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Introduction

MyBattery is a utility program designed specifically for portable Macintosh computers. MyBattery provides you with information about the internal battery pack on a Macintosh Portable, Macintosh PowerBook, or Outbound Notebook computers:

- The current battery voltage in numeric form,
- The current battery voltage in graphical form, using either a bar graph or a "gas gauge" display,
- An estimate of the remaining useful time on your battery,
- Battery charger status.

Compatibility

MyBattery will work with System 6.0.8 or later. It is fully compatible with System 7.

MyBattery has been tested on PowerBook models 100, 140 and 170. MyBattery should work on any portable Macintosh that supports the Power Manager (part of Apple's Macintosh system software).

Features

MyBattery is designed to help you make the most of your rechargeable battery. It gives you information about the battery charger, battery voltage, and estimates of remaining battery time.

Bar graph display

The bar graph display shows the battery voltage using a bar, as illustrated below.

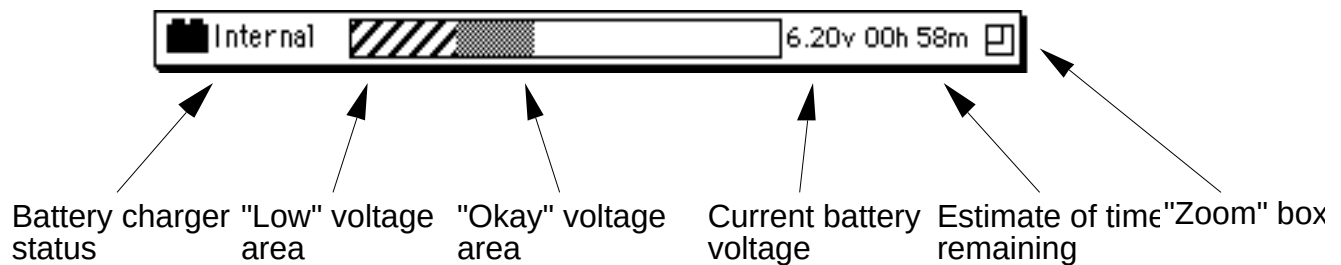| Battery charger status | "Low" voltage area | "Okay" voltage area | Current battery voltage | Estimate of time remaining | "Zoom" box |

Figure 1. The bar graph display shows the battery voltage using a two-color bar graph.

Battery charger status   Shows you whether the battery is charging or not. See the "charger status" section below for more information.

"Low" voltage area   The lower part of the bar graph is striped. This region reflects a battery voltage of 5.50 volts to 5.90 volts (where you'll get your first "low battery" warning).

"Okay" voltage area   The upper part of the bar graph is filled with a solid pattern. This region reflects a battery voltage above the low voltage threshold - from 5.91 volts up. The pattern of this area changes depending on your charger status; if you are running off the internal battery, it is shaded gray. If you are running off the

recharger, it's shaded black.

Current battery voltage   This is the battery voltage returned from the Power Manager, with a granularity of 1/100 volts.

Estimate of time remaining   This display is an estimate of how much useful time you have left before your first low voltage warning. Refer to the "How the estimate works" section for more information.

"Zoom" box   Allows you to toggle between large and small versions of the bar graph display. The smaller version takes up less screen space, but doesn't show the estimate of time remaining.

"Gas gauge" display

The gas gauge display shows much of the same information as the bar graph display. However, it uses a gauge display, with a needle that moves from empty to full, depending on your battery voltage.

While the "Empty" point is the same on all PowerBooks (5.90 volts), the "Full" point is automatically calibrated for your type of PowerBook. On a PowerBook 100, the "Full" point is scaled to be 6.20 volts. On a PowerBook 140/145/170, the "Full" point is scaled to be 6.70 volts.

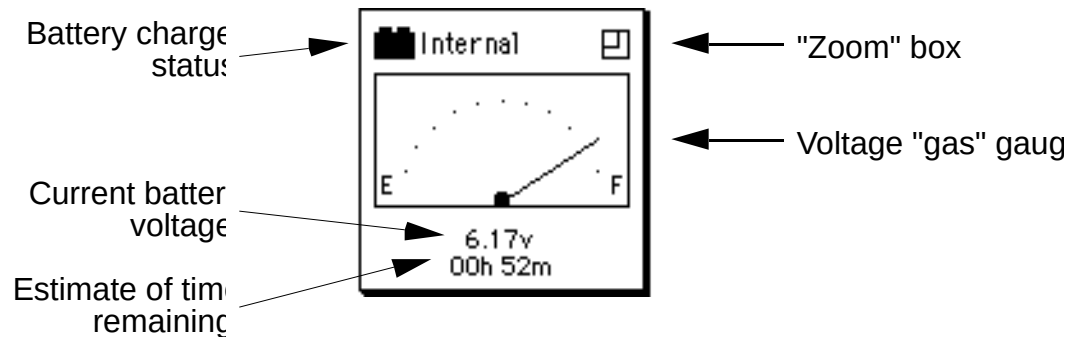Like the bar graph display, the "zoom box" toggles the gas gauge display between large and small displays.

Battery charge status   "Zoom" box

Voltage "gas" gauge

Current battery voltage

Estimate of time remaining

Figure 2. The "gas" gauge display shows the battery voltage between "full" and "empty."

Charger status

The charger status shows one of four possible states:

Hi-charge — When this icon is displayed, your battery is being charged at the "hi-charge" rate.

Lo-charge — When this icon is displayed, your battery is being charged at the "lo-charge" rate.

Internal — When this icon is displayed, you are running off the internal battery. Battery voltage is OK.

Internal — When this icon appears, you are running off the internal battery. Battery voltage is low (i.e., below 5.90 volts).

Figure 3. The charger status is shown using one of four displays.
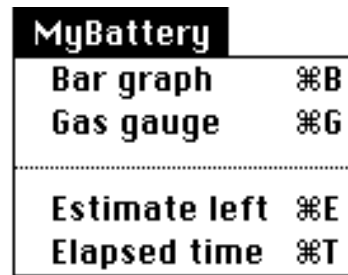
When you first attach the charger to your PowerBook, it will go into the "hi-charge" mode. This mode charges the battery very quickly. After some time, the charger will switch to the "lo-charge" mode. This mode tops off the battery, and keeps it fully charged.

Note: There is one little peculiarity about the battery charger. If the

battery charger is plugged into the PowerBook, but the other end isn't plugged into a wall outlet, the PowerBook incorrectly thinks that the battery is charging!

The MyBattery menu

In addition to the **File** and **Edit** menus, MyBattery has a **MyBattery** menu. This menu, as shown below, has several options for the displays.

```
┌─────────────────────────┐
│ MyBattery               │
│ Bar graph          ⌘B   │
│ Gas gauge          ⌘G   │
│ ....................... │
│ Estimate left      ⌘E   │
│ Elapsed time       ⌘T   │
└─────────────────────────┘
```

*Figure 4. The **MyBattery** menu lets you select different display options.*

Bar graph selection Brings up the bar graph display, if the gas gauge is currently being displayed.

Gas gauge selectionBrings up the gas gauge display, if the bar graph is currently being displayed.

Estimate left   This selection will display an estimate of the amount of useful battery time remaining. The time is shown in hours and minutes.

Elapsed time   This selection will display the elapsed time that your PowerBook has been running off the battery. This time is reset when the PowerBook is attached to the battery charger. To differentiate between the estimate left and the elapsed time, the elapsed time is shown in italics.

Moving the displays

Any of the window displays can be dragged to a screen location that you desire. For example, you can drag the bar graph display to the bottom left corner of the screen, so you can see it under the windows of other applications.

To drag a window, move the mouse pointer over the window. Click down

on the mouse button, and with the mouse button still pressed down, drag the window wherever you want it. MyBattery will remember where you left it and will bring the window up in the same position the next time your run MyBattery.

Installing MyBattery

MyBattery is a stand-alone application, designed to run all the time. Because MyBattery takes up little memory (less than 60k), you'll hardly notice that it's there!

To install MyBattery, simply copy the application to wherever you want it - your "Utilities" folder or wherever. The first time you run MyBattery, it will create a "MyBattery Preferences" and "MyBattery Data" file in your "System" Folder (or in the "Preferences" folder if you are running System 7).

Running on startup under System 6.0.x

If you want MyBattery to run whenever you turn on or restart your Macintosh, perform the following steps:

1) Locate your copy of MyBattery.
2) Click on it once with the mouse to select the application icon.
3) From the **Special** menu, choose "Set Startup...".

4) Under the sentence that says "Upon startup, automatically open", click on the radio button for "MyBattery 1.20".
5) Restart! MyBattery should start running automatically.

Running on startup under System 7

1) Locate your copy of MyBattery.
2) Click on it once with the mouse to select the application icon.
3) From the **File** menu under the Finder, choose "Create Alias".
4) Drag the alias to the "Startup Items" folder, inside your "System Folder".
5) Restart! MyBattery should start running automatically.

How the estimate works

MyBattery uses a historical estimation technique to estimate the remaining useful time on your battery.

What does this mean? As you use your PowerBook, MyBattery monitors the battery voltage. As the battery voltage drops, MyBattery measures the amount of time it took, and stores this information away. MyBattery then uses this information to make the estimates.

When you first run MyBattery, it initializes the estimates with some default data. As you use your PowerBook with MyBattery, however, it will start basing it's estimates on the data it has collected about your computer. Therefore, the accuracy of the estimates will increase the more you use your computer.

How accurate is it?

Well, there is no foolproof way of estimating the remaining time left on a battery. There are too many factors that can affect your battery life - temperature, disk accesses, screen brightness, initial battery charge, and so on. But once MyBattery has collected a reasonable collection of measurements, the estimate should be pretty accurate - for your computer!

One advantage of the historical technique is that it allows MyBattery to handle different types and ages of batteries. As your battery gets older, it's useful life slowly decreases. MyBattery will continue to update it's estimates to reflect this change.

There are also several third-party battery options that last longer than Apple's standard battery. MyBattery's estimates will be tailored to your type of battery.

Estimation problems

MyBattery assumes that your battery usage doesn't vary much from session to session. There are, however, two situations that can cause MyBattery to give poor estimations:

1) Inconsistent battery charging. If you sometimes charge your battery fully, and other times only charge it for an hour or two, MyBattery's estimate will lose some accuracy. As a general principle, it's good to charge your batteries fully between uses.
2) Swapping between radically different battery types. If you had two batteries - the standard Apple battery that lasts 2 hours and a suitcase-sized battery pack that lasted 15 hours - and swapped back and forth between them, MyBattery would be very confused. It's estimates would fall somewhere in between.

Registration

When you receive MyBattery, it comes unregistered. When MyBattery isn't registered, a "†" symbol appears next to the current voltage display.

What does registering your copy do? It activates the historical estimation technique that MyBattery uses to estimate the amount of time remaining. In unregistered copies, MyBattery makes it's estimate based on stored, default values. When the historical estimation technique is activated by registering your copy, MyBattery will "learn" your battery consumption and will use this information to make more accurate estimates.

How to register

Included in the MyBattery is a TeachText registration form. Print out the form and send it in with a check or money order for $10. Please, the check or money order must be in U.S. dollars, drawn on a U.S. bank. Also, please make it payable to Jeremy Kezer.

Addresses

If the registration form isn't present, please send the check to the following:

> Jeremy Kezer
> 143 Songbird Lane
> Farmington, CT 06032

I can also be reached vial EMail on America Online. My user name is **JBKezer**.

Troubleshooting

While I have attempted to test MyBattery as thoroughly as possible, there is no way of testing all the possible configurations. If MyBattery is operating erratically, it's possible that some piece of software is interfering with it.

Application interference

If MyBattery is operating erratically with other applications running, note the other applications that are running. Next, restart your computer and try running MyBattery by itself. If the problem does not appear, try running the same applications, one by one. When you isolate the problem application, drop me a note and let me know what it is!

INIT/CDEV/Extension interference

If MyBattery continues to operate erratically, an INIT, CDEV or system Extension (collectively known as extensions) may be interfering. First, restart your machine while holding down the SHIFT key. A message will come up stating "Extensions off". Try MyBattery; if the problem doesn't appear, it is most likely an extension causing the problem.

Isolating the offending extension can be tedious, especially if you have lots of extensions loaded. Start out by removing half of your extensions. Restart and try MyBattery. If the problem occurs, remove half of the extensions that were loaded, and try again. If the problem did not occur, swap the extensions you loaded with the ones you didn't, and try again.

Continue this process until you isolate the offending extension. Drop me a line and let me know what extension was causing the problem.

Upgrading System 6 to System 7

When MyBattery is running under System 6.0.x, it creates a "MyBattery preferences" file and a "MyBattery data" file. If you upgrade to System 7 and want to preserve your preferences and estimation data, copy these files to the "Preferences" folder in your "System" folder. Otherwise, MyBattery will create new files in your "Preferences" folder using default values.

Technical information and references

References

The information used to write MyBattery and this manual has been culled from various sources, including:

- Inside Macintosh, Volume VI (Apple, published by Addison Wesley). This volume contains a discussion of the Power Manager software.
- Macintosh PowerBook Family Developer Notes (Apple). Discusses technical side of PowerBook hardware and firmware.
- The PowerBook Companion (Richard Wolfson, Addison

Wesley). A great book with lots of tips for PowerBook users (did you know that when Apple prepares your PowerBook hard drive, 1.6 megabytes of hard drive space is unused? Buy the book and find out how to get it back!).

Low Battery Warnings

<u>PowerBook 100</u>
Typical "fresh" battery   ≈6.20v
First warning message   @5.90v
Second warning message   @5.81v
10 second dialog   @5.78v
Forced shutdown   @5.74v

<u>PowerBook 140/145/170</u>
Typical "fresh" battery   ≈6.70
First warning message   @5.90v
Second warning message   @5.75v
10 second dialog   @5.65v
Forced shutdown   @5.55v

Version History

<u>1.20 - ???</u>

- Password registration
- Historical estimating technique
- Auto-configure for different PowerBook types
- Handling for system sleep

1.10 - 23 August 1992

- Estimate limited to 4 hours
- Display --h --m fix for bar graph display
- Add elapsed battery time display
- Improved estimations of remaining battery time
- Improved error checking
- "Full" is now 6.20 volts on gas gauge
- Turned off compiler optimization to fix PowerBook 140/170 problems

1.00 - 17 August 1992

- Displays two-color bar graph
- Added separate icon for low battery condition
- Gas gauge display
- "small displays"

0.90 - 4 August 1992

- First release

Disclaimer

While I have attempted to test MyBattery as fully as possible, I cannot guarantee proper operation on other computer systems. I am not liable for any direct or indirect damage caused by MyBattery. The individual using the software bears all risk as to the quality and performance of the software.

If you have registered your copy of MyBattery, and are not satisfied with it's operation, your registration fee shall be returned to you. You are then obligated, however, to delete all registered copies.