THE FUTURE OF THE
RIGHT TO REPAIR
& FREE SOFTWARE

LibrePlanet 2023
Boston, MA

Elizabeth Chamberlain
19 March 2023
liz@ifixit.com
92,724 free repair manuals
Introduction

Change your tractor’s engine oil and filter every 100 hours of use to keep your crops coming season after season.
# PowerBook G3 Pismo Repair

Model M7572 / 400 or 500 MHz G3 processor
Author: Miroslav Djuric (and 7 other contributors)

## Guides

### Replacement Guides

<table>
<thead>
<tr>
<th>Airport Card</th>
<th>Clutch Cover</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Framework</td>
<td>Hard Drive</td>
<td>Heat Shield</td>
</tr>
<tr>
<td>Heat Sink</td>
<td>I/O EMI Shield</td>
<td>Inverter</td>
</tr>
<tr>
<td>Keyboard</td>
<td>Logic Board</td>
<td>Lower Case</td>
</tr>
<tr>
<td>Modem</td>
<td>Optical Drive</td>
<td>PC Card Cage</td>
</tr>
<tr>
<td>FRAM Battery</td>
<td>Power Card</td>
<td>Processor</td>
</tr>
<tr>
<td>RAM</td>
<td>Sound Card</td>
<td>Upper Case</td>
</tr>
</tbody>
</table>

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*Created by [Guides](#) featuring [Articles](#) and [Tools](#) with [Details](#) including [Troubleshooting](#), [Upgrades](#), [Identification and Background](#), [Additional Information](#)*
Community

Solve Problems
Get help from friendly fixers and share a helping hand with others around the world.

Answers Forum

Improve iFixit
Help us improve how-to guides that others have started and become a guardian of good quality.

Improve Guides

Help Translate
Translate iFixit into your mother tongue and make repair information available to everyone!

Start Translating
Step 4  Heat Shield

- Remove the two silver Phillips #1 screws that attach the heat shield to the internal metal framework.

- Lift the heat shield up and pull it toward you.

On my M7572, these are T9s not Philips.

Rufleyboy - May 5, 2010
Editing Step 2 — Add a title

**Notice:** You are now editing a prerequisite to the guide you were just viewing. Any changes you make will affect all 4 guides that include this step.

**Step Type:**  
- Image

- Remove the sprocket guard plate.

**Privacy**
- Public

**Steps**
- 1
- 2

**Delete Step**

**Insert Step**
Licensing

All iFixit content is licensed under the Creative Commons BY-NC-SA 3.0 license.
All Parts

Quality ensured replacement parts for DIY repair

Repair with confidence! iFixit has you covered with parts, tools, and free repair guides. All of our replacement parts are tested to meet rigorous quality standards and are backed by our industry-leading guarantee.

Choose a model

- Mac Parts
- iPhone Parts
- Android Phone Parts
- PC Laptop Parts
- Game Console Parts
- iPad Parts
- Android Tablet Parts
- iPod Parts
- Chromebook Parts
- Other Electronics Parts
# iPod Classic Teardown

**Introduction**

We disassembled this iPod on September 7, 2007.

This teardown is not a repair guide. To repair your iPod Classic, use our service manual.

## Step 1  iPod Classic Teardown

- Apple ships two new iPods on the same day, and we take apart two new iPods on the same day (well, the same shift).
- We title this picture, "rising to the challenge."
Step 1  Battery

Apple designed their new iPods to be very difficult to take apart without destroying major components. Because of the metal faceplate, the metal backing, and the 13 (yes, 13) metal clips holding the case together, this is one of the toughest iPods to disassemble.

⚠️ Proceed with caution and the warning that you may significantly damage your iPod beyond its present condition. Also, you may want a few extra pairs of plastic opening tools during installation, as they are easy to ruin when opening the iPod. Have fun!

⚠️ Before opening your iPod, ensure that the hold switch is in the locked position.
Final Thoughts

- Displays and back glass covers can be replaced without disassembling any other components.
- 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.
- Delicate OLED panels are not well protected from accidental prying, yet must be removed for most repairs.
- Stubborn glue at all entry points complicates any repair attempt.

Repairability Score

Repairability 2 out of 10
(10 is easiest to repair)
RIGHT TO REPAIR

If you bought it, you own it—and you should be able to fix it.
On last season of RIGHT TO REPAIR
On last season of Right to Repair

WINS?

25 November 2022

New EU rules for smartphones and tablets: still far from a true Right to repair

Reaction from Right to Repair Europe on the still unpublished new ecodesign rules for smartphones and tablets. A positive step, but far from a real Right to Repair
7 years

5 years
How Parts Pairing Kills Independent Repair

The biggest threat to repair is no longer hostile hardware. Today, many independent repair shop owners are most worried about the trend in electronics manufacturing known as “parts pairing.”

January 17, 2023
cool, but

OVERPRICED HARDWARE
OVERPRICED HARDWARE EVERYWHERE
On last season of Right to Repair

WINS?

New York Passes Historic Right to Repair Bill

The world’s first comprehensive right to repair bill has finally been signed into law by New York Governor Kathy Hochul, over six months after it passed the legislature nearly unanimously....

December 29, 2022 by Kyle Wiens
cool, but

Discussing Kathy Hochul's butchering of right to repair with News10's Amal...

Louis Rossmann
105K views • 3 weeks ago
cool, but
assemblies

Item # IF358-031-4

Samsung Galaxy S21 5G (USA) Screen and Battery - Genuine

$160.99

5 stars | 2 reviews
cool, but
goal #1
parity with manufacturer repair
Deere Promised Farmers the Right to Repair. Can We Trust Them?
cool, but
cool, but
Success

what people think it looks like

Success

what it really looks like
Label

Colour corresponds to level of reparable in 2 point intervals
indice de reparabilité 8.7

Les paramètres de calcul de l'indice de reparabilité sont disponibles sur la page du produit concerné sur Balanger.com ou auprès d’un conseiller.

Garantie 2 ans

Pièces détachées. Pendant 10 ans, à compter de la date d'achat.
22 December 2022

The EU battery directive will make it easier to replace batteries

We celebrate an important repair win on part pairing: this directive finally bans software tricks which hinder the replacement of batteries. We regret however, that an exemption for products used in wet conditions leaves many products such as electric toothbrushes with hardly replaceable batteries.
Flood of "right to repair" bills signals DIY watershed
Consumer Right To Repair Agricultural Equipment
software often blocks repair
Lockout History
4
12/26/79  19:18
R  BRL>41F AFTER SL
> Exit

14
AT YOUR SERVICE

We know your equipment represents your livelihood, so we take service and support to another level. Wherever you’re located, whatever your specialty, we’re here to keep you up and running.
Ice Cream Machine Hackers Sue McDonald's for $900 Million

Kytch alleges that the Golden Arches crushed its business—and left soft serve customers out in the cold.
Important Battery Message

Unable to verify this iPhone has a genuine Apple battery.

- Settings
- OK
iPhone parts pairing is getting worse

Each model has had more serialized parts

<table>
<thead>
<tr>
<th>iPhone Model and Year Released</th>
<th>Serialized and not replaceable</th>
<th>Serialized and reprogrammable</th>
<th>Serialized and not reprogrammable</th>
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<tbody>
<tr>
<td>iPhone 4S 2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPhone 5S 2013</td>
<td></td>
<td></td>
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<td>iPhone 6S 2015</td>
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<td>iPhone 7 2016</td>
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<tr>
<td>iPhone 8 2017</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>iPhone X 2017</td>
<td></td>
<td></td>
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<tr>
<td>iPhone XR 2019</td>
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<tr>
<td>iPhone 11 2019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPhone 12 2020</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data: Alexandre Isaac, Repair Academy
It’s not just Apple
Lots of products limit repair through paired parts.

**Chainsaws**
Only dealers can update firmware on new parts for Husqvarna chainsaws and automowers.

**TVs**
On many TVs, mainboards, t-con modules and panels must be paired via a hidden routine.

**Xbox One**
The Xbox disc drive is paired to the motherboard, so replacing one means replacing both.

**PS4/PS5**
Sony took a cue from Microsoft and also paired the PlayStation disc drive with the motherboard.

**Food Processors**
When a Thermomix food processor throws an error, only official Vorwerk technicians can get the software to reset it.

**Washing Machines**
Many appliances require access to expensive manufacturer software to calibrate replacement parts.

**Cars**
Some parts are VIN locked, or paired to a car’s serial number, requiring a dealer to program replacement parts.

**Tractors**
Replacing some parts on John Deere tractors requires dealers to input a code to get the tractor out of “limp mode.”
“I worked in a call center that provided technical support to a gaming console with a high failure rate, and

if we saw that customers tampered with their devices physically or by software, we denied service on the hardware, even if the customer was willing to pay.”
When DRM Comes For Your Wheelchair

BY CORY DOCTOROW  |  JUNE 7, 2022
WHEELCHAIR RIGHT TO REPAIR

93% Of wheelchair users have needed their chairs serviced in the last year

Many repairs take 7 weeks or longer

One of the biggest challenges is the long wait for service and parts

83% Responded by saying that the new law would “make life better” for wheelchair owners
It's Now Okay to Bypass DRM Software to Fix Gadgets, but Right-to-Repair Fight Isn’t Over

Consumer rights advocates praise a U.S. Copyright Office decision, while hoping for state legislation

By Nicholas De Leon
October 26, 2018
Liberate the appliances! Washing machine hacker outsmarts anti-repair measures – Week in Repair
Welcome to the Tractor Hacking team site

PolyCAN Demo | Manipulating the RPM...

PolyCAN
Hacking Tractors for Repair

Watch on YouTube
<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Allocation</th>
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<tbody>
<tr>
<td>A</td>
<td>ECU_GND</td>
</tr>
<tr>
<td>B</td>
<td>Unswitched Power a</td>
</tr>
<tr>
<td>C</td>
<td>Tractor Bus CAN_H</td>
</tr>
<tr>
<td>D</td>
<td>Tractor Bus CAN_L</td>
</tr>
<tr>
<td>E</td>
<td>Not Specified b</td>
</tr>
<tr>
<td>F</td>
<td>Not Specified c</td>
</tr>
<tr>
<td>G</td>
<td>Not Specified c</td>
</tr>
<tr>
<td>H</td>
<td>Implement Bus CAN_H</td>
</tr>
<tr>
<td>J</td>
<td>Implement Bus CAN_L</td>
</tr>
</tbody>
</table>

a A direct connection to positive battery power through a 10A fuse.
b Used for the shield of an SAE J1939 network in an SAE diagnostic connector.
c Used for SAE J1708 network in an SAE diagnostic connector.
<table>
<thead>
<tr>
<th>Diagnostic Trouble Code</th>
<th>Display</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTI 524238.31</td>
<td>Transmission Lever Not in Park</td>
<td>Left-Hand Reverser Lever Not in Park or Neutral at Power Up. Place lever in park or neutral. Restart vehicle. If code returns, have John Deere dealer repair at earliest convenience.</td>
</tr>
<tr>
<td>Time Stamp</td>
<td>Sent: 2480  Recv: 3927  103.93508982658386,61443,255,0,3,FF 00 00 FF 00 FF FF FF</td>
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<td>------------</td>
<td>--------------------------------------------------</td>
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<tr>
<td></td>
<td>Sent: 2481  Recv: 3928  103.93542575836182,61184,255,0,3,64 06 00 7D FF FF FF FF</td>
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<td>Sent: 2482  Recv: 3929  103.93630867150118,61184,250,0,6,64 01 FF 00 00 FF FF FF</td>
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<td>Sent: 2483  Recv: 3930  103.93735080120544,126728,0,3,3,01 01 FF FF FF FF FF F5</td>
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<td>Sent: 2484  Recv: 3931  103.94149231907996,61184,0,6,1,64 15 IF F0 CD 16 16 0E</td>
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<td>Sent: 2485  Recv: 3932  103.94474506378174,65097,255,71,3,FF FF FF FF FF FF FF</td>
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<td>Sent: 2486  Recv: 3933  103.94546808789062,65128,255,71,6,34 FF FF FF FF FF FF FF</td>
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<td>Sent: 2490  Recv: 3937  103.96094923683187,65535,255,6,6,05 05 FF FF FF FF FF F7</td>
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<td>Sent: 2491  Recv: 3938  103.96143555691174,61443,255,0,3,F0 FF 7D 00 00 FF FF FF</td>
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<td>Sent: 2493  Recv: 3939  103.96190214517814,61443,255,0,3,FF 00 00 FF 00 FF FF FF</td>
<td></td>
</tr>
</tbody>
</table>
Could These Students Improve the Global Food Supply? They’re Finding Out — One Tractor at a Time
Sick.Codes
@sickcodes

Playing Doom on a John Deere tractor display (jailbroken/rooted) at @defcon

11:10 AM · Aug 14, 2022

981 Retweets 181 Quotes 3,633 Likes
Def Con hacker shows John Deere’s tractors can run Doom

/Mow down your enemies

A New Jailbreak for John Deere Tractors Rides the Right-to-Repair Wave

A hacker has formulated an exploit that provides root access to two popular models of the company’s farm equipment.
Farmers Fight John Deere Over Who Gets to Fix an $800,000 Tractor

The right-to-repair movement has come to the heartland, where some farmers are demanding access to the software that runs their equipment.

By Peter Waldman and Lydia Mulvany
March 5, 2020 at 2:00 AM PST
For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.
gpl-violations.org project prevails in court case on GPL violation by D-Link

Harald Welte — 2006-09-22
Quick Install Guide

GPL Code Statement

This D-Link product includes software code developed by third parties, including software code subject to the GNU General Public License ("GPL") or GNU Lesser General Public License ("LGPL"). As applicable, the terms of the GPL and LGPL, and information on obtaining access to the GPL code and LGPL code used in this product, are available to view the full GPL Code Statement at:

https://tsd.dlink.com.tw/GPL

The GPL code and LGPL code used in this product is distributed WITHOUT ANY WARRANTY and is subject to the copyrights of one or more authors. For details, see the GPL code and the LGPL code for this product and the terms of the GPL and LGPL.

Written Offer for GPL and LGPL Source Code

Where such specific license terms entitle you to the source code of such software, D-Link will provide upon written request via email and/or traditional paper mail the applicable GPL and LGPL source code files via CD-ROM for a nominal cost to cover shipping and media charges as allowed under the GPL and LGPL.

Please direct all inquiries to:

Email:
GPLCODE@dlink.com

Sneil Mail:
Attn: GPLSOURCE REQUEST
D-Link Systems, Inc.
17595 Mt. Herrmann Street
Fountain Valley, CA 92708
FSFE compliance workshop discovers GPL violation by FANTEC, Welte wins in court

on: 2013-06-26
Consumer electronics & home office equipment

› Home cinema - 3D Full HD Media Player
› Storage devices
› Action cameras
› HiFi audio
› Accessories for mobile devices
I found a vulnerability in your proprietary mobility stack enabling unauthorized remote control over Bluetooth.

Everyone should have the right to run, study, fix and share software they use.
Software Freedom Conservancy files right-to-repair lawsuit against California TV manufacturer Vizio Inc. for alleged GPL violations

Litigation is historic in nature due to its focus on consumer rights, filing as third-party beneficiary

FOR IMMEDIATE RELEASE

IRVINE, Calif. (Oct. 19, 2021) Software Freedom Conservancy announced today it has filed a lawsuit against Vizio Inc. for what it calls repeated failures to fulfill even the basic requirements of the General Public License (GPL).
APPLICATONS

GPL legal battle: Vizio told by judge it will have to answer breach-of-contract claims

Fine-print crucially deemed contractual agreement as well as copyright license in smartTV source-code case

Thomas Claburn

Mon 16 May 2022 / 23:36 UTC

The Software Freedom Conservancy (SFC) has won a significant legal victory in its ongoing effort to force Vizio to publish the source code of its SmartCast TV software, which is said to contain GPLv2 and LGPLv2.1 copyleft-licensed components.
After 2 years and more than a dozen ignored GPL source code requests, SFC called Deere out publicly this week.
Software Freedom Conservancy Launches Self-Service Copyright Assignment Process
Developers Can Dedicate their Copyrights to Charity to Assure Software Rights

May 2, 2022
You deserve the right to repair your stuff

1,739,868 views | Gay Gordon-Byrne • TEDMonterey

A self-declared "repair geek," Gay Gordon-Byrne is a driving force behind the right-to-repair movement, which aims to empower people to fix their stuff. She describes how the movement is gaining legislative momentum and breaks down how the global shift away from "throwaway society" can literally turn trash into treasure in a circular economy — so we can all experience that "Yes! I fixed it!" feeling.

About the speaker

Gay Gordon-Byrne

Gay Gordon-Byrne fights for your right to repair the consumer goods you buy.
Dear Bay Staters,

It's time to speak out for your right to repair

Massachusetts is already leading the world in repair, by passing the first-ever Right to Repair bill in 2012, for automobiles.

It's time to guarantee that Bay Staters can fix everything they own. This year, MA is considering two bills: HD 3826 and SD 793, which would give Massachusetts the right to fix cell phones and tablets.

Your legislators need to hear why repair matters to you—what have you tried to fix but couldn't? How have parts, tools, and repair documentation limitations made your life or business more difficult?

Use the form below to call or write your legislators—we'll track down their contact information.

[your state].repair.org
Right to Repair

Want the right to repair your stuff? We are working to get Apple, John Deere and other companies to provide access to the information, tools and parts we need.

NEW ECONOMY
Let us fix our stuff

We should give every consumer and every small business access to the parts, tools, and service information they need to repair products by passing Right to Repair reforms.

SIGN THE PETITION

Companies don’t make things like they used to, and that’s a big problem. Not long ago, most consumer goods and business products were easily
Fight to Repair

Weekly dispatches from the front lines of the global fight for the right to repair. Written and curated by Paul Roberts, the founder of SecuRepairs.org and Editor at The Security Ledger, and Jack Monahan.

Launched 2 years ago

Sign up with email  Subscribe

No thanks
Linux on the Framework Laptop

We designed the Framework Laptop from the outset to be a great Linux laptop, and the Framework Laptop Off Edition comes with no OS loaded to let you bring your favorite Linux distribution. We deliberately selected components and modules that didn’t require new kernel driver development and have been providing distro maintainers with pre-release hardware to test to improve compatibility. We’re also working on enabling firmware updates through LUPS to complete the Linux experience.
Fedora 37 Installation on the Framework Laptop

Written By: Nirav Patel (and one other contributor)

- Comments: 39
- Favorites: 2
- Completions: 18

Difficulty: Easy

Steps: 8

Time Required: 00:10:00 - 00:20:00

Sections: 1

Flags: 0
<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
<th>Date</th>
<th>Version</th>
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</thead>
<tbody>
<tr>
<td>.github</td>
<td>Merge pull request #535 from FrameworkComputer/lin...</td>
<td>3 months ago</td>
<td>38c1b38</td>
</tr>
<tr>
<td>.vscode</td>
<td>add vscode workspace files</td>
<td>3 years ago</td>
<td></td>
</tr>
<tr>
<td>baseboard</td>
<td>Add host command to check privacy switch status (#513)</td>
<td>3 months ago</td>
<td></td>
</tr>
<tr>
<td>board</td>
<td>fix i2c controller mapping on TGL</td>
<td>3 months ago</td>
<td></td>
</tr>
<tr>
<td>builtin</td>
<td>Replace _<strong>attribute</strong>((noreturn)) with noreturn</td>
<td>3 years ago</td>
<td></td>
</tr>
<tr>
<td>chip</td>
<td>Merge branch 'hx30' into hx20-hx30</td>
<td>4 months ago</td>
<td></td>
</tr>
<tr>
<td>common</td>
<td>Fix: auto brightness decrease curve not smooth enough...</td>
<td>last year</td>
<td></td>
</tr>
</tbody>
</table>

**About**

Embedded Controller firmware for the Framework Laptop

- Readme
- BSD-3-Clause license
- 773 stars
- 20 watching
- 46 forks

**Releases**

No releases published
Camera upgrades for your Fairphone 3

Discover the greener way to get new features

Discover modules  How to upgrade

Source files for everything are available, for free, forever, without any limits.

Complete documentation for assembly, modifications, and maintenance.

Full transparency on parts, fabrication methods, and how it all works.
Dare to Repair! 3D Printed Repair Parts Contest

Article by:
Kay Kay Clapp
@kaykay

February 14, 2018
Filed under: Contests
Add Comment
BEST SPARE PARTS STL FILES FOR REPAIR THANKS TO 3D PRINTING

DOWNLOAD 3D MODELS OF SPARE PARTS

You are looking for your own 3D printable Spare Parts platform? Contact us. This is probably the first use you think of when you think of 3D printing, repairing small broken plastic parts that are impossible to find on the market. In this collection, find enough to repair all the broken objects in your home and give them a second life!
Porsche Can Now 3D-Print Parts For The 959 Supercar

The new components can help Porsche 964 and 356 owners, too.

By: Chris Bruce
The ancient computers in the Boeing 737 Max are holding up a fix

The perils of fixing a hardware problem with software

By Darryl Campbell
Apr 9, 2020, 5:00 AM PDT | 0 Comments / 0 New
Tesla Full Self-Driving Beta v11 is coming this weekend, if you believe Elon Musk

After months of waiting, Tesla Full Self-Driving Beta v11 is going to a wide release this weekend, if you believe Elon Musk.
Ford patents system for vehicles to repossess themselves

With this tech, if you don't make payments, your Ford could drive itself to the impound lot — or even the scarpayrd

Jill McIntosh

Published Feb 28, 2023 • Last updated Mar 01, 2023 • 3 minute read

An August 2015 file photo of tow trucks in Ottawa PHOTO BY MATT DAY /Postmedia files
“In 2025, there will be 55.7 billion connected IoT devices.”

– KPMG, 20 Predictions for the Next 20 Years
software is everywhere, and it must be free
free to hack
share
repair
Together we can fix any thing.

liz@ifixit.com