CPU, which contains all the software programming. When the CPU board was changed in the DataMaster, the method by which the microprocessor evaluates the signal to arrive at a breath alcohol concentration also changed. It had to because the program or algorithm used for converting the signal obtained from the absorption of infrared energy was revamped to accommodate the new CPU board and software.

The detector circuitry also changed. The fixed resistor in the Verifier became a variable resistor in the DataMaster. A resistor opposes the flow of electrical current. The Verifier had a fixed resistor; that is, one which was set at a constant resistance. The variable resistor in the DataMaster, however, is designed so that the resistance value can be adjusted. This has the advantage of increasing the stability of the signal produced by the detector.

Perhaps one of the most important differences between the Verifier and the DataMaster is the software. The Verifier had a somewhat limited RAM data storage capability, while the DataMaster has expanded RAM data storage capacity. Because of this extra memory, a new circuit board was created and additional software was included. The mathematical formula used to calculate the presence of acetone in breath samples was also changed in the new DataMaster software. The software allows for the display of either a two-digit number or three-digit number (.00 or .000). The display is controlled through a setting in the supervisory panel.

The software program of the DataMaster differs from the Verifier with respect to the erasable programmable read-only memory (EPROM). This is a device in which the program for the microprocessor is stored. It is unlike RAM memory because it is nonvolatile and does not have to be kept powered to retain its memory. Rather, it is erasable when exposed. If the EPROM is exposed to ultraviolet light for approximately 15 minutes, the program can be erased and reprogrammed. The mathematical formulas are located within the EPROM. The DataMaster contains four EPROMs: U-16, U-23, U-24 and U-25. The State of Washington, which ordered the DataMaster, experienced several problems with the EPROMs in the first machines received, and as a result, EPROMs were changed several times. These changes can significantly affect the operation of the machine in determining breath test results. Therefore, these machines should be retested and recertified whenever an EPROM is changed.

The DataMaster also uses a different simulator than the Verifier, which uses the Smith & Wesson simulator, while the DataMaster uses a Guth simulator.

The breath tube mounting to which the operator attaches the detachable breath tube is also different. With the DataMaster, the breath tube can be adjusted when placed in the mounting pivots. On the Verifier, however, the breath tube, once attached, is fixed in one position.

§233.1 Problems With the DataMaster

There are several reported problems with the DataMaster, most coming from the state of Washington. Specification problems, repair and maintenance problems, problems with the meter valve (instability producing imprecise readings, or failing to produce readings), problems with zeroing, instability of infra-red lamps, improper display of interferents (generally acetone), problems with displaying results to three decimal points, and problems with lack of specificity for ethanol. Finally, as with any other computer-controlled machine, such as the Intoximeter 3000 or Intoxilyzer 5000, the Verifier and the DataMaster are subject to so-called transient error. This occurs where the computer will not function properly for a period of time until it corrects itself. This error can occur during a breath test without the operator being aware of it.

The Datamaster has the ability to gather and transmit information from individual test sites to a central computer. In some states, including Michigan, this software capability is turned off. In other states, such as Washington, this information continues to be gathered and stored. In those states where such information is available, it is good practice to obtain it through the discovery process. The appropriate discovery demand should seek the production of the entire history of a specific machine, including all test results and recorded malfunctions. An examination of the data might reveal the number of times that the malfunctioned or displayed an error code.

In *City of Bellevue v. Helm*, No. 86-1-04295-1, the Superior Court of Washington, King County, 1987, held that chemical test results obtained from the BAC Verifier Datamaster were inadmissible as evidence because the act of approving the DataMaster was void. The court determined that because the machine was approved at the time when it was no more than a mere concept and because there was no data available to demonstrate that the machine could apply infrared spectroscopy principles, its approval was arbitrary and capricious. *See, also Seattle v. Peterson*, 39 Wn.App. 524, 527 (1985) where the court stated:

> The inquiry is as to the reliability of the machine itself. If the validity of a scientific principle is a prerequisite to its admission into evidence, then consistency requires that evidence of the ability of the machine to employ that scientific principle reliably must also precede admission of the machine's results into evidence.

The *Helm* court went further, however, and held that even assuming that the original approval of the Datamaster was valid, the particular machine used to obtain breath test results was an unapproved device because the machine used in the field to obtain breath test results differed in at least 17 ways from the machine was court approved by the regulatory authority. *But see State v. Ford*, 755 P.2d 806 (Wash. 1988) where the Supreme Court of Washington upheld the validity of breath test performed on the BAC Verifier Datamaster even though 17 changes and modifications have been made to the device since its approval by the state toxicologist.

Note: The problems at issue in these cases appear to be those of the original manufacturer, Verax Systems, Inc. The BAC Verifier, Datamaster and Datamaster II technology are now owned by National Pattern Analytical Systems, Inc.

In *State v. Craig*, 1175-8-89 (Franklin Circuit, Vermont, November 9, 1989) the trial court suppressed the results of the BAC Datamaster II on the grounds of the unreliability of the silica-gel samples provided to defendant as independent verification of the BAC Datamaster II results. The court used words like "machine" and "plumbing" to describe the BAC Datamaster II and its internal components. The court's use of these kinds of phrases indicates that it was not overawed by the BAC Datamaster II's apparent scientific sophistication. For further discussion of the court's holding and findings in *State v. Craig*, *see* Tarantino, "Words that Condition the Jury's Perceptions," 5 *DWI Journal: Law & Science* 1 I (November 1990).

Based on the various changes and modifications made in the BAC Verifier, the Datamaster and the Datamaster II make sure that your state has certified the particular machine or device used to test your client. If not, you may have a convincing argument that the machine has not been properly approved, and therefore the results of any chemical tests conducted on your client should not be admissible. *See* "Was Datamaster Rightly Approved?" 7 *Drinking/Driving Law Letter* 18 (September 2, 1988).

§233.2 The New DataMaster "DMT"

In late 2004, NPAS began marketing a modernized version of the standard DataMaster. This new device, DataMaster Transportable (DMT), contains a variety of new features and updates. The DMT evolved from the standard DataMaster and in many ways operates similarly. However, the DMT comes with a new user interface, internal circuitry, CPU, sample chamber size and software. The unit is also smaller in size and the metal case

contains fewer openings. The more uniform case is intended to obviate the possibility of radio frequency waves interfering with test results. In fact, the manufacturer claims that the new case essentially makes it immune to RFI problems that may occur with field use. Consequently, the DMT can be ordered with a power source that allows transport in an automobile for immediate roadside breath testing.

Data entry is by means of a standard USB keyboard. Unlike prior versions, the new DMT does not contain an internal printer. Instead it can communicate via USB port with a user-supplied printer. As a result, the DMT can support color printing. There is also a serial (RS-232) port to allow communication with digital simulators. NPAS uses a single point factory calibration for the DMT. Wet bath external simulation is standard. There is also the option of dry-gas with automatic barometric pressure compensation.

In addition to having a more modern and powerful CPU, the DMT contains a touch screen and a Windows type, full-color graphics interface. There is also the option of a graphing capability that allows the user to observe the suspect's blow pattern as the breath sample is being received. NPAS contends that this capability allows the subject's breath flow and alcohol absorption curve to be observed as the subject is blowing. This function might assist an operator in distinguishing when the subject is actually unable to provide a sufficient breath sample from those circumstances when the same subject is simply unwilling to provide a sufficient sample. From the defense perspective, this function may provide potentially exonerating evidence when a motorist is charged with a refusal after attempting to provide a breath sample. This is especially true when the DMT is ordered with an available software modification that will allow this graph to be captured for subsequent printing. On the other hand, NPAS hopes these changes will eliminate defenses related to sample size and acceptance. The breath sample graphing capability is perhaps the most significant overall difference in the new unit, as no other breath testing machine currently has this capability.

The CPU platform is also new, which the manufacturer claims will allow for easier maintenance. The DMT also has the capability of remote communication by high-speed modem or Ethernet. This will allow remote communication with the device for troubleshooting, voltage adjustments and control of internal components such as the pump. Finally, it also has a flash capable memory that will allow the device's program and software to be updated remotely.

§233.2.1 Theory and Operation

The essential technology for the DMT is the same that is used in the standard DataMaster—both use infrared energy to measure the presence of ethanol in a breath sample. The same mathematical formulas are also used to determine the amount of breath alcohol present in the breath sample and to express this quantity in grams of alcohol per 210 liters of breath. The formula used to calculate the presence of acetone in the breath sample is also unchanged. As with the standard DataMaster, the DMT also reads to three digits past the decimal place. It will similarly also optionally truncate the final digit, and report only the first two digits.

The test run sequence is also essentially the same, beginning with a purging of the sample chamber and a subsequent blank test. There is also an identical internal quartz standard. After the blank test and upon verification of the internal standard, the subject will be instructed to provide a breath sample. The software can be programmed to request either one or two tests, depending on the state's regulations. If the DMT is programmed for two tests, it can then be further programmed to require a minimum of two minutes between samples. The optical path on the DMT is considerably shorter and the sample cell volume has also been significantly reduced. Both of these changes have allowed the unit to be more compact and, therefore, more easily transportable.

Three optical filters are used at 3.44, 3.37 and 3.50 microns. This three-filter system is an attempt to only allow the passage of a limited frequency range of infrared energy thereby increasing the unit's overall specificity to ethanol. These filters are also used in effort to exclude other alcohols and interfering compounds. The "stepper motor" (used to drive the filter wheel) now uses geared wheels and is computer controlled. The hope is that this new system will afford greater precision in the placement of the filters within the optical path.

§233.2.2 How the DMT Is Different From the Standard DataMaster

1. Technology: The DMT uses the same optical filters (3 are standard) and internal quartz standard that are used in the standard DataMaster. The infrared light source and the detector are also identical. However, the DMT does have some significant changes in the optical bench. The DMT uses a new computer controlled mechanical system for placement of the optical filters into the path, and the sample cell volume has been reduced to 23cc and is 54cm long. The standard DataMaster uses a sample volume of 50cc and is 110cm long.

2. Operating System: All models of the standard DataMaster use a Motorola 6809 microprocessor. The DMT uses a 32 Bit, 520MHz Intel RISC embedded CPU operating a Microsoft Windows (CE) System. This modernizes the DMT such that it is now capable of the functions, computations and storage capabilities of a comparable PC computer. This also increases and modernizes the DMT's communications options.
3. The full color touch screen graphics LCD display is also totally new. This allows the DMT to perform the following:
   A. Graphing the breath flow of the subject in real time and storing this information to memory.
   B. Graphing the breath alcohol rise in real time and storing this information to memory.
   C. Simultaneous presentation with control and adjustment capability of all critical voltages via digital potentiometers. (This can also be done remotely via modem or Ethernet).
   D. The use of a precision Mass Flow Sensor to monitor breath flow.
4. The DMT can operate on 90 to 240 VAC, or from a 12 VDC power source for mobile applications.
5. Other capabilities: Voice commands, bar code reader/scanner, USB Capable, external or screen operated keyboard, 1000 test storage capability (more with memory expansion), Wet bath or dry gas simulation, single point calibration and temperature controlled simulator and breath tubes.

§233.6.3 States That Have Adopted or Are Considering Adopting the DMT

DOT:	Passed
AR:	In evaluations
KS:	Declined
NY:	Passed, 60 in service
RI:	Declined
AK:	Under evaluation
IN:	Under evaluation
IA:	Passed, deliveries pending
MI:	Passed, delivery pending
MN:	Under evaluation
PA:	Passed
SC:	Passed, in production
TX:	Under evaluation
VA:	Did not bid
VT:	Passed, in production
WA:	Under evaluation
Bermuda:	Passed, In service
Canada:	Passed, deliveries pending