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Source Codes of Breath-Alcohol Analyzers:
Another Red Herring

by

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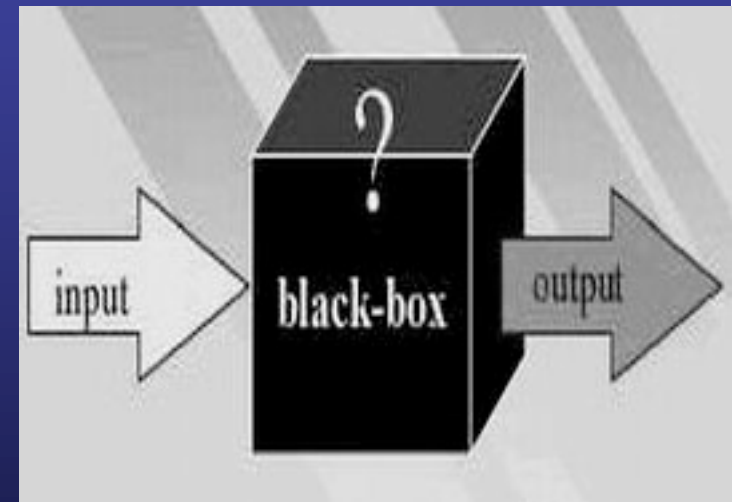
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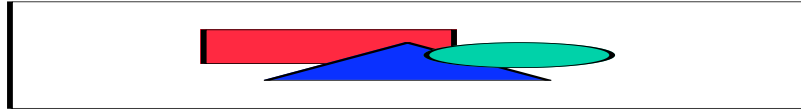
SOURCE CODES OF BREATH- ALCOHOL ANALYZERS: ANOTHER RED HERRING

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Florida Standoff on Breath Tests Could Curb Many DUI Convictions

By LAUREN ETTER
Staff Reporter of THE WALL STREET JOURNAL
December 16, 2005

A court fight in Florida over the software used in the instruments that detect alcohol in breath could threaten the ability of states and localities to prosecute drunk drivers.

The battle is over the source code of breath analyzers made by CMI Group, a closely held maker of breath-alcohol instruments. Defense lawyers have challenged the use of the device and asked to see the original source code that serves as its computer brain, saying their clients have the right to examine the machine that brings evidence against them.

Last February, a state appeals court in Daytona Beach ruled that Florida had to produce "full information" about the test that establishes the blood-alcohol level of people accused of driving under the influence, or DUI. Otherwise, the court said, the evidence is inadmissible.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

OVERVIEW:

The history of prosecutions of alcohol-related traffic offenses, and more recently administrative driver license sanctions following such offenses, is intertwined with spirited DUI defense activity. With the advent and now dominance of Time-of-Test “per se” or absolute alcohol concentration laws, the DUI defense target emphasis has shifted primarily to the issue of the instrumental alcohol test results. Over the years, many technical DUI challenges have been offered – some legitimate, and many spurious.

Among the most recent in the latter category is the DUI defense discovery demand for the “Source Code” of the software for the quantitative evidential breath-alcohol analyzer with which the defendant was tested. In computers, “source code” constituting a computer program is any series of statements written in some human-readable computer programming language. With few exceptions, source codes are proprietary and not disclosed to purchasers of the computer or computed program component of another device.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

OVERVIEW, continued

The usual DUI defense posture is that the source code is needed to evaluate the scientific reliability of the breath-alcohol analyzer and the validity of the test results. An alternative argument is that it is needed to determine whether a given breath-alcohol analyzer is in fact in all respects a state-approved device, or one with unapproved modifications. Yet another basis for the demand for discovery of the analyzer source code is that the defense is entitled to it as part of the “full information” concerning the test to which a tested defendant is statutorily entitled in some jurisdictions.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

OVERVIEW, continued

Pretrial DUI discovery demands for source codes of breath-alcohol analyzers have been made to date in FL, GA, NE, NJ, NY, WA and elsewhere, involving the Model 5000 and 8000 Intoxilyzers, the BAC DataMaster, and the Alcotest 7110 MKIII. The majority and recent trend of trial court and appellate court decisions has been to deny the discovery demands for source codes or suppression of the breath-alcohol test result as a sanction for nondisclosure. A few trial-level courts have ruled for the defense. In the one reported instance in which a breath-alcohol analyzer source code was disclosed by the manufacturer, no favorable outcome for the defendant resulted.

In purely scientific and technical terms, source codes are particularly arcane as a class of information. Access to the source code(s) for a given breath-alcohol analyzer is not necessary to evaluate its scientific reliability, state-approved status, or other features or characteristics relevant and material to the issue of the validity of breath-alcohol analysis results obtained by its use.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

SCIENTIFIC ASPECTS

What is a source code? Source Code is any series of statements written in some human-readable computer programming language. It is the basis of all computer programs, and consists of a structured set of instructions that direct a computer or microprocessor to perform specific operations. The last step in the process of creating a computer program is the conversion of the source code from (almost) English-like language to computer-executable binary machine code (composed only of the digits 0 and 1). A Java™ Source Code visual example is illustrated in the next slide for character (letter) conversion into NATO military call words. It contains an example of misleading commentary – claiming to be able to process the number characters 0-9, although the code only processes the letters a-z/A-Z. The main steps in the process of generating an executable program from source codes is shown diagrammatically in the subsequent slide.

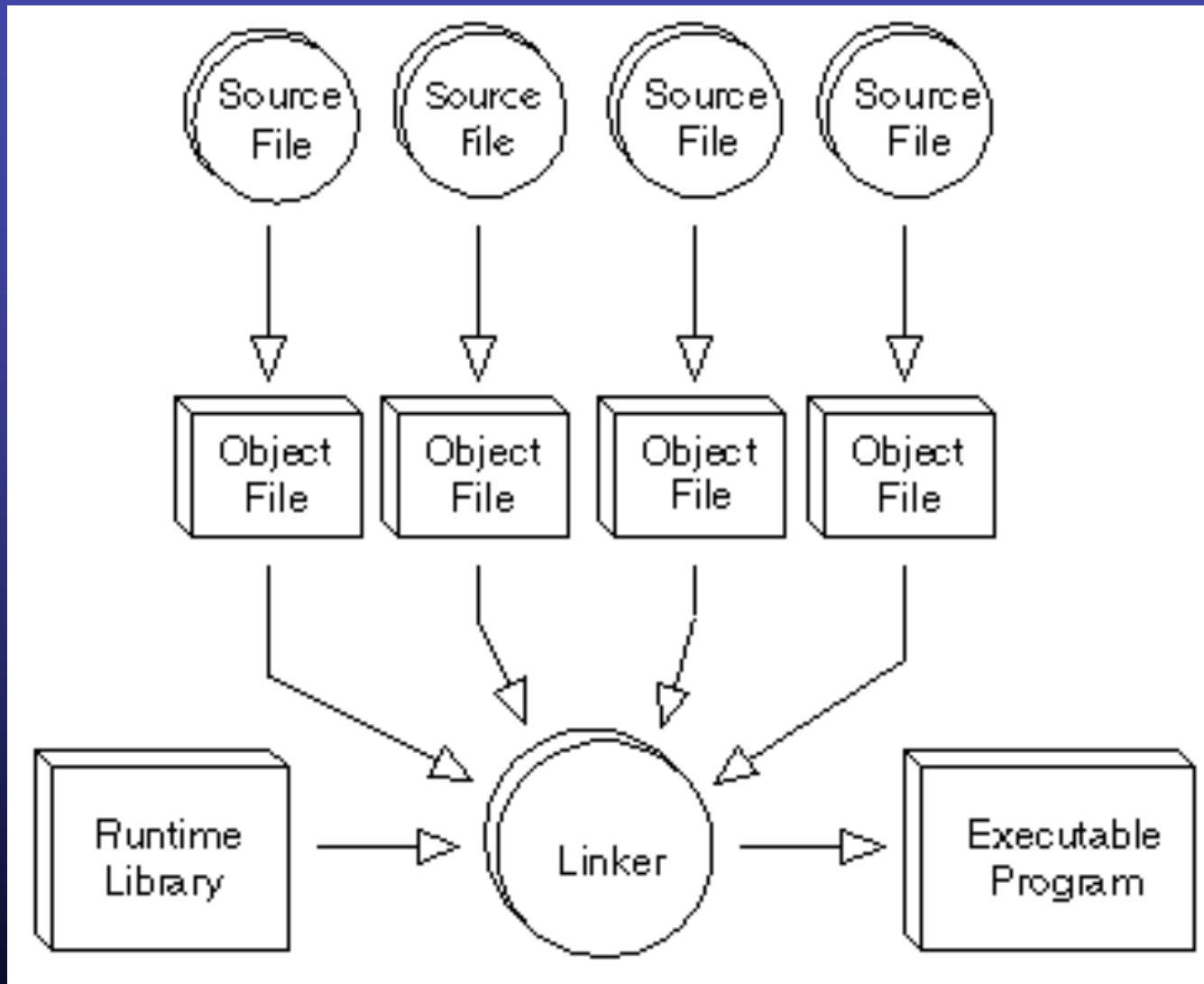
SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

```
1 private static final String[] natoCalls = {
2     "Alpha", "Bravo", "Charlie", "Delta", "Echo",
3     "Foxtrot", "Golf", "Hotel", "India", "Juliet",
4     "Kilo", "Lima", "Mike", "November", "Oscar",
5     "Papa", "Quebec", "Romeo", "Sierra", "Tango",
6     "Uniform", "Victor", "Whiskey", "X-ray", "Yankee", "Zulu"
7 };
8
9 /**
10  * @brief Returns the NATO call for a letter. eg. F = Foxtrot.
11  * @param letter A character in range a-z, A-Z or 0-9
12  */
13 public static String getNATOCall(char letter){
14     if(letter >= 'a' && letter <= 'z'){
15         return natoCalls[letter-'a'];
16     }
17     if(letter >= 'A' && letter <= 'Z'){
18         return natoCalls[letter-'A'];
19     }
20     return null;
21 }
```



Internet Micropedia Screen Shot of Java™ Source Code for
Converting a Letter into a NATO Call Word.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS



Schema of Source Code → Object Code → Machine Code Transformation.

[Source: Webopedia Computer Dictionary]

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

SCIENTIFIC ASPECTS, continued

Software and its respective source code typically fall into one of two availability paradigms: Free (open) software and programming language, e.g., JAVA™, and proprietary software which is kept restricted. Protection of the latter is via trade secrecy, use of copyrights, patents, and such code protections as encryption. When source codes are kept secret, the corresponding software is only made available in object code (machine language) form, if at all.

The operating software and firmware for breath-alcohol analyzers is commonly contained in whole or part on discrete EPROMs (Erasable Programmable Read-Only Memory chips). These are usually programmed by the manufacturer to accomplish user-desired steps and outcomes in the instrumental analysis process: Prompting information entries, controlling the timing of steps such as duplicate breath sampling, sounding tones indicating sampling in progress, managing report printing, etc.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

SCIENTIFIC ASPECTS, continued

These forms of software, inclusive of that which is instrument-embedded-firmware, are an integral part of the system for the instrumental breath-alcohol analysis process. It is disingenuous and incorrect to claim that the entire instrument system can only be evaluated for reliability and validity by examining individual system components, such as the source code version of the operating software.

An analogy may help: Assume that the point-at-issue is whether an instrument – a computerized word processor with an integral printer – can and does produce or reproduce correctly imprinted and spelled written text, from a known source. Whether the word processor does function properly or not can be readily determined by examining its repeated printed output of one or more standard test messages.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

SCIENTIFIC ASPECTS, continued

It is not necessary or appropriate to disassemble the device and examine, in isolation, its several physical components, subassemblies and microprocessors, etc., or the source code, as a means to ascertain its functioning. You simply compare the output with the input under known conditions, initially and at appropriate time intervals thereafter. The same is true for quantitative evidential breath-alcohol analyzers – just as NHTSA's Conforming Products List is derived.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS

Defense pretrial discovery motions in Florida DUI cases sought to compel production by the State of the source code software, checksums, and EPROMs for the Intoxilyzer 5000, and more recently the Intoxilyzer 8000, in addition to materials already provided: Manuals, schematics, studies, and correspondence concerning the device. The filings in various cases indicate that the grounds for the additional discovery demand were that 1) the defense is entitled to it by virtue of the (then) FL statutory provision §315.1932 “...Upon the request of the person tested, full information concerning the test taken at the direction of the law enforcement officer shall be made available to the person or his or her attorney...”; or 2) they are entitled to inspect all aspects of the Intoxilyzer to determine whether the machines (sic) have been substantially modified, and to determine the effect of the source code on the machine’s (sic) reliability; or 3) that the machine’s (sic) margin of error needs to be studied.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued

Some arguments by DUI defense counsel in support of discovery motions for the source code of breath-alcohol analyzers sound hauntingly familiar:

“If we’re determining guilt by machine, we have to take into consideration that there are isolated computer glitches that could affect the test,” argues Stuart Hyman, a Florida criminal-defense attorney and architect of the litigation.”

[“Florida Standoff on Breath Tests Could Curb Many DUI Convictions,” *Wall Street Journal*, Dec. 16, 2005.]

“The defense argued at the hearing that without the source codes, the defendant is being denied his constitutional rights to confrontation and to the effective assistance of counsel. Defendant’s motion on these grounds must be denied...”

[State of Florida v. Licari, et al., 2006]

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued

Some reported expert testimony on the need for source codes is equally astounding:

“Dr. Frank Urban (State’s witness) testified that he doesn’t need the source code to test the accuracy of the machine...” and “...ability to access the source code... would yield little or no information as to the accuracy and reliability of the instrument as a whole.”

[State of Florida v. Irish, et al., 2006.]

“...Dr. Myler (defense witness) agreed that there is no reason, in general, to believe that the Intoxilyzer 5000 records inaccurate breath test results. Additionally, he admitted that if an Intoxilyzer 5000 accurately reads a known solution of alcohol [in a test mode], the instrument is working properly... Dr. Myler testified that the source code is needed to evaluate the Intoxilyzer 5000 “to the best extent possible” and in order to have “complete confidence” in the instrument.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued

“As put by Dr. Myler, “I, on the part of the defendants and the defense, would like to have the opportunity that the manufacturer has to give close scrutiny to this device. That’s all.” However, as a matter of discovery in a criminal case..., neither professional curiosity nor a desire to independently evaluate the instrument will justify the compelling of the source code, particularly considering it is a trade secret.”

[State of Florida v. Licari, etc., et al., 2006]

“Dr. Myler (defense witness)...testified about insidious bugs in software programs developed by Microsoft, not CMI, Inc.... He further argued that when an Intoxilyzer 5000 acts “funky... it must be an insidious bug.” In fact he could give nothing but theoretical possibilities that there “might” be problems and if he could see the source code, he could be sure there were none.”

[State of Florida v. Allen, et al., 2006.]

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued



“The Defendant’s expert, Stephen Rose, was unable to opine that production of the source code would assist him in determining whether the subject breath reading was inaccurate. Rather, he was eager to give a generic opinion that the Intoxilyzer 5000 was not a forensically reliable machine regardless of any possible modifications to the hardware or software... The defendant’s second expert, Dr. Harlan Myler, conceded that his opinions regarding the effects of any hardware and software modification were merely intelligent guesses.”

[State of Florida v. Bastos, et al., 2006.]

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ISSUES, continued

In sum and substance, the great majority of both trial and appellate-level courts in Florida have ruled that the defense is not entitled to the discovery requested. Grounds for those decisions include:

- Failure of the defense to establish necessity for or materiality of the requested information.
- Lack of a duty on the part of the State to produce information and materials not in its possession, custody, or control.
- Legislative intent inherent in the DUI statute does not extend to requiring the State to produce evidence to which it has no legal right.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued

The Florida Solution: Amend the Statutes

The Florida Legislature in 2006 amended the relevant statutory provision
Florida Statutes Ann. § 316.1932 (2006)

- “...4. Upon the request of the person tested, full information concerning the results of the test taken at the direction of the law enforcement officer shall be made available to the person or his or her attorney. Full information is limited to the following:
- a. The type of test administered and the procedures followed.
 - b. The time of the collection of the blood or breath sample analyzed.
 - c. The numerical results of the test indicating the alcohol content of the blood and breath.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

LEGAL ASPECTS, continued

The Florida Solution: Amend the Statutes, continued

- d. The type and status of any permit issued by the Department of Law enforcement which was held by the person who performed the test.
- e. If the test was administered by means of a breath testing instrument, the date of performance of the most recent required inspection of such instrument

Full information does not include manuals, schematics, or software of the instrument used to test the person or any other material that is not in the actual possession of the state. Additionally, full information does not include information in the possession of the manufacturer of test instruments...”

Other states are making comparable changes to their DUI laws: Arizona (2006), Missouri (2006).

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

DUBOWSKI PERSPECTIVE

The hopefully short-lived attempt to generate a new DUI defense legal issue based on unavailability of the source code for some evidential breath-alcohol analyzer appears to have failed, deservedly. There was never a need for, nor a valid legal basis to require disclosure of the source code because the entire analyzer is readily tested and evaluated as a system prior to its state approval, and at any time thereafter. Simultaneous vapor-alcohol control tests accompanying each and every subject test would provide further real-time proof that the system was (or was not) performing properly on the relevant occasion. That is why the profession recommends that necessary scientific safeguard, as I have in print, since 1960. The Florida courts, and those in the few other new jurisdictions in which the source code discovery demand has surfaced, are to be commended for recognizing the legal invalidity of that demand and its unnecessary for evaluating the scientific reliability and proper functioning of a quantitative evidential breath-alcohol analyzer.

SOURCE CODES OF BREATH-ALCOHOL ANALYZERS

DUBOWSKI PERSPECTIVE, continued

Especially inept expert testimony only further exposed the Red Herring fallacy of this new defense tactic. The prompt Florida legislative remedy provided for the attempted unwarranted extension of the “full information” provision of the DUI law by the DUI defense bar is a model for future responses to similar challenges elsewhere. The source code DUI defense now moves to the dust bin of history, to join such other past non-meritorious DUI defense challenges to evidential breath-alcohol testing as Radio-Frequency Interference and the effects of altitude.

Despite being misapplied with respect to breath-alcohol testing, the source code discovery issue is not trivial. Imagine the havoc that could result if a binding precedent were established that any person involved with or affected by a microprocessor-containing device has a right to examine that device’s source codes, in any litigation. Think ATM machines, microwave ovens, vending machines, change-makers, voting machines. The list is endless, and the prospect is frightening.