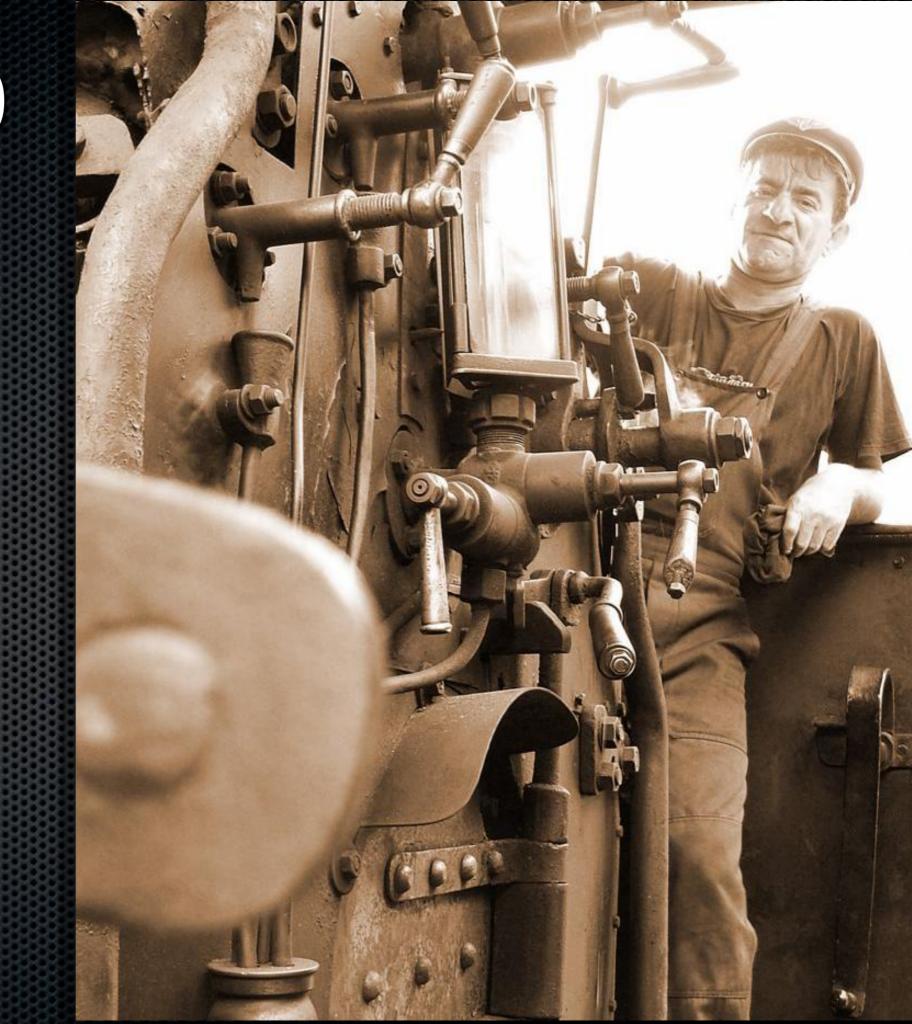
# SusTech 2013

# Design Like You Give a Damn

Daniel Wiens iFixit



# Repair 1.0





How to be a mechanic

Figure it out
Printed repair manuals
Trade school

# How to be a mechanic in 2013



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# Do-it-yourself repair

Fix your own hardware with our free service manuals.

Step-by-step photos and instructions make it easy.

Learn more

### Mac Repair



1.6k Guides

122 Devices

4.6k Parts



Featured Guide MacBook Unibody Model A1342 Logic Board Replacement

### Game Console Repair



332 Guides

48 Devices

333 Parts



Featured Guide Repairing Sega Genesis Reset

### **Phone Repair**



1k Guides

240 Devices

109 Parts



Featured Guide Repairing Blackberry 7105t Battery Connector

### iPhone Repair



111 Guides

6 Devices

### Vehicle Repair



111 Guides

74 Devices

### Camera Repair



492 Guides

101 Devices

### **PC** Repair



643 Guides

199 Devices

### iPad Repair



65 Guides

7 Devices

### iPod Repair



147 Guides

21 Devices

### **Household Repair**



23 Guides

42 Devices

### Contribute

Don't see the repair you're looking for? Help us out by starting it!

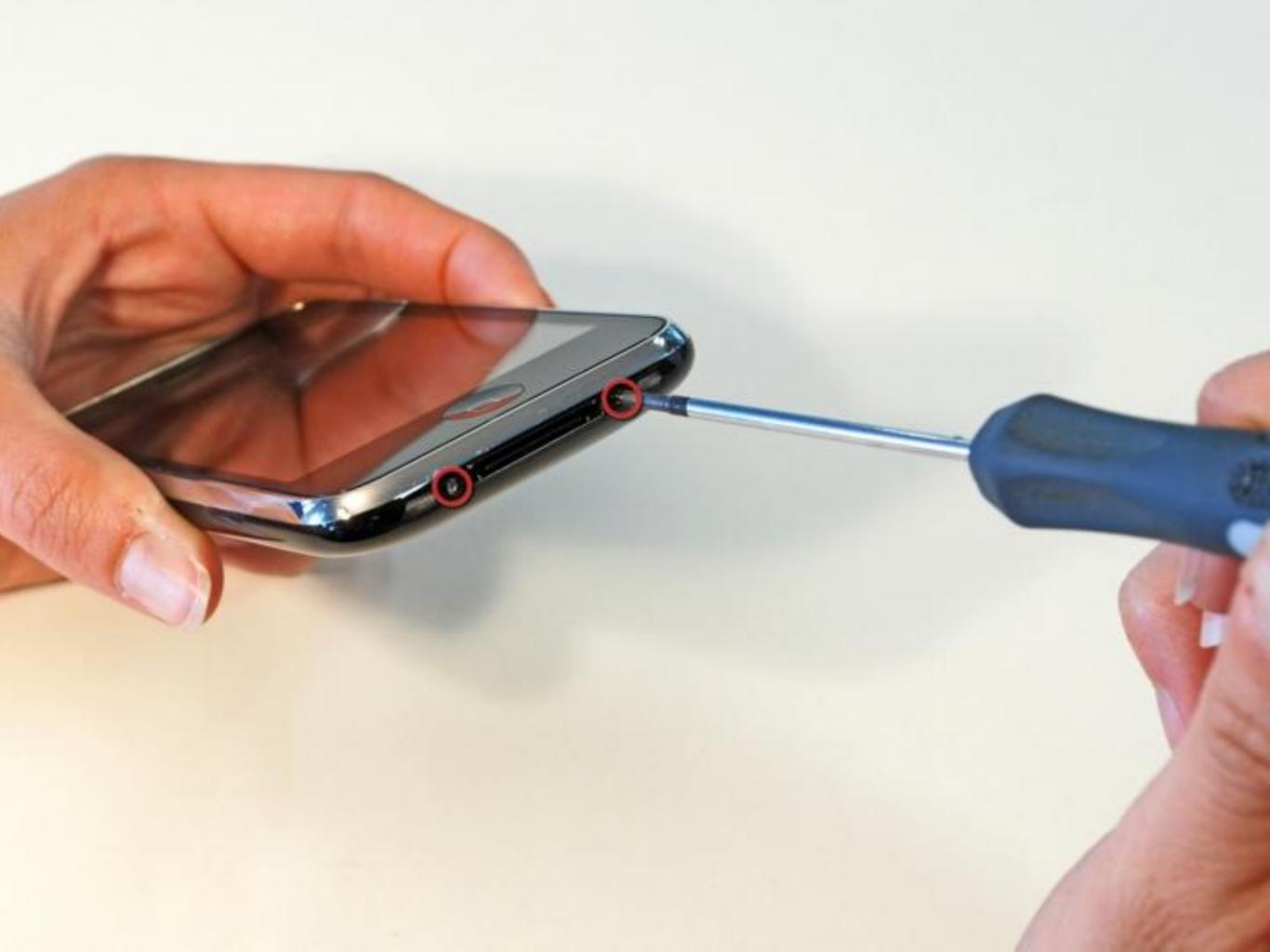
### Media Player Repair

Nintendo Game Console...

Sony Game Console Repair

Microsoft Game Console...











# Green design is all about product longevity.

# Which includes modularity. The ability to replace.

### **Tablet Repairability**

Our engineers disassembled and analyzed each tablet, awarding a repairability score between zero and ten. Ten is the easiest to repair.

### How we rate devices:

A device with a perfect score will be relatively inexpensive to repair because it is easy to disassemble and has a service manual available. Points are docked based on the difficulty of opening the device, the types of fasteners found inside, and the complexity involved in replacing major components. Points are awarded for upgradability, use of non-proprietary tools for servicing, and component modularity.



Dell XPS 10

- \* Easy to open. Easy to remove battery.
- \*Color-coded screws and labeled cables inside.
- LCD is fused to the glass.





Amazon Kindle Fire

- Device is easy to open. No proprietary fasteners.
- Simple design with standard Phillips screws.
- Glass panel is fused to frame.





Dell Streak

- . Device is easy to open.
- Battery is easy to replace.
- LCD is fused to the glass.





Motorola Xoom

- . No proprietary fasteners.
- LCD and front glass are not fused.
- 57 screws means a long disassembly time.





Samsung Galaxy Tab 2 7.0

- Modular design and easy to remove components.
- Front glass is not fused to the LCD.
- Heat gun is needed to replace the LCD.







Apple iPad Mini

- . LCD and glass are not fused together.
- Excessive amounts of adhesive makes any repair difficult.
- Hidden screws complicate disassembly.

2



Microsoft Surface Pro

- Battery is not soldered to the motherboard.
- Tons of adhesive holds everything in place.
- -Opening the device risks shearing the display cables.













## Chumby One











## Pleo



# iPod Shuffle

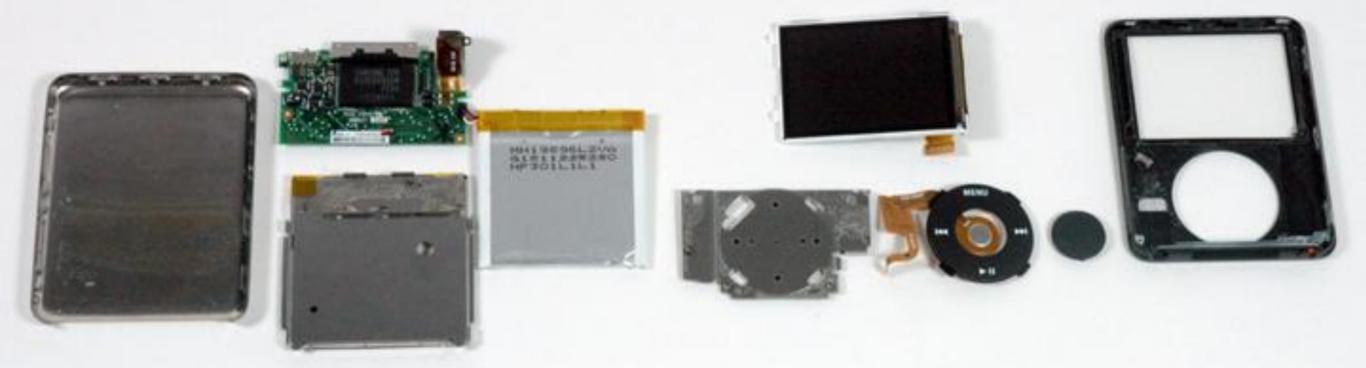
# iPod Shuffle



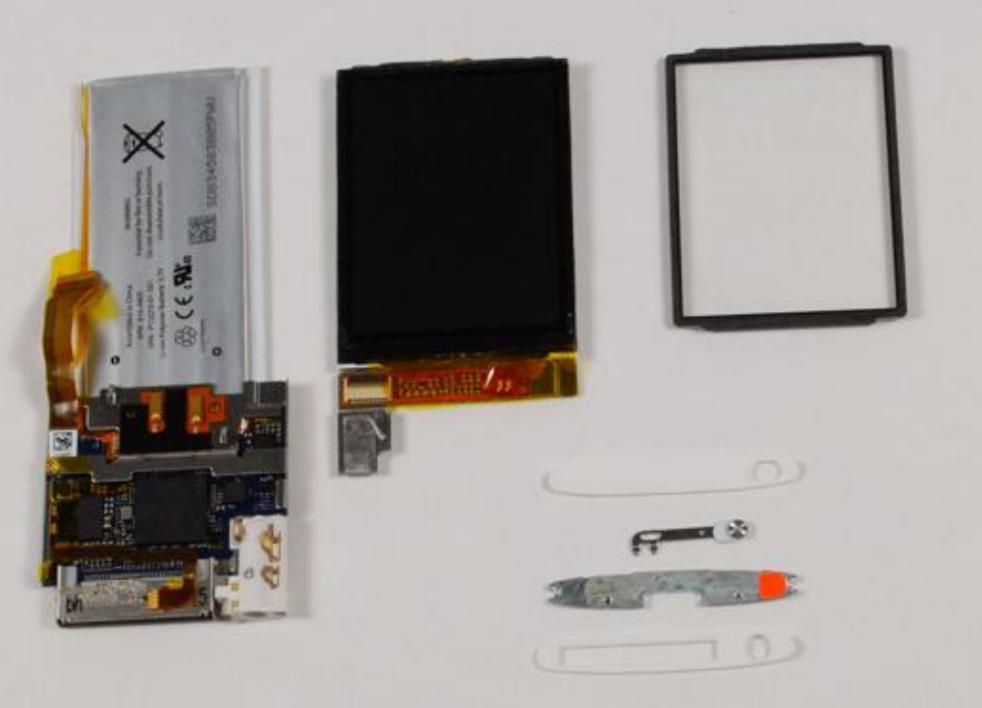




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## Gadget Teardowns

User-contributed sneak peeks inside the hottest new gadgets. Comprehensive disassembly photos, hardware analysis, and witty commentary.



#### **Motorola Droid**

Dr.Wreck has finally worked up the courage to tear apart his Brand New Motorola Droid!















#### Recent Popular



iFixit User

**Browse Teardowns** 

Psion 5 by Peddy

Here's a Psion Series 5 for disassembly. It's...



Christmas tree by bag

The holidays are about to finish and at some...



#### Canon PowerShot S500 by bac

My old Canon PowerShot S500 digital camera...



#### RIM Blackberry Pearl 8130 by Liam Speirs

Here's a Blackberry Pearl 8130 for disassembly....



#### Contribute



Write your own teardown! Take apart something and show us what you find. Our teardown creator makes publishing step-by-step photos easy.

Create a Teardown



Why should I create a teardown?

Guidelines for creating a teardown

How to create a teardown

#### Popular Repair Guides

iBook G4 14" 933 MHz-1.33... One RAM slot will accept PC2100... 55 recent views



MacBook Pro 15" Unibody...



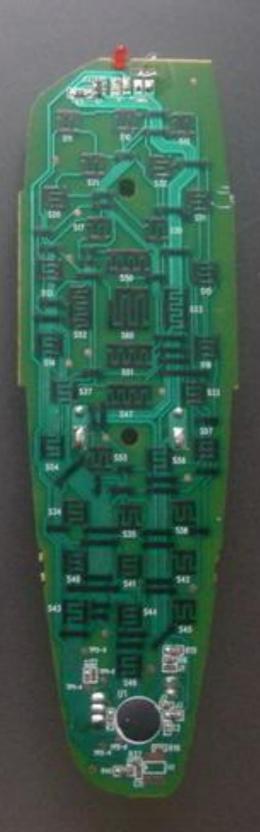
## Sony Transistor Radio



### Sky TV Remote







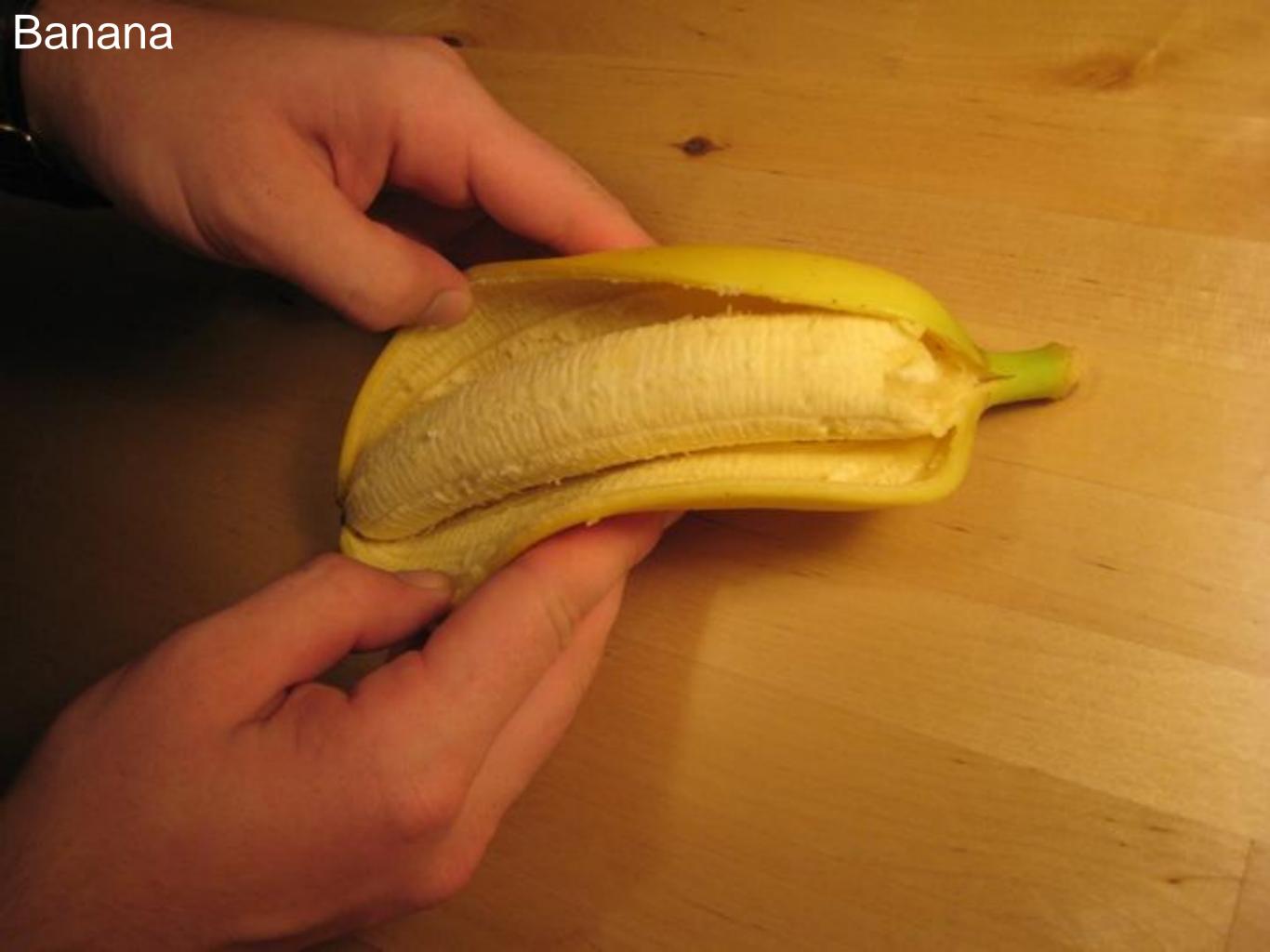






phoneWreck



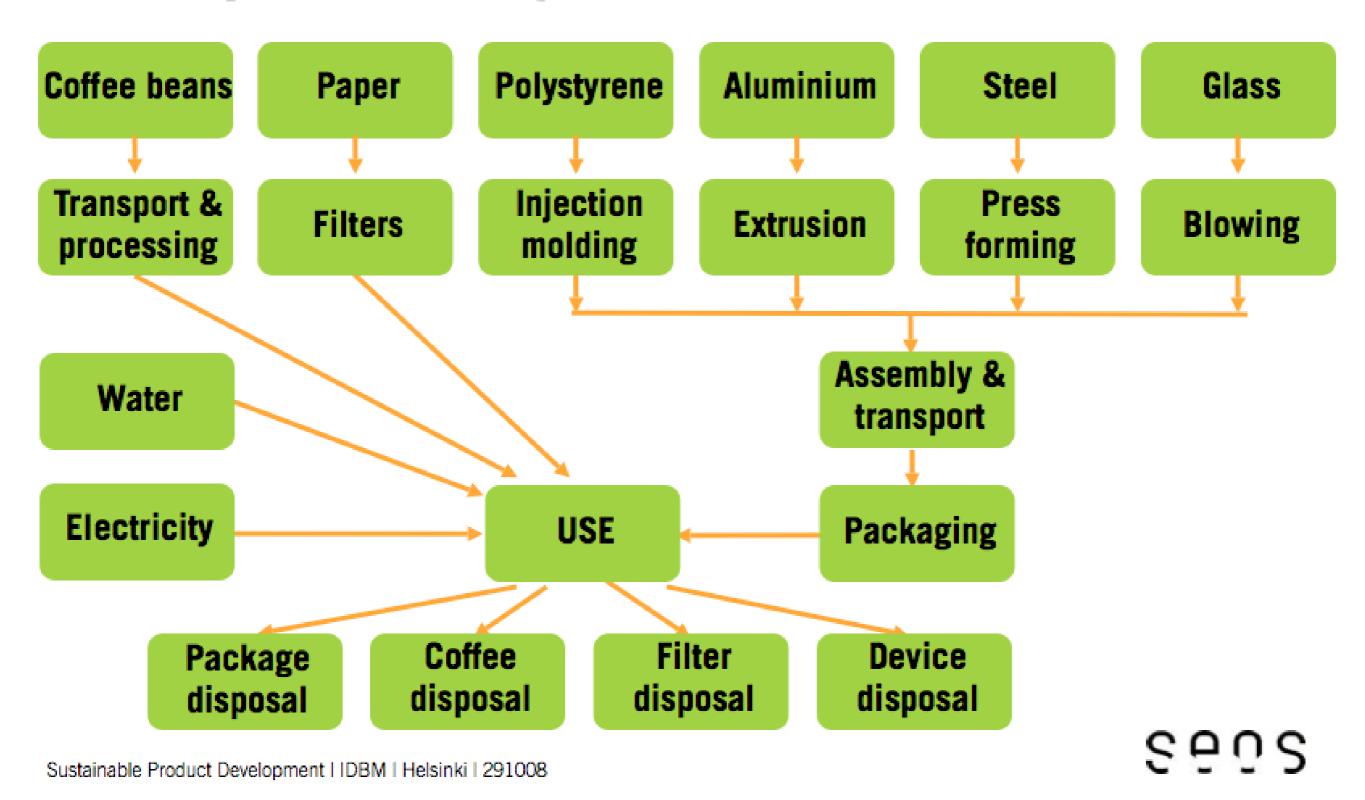


Starbucks
Barista





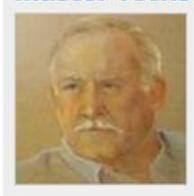
## Example: Life cycle of a coffee maker



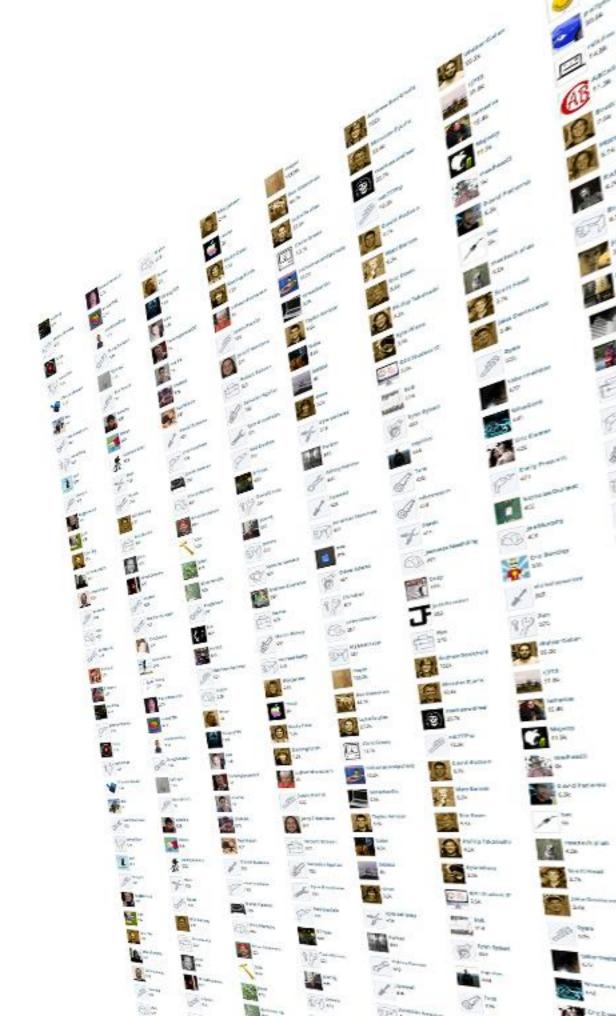
# Milions of people use iFixit to fix their own things



**Master Techs** 

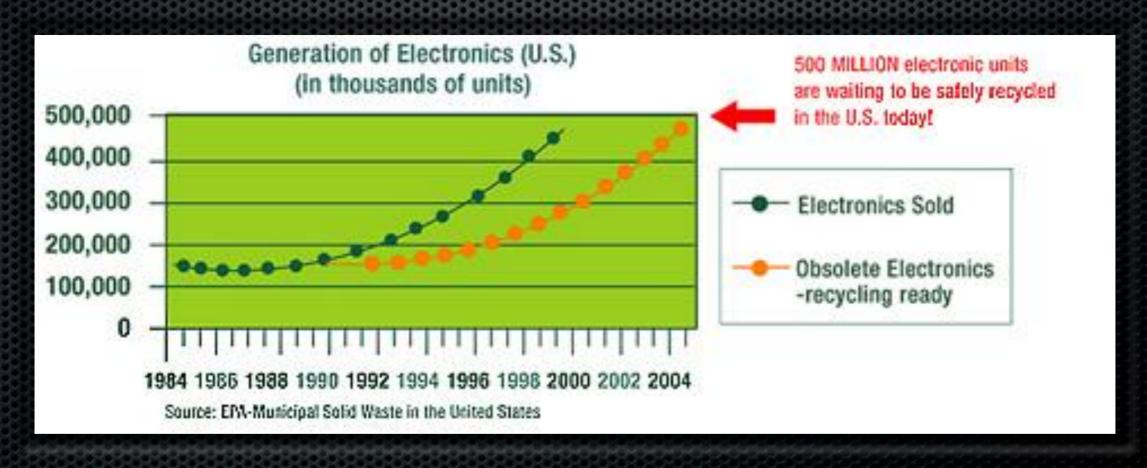


106,835 Reputation
5,168 Solutions
80 Guides
Member Since 01.04.10



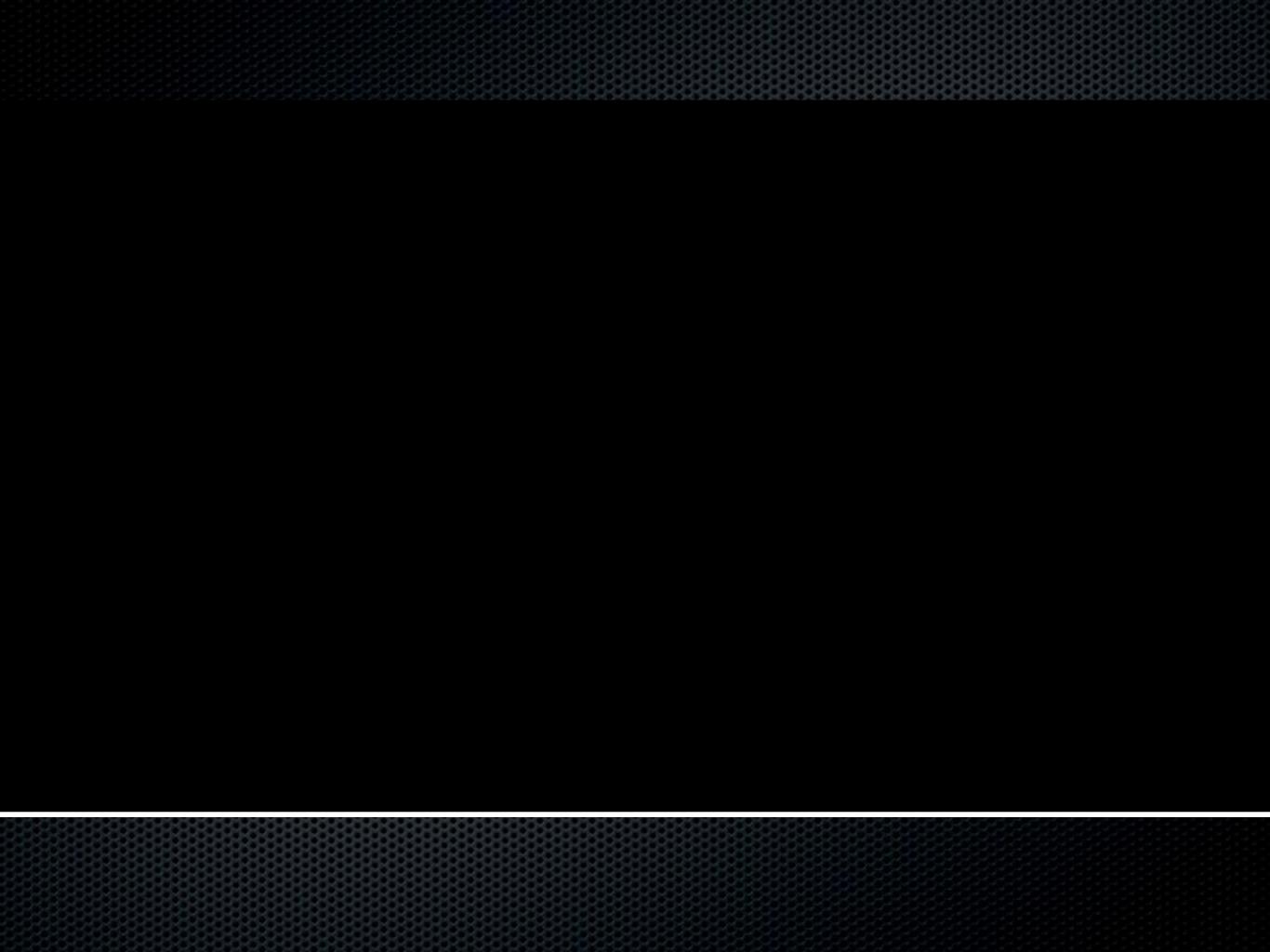
### In 2005 the US buried electronics containing:

77 million pounds of lead (965 semi trucks full)
183 thousand pounds of mercury
1.3 million pounds of arsenic



If ingested, that much arsenic would kill **7.6 billion people**.















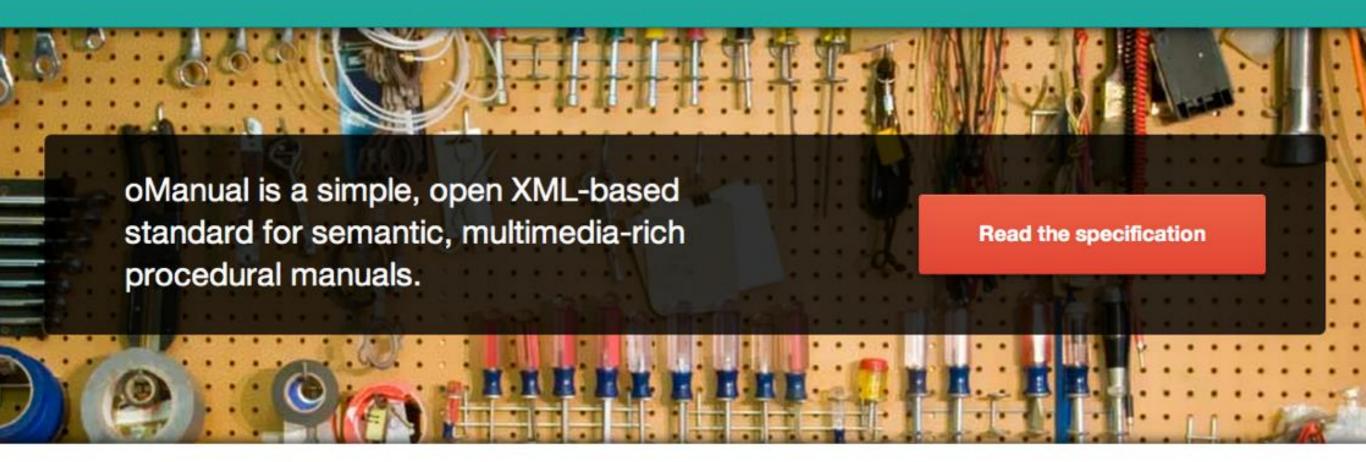


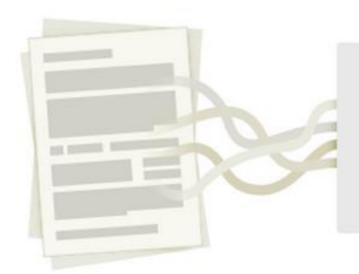




Documentation







Traditional procedural documents like service manuals don't meet the needs of modern applications. Documents need to incorporate multimedia and understand prerequisite dependencies. The oManual file format enables interoperability while allowing complete flexibility of presentation.





WE HOLD THESE TRUTHS TO BE SELF-EVIDENT

# SELF-REPAIR MANIFESTO:

#### REPAIR IS BETTER THAN RECYCLING.

MAKING OUR THINGS LAST LONGER IS BOTH MORE EFFICIENT AND MORE COST-EFFECTIVE THAN MINING THEM FOR RAW MATERIALS.

#### REPAIR SAVES THE PLANET.

EARTH HAS LIMITED RESOURCES AND WE CAN'T RUN A LINEAR MANUFACTURING PROCESS FOREVER. THE BEST WAY TO BE EFFICIENT IS TO REUSE WHAT WE ALREADY HAVE!

#### REPRIR SAVES YOU MONEY.

FIXING THINGS IS OFTEN FREE, AND USUALLY CHEAPER THAN REPLACING THEM. DOING THE REPAIR YOURSELF SAVES SERIOUS DOUGH.

#### REPAIR TEACHES ENGINEERING.

THE BEST WAY TO FIND OUT HOW SOMETHING WORKS IS TO TAKE IT APART!

#### IF YOU CRN'T FIX IT, YOU DON'T OWN IT.

REPAIR CONNECTS PEOPLE AND DEVICES, CREATING BONDS THAT TRANSCEND CONSUMPTION. SELF-REPAIR IS SUSTAINABLE.

REPAIR TRANSFORMS CONSUMERS INTO CONTRIBUTORS © REPAIR INSPIRES PRIDE IN OWNERSHIP
REPAIR TRANSFORMS CONSUMERS INTO CONTRIBUTORS © REPAIR INSPIRES PRIDE IN OWNERSHIP
REPAIR INJECTS SOUL AND MAKES THINGS UNIQUE © REPAIR IS INDEPENDENCE
REPAIR REQUIRES CREATIVITY © REPAIR IS GREEN © REPAIR IS JOYFUL
REPAIR IS NECESSARY FOR UNDERSTANDING OUR THINGS © REPAIR SAVES MONEY AND RESOURCES

#### WE HAVE THE RIGHT:

TO OPEN AND REPAIR OUR THINGS WITHOUT VOIDING THE WARRANTY O TO DEVICES THAT CAN BE OPENED TO ERROR CODES AND WIRING DIAGRAMS O TO TROUBLESHOOTING INSTRUCTIONS AND FLOWCHARTS TO REPAIR DOCUMENTATION FOR EVERYTHING O TO CHOOSE OUR OWN REPAIR TECHNICIAN TO REMOVE 'DO NOT REMOVE' STICKERS O TO REPAIR THINGS IN THE PRIVACY OF OUR OWN HOMES

TO REPLACE ANY AND ALL CONSUMBBLES OURSELVES
TO HARDWARE THAT DOESN'T REQUIRE PROPRIETARY TOOLS TO REPAIR
TO RVAILABLE, REASONABLY PRICED SERVICE PARTS

INSPIRED BY MISTER JRLOPY'S MAKER'S BILL OF RIGHTS AND PLATFORM 21'S REPAIR MANIFESTO



JOIN THE REPAIR REVOLUTION AT IFIXIT.COM

# The Atlantic



The Iraq War, in Images

U.S. Ex Arer One Tons

Politics Business Tech Entertainment Health Sexes National Global C

Special Reports Video Photo Ebook Newsletters JUSTIN The Engines That Propelled Us Into Space, Recov

# White House Backs the Right to Unlock Your Phone—Will Congress?

KYLE WIENS | MAR 5 2013, 2:55 PM ET

The next step for advocates of phone unlocking is legislation that will give people who open up their devices -- with or without carrier permission -- legal protection.

ISSUES

the ADMINISTRATION

the WHITE HOUSE

our GOVERNMENT



Help make We the People even better. Share your feedback on how this new platform can improve.

Share Your Feedback ()

CREATE A PETITION

**OPEN PETITIONS** 

RESPONSES

**HOW & WHY** 

View My Petitions | Log out

This petition has been responded to by the White House. See the response below.

WE PETITION THE OBAMA ADMINISTRATION TO:

#### Make Unlocking Cell Phones Legal.

The Librarian of Congress decided in October 2012 that unlocking of cell phones would be removed from the exceptions to the DMCA.

As of January 26, consumers will no longer be able unlock their phones for use on a different network without carrier permission, even after their contract has expired.

Consumers will be forced to pay exorbitant roaming fees to make calls while traveling abroad. It reduces consumer choice, and decreases the resale value of devices that consumers have paid for in full.

The Librarian noted that carriers are offering more unlocked phones at present, but the great majority of phones sold are still locked.

We ask that the White House ask the Librarian of Congress to rescind this decision, and failing that, champion a bill that makes unlocking permanently legal.

Created: Jan 24, 2013

Issues: Civil Rights and Liberties, Consumer Protections, Technology and Telecommunications

**TOTAL SIGNATURES** 

114,322

**Helpful Hints** 

Creating a duplicate or similar petition will make it harder for you to get an official response. Instead, sign and help promote the one that has already been created.

Recent Petitions

Recent Responses

History of Petitions

CREATE A PETITION

#### It's Time to Legalize Cell Phone Unlocking

By R. David Edelman

Thank you for sharing your views on cell phone unlocking with us through your petition on our We the People platform. Last week the White House brought together experts from across government who work on telecommunications, technology, and copyright policy, and we're pleased to offer our response.

The White House agrees with the 114,000+ of you who believe that consumers should be able to unlock their cell phones without risking criminal or other penalties. In fact, we believe the same principle should also apply to tablets, which are increasingly similar to smart phones. And if you have paid for your mobile device, and aren't bound by a service agreement or other obligation, you should be able to use it on another network. It's common sense, crucial for protecting consumer choice, and important for ensuring we continue to have the vibrant, competitive wireless market that delivers innovative products and solid service to meet consumers' needs.

This is particularly important for secondhand or other mobile devices that you might buy or receive as a gift, and want to activate on the wireless network that meets your needs -- even if it isn't the one on which the device was first activated. All consumers deserve that flexibility.

The White House's position detailed in this response builds on some critical thinking done by the President's chief advisory Agency on these matters: the Department of Commerce's National Telecommunications and Information Administration (NTIA). For more context and information on the technical aspects of the issue, you can review the NTIA's letter to the Library of Congress' Register of Copyrights (.pdf), voicing strong support for maintaining the previous exception to the Digital Millennium Copyright Act (DMCA) for cell phone carrier unlocking.

Contrary to the NTIA's recommendation, the Librarian of Congress ruled that phones purchased after January of this year would no longer be exempted from the DMCA. The law gives the Librarian the authority to establish or eliminate exceptions -- and we respect that process. But it is also worth noting the statement the Library of Congress released today on the broader public policy concerns of the issue. Clearly the White House and Library of Congress agree that the DMCA exception process is a

# WIRED



KEEPING IT REAL

2 hours ago

Ring of Bitcoins: Why Your Digital Wallet Belongs on Your Finger



PHOTO GALLERY 10 Compai Chasing Innovation That Reall Matter



WIRED OPINION Forget the Cellphone Fight — We Should Be Allowed to Unlock Everything We Own

I Tried to Make the Intelligence Behind the Iraq War Less **Bogus** 

DAMAGE CONTROL

The Develop Journey of Li Mansion, Fro Kyoto to Can



PHOTO GALLERY Behind-the-News Photos Show Celebrity Sausage Being Made

THE MOBILE MARKET 3 Things Samsung Needs to Overtake Apple





PRINT AND DIG Subscribe to

Renew

Give a gift



It hasn't always been that way. Copyright laws were originally designed to protect creativity and promote innovation. But now, they are doing exactly the opposite: They're being used to keep independent shops from fixing new cars. They're making it almost impossible for farmers to maintain their equipment. And, as we've seen in the past few weeks, they're preventing regular people from unlocking their own cellphones.

This isn't an issue that only affects the digerati; farmers are bearing the brunt as well. Kerry Adams, a family farmer in Santa Maria, California, recently bought two transplanter machines for north of \$100,000 apiece. They broke down soon afterward, and he had to fly a factory technician out to fix them.

Because manufacturers have copyrighted the service manuals, local mechanics can't fix modern equipment. And today's equipment — packed with sensors and electronics — is too complex to repair without them. That's a problem for farmers, who can't afford to pay the dealer's high maintenance fees for fickle equipment.

Adams gave up on getting his transplanters fixed; it was just too expensive to keep flying technicians out to his farm. Now, the two transplanters sit idle, and he can't use them to support his farm and his family.

God may have made a farmer, but copyright law doesn't let him make a living.

#### **WIRED OPINION**



#### Kyle Wiens

Kyle Wiens is the co-founder and CEO of iFixit, an online repair community and parts retailer internationally renowned for their open source repair manuals and product teardowns. Launched out of his Cal Poly college dorm room in 2003, iFixit has now empowered upwards of 15 million people to repair their broken stuff.

#### READ MORE >



# TOSHIBA Leading Obsolescence



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 <a href="http://tim.id.au">http://tim.id.au</a> and that your ABN is

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.

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We are also concerned that by providing the Manuals to unqualified person you may be endangering their well-being.

You are required to immediately disable the links to the Manuals that are contained and published on and

We are also concerned that by providing the Manuals to unqualified person you may be endangering their well-being.

You are required to immediately disable the links to the Manuals that are contained and published on and distributed from your website and to destroy all copies of the Manuals that you hold in whatsoever format (electronic or hard copy) within seven (7) days of the date of this letter.

Please confirm that you will attend to this request within the time limit imposed and that you will not copy, hold, display, publish (in any format) nor cause or permit the copying, display, publication (in any format), or distribution of the Manuals in the future without the prior written consent of Toshiba being first had and obtained.

Should you not comply with our request we may decide to take whatever steps are available to us to protect our proprietary information and seek to recover our costs in taking such action from you without further notice.

Yours faithfully

Toshiba (Australia) Pty Limited

John Ryan

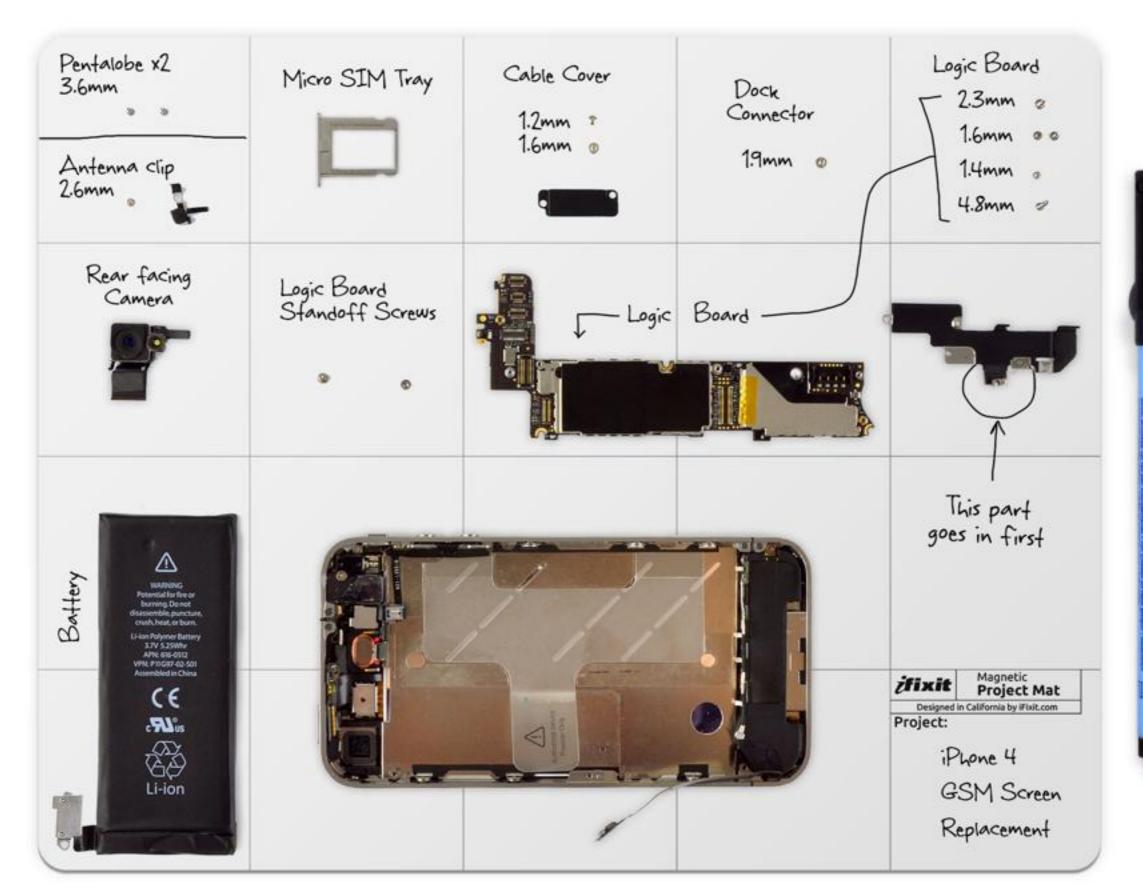
Company Secretary





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- Contribute hardware: kyle@ifixit.com

# Right to Repair Coalition

- Unlocking and jailbreaking devices
- Copyright of service documentation
- Lack of parts
- Difficult / impossible to repair and recycle designs