News Update

Some people reported problems with the chapter 3 PDF and upon checking I discovered the file was corrupted. I have uploaded a new file and that has fixed the problem.

Word has reached us that the Democratic National Committee has endorsed a "voter-verifiable audit trails" for the next election in 2004. This is not quite what we want, the explicit words "paper ballot" are missing and nothing else will do. After all, we are dealing with politicians and lawyers, so words *are* important, but they are headed in the right direction.

Our site was shut down for about 8 hours on Friday by our ISP due to a bogus spam complaint. I persuaded them to bring the site back up, but we were still denied access to the site and were told to find another provider. After being cleared by SpamCop.net and after a few email from supporters, the ISP reversed itself and returned full control of the site to us.

Finally, if you would like to help support the author and the publisher in defraying our expenses (band-width, distribution, research, legal fees, etc.), you may do so in one of three ways:

1) A single contribution.
2) A subscribing contribution.
3) By passing along this book or hosting it on your own web site.

A single contribution of any amount can be made via PayPal, credit card, check or money order. A subscribing contribution of $1.95 a month can be made the same way.

For how to make a contribution, please go to our support page at:

www.blackboxvoting.com/bbv/support.html

or email me at david@plan9.org

Thanks!

David.

Chapter 5
Black Box Voting

Ballot Tampering in the 21st Century

by Bev Harris

with
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How Are These Machines Tested?

When you apply your energy to fighting for trustworthy voting machines, one of the first rebuttals you'll hear is the certification argument. It goes like this: Trust the machines, because they are "tested and tested and tested again." This usually comes with a pat on the head and a condescending, "We know best."

You'll also discover that your opponents use canned rebuttals. If you know what questions to ask, the certification procedures implode. What we are looking for here, if certification is to mean anything at all, is a line-by-line examination of the source code. This, in itself, will not make the system secure. But doing a pseudo-examination of the system, spot-checking a few selected items without looking at the source code, or running automated diagnostics, is worse than no examination at all since it gives people false comfort.

What good is it to "certify" a system if you have never examined the secret, proprietary formula that tells the machine what to do and how to record your vote? A thorough examination should include looking at how the vote-counting program interacts with operating systems and other devices, like video cards — and it must be done by a human being, who can evaluate what each line of code does, not by a machine, which can only look for patterns.

I tried to find out who does the critically important "eyes on the code" examination. Who takes it apart and puts it all together again to see what every line does? Without that, secret "back doors" can be put in the code, telling the machine to do one thing while you think it is doing another.

Who are the people who test and test and then test again?

• The state
• An independent state voting machine examiner (sometimes)
• A National "ITA" (Independent Testing Authority): Wyle Laboratories, Ciber Labs.

Does the state examine the source code?

State certification checks the manual provided by the manufacturer. They review voting machine specifications against state guidelines to see that the machine follows the law. Is it accessible to the disabled? Does it prevent people from voting more than once?

When you ask about state testing of the software code itself, everyone hurries forward with their prepared rebuttal: "We do a Logic and Accuracy test (L&A)," they'll say. No, that's not what I asked.

Does anyone at the state level do a line by line examination of the source code?

Well, no. At least not in Georgia. Not in Washington State. Not in Indiana. So far, I haven't found a single state that does an eyes-on examination of the source code.

Logic and Accuracy tests

The L&A test is called a "black box" test; examining the source code is called "white box" testing. According to Arnold B. Urken, who founded Election Technology Laboratories, the first voting machine testing lab, white box testing — eyes-on examination of the source code — should be mandatory if certification is to mean anything. Urken was so adamant about this that he refused to certify ES&S (then called AIS), because the company would not allow him to examine its code.

L&A testing tells you nothing about tampering, and it can't be counted on to catch software programming errors. In an L&A test, you run test ballots through the machine. If it counts correctly, it passes the test. Some touch-screens use an auto-

Secret "back doors" can be put in the code, telling the machine to do one thing while you think it is doing another....

mated program to simulate someone casting test votes.

Now, if you are a suspicious type (read: a student of human nature), you might wonder how hard it would be to slide through an L&A test. Not surprisingly, many creative computer experts have thought about this, too. To get around an L& A test, an ethically challenged person might:

When machines lose 25 % of their votes, it's clear that the L&A test didn't do the job.

• Set the program to activate only towards the end of election day, using the date and time function of the computer. Because the L&A test is done before the election (and sometimes also after the election), the miscount will occur only during the election itself.

• Put a multiplier in the tabulation code, tied to party affiliation, set to activate only when in "election mode." (I was surprised to find that many of these machines require the administrator to tell the machine when it is in "test mode" and when it is in "election mode." This has to be one of the silliest security holes in the system. Why would you *tell* the machine when it is being tested?)

• Activate a program by casting a ballot with a specific configuration. The AccuVote optical scan machines made by Diebold (Global Election Systems) use a specially configured card to start an election and signal to the computer that the election is finished with an "ender" card. Because the code is proprietary, we are not allowed to see what functions are activated by the ender card. This card is a perfect target for introducing alterations at the end of the election.

• Set an "Easter egg" to hatch only when activated by remote access.

In fact, we already know that L&A tests do not catch hundreds of miscounts.

What about the independent state examiner?

When I spoke with Michael Barnes, an elections official with the Georgia's Secretary of State's office, he said that Dr. Brit Williams from Kennesaw University, the independent examiner for the state of Georgia, does the voting machine certification for Georgia. I called Dr. Williams, who told me that he doesn't certify for the state, saying the Secretary of State's office does it. He also said he does not examine the source code.

Harris: "I have questions regarding the certification of the machines used in Georgia during the last election."

Dr. Williams: "For the state of Georgia — I don't do certification. The law gives the Secretary of State the authority to say what systems are certified and what are not. What I do is an evaluation of the system. The FEC publishes standards for voting systems. We have national labs that examine for compliance with the FEC and if they are in compliance, certification is issued by NASED. Once that's done it's brought into the state and I evaluate them as to whether or not the system is in compliance with Georgia rules and regulations. Then the Secretary of State takes that report, in combination with the others, and certifies it."

He described a procedure where teams of people with a test script checked out each machine, but the tests seem to focus on the hardware. They test the printer, the card reader, the serial port, the screen calibration and then perform an L&A test.

My question remains: Who looks at the source code?

Dr. Williams: "We don't look at source code on the operating system anyway. On our level we don't look at the source code, that's the federal certification labs that do that."

Well, then, I guess they just meant "test and test."

I went to the ES&S Web page, which proclaimed that its voting machines were tested by Wyle Laboratories. David Elliott, of the Washington State Elections Division, said that Wyle is a very reputable firm that tests aircraft systems. Both Michael Barnes and Brit Williams, from the state of Georgia, said that Wyle Laboratories tests their voting machines.

I looked up Wyle Laboratories, and I came across a surprising article. It turns out that Wyle decided to *stop testing* voting machine software in 1996, citing bloated code that was more than 900,000 lines long. I called Edward W. Smith at Wyle Labs, who confirmed that Wyle no longer tests voting machine software. Wyle only tests hardware and firmware.

Can you drop it off a truck? How does it stand up to being left in the rain? Good things to know, but some of us also want to know that someone has examined every line of the source code to make sure no one tampered with it.

What is "firmware?"

Firmware is programming that is stored in read-only memory (ROM) or programmable ROM (PROM). It is created and tested like software.

Wyle Laboratories is responsible for testing the firmware, and after it is certified it is not to be changed without reexamination, so you can imagine my surprise when I ran into these comments, written into the source code files for Diebold Election Systems by its programmers:

> "Remove SCWinApi module till pass WYLE certification."[1]

And because the version sent to Wyle for certification is supposed to be *the* version, and after certification the voting machines are supposed to use *only* the officially certified version, you might wonder at this comment:

> "Merge WYLE branch into the stable branch."[1]

Why are we are removing things before we send them to Wyle, and why are we merging the officially certified version back into something else? Just wondering.

I called Diebold to ask, but no one returned my call.

I guess this stuff is just "tested."

Who does look at the software source code?

By visiting the Election Center Web site, I discovered that a lab called Ciber, Inc. tests voting machine software. Another lab, called SysTest, is also authorized to certify software, but all the major companies seem to be certified by Ciber.

Who owns Wyle Laboratories?

Wyle Laboratories and Wyle Electronics were once related. At one point, there also seems to have been a Wyly Laboratories.

PR Newswire 06/26/1995: New Name - Old Name **Wyle Electronics - Wyly Laboratories**

Texas billionaires Sam and Charles Wyly were the ninth-biggest contributors to George W. Bush in 2000, and Sam Wyly bankrolled the dirty tricks that wiped out John McCain's lead during the South Carolina primary. I wondered if the Wyly brothers are involved in Wyle (pronounced Wyly). I found many Wyly companies, and at least two companies called Wyly E. Coyote, but never found a link between Texas Bush-pal Wyly brothers and Wyle Laboratories.

I did find a link between Wyle Laboratories and prominent, ultra-right wing, monied interests. William E. Simon, along with Richard Mellon Scaife and the Coors family, has been one of the primary supporters of the Heritage Foundation and its derivatives.

And I did find conflict of interest. You would expect that a company who certifies our voting machines would not have its owners running for office. You would also expect that no one who owns the certification company would be under criminal investigation. You'd be disappointed.

Shortly after Wyle Laboratories split off from Wyle Electronics in 1994, controlling interest was acquired by William E. Simon & Sons, a firm owned by a former Secretary of the Treasury, William E. Simon and his son, Bill Simon, a candidate for governor of California in 2002, whose firm was convicted of defrauding investors.

Shortly before the election, in August 2002, William E. Simon & Sons was convicted of fraud and ordered to pay $78 million in damages. In what is surely record time for our glacial judicial system, the conviction was overturned in September 2002. The reason? William E. Simon & Sons had partnered up with someone who was a criminal and no one could tell who was the guiltiest.[2]

Recently, Wyle Laboratory shares held by William E. Simon & Sons were bought out. Now Wyle Laboratories is a wholly owned subsidiary of LTS Holdings, Inc., an entity I can find no information about, controlled by individuals whose names are not available.

I thought the certification process would involve, say, an expert in voting putting on a white lab coat, brushing away the voting machine employees and independently, painstakingly, testing the accuracy and integrity of the software. After all, our voting system is at stake. Surely, Ciber holds the answer. I decided to give them a call but found out that the public is not allowed to ask Ciber any questions.

When Wyle's division in Huntsville, Alabama, stopped testing voting machine software in 1996, that certification process went to Nichols Research, also of Huntsville, Alabama. Shawn Southworth tested the voting machine software for Nichols Research.

But Nichols Research quit doing it and voting software examination went to PSInet, of Huntsville, Alabama. Shawn Southworth tested the voting machine software for PSInet.

PSInet ran into financial difficulties. Voting software certification was taken over by Metamore, in Huntsville, Alabama, where Shawn Southworth handled it.

Metamore no longer does software certification for voting machines. Now it is done by Ciber, of Huntsville, Alabama. Shawn Southworth is in charge of it.

I called to talk to Shawn Southworth, but his assistant told me that she was supposed to refer all questions back to The Election Center. The only person at The Election Center who is authorized to answer questions about certification procedures is R. Doug Lewis. I left a message for Southworth anyway, but he did not call me back.

I looked up Shawn Southworth on the Web. I found pictures of his motorcycles and I found pictures of him at the beach. Though I'm sure he is eminently qualified (but we're not allowed to ask his credentials), no one has yet convinced me that Shawn Southworth should be entrusted with the sanctity of the vote-counting for all of America.

Who selects the certifiers?

The NASED ITA Technical Sub-Committee of the Voting Systems Board is a small group of people who select the certification agencies. This group looks to R. Doug Lewis of The Election Center as their leader.

What government agency is the Election Center connected with? None: The Election Center is a private corporation. Who runs the Election Center? A man named R. Doug Lewis, who was not elected by anyone.

What are the credentials of R. Doug Lewis? With some persistence, I located a bio for Doug Lewis,[3] but all it said was that he was an assistant to the president in the White House (doesn't say which president); that he ran campaigns for various important politicians (doesn't name any of them); that he headed the Democratic Party for the states of Texas and Kansas (doesn't say what years), and that he consulted for the petrochemical industry (doesn't say what company). With a little more digging, I found that he "managed affairs" for former Texas governor John Connally.

But who is R. Doug Lewis? Through the Election Center, he organized the National Association of Secretaries of State (NASS), which is heavily funded by voting machine vendors; he organized the National Association of State Election Directors (NASED), he is very active with the International Association of Clerks, Recorders, Election Officials and Treasurers (IACREOT), and he set up the training programs for election officials. When election officials want to know if these voting machines can be trusted, they ask: R. Doug Lewis.

I'm sure R. Doug Lewis is a terrific guy (the feeling apparently isn't mutual; he hangs up on me when I call him). But what I do want to know is this: What specific credentials qualify him for the critical work of overseeing the security of voting systems in the United States? Who appointed him?

The Election Center has specific instructions about this. Here they are:

"The ITAs DO NOT and WILL NOT respond to outside inquiries about the testing process for voting systems, nor will they answer questions related to a specific manufacturer or a specific voting system. They have neither the staff nor the time to explain the process to the public, the news media or jurisdictions. All such inquiries are to be directed to The Election Center..."[3]

So I called The Election Center, and was told the only person who could answer my questions was R. Doug Lewis.

Harris: "Mr. Lewis, I understand that your organization is the one that, basically, certifies the certifiers of the voting machines, is that correct?"

Lewis: "Yes."

Harris: "Do you have anything in writing that shows that a line-by-line examination of source code was performed by either Ciber or Wyle?"

Lewis: "No. But that's what they do. They go line by line. They're not trying to rewrite it."

Harris: "Where can I get something in writing that says they look at the code line by line?"

Lewis: "I don't know where you'd find that."

Harris: ... "Let me be more precise. Are you saying that Wyle and Ciber do a line-by-line check on the code, and the way it interacts with the system, to make sure that no one could have put any malicious code into the voting machine software?"

Lewis: "Oh. That's what you're talking about. I don't know if they do a line-by-line check to see if there's a problem."

Harris: "Who can I speak with at Ciber and Wyle?"

Lewis: "I don't think anyone there could answer your questions."

Harris: "Who do you speak with at those labs?"

Lewis: *(muttered)* -"Shawn S...... at Wyle."

Harris: "Okay, who at Ciber?"

Lewis: "No, Shawn S...... is at Ciber. And the person at Systest would be Carolyn Coggins —"

Harris: "Who should I ask for at Wyle?"

Lewis: "Wyle tests the hardware."

Harris: "But they also test the firmware, don't they?"

Lewis: "Jim Dearman at Wyle."

Harris: "I couldn't quite catch the name of the person at Ciber. Did you say Shawn S....... what was that last name?"

Lewis: (*muttered*)"Shawn Sou....."

Harris: "I'm sorry, I couldn't understand you. What is that name again?"

Lewis: (*muttered*)"Shawn South....."

Harris: "How do you spell that?"

Lewis: (m*uttered very fast*)"Southw...."

Harris: "I'm sorry, you'll have to slow down. How do you spell that?"

Lewis: (*quietly*)"S—o—u—t—h—w—[ard?]" (I was never able to understand him. I looked it up on the Web. The correct spelling of the name is Shawn Southworth).

Harris: "I have one more question: Prior to taking over The Election Center, you owned a business that sold used computer parts, which ended up going out of business. Shortly after that you took over The Election Center. Did you have any other experience at all that qualified you to handle issues like the security of national elections?"

Lewis: "Oh, no, no, no. I'm not going to go there with you."

Harris: "I have newspaper articles published shortly after your computer reselling company went out of business that refer to you as an expert in election systems. What else did you do that qualified you to take over your current position?"

Why should we trust anyone? Why can't we just verify the accuracy of these machines?

Lewis: "My background is that I

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owned a computer hardware and software business.
I've never claimed to be an expert. That's the
reason we have laboratories, nationally recognized
laboratories."
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Lewis's used computer reselling business was called Micro Trade Mart, which appears in the Texas Franchise tax database this way:

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Micro Trade Mart Inc.
Director: R. Doug Lewis
President: R. Doug Lewis
This corporation is not in good standing as it has not satisfied all
state tax requirements.
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Lewis ran Micro Trade Mart from 1986 through June 1993. I pulled the corporate documents for The Election Center, a Virginia corporation, and found that it was originally started by a group of individuals in Washington, D.C., but I could not find their names. Lewis became Executive Director of The Election Center in 1994.

I don't know why R. Doug Lewis, after holding the position of "Assistant to the President in the White House,"[4] spent eight years selling used computers.

All I really want to know is: What qualifies him to certify voting machine certifiers, and why must everyone, including the media, talk *only* to R. Doug Lewis when they want to find out how our voting machines are tested?

And now for the rudest question of all: Why should we trust anyone? Why can't we just verify the accuracy of these machines, using a voter-verified paper trail and a robust audit procedure?

* * * * *

Professor David Dill, of the computer science department at Stanford University, tried to get answers about source code certification as well. According to an e-mail he sent me, Dr. Dill has also become concerned that there seems to be *no* eyes-on examination of the code.

As far as I can tell, voting machine software is never actually examined by anyone. Not in the only truly meaningful way: by examining the source code itself line by line.

Chapter 5 footnotes

1 – Source code files for Diebold Election Systems, cvs.tar, Accutouch directory, VoterCard.cpp,v

2 – *The San Francisco Chronicle,* 6 August 2002: "…Though Republican candidate for governor Bill Simon insists he knew nothing of his former investment partner's criminal background, an investigation ordered by Simon's accounting firm revealed four years ago that the man was a convicted drug dealer. ... Even a quick Internet search would have shown that Paul Edward Hindelang's 1982 conviction for smuggling 500,000 pounds of marijuana into the country had been splashed over the front pages of Florida newspapers…and court records show that William E. Simon and Sons…and their partners, as well as his attorneys and accounting firm, spent nearly $1 million in so-called due diligence research on Hindelang and others involved.

3 – NASED Web site, *NASED General Overview for Getting a Voting System Qualified.* http://www.nased.org/ita_process.htm

4 – University of Virginia Center for Governmental Studies National Symposium, professional credentials of R. Doug Lewis.