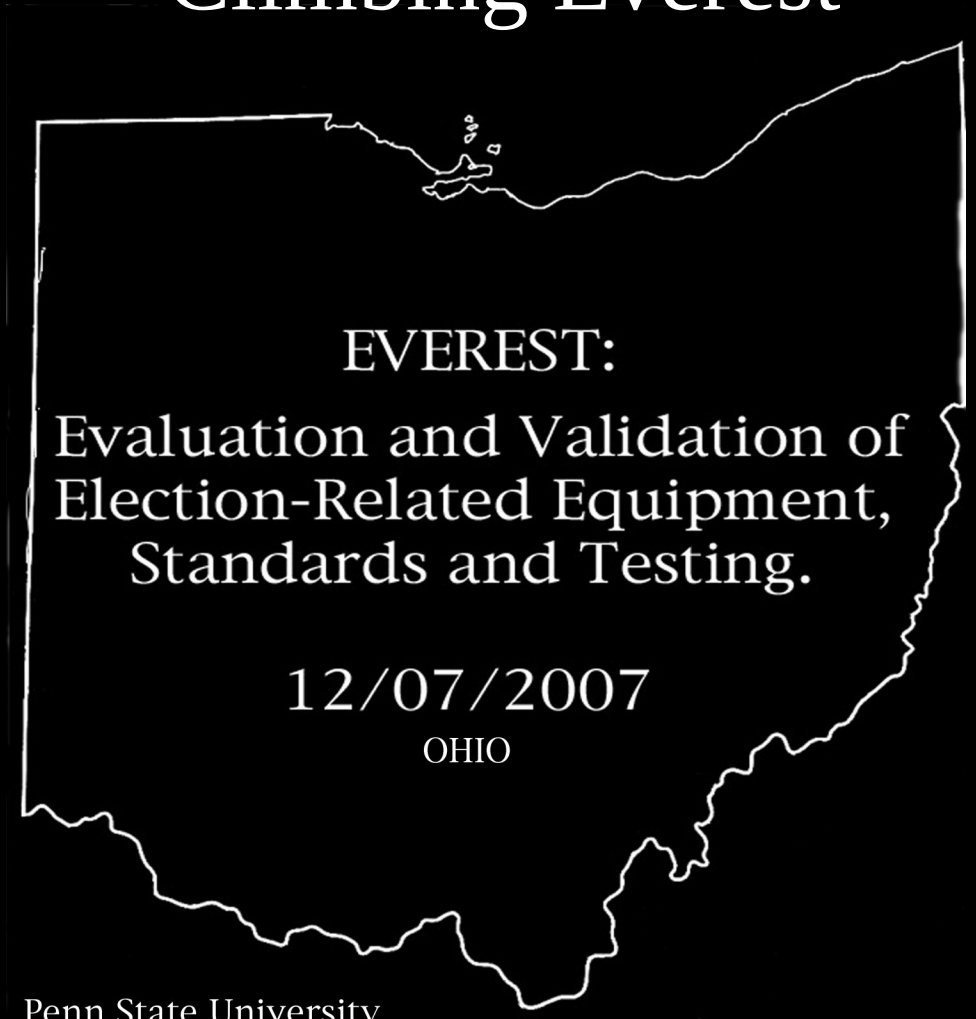
Climbing Everest



Penn State University
University of Pennsylvania
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MOUSE

FOR



OVERLORD

Voting 101



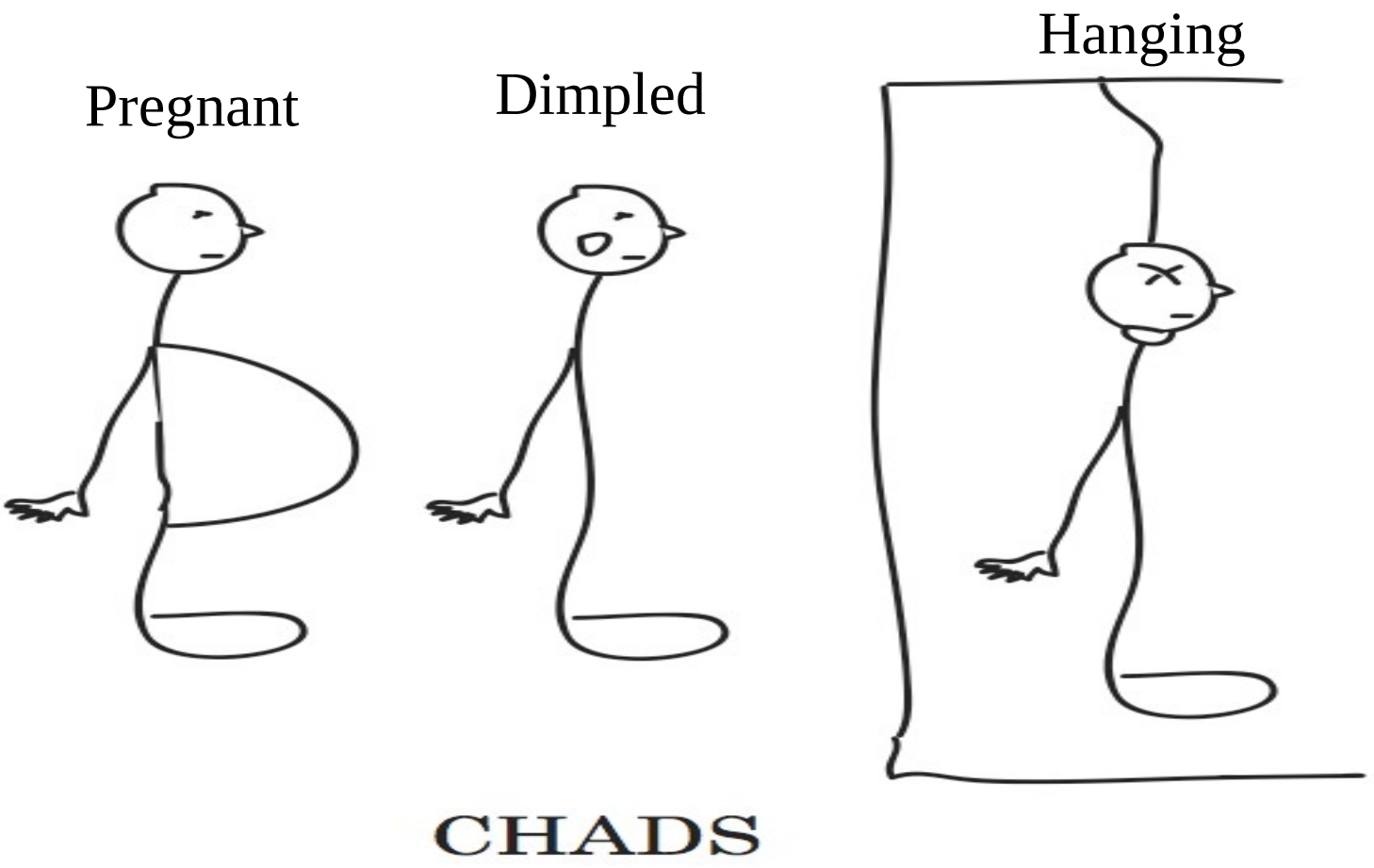
Voting in the US

- Highly decentralized:
  - *Federal* government sets broad standards
  - Each *state* has own laws, rules, requirements
  - Elections run by *counties* (>3000 in US)
  - Voting takes place in neighborhood *precincts*
    - tens, hundreds or thousands per county
- Complex:
  - Typical election has many races
  - Precinct may have several different ballots

Feds vs. States



HAVA



- Favorite HAVA quote:

"For States that **do not** use electronic equipment to assist voters with 'detecting errors', they must:

Establish a voter education program

Provide voter with instructions*

*emphasis added

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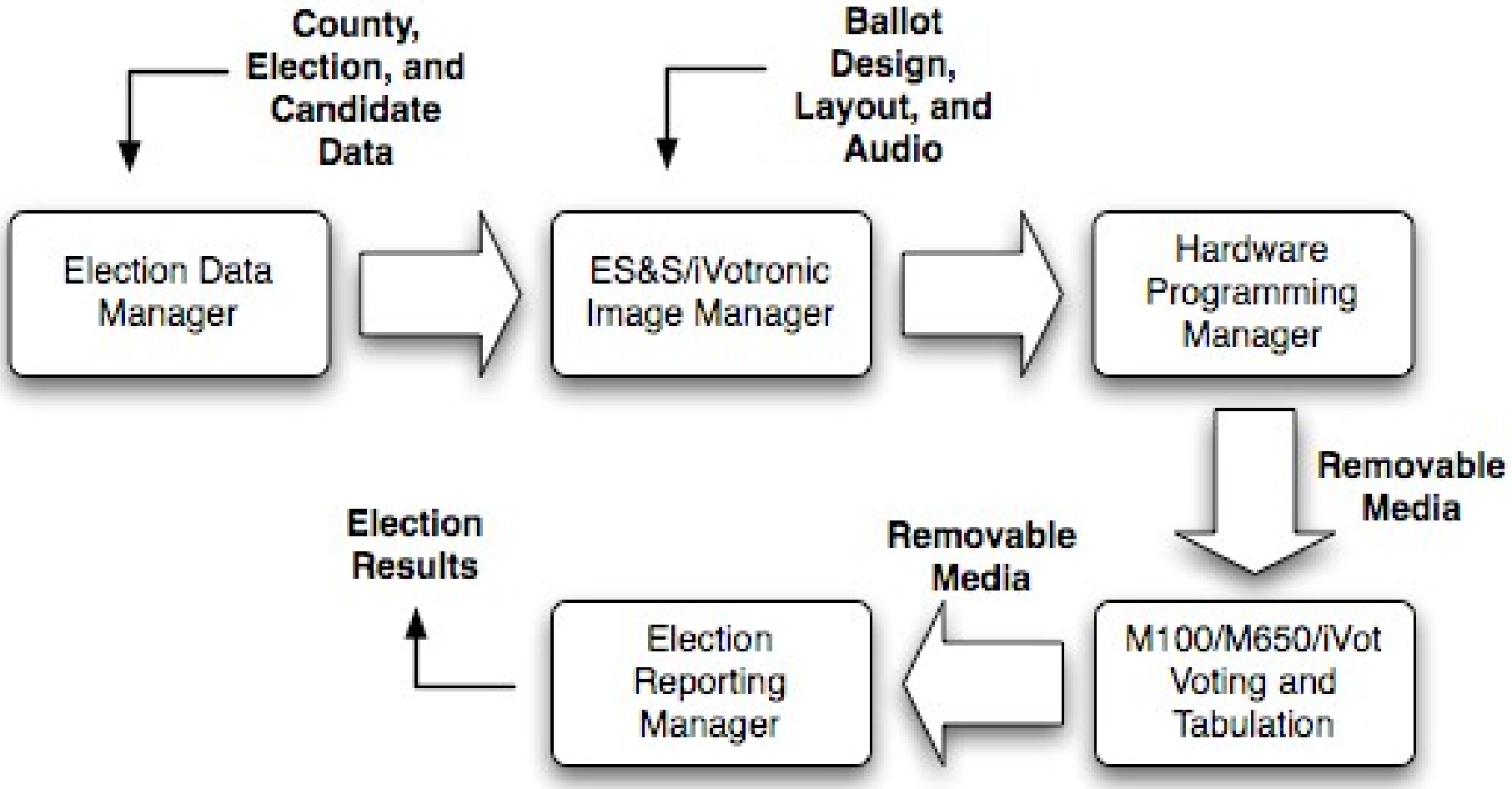
ES&S Structure



Computerized Voting

- Direct Recording Electronic (DRE)
  - specialized voting computer, typically with touch-screen interface
  - records voter selections internally
- Precinct Counted Optical Scan
  - voter fills out a paper ballot (fill in circles)
    - ballot marking devices can assist disabled
  - voter inserts ballot into precinct ballot reader, which either accepts ballot and records vote or rejects and returns ballot to voter
- Centrally (County) Counted Optical Scan
  - absentee ballots



The Horror, the Horror

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Sorry there are so few,
we were limited on time.

Lines of Code vs. % of Market Share*

ES&S - 670000+ - > 40% market share

Premier- 334000+ - > 40% market share

Other > 20% :

Hart - 300000+

Sequoia - 800000+

*sorry, there's no correlation



My Buffer Overfloweth

If it’s good enough for a minibar…




Hart
Billet Dpt
Key
Hart
Hart
Billet Dpt
Key
Hart




VOTE


291656
291657
291656
291655
291654
291653
291652

Any Port in a Storm




BUY ME!







“With a little token…”

“Anyone who considers arithmetical methods of producing random digits is, of course, in a state of sin”

-- John Von Neumann, 1951

“Random numbers should not be generated with a method chosen at random”

-- Donald Knuth, The Art of Computer Programming Vol 2

“The best defense against logic is ignorance”

-- anon

Well… it has passwords and encryption.

It’s not a backdoor, it’s a feature

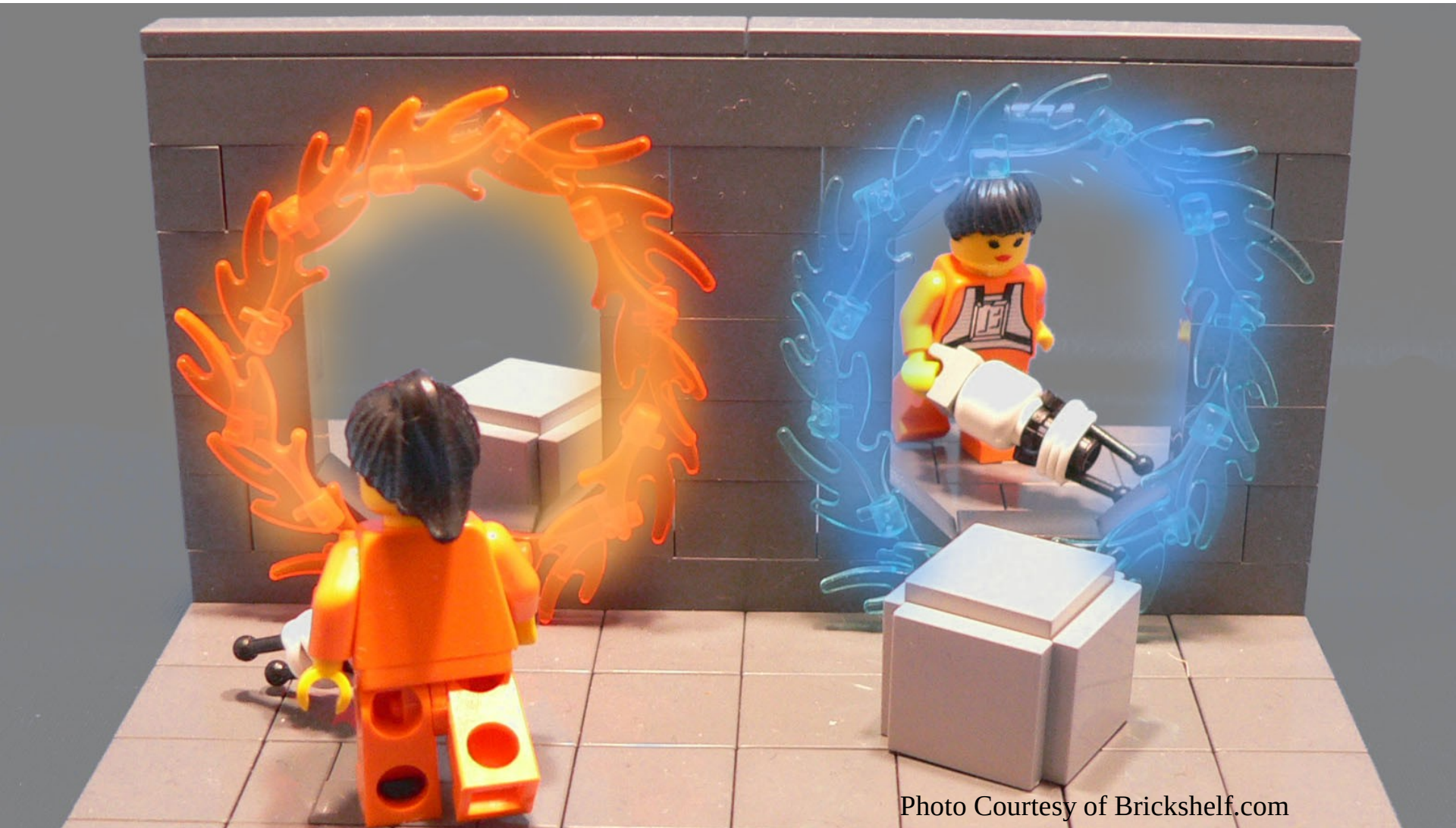


Photo Courtesy of Brickshelf.com



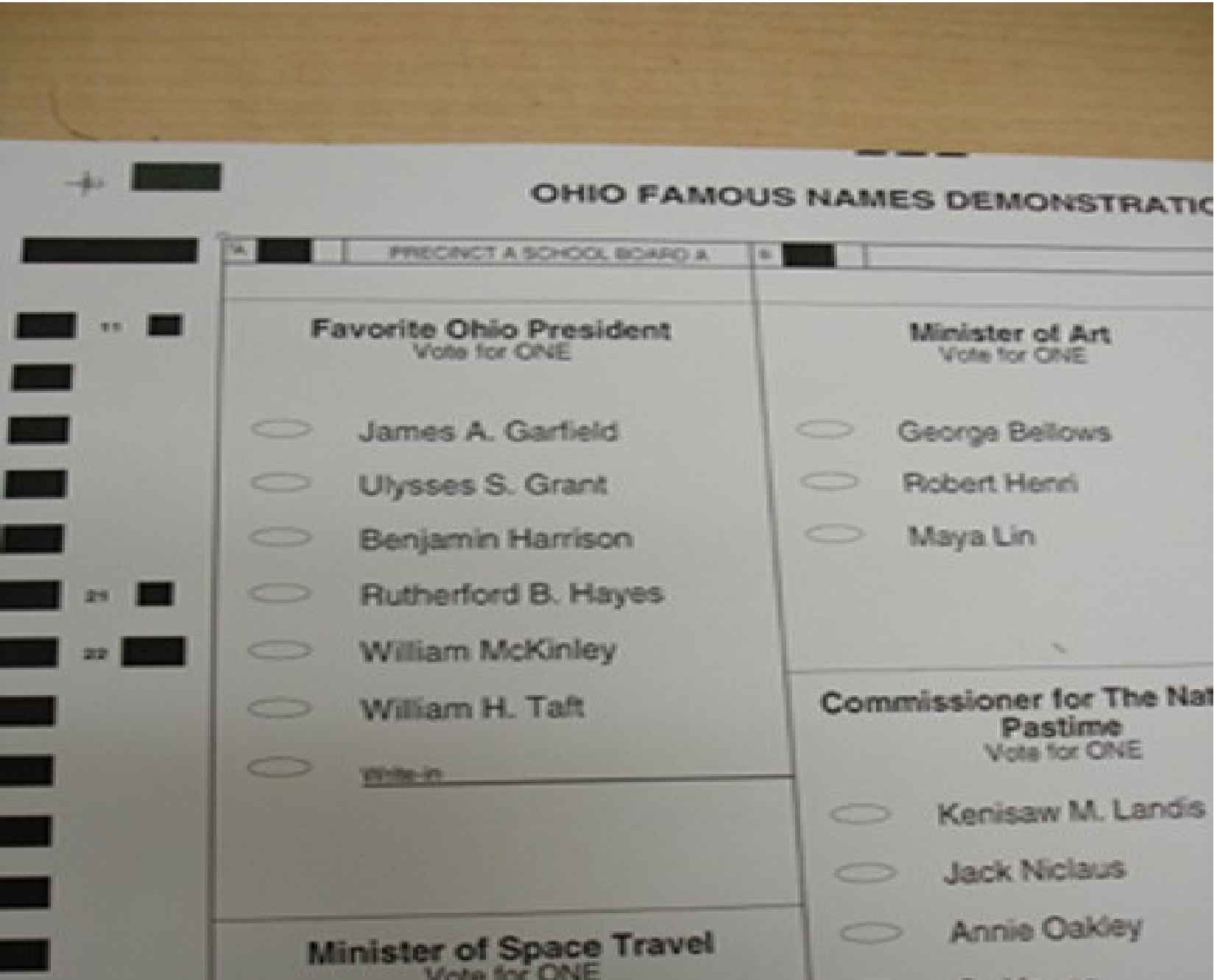
i’m in ur DRE, changin’ ur votes


VOTE
iVotronic Terminal Initialization
Press the VOTE button to start the Initialization Process.
Press the touch screen to EXIT the Initialization Process.
Following the Initialization Process the iVotronic Terminal will contain the following Passwords:
DRE Password: EVEREST
Service Menu Password: EVEREST
Election Central Menu Password: EVEREST
Clear and Test Password: EVEREST
Override Password: EVEREST
Lock Unlock Password: EVEREST
Upload Firmware Password: EVEREST
Qualification Code Password: EVEREST
iVotronic

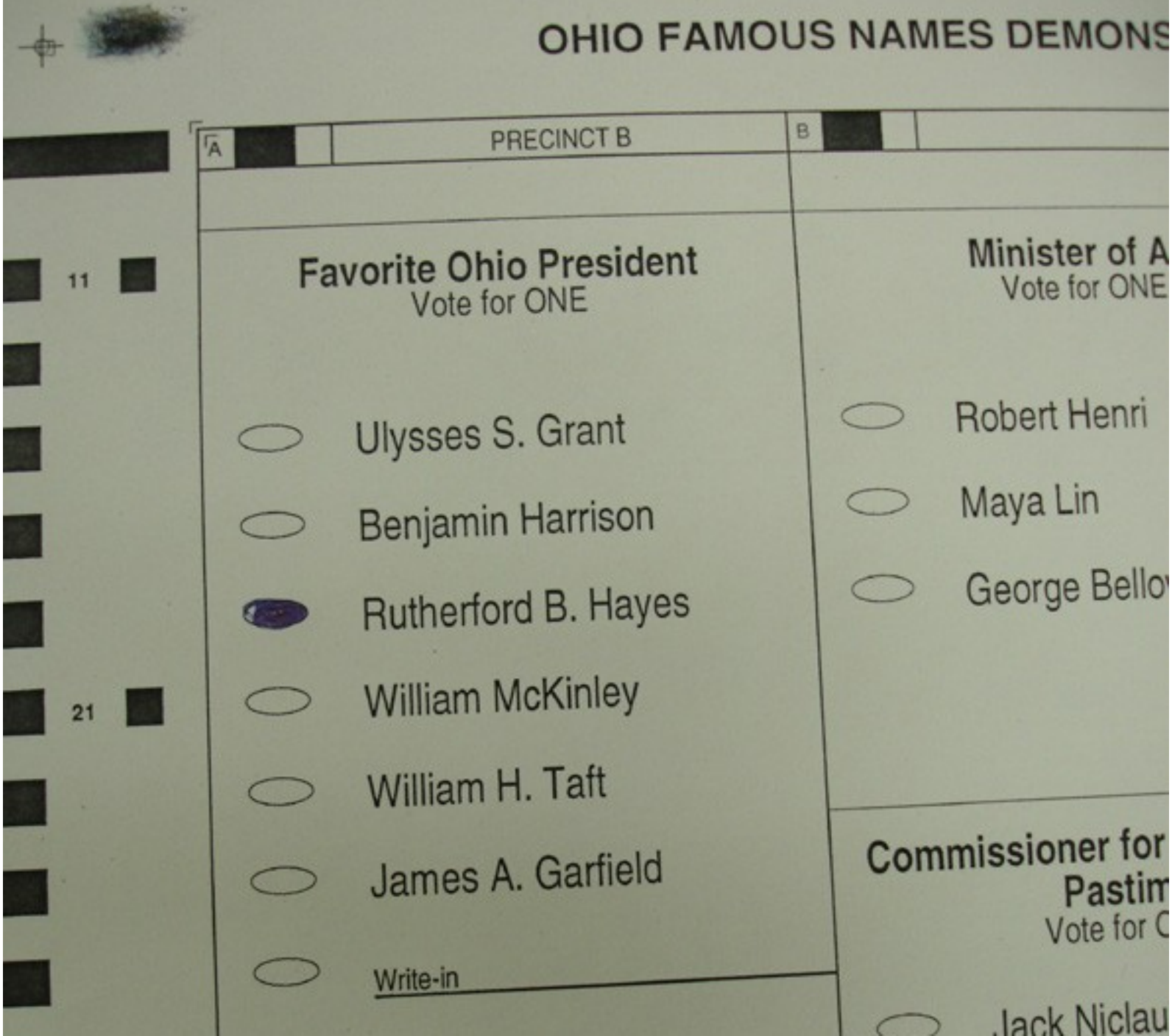

ABSENTEE MODE
EVEREST software installed :)
REPORTS
FORMAT
GRAND TOTALS
PREC. PROCESSED
TOTALS BY PRECINCT
LAST PRECINCT
LAMP TEST
STOP
START


iMedia powered by GNU GRUB version 0.97 (640K lower / 228288K upper memory)
PennState alternative voting-OS Linux
PennState alternative voting-OS Linux Red Team
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.
HART
intercivic

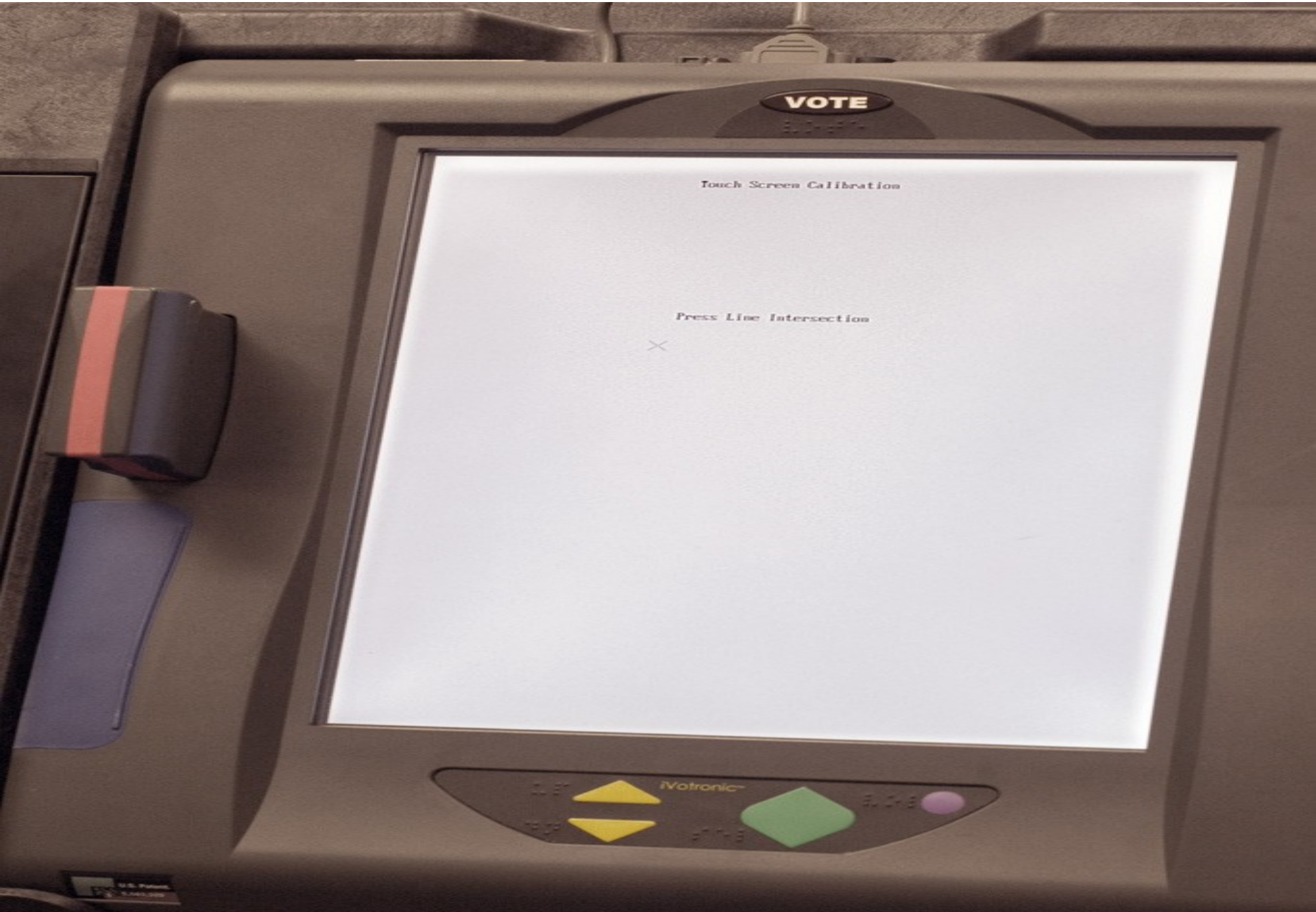
Give me a P


OHIO FAMOUS NAMES DEMONSTRATIO
PRECINCT A SCHOOL BOARD A
Favorite Ohio President
Vote for ONE
James A. Garfield
Ulysses S. Grant
Benjamin Harrison
Rutherford B. Hayes
William McKinley
William H. Taft
Minister of Art
Vote for ONE
George Bellows
Robert Henri
Maya Lin
Commissioner for The Nat
Pastime
Vote for ONE
Kenisaw M. Landis
Jack Niclaus
Annie Oakley
Minister of Space Travel


OHIO FAMOUS NAMES DEMONSTRATION
PRECINCT 8
Favorite Ohio President
Vote for ONE
Ulysses S. Grant
Benjamin Harrison
Rutherford B. Hayes
William McKinley
William H. Taft
James A. Garfield
Write-in
Minister of Art
Vote for ONE
Robert Henri
Maya Lin
George Bellows
Commissioner for The Natio
Pastime
Vote for ONE
Jack Niclaus
Annie Oakley
Cy Young
Kenisaw M. Landis
Minister of Space Travel
Vote for ONE
Nancy Currie
John Glenn
Judith Resnick
Neil Armstrong
Minister of Musi
Vote for ONE


OHIO FAMOUS NAMES DEMONS
PRECINCT B
A
B
11
21
Favorite Ohio President
Vote for ONE
Ulysses S. Grant
Benjamin Harrison
Rutherford B. Hayes
William McKinley
William H. Taft
James A. Garfield
Write-in
Minister of A
Vote for ONE
Robert Henri
Maya Lin
George Bello
Commissioner for
Pastim
Vote for
Jack Niclau

Give me an R


VOTE
Touch Screen Calibration
Press Line Intersection
iVotronic

Give me a U


VOTER CARD ENCODER
DIEBOLD
Unlimited
Votes
ON
OFF
1
2
3
NO
4
5
6
7
8
9
*
0
#
YES

- Give me a C -

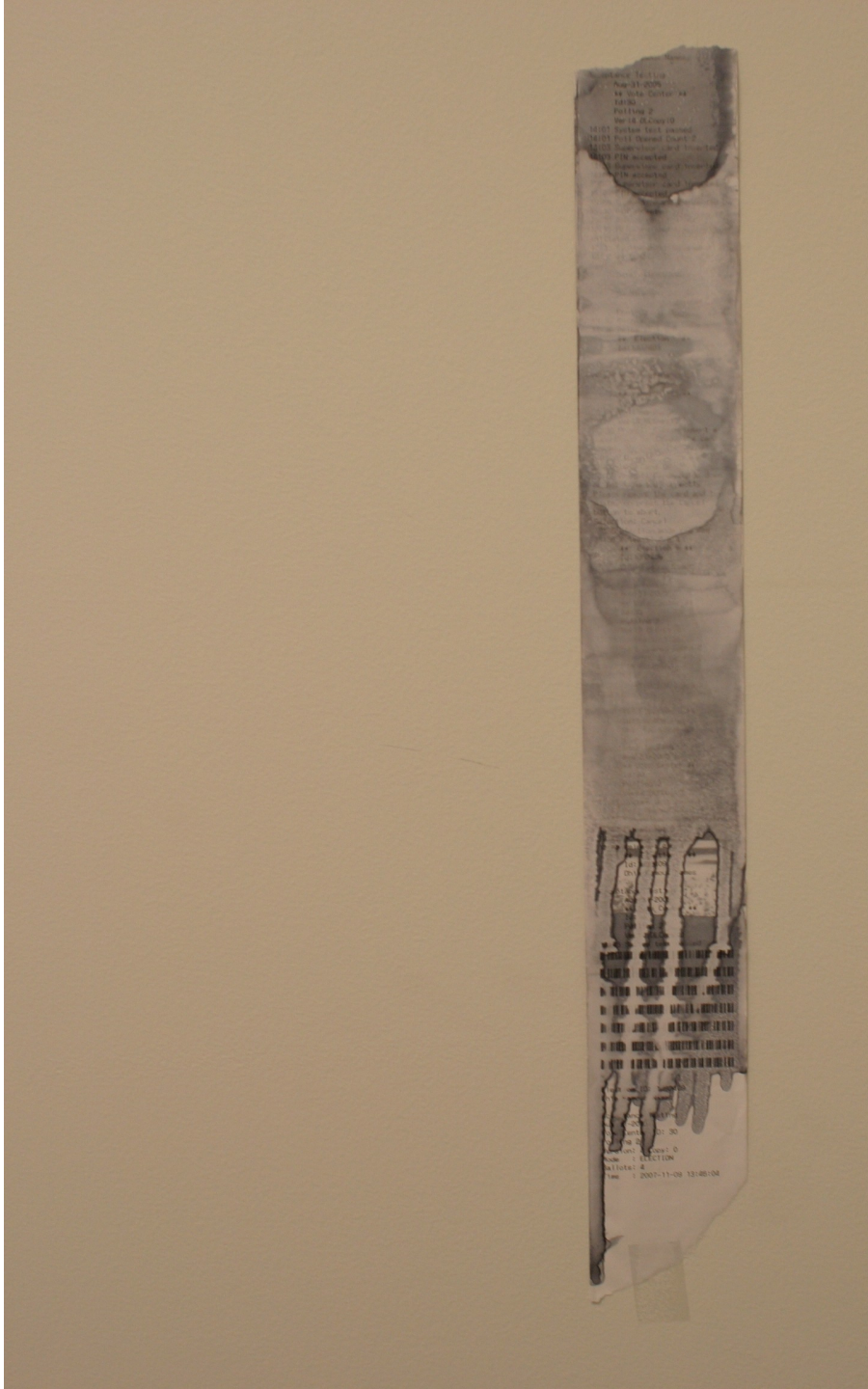
Cast multiple votes,

Erase audit logs

Disable VVPAT

Zero Totals

IOW, *Anything*



What's that Spell?

PRUC!

of course it may spell PRUC, but it means…

VIRAL PROPAGATION

Conclusions

- All academic, right?

Conclusions

- All academic, right?
- Unsafe at any speed.

Conclusions

- All academic, right?
- Unsafe at any speed
- What can you do?

Conclusions

- All academic, right?
- Unsafe at any speed
- What can you do?
  - VOTE!

Conclusions

- All academic, right?
- Unsafe at any speed
- What can you do?
  - VOTE!
  - Become a Poll Worker

Conclusions

- All academic, right?
- Unsafe at any speed
- What can you do?
  - VOTE!
  - Become a Poll Worker
  - Build a better system

MOUSE

FOR



OVERLORD

Shmoocon 2008



CATS: ALL YOUR VOTE ARE BELONG TO US.