



IFIXIT

Right to Repair

 **repair.org**

Fix, or Toss? The 'Right to Repair' Movement Gains Ground

Both Republicans and Democrats are pursuing laws to make it easier for people to fix cellphones, cars, even hospital ventilators. In Europe, the movement is further along.



Right to Repair is a Growing Movement



88% of Voters

in Massachusetts overrode the car companies and passed the automobile owners' Right to Repair law in November, 2012.



114,322 Americans

signed a petition to legalize cell phone unlocking. The White House supports cell phone unlocking—but your voice is still needed to convince Congress.

Monopoly Strategies

Copyright on Service Manuals



31st July 2012

Dear Mr Hicks,

Toshiba copyright Repair Manuals.

We understand that you are the owner and editor of a website that is found at <http://tim.id.au> and that your ABN is [REDACTED]

On your website we are able to read and see that you are distributing, by download, copyright repair manuals (the Manuals) that are proprietary to Toshiba (Australia) Pty Limited and its parent company, Toshiba Corporation of Japan (Toshiba).

The Manuals are only available to Toshiba authorised service providers under strict confidentiality agreements. You are not a Toshiba authorised service provider and therefore you have no rights to have any of the Manuals that are listed and linked under the heading "Toshiba" that appears on your website.

OPERATION:



FIX TOSHIBA

by: iFixit.com

TOSHIBA

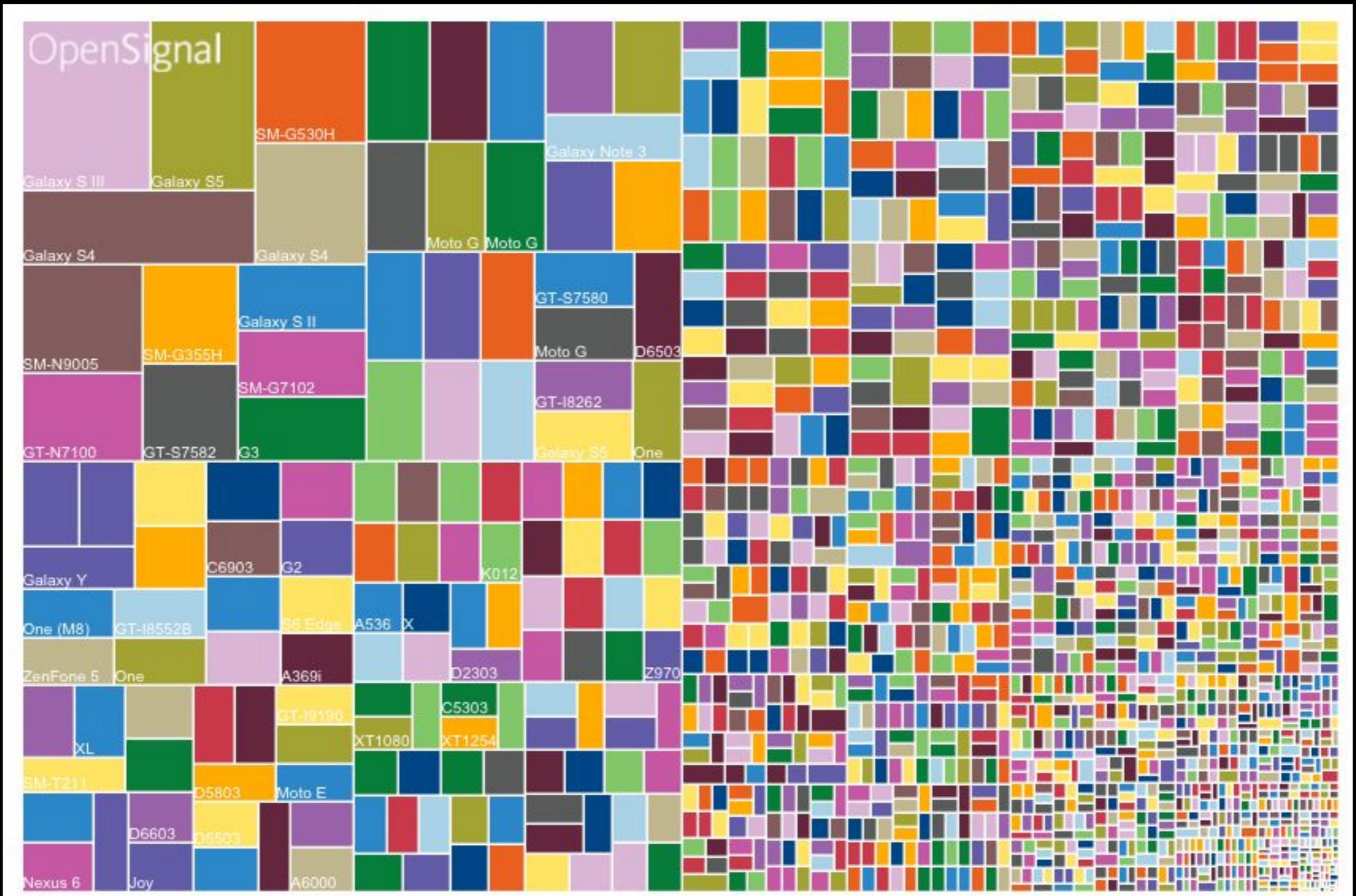
Leading Obsolescence»»»





| | |
|-------------------|--------|
| iPhone XR | 13.54% |
| iPhone 7 | 11.61% |
| iPhone 8 | 11.4% |
| iPhone X | 10.68% |
| iPhone 8 Plus | 9.26% |
| iPhone 7 Plus | 6.8% |
| iPhone 6S | 6.8% |
| iPhone XS Max | 6.65% |
| iPhone XS | 5.63% |
| iPhone 11 | 4.28% |
| iPhone 6 | 3.97% |
| iPhone 11 Pro Max | 3.25% |
| iPhone 6S Plus | 2.62% |
| iPhone 11 Pro | 2.49% |
| iPhone 6 Plus | 1.02% |

Android Fragmentation



PSP® (PlayStation® Portable)

DC 5V 1.2A

FCC ID: AK8PSP2001



CERTIFIED

IC: 409B-PSP2001

FCC Statement See Instruction Manual

Complies Canada ICES-003/NMB-003

CERTIFICATION COMPLIES WITH 21 CFR 1040.10

AND 1040.11 EXCEPT FOR DEVIATIONS PURSUANT TO

LASER NOTICE NO.50. DATE JULY 26 2001.

SONY COMPUTER ENTERTAINMENT Inc.

2-6-21, MINAMI-AOYAMA, MINATO-KU, TOKYO,

107-0062 JAPAN

MANUFACTURED: HONGFUTAI YAN TAI CHINA

Apparatus Claims of U.S. Patent Nos. 4,631,603,

4,577,216, 4,819,098 and 4,907,093 licensed for

limited viewing uses only.

SERIAL No. **HU1124865**

Sony Computer Entertainment Inc.

MADE IN CHINA

3-274-949-01

EN: WARRANTY VOID IF SEAL DAMAGED
FR: GARANTIE NON VALABLE SI SCHE
ENDOMMAGE. / ES: GARANTIA NO E
VALIDA SI SELLO ES DA-ADO.

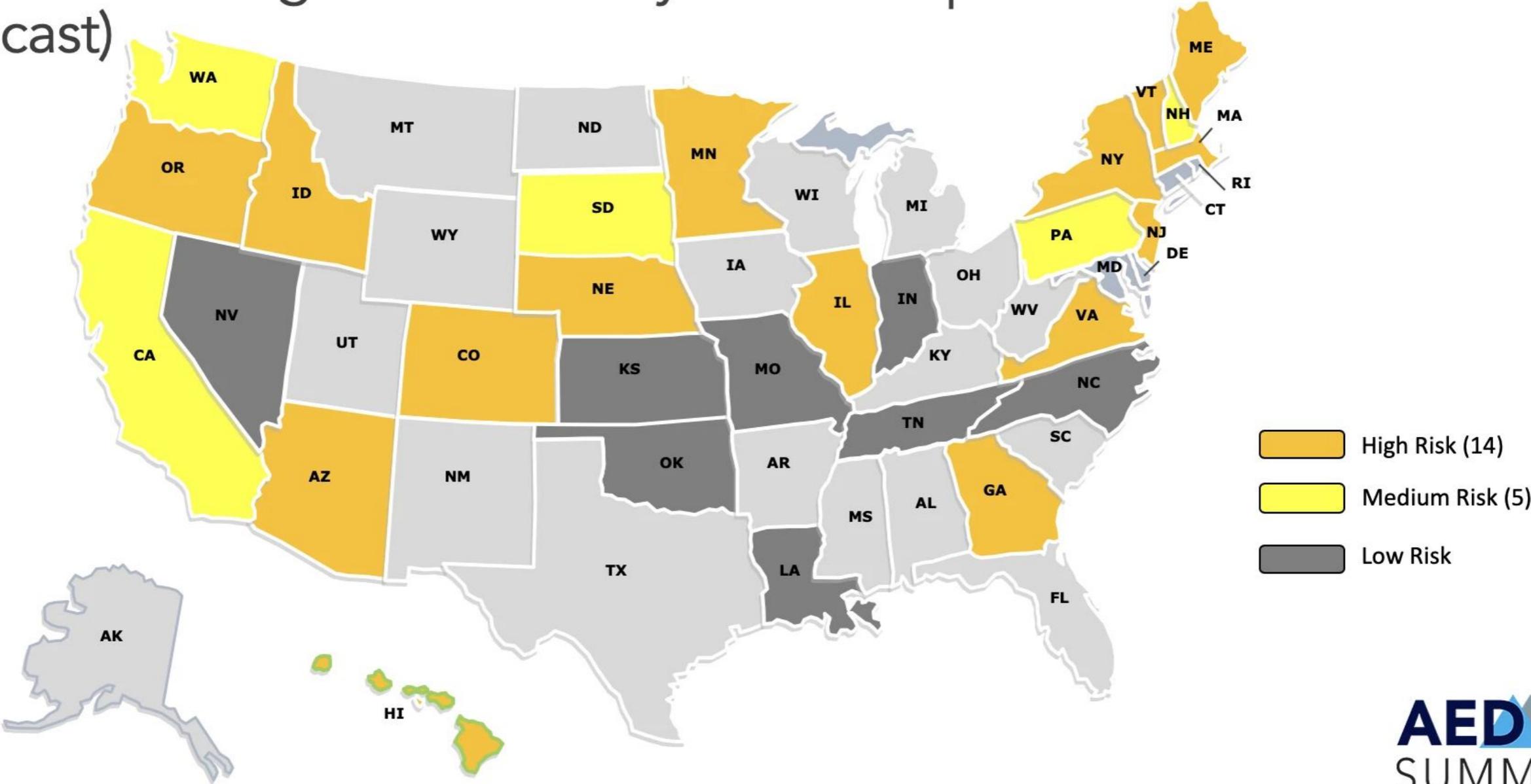


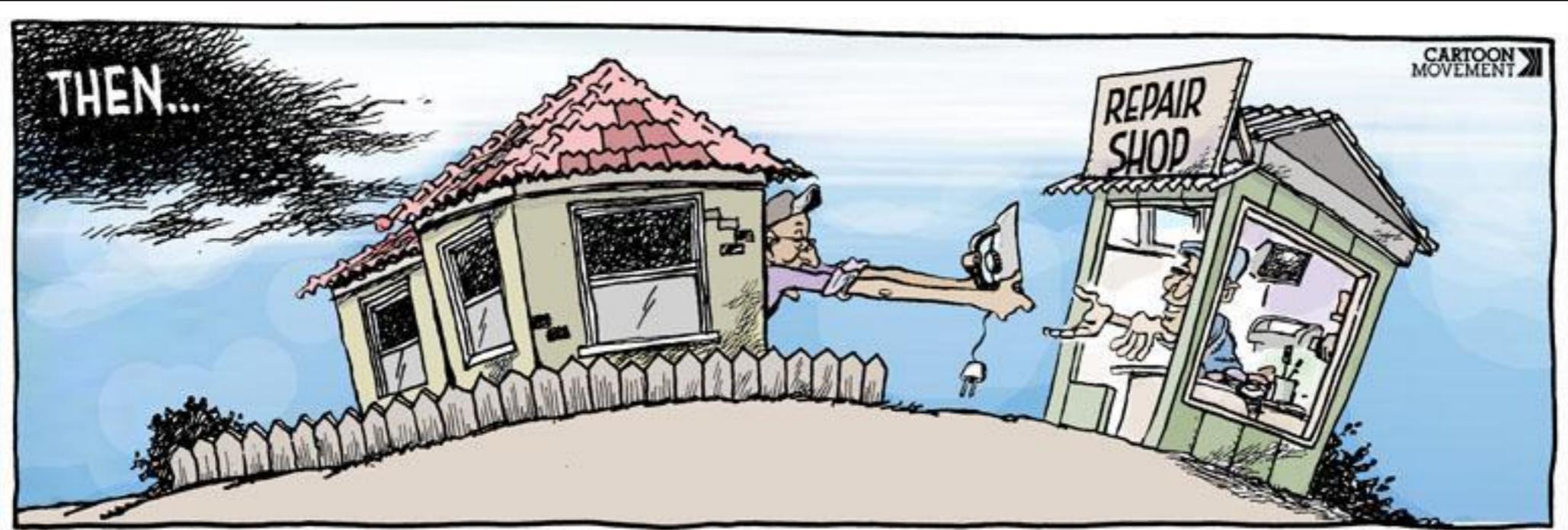
Right to Repair Legislation

Parts + Tools + Know-how



2020 – State Legislative Activity “Heat Map” (forecast)

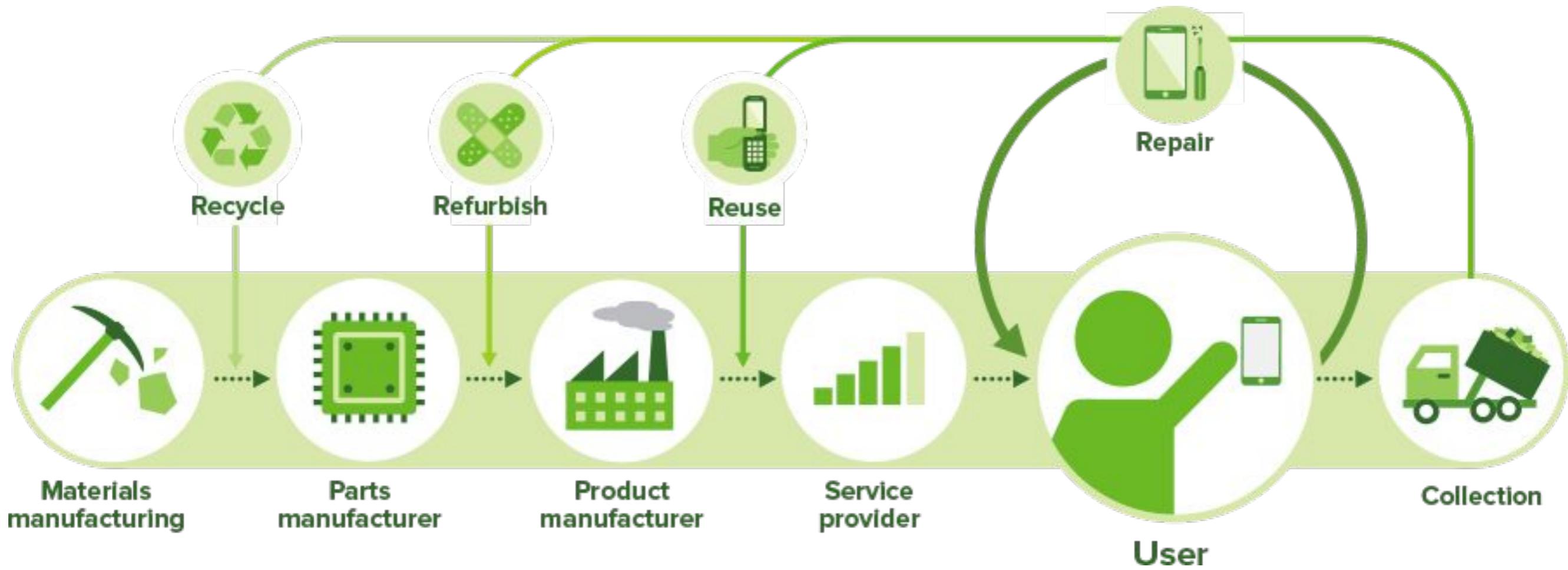




A wide-angle photograph of a large industrial sewing factory. The scene is filled with rows of sewing machines and workers. In the foreground, a woman with dark hair is seen from the side, working at a sewing machine. She is wearing a black and white patterned top. To her right, another woman in a yellow shirt is also working at a sewing machine. The background shows a long, brightly lit factory floor with many more workers and sewing machines. There are shelves with spools of thread and other supplies. The overall atmosphere is one of a busy, large-scale manufacturing environment.

It's Time for a Repair Jobs Revolution

Repair jobs may be an answer to the global unemployment problem, help bridge the digital divide, and cut down the amount of unnecessary waste.



**Repair is a cornerstone of our
environmental and economic
future.**



Tammie Jo Shults, who calmly landed Southwest Flight 1380, broke barriers as a fighter pilot



Attention women: Your choice of blood pressure medicine may affect your risk of pancreatic...



East Bay fault is 'tectonic bomb,' more data from Andreas, new study

BUSINESS

LA TIMES

Those stickers warning that repairs will void your warranty are nonsense, FTC says



By WASHINGTON POST
APR 11, 2018 | 8:45 AM





FEDERAL TRADE COMMISSION
PROTECTING AMERICA'S CONSUMERS

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Nixing the Fix: A Workshop on Repair Restrictions



JUL 16, 2019 12:30PM

CONSTITUTION CENTER

400 7th St SW, Washington, DC 20024 | [Directions & Nearby](#)

HOW DO REPAIR RESTRICTIONS AFFECT CONSUMERS + SMALL BUSINESSES?

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EXEC. DIR., THE REPAIR ASSOCIATION

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FOLLOW NIST STANDARDS to HELP CYBERSECURITY

FEDERAL ISSUE

DESIGN CONSTRAINTS → HIGHER COSTS

George Kerchner
EXEC. DIR., THE RECHARGEABLE BATTERY ASSOC.

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> 600°C THERMAL RUNAWAY

HANDING INFO to CONSUMERS will NOT SOLVE SAFETY ISSUES

UNAUTHORIZED REPAIRS REMOVES ACCOUNTABILITY

NIST

ARGUMENTS FOR + AGAINST REPAIR RESTRICTIONS

THINK ABOUT SECURITY WHEN BUILDING PRODUCTS

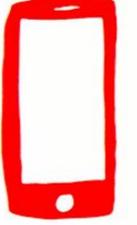
Gary McGraw
SECURITY RESEARCHER, SECURE REPAIRS.ORG

DESIGN THINGS to be REPAIRABLE

CONSTRAINTS DOESN'T MEAN HIGHER COSTS

LOOKS SAME, BUT DIFFERENT

PEOPLE SHOULD BE ABLE to FIX THEIR STUFF



@FTC #NixTheFixFTC



Repairable Products Make Good Sense

Repair is good for manufacturers, good for the economy, and good for the rest of us.

We rate the latest products to make it easy to buy repairable hardware.

Smartphones





iPhone 12 Pro

2020

- + Display and battery replacements remain a priority in the new iPhones' design.
- + Most other important components are modular and easy to access or replace.
- Glass on front and back doubles the likelihood of drop damage—and if the back glass breaks, you'll be removing *every* component and replacing the entire chassis.

6



Microsoft Surface Duo

2020

- Batteries are glued and require extensive disassembly to service.
- The USB-C port is soldered directly to the main board.
- Uncommon tri-point screws secure key components.

2



Samsung Galaxy Note 20 Ultra

2020

- Battery replacement remains far too difficult for a consumable component.
- Screen repairs are tedious, poorly prioritized, and unnecessarily expensive.
- + You'll only need one screwdriver, a standard Phillips.

3



iPhone SE 2020

2020

- + The two most commonly replaced components, display and battery, remain straightforward to access with the proper knowledge and tools.
- + Most components are modular and independently replaceable, including many that are cross-compatible with iPhone 8.
- The fragile glass back is impractical to replace.

6



ようこそ!!
ハッピーマンの
世界へ

ようこそ!!
ハッピーマンの
世界へ

NOTE
電確認
コーナー

Surface Pro3

液晶割れ
iFixitが10段階中1位評価
修理分解超高難易度品
持ち帰者はいりか? (修理費は別途29,700円)

無保証
返品不可

¥1313 付属品もいり

PCNETジャンク通り店 地下フロア

容赦無し
問答無用の
返品交換不可
それが、それが PCNETの
JUNK (夢、または希望と読む)

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Windows

Windows





Surface Pro 3

液晶割れ

iFixitが10段階中1と評価した
修理・分解超高難易度品!

找む猛者はいるか!?

*通常送料はスタートまで

SPECIAL



替原
特価品

無保証
中古品

税込

¥ 13113

返品交換不可

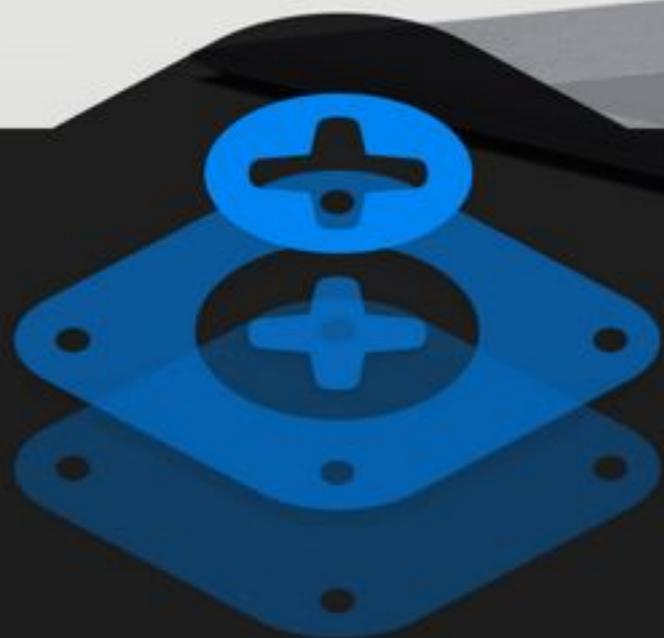
付属品も13113

PCNETジャンク通り店 地下フロア

PCNETジャンク通り店 地下フロア
13113 (税込)
13113

谷村

Microsoft Surface Laptop



TEARDOWN











Final Thoughts

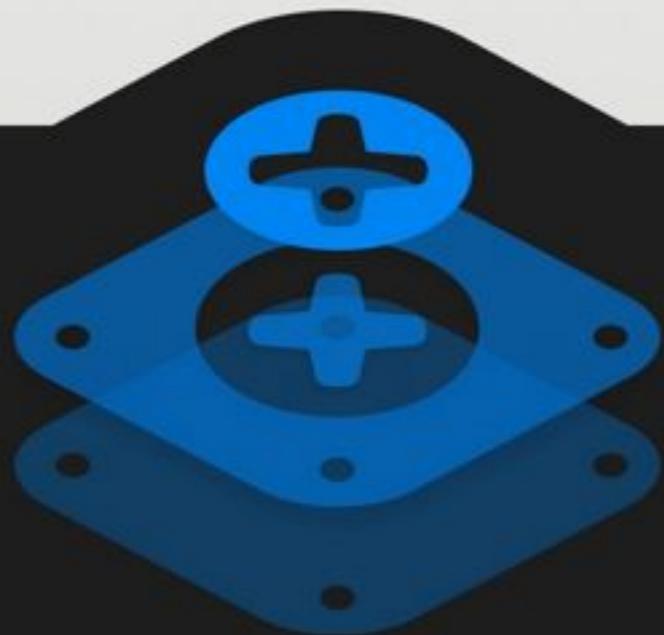
- ✘ This laptop is not meant to be opened or repaired; you can't get inside without inflicting a lot of damage.
- ✘ The CPU, RAM, and onboard storage are soldered to the motherboard, making upgrades a no-go.
- ✘ The headphone jack, while modular, can only be accessed by removing the heat sink, fan, display, and motherboard.
- ✘ The battery is difficult and dangerous to replace, giving the device a limited lifespan.

Repairability Score



Repairability 0 out of 10
(10 is easiest to repair)

Microsoft Surface Laptop 3 15"



TEARDOWN



Final Thoughts

- ✓ The opening procedure is straightforward, with a clever design that represents a *dramatic* improvement over its predecessors.
- ✓ The M.2 SSD is fully modular and easy to access.
- Torx Plus screws call for relatively rare drivers, but our standard Torx drivers worked in a pinch.
- Display access is well-prioritized, but must be replaced as an (expensive) complete unit—subcomponents aren't modular.
- While many components are modular, intricate layered construction makes them difficult to service.
- ✗ The firmly glued-down battery will be very difficult to service when it inevitably goes kaput.

Repairability Score



Repairability 5 out of 10
(10 is easiest to repair)

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Electric goods 'should have repairability rating'

By Justin Parkinson
Political reporter, BBC News

🕒 3 days ago



GETTY IMAGES

The government must look at forcing manufacturers to put "repairability" scores on electric devices, opposition parties have said.



INDICE DE RÉPARABILITÉ

Right to Repair Legislation

Parts + Tools + Know-how



Massachusetts "Right to Repair" Initiative, Question 1 (2012)

The **Massachusetts "Right to Repair" Initiative**, also known as **Question 1**, was on the [November 6, 2012 general election ballot](#) in the state of [Massachusetts](#) as an [initiated state statute](#), where it was **approved**. The measure, originally filed four times with the [Massachusetts Attorney General](#), was filed by Arthur W. Kinsman, and was assigned initiative numbers [11-17](#). The proposal required automobile manufacturers to provide non-proprietary diagnostic directly to consumers and also the safety information needed to repair their cars.^{[1][2]}

According to reports, on the last day of session, a [legislative compromise](#) was confirmed. Although the compromise was enacted, Question 1 remained on the ballot. The measure became a law as well when voters approved it.^[3]

Question 1



Type [State statute](#)

Origin [Right to Repair Coalition](#)

Topic [Business regulation](#)

Status ✔

Election results

See also: [2012 ballot measure election results](#)

The following are **official** election results:

| Massachusetts Question 1 | | |
|--------------------------|-----------|------------|
| Result | Votes | Percentage |
| ✔ Yes | 2,353,603 | 87.7% |
| No | 392,562 | 12.3% |

Results via [the Massachusetts Secretary of State](#).



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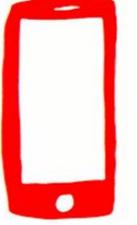
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@FTC #NixTheFixFTC

DMCA 1201



17 U.S. Code § 1201 - Circumvention of copyright protection systems

[U.S. Code](#) [Notes](#)

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(a) VIOLATIONS REGARDING CIRCUMVENTION OF TECHNOLOGICAL MEASURES.—

(1)

(A) No person shall [circumvent a technological measure](#) that effectively controls access to a work protected under this title. The prohibition contained in the preceding sentence shall take effect at the end of the 2-year period beginning on the date of the enactment of this chapter.





kylewiens.com
@kwiens

Hacking Tractors for Repair

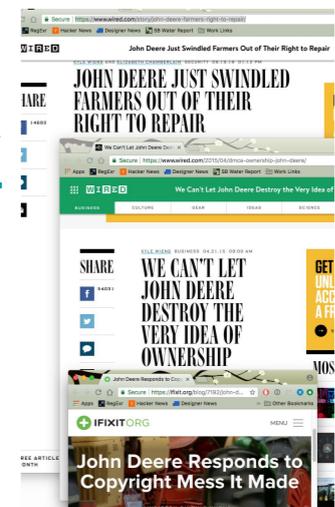
Using MITM Brute Force



Motivation

- Companies are locking diagnostics and commands behind proprietary code.

- <https://www.wired.com/story/john-deere-farmers-right-to-repair/>
- <https://ifixit.org/blog/7192/john-deere-mess/>
- <https://www.wired.com/2015/04/dmca-ownership-john-deere/>



- Without access to information, repair becomes difficult.

- Tractor commands aren't encrypted. We can view and copy them.

- With a library of possible commands we can create our own tools.



Progress

- The CAN “language” has an open source handbook to help figure out commands
 - <http://opengarages.org/handbook/>
- Previous students have captured data packets and parsed some of them
 - <https://tractorhacking.github.io/documentation/> has their results and instructions for how to pickup where they left off.
 - The last group improved data collection with PolyCAN

Car Hacker's Handbook by OpenGarages

Download the book for free!

Below you can download the book in several different formats. The license of the books is under a [Creative Commons Attribution-NonCommercial-ShareAlike license](#), which lets you share it, remix it, and share your remixes, provided that you do so on a noncommercial basis.

Modern cars are more computerized than ever. Infotainment and navigation systems, Wi-Fi, automatic software updates, and other innovations aim to make driving more convenient. But vehicle technologies haven't kept pace with today's more hostile security environment, leaving millions vulnerable to attack.

The Car Hacker's Handbook will give you a deeper understanding of the computer systems and embedded software in modern vehicles. It begins by examining vulnerabilities and providing detailed explanations of communications over the CAN bus and between devices and systems.

Then, once you have an understanding of a vehicle's communication network, you'll learn how to intercept data and perform specific hacks to track vehicles, unlock doors, glitch engines, flood communication, and more. With a focus on low-cost, open source hacking tools such as Metasploit, Wireshark, Kayak, can-utils, and AChipWhisperer, The Car Hacker's Handbook will show you how to:

- Build an accurate threat model for your vehicle
- Reverse engineer the CAN bus to fake engine signals
- Exploit vulnerabilities in diagnostic and data-logging systems
- Hack the ECU and other firmware and embedded systems
- Feed exploits through infotainment and vehicle-to-vehicle communication systems
- Override factory settings with performance-tuning techniques
- Build physical and virtual test benches to try out exploits safely

If you're curious about automotive security and have the urge to hack a two-ton computer, make The Car Hacker's Handbook your first stop.

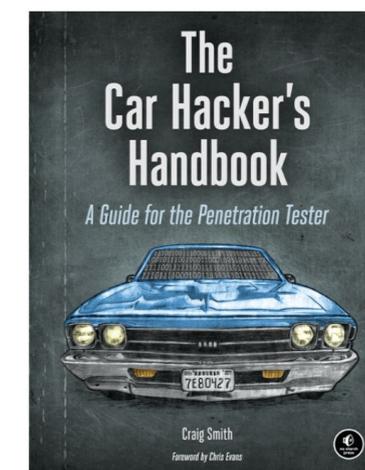
View Online

[View Book Online](#)

Download

[Download htmlz](#)

Purchase



Documentation

Documentation of our efforts to reverse engineer the John Deere CAN bus protocol can be found here. This documents work performed from September 2017 - March 2018.

- [Connecting to a Live System](#)
- [Connecting to the ECU](#)
- [Benchtop ECU Internals](#)
- [Future Reverse Engineering Work](#)
- [Processing Script](#)
- [Proprietary CAN IDs](#)
- [Technical Notes CAN](#)
- [Technical Notes J1939](#)

Documentation of individual CAN-BUS IDs extracted from the tractor can be found below:

CAN-Bus ID Format Explanation

- 0 - Torque/Speed Control 1
- 000C7802 - Electronic Engine Controller 16
- 000C7803 - Electronic Engine Controller 16
- 000C7EBE - Electronic Engine Controller 16
- 000C7F65 - Electronic Engine Controller 16
- 000C7F78 - Electronic Engine Controller 16
- 000C7F79 - Electronic Engine Controller 16

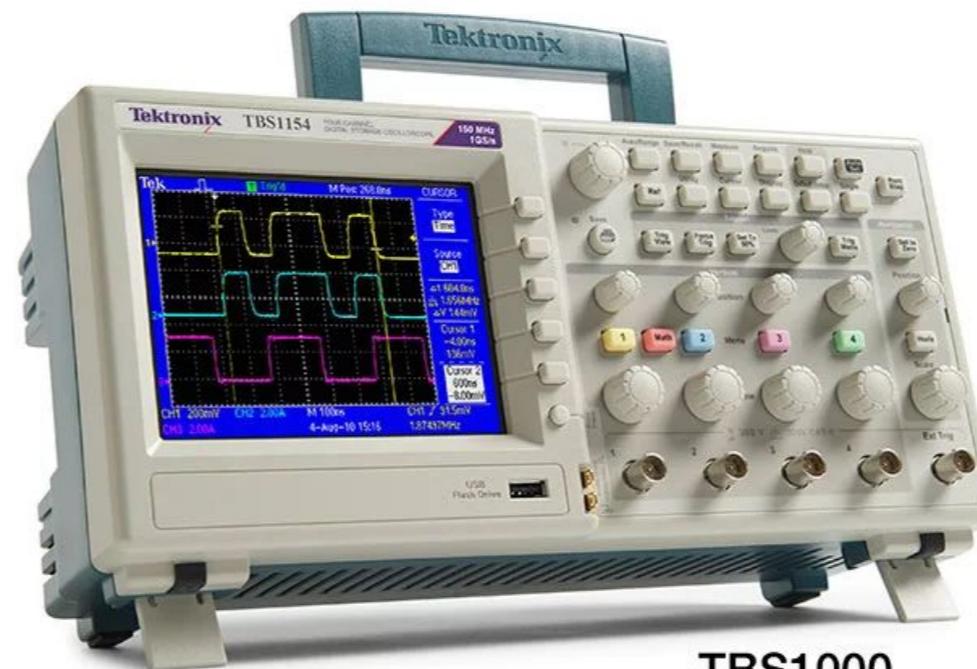
General Goals

- Define John Deere Tractor CAN commands
 - Expand on existing library
- Attempt to get a bench ECU (Engine Control Unit) working.
 - We bought one. Record signals from live tractor, play back on ECU



Required Skills

- Minor knowledge of electronics
- Knowledge of oscilloscope & function generators
- Programming



TBS1000

Implications

- Help farmers around the world save time and money
- Learn how “Security through Obscurity” can be brute forced



Deliverables

- More CAN library commands
- Create oscilloscope symbol table
 - <https://about.keysight.com/en/newsroom/backgrounders/CANdbco/>
 - http://socialledge.com/sjsu/index.php/DBC_Format

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- 000C7F78 - Electronic Engine Controller 16
- 000C7F7E - Electronic Engine Controller 16
- 000C7FFD - Electronic Engine Controller 16
- 0C000006 - Torque/Speed Control 1
- 0CF00300 - Electronic Engine Controller 2
- 0CF00400 - Electronic Engine Controller 1
- 18F00503 - Electronic Transmission Controller 2
- 18F00647 - Electronic Axle Controller 1
- 18FDC00 - Diesel Particulate Filter Control 1
- 18FE6300 - Aftertreatment 1 Outlet Gas 2
- 18FE6847 - Vehicle Fluids
- 18FE6900 - Engine Temperature 3
- 18FED500 - Alternator Information
- 18FEDF00 - Electronic Engine Controller 3
- 18FEE500 - Engine Hours Revolutions
- 18FEE706 - Vehicle Hours
- 18FEE800 - Engine Temperature 1
- 18FEF00 - Engine Fluid Level/Pressure 1
- 18FEF147 - Cruise Control/Vehicle Speed 1
- 18FEF200 - Fuel Economy (Liquid)
- 18FEF500 - Ambient Conditions
- 18FEF600 - Intake/Exhaust Conditions 1
- 18FEF700 - Vehicle Electrical Power 1
- 18FEFC47 - Dash Display 1
- 1CFDDF47 - Front Wheel Drive Status





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