

Twitter Thread by Jennifer Cohn 🗳️ ■ ■



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[@jennycohn1](#)



■ ES&S's ExpressVote voting system reportedly has an integrated zebra technologies barcode reader whose "operation can be modified by scanning configuration barcodes," which can "reconfigure which types of barcodes the scanner reads," & "how it reads...&..processes them." 1/

10.5 Integrated Zebra Technologies, QR Code Scanner

In an email received by Commissioner Douglas Kellner, Kevin Skoglund stated the following potential issue with ExpressVote XL:

The EAC certification for ES&S EVS 6.0 lists "COTS Hardware" which includes: "Zebra Technologies, QR code scanner (Integrated), DS457-SR20009". It appears that this barcode scanner is integrated into the ExpressVote XL and into ExpressVote HW 2.1. If so, and if it is the commercial off-the-shelf (COTS) version as the EAC document indicates, then its operation can be modified by scanning configuration barcodes.

These configuration barcode are not secret. Zebra publishes them in their online manuals. They can reconfigure which types of barcodes the scanner reads, how it reads them, and how it processes them. They could cause the barcode scanner to stop tabulating ExpressVote barcodes or to tabulate them incorrectly. They can even be used to allow sending unintended data and keyboard commands to the voting system. A set of carefully constructed keyboard commands could be used to manipulate the voting system software.



The ExpressVote XL and the ExpressVote HW 2.1 immediately scan every inserted ballot card. They scan barcodes to detect ballot style information on new ballot cards. They scan ballot style and ballot selection barcodes from printed ballot cards to enable voter review. A ballot card pre-printed with configuration barcodes could be submitted by any voter while inside the privacy of the voting booth.

TJ Burns from ESS responded with an email that stated:

The ExpressVote XL uses a Contact Image Sensor (CIS) in the Paper Path Module. When a card is inserted, the CIS captures an image of the card to allow it to determine whether it is voted or unvoted by evaluating whether certain barcodes are present and valid for the election. Additionally the CIS scans the card as it is being printed to allow the XL's software to validate that the barcodes have printed successfully, provide readback of the selection as represented by the barcodes, create a Cast Vote Record, and store the image as a data artifact. The CIS used is the same technology used on the DS200 but is a smaller version since it need only image a 4.25" card rather than an 8.5" ballot.

Unlike the standard ExpressVote that is certified and marketed outside of the State of New York, the XL currently does not support the Zebra DS457 or any additional scanner – internally integrated or externally attached – for ballot activation.

After reviewing the 6.0.4.1 Technical Data Package (TDP) for ExpressVote XL, NYSTEC found that Zebra DS457 is not listed as a component. As stated in "Approved Parts List: ExpressVote XL HW Rev 1.0" (file "EVOTEXL_1'0_L_APL.pdf"), the scanner component is "Pb-free CIS,SL6R108X-160721,108mm, single light." Therefore, the issue Kevin raised is not present in the system SLI tested for use in New York State.

2/ "They could cause the barcode scanner to stop tabulating ExpressVote barcodes or to tabulate them incorrectly. They can even be used to allow sending unintended data & keyboard commands to the voting system."

3/ "A set of carefully constructed keyboard commands could be used to manipulate the voting system software."

4/ This is a serious problem because, with the ExpressVote, the only part of the paper record counted as your vote is the barcode....

5/ Although there is human readable text beneath the barcode, a recent study showed that voters miss 93% of inaccuracies in that text. This is an invitation to fraud, especially for down ballot races, such as for state legislature.

6/ Discussion of the study referenced in post 5. [@jhalderm](#) led the study. <https://t.co/R3aVXpCOGZ>

7/ As I explain here, the US rarely conducts robust manual audits anyway. This must change. <https://t.co/mbxFpCpFoQ>

8/ "America's preeminent election-auditing expert, Philip Stark...told me...that 'only a few jurisdictions currently audit elections in a way that has a good chance of catching & correcting wrong reported outcomes...[E]ven those states only audit a few contests in each election."

Earlier this year, though, Republicans **blocked federal legislation**, the SAFE Act, which would have required such audits for most federal races. America's preeminent election-auditing expert, Philip Stark, a professor of statistics at the University of California at Berkeley, told me a few weeks ago that "only a few jurisdictions currently audit elections in a way that has a good chance of catching and correcting wrong reported outcomes. That requires a trustworthy paper trail—primarily hand-marked paper ballots kept demonstrably secure throughout the election and the audit—and [what is known as] a risk-limiting audit using that paper trail. But, to the best of my knowledge, even those states *only audit a few contests* in each election." (Emphasis added.) A report by the **National Conference of State Legislators** confirms that just three states (Colorado, Rhode Island, and Virginia) require risk-limiting audits for one or more races.

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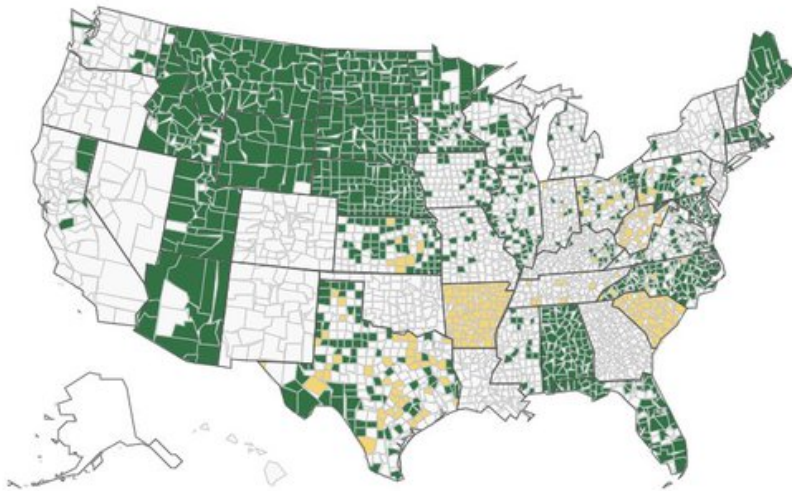
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9/ Link to screenshot in post 1. It was election security expert [@kskoglund](#) who identified the concern about the zebra barcode reader. The ExpressVote XL apparently doesn't have it, but ESS acknowledged that the ExpressVote does. <https://t.co/p0fozWDzww>

10/ I wrote about ES&S as a company here. <https://t.co/JnJ8bwF3vH>

11/ Verified Voting's verifier tool shows which jurisdictions used ES&S ExpressVote voting systems in 2020. The ones in yellow used it for all or most in person voting. The ones in green used it primarily for ADA use. <https://t.co/CxiHJD5hew>



🔍 Search Results

- Hand marked paper ballots, with BMDs for accessibility
- Hand marked paper ballots, with DREs with VVPAT for accessibility
- Hand marked paper ballots, with DREs without VVPAT for accessibility
- Ballot Marking Devices for all voters
- Hybrid BMD/Tabulator
- DREs with VVPAT for all voters
- DREs without VVPAT for all voters



12/ I don't know if all versions of the ExpressVote use the Zebra barcode reader.

13/ It appears that much of Texas and all of Arkansas and SC used the ExpressVote as a primary voting system. The largest county in Kansas, Johnson County, did too.

14/ Much of West Virginia and Ohio too.

15/ More from post 1 report: "These configuration barcode are not secret...They cld cause the barcode scanner to stop tabulating ExpressVote barcodes or to tabulate them incorrectly. They can even be used to allow sending unintended data & keyboard commands to the voting system."

16/ "A set of carefully constructed keyboard commands could be used to manipulate the voting system software."

The kicker: "A ballot card pre-printed with configuration barcodes could be submitted by any voter while inside the privacy of the voting booth." ■

We really just need #HandMarkedPaperBallots (exception for voters w/ disabilities). #BanTheExpressVote
#BanBarcodeVoting 17/

PS. This does NOT prove fraud. It does indicate a potentially serious vulnerability. 18/

19/ #BanBarcodeVoting



20/ #HandMarkedPaperBallots #PenAndPaper #ProtectOurVotes



#HANDMARKEDPAPERBALLOTS
#PROTECTOURVOTES



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