Mobile Computing in the Outdoors

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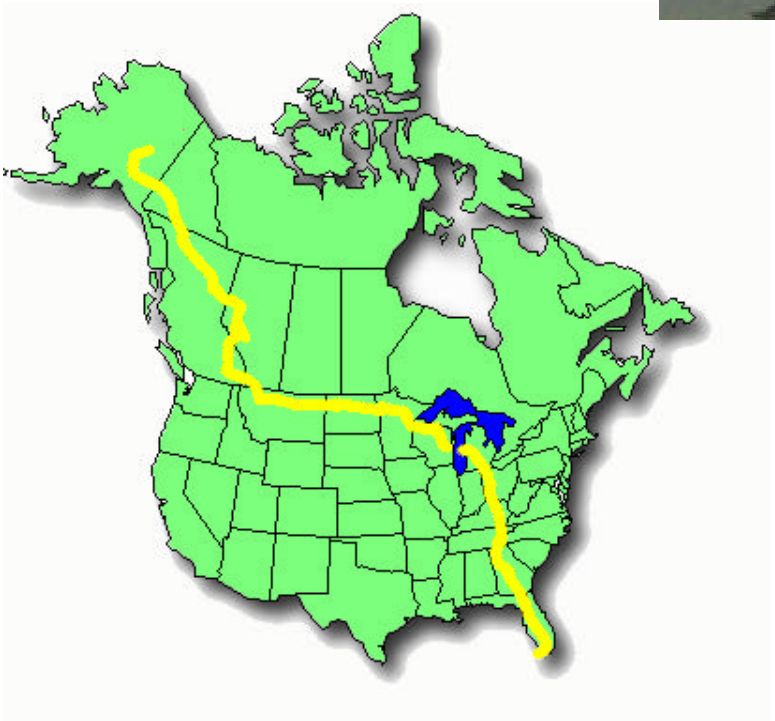

I learned a lot about mobile computing when I rode my bicycle 6,011 miles from Fairbanks, Alaska to Key West, Florida, while maintaining a website daily with my PowerBook® 5300c. For the most part, I traveled solo and self-contained (no support vehicle or people). I carried my PowerBook, a digital camera, pc card modem, etc. in panniers on my bicycle over some of the worst roads in North America. My website:

<http://www.voyager.net/tailwinds>

Outdoor Storage

Wetsuit® (Kensington <http://www.kensington.com/products/>) PowerBook carrying case: The nearly weightless form-fitting neoprene Wetsuit is perfect for protecting just the PowerBook, nothing else. I use the small pocket on top to carry my pc card modem, but there is really no extra room in the Wetsuit case. Where weight is my primary concern, that is how I want it. Despite the name, however, the Wetsuit does not protect the PowerBook from the wet; it is just good padding and a means of carrying the PowerBook away from the bike. I insert the PowerBook into the Wetsuit case and then the Wetsuit into a waterproof OR bag.

OR Hydroseal® Stuff Sacks (Outdoor Research <http://www.orgear.com/>) I use 3 OR waterproof Hydroseal bags to protect my gear (sleeping bag, computer) from rain, dust, dirt, etc. I pack my PowerBook, in two OR waterproof bags: one with the Velcro roll-top closure (advanced stuff sack-model) and one without (standard stuff sack). Despite torrential rains, not one drop of water ever got through to my PowerBook. And these bags seem to breathe just enough to avoid trouble with condensation.

Hefty OneZip® plastic bags<http://www.tenneco-packaging.com/>
I store my diskettes, power cords, modem, paperwork, cables, digital camera, microcassette recorder, cell phone and power supply "bricks" in Hefty OneZip® plastic bags. Instead of the usual groove closure, these plastic bags have zippers. The zippers simplify opening and closing and provide a very good waterproof seal (they're so airtight that you must open the zippers a bit to let air out before you put them in the panniers). I buy the freezer version; they are thicker and more durable.

Power supply

At Kluane Lake, Yukon Territory, I had quite a scare. I plugged my PowerBook into an outlet at a lodge which was producing its own power with a diesel generator. The mouse and monitor seemed to show everything to be in working order, but there was NO response from keyboard. I downloaded about 100 digital photos entirely with the mouse, nesting numerous "untitled" folders inside one another because I couldn't input anything from the keyboard. Initially, I thought riding over bumpy unpaved roads had dislodged the keyboard connector inside the PowerBook, but it turned out that the trouble I experienced was due to faulty power. When a PowerBook receives inadequate power, the power manager, a component of the operating system, isolates some of the hardware. In my case, it was the keyboard. When the human body is threatened by some unfamiliar protein, such as a bee sting, it does the same thing by going into anaphylactic shock.

Some PowerBook users are obsessed with wringing more time out of their batteries. Nothing you do (dimming the monitor, spinning down the hard drive, RAM disks, etc.) makes any appreciable difference in your battery life. I use sleep liberally and try to make the most of the time my PowerBook is running, but I've given up on conservation techniques. I carry only one battery and look for an AC power supply every night to recharge it as often as I can. I do intend on my next remote bicycle trip to use a **KISS** (Keep it Simple Systems <http://WildWestWeb.com/Public/KISS_Home_Main.html>) solar panel. The KISS Mercury panel for PowerMacintosh PowerBooks, is about the size of an open 3-ring binder and weighs more than 2 lbs, but it could recharge all my battery devices and I could eliminate some AC adaptor bricks.

BTI AC adaptor: In order to reduce my weight, I used a BTI AC adaptor instead of the one furnished by Apple. The BTI also uses a 2 prong plug instead of a grounded 3 prong, so I didn't need to carry a bulky extension cord or adaptor. The BTI power supply that I purchased to replace Apple's heavier original seemed to suffer a bit more from bad power than the Apple power supply.

Madison Line AC adaptor: For PowerBook 1400s, 2400s, 3400s and the G3, the MadisonLine adaptor seems to be identical in size but a bit more advanced.

Global Positioning Systems

One of the more interesting products to come along in years is the global positioning system (GPS) satellite navigation system. A GPS receiver looks to a network of 24 satellites orbiting about 11,000 nautical miles above the Earth to determine geographic position. To determine where you are, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received by the GPS receiver. The time difference tells the GPS receiver how far away that particular satellite is. Using distance data from several satellites (up to 12), the GPS receiver triangulates your position. With four or more satellites, a GPS receiver can determine a 3D position which includes latitude, longitude, and altitude. A GPS receiver can also calculate speed and direction of travel. GPS systems are capable of extreme accuracy (down to mere millimeters), but in the interest of national security, President Reagan declared in the early 1980s that highly accurate GPS receivers would be restricted to the military. A typical civilian GPS receiver therefore provides 60 to 225 feet accuracy, but for most purposes that is quite adequate. I've used two different GPS units with my PowerBook and found them as accurate as 40'.

DeLorme Tripmate™ (<http://www.voyager.net/tailwinds/gifs/delorme.gif>

The Tripmate is a GPS receiver that is made to be used exclusively in conjunction with a laptop computer. The Tripmate GPS for the Mac will show your location anywhere in the United States on Street Atlas USA® 4.0 maps (using either the Street Atlas CD or map data loaded from the CD into the PowerBook hard drive). The software allows you to create a "bread crumb trail" showing exactly where you went over a period of time. That feature will be quite useful in showing where I rode over the day. The negative side of the Tripmate is that it is not a stand-alone product. It has no display capabilities of its own. To use it, you must connect it to a PowerBook. That is less practical for me on my bicycle. On the other hand, the DeLorme software for the Tripmate can be used with stand-alone GPS systems from several manufacturers, including the Garmin GPS receivers (below).

Garmin GPS III™ <http://www.garmin.com>

The Garmin GPS III features a 12 channel receiver with an LCD screen display for vertical or horizontal orientation. It comes with geographic data (streets, rivers, natural features) for all of North America or Europe loaded into ROM. It can therefore be used either stand-alone (Garmin even makes a bicycle handlebar bracket for the GPS III) or in conjunction with the DeLorme Tripmate® software or **GPSy**™ <http://www.gpsy.com/> a Macintosh GPS communications program that has sophisticated mapping, logging, and data transfer features.

Lighting

The ADB Flexlight™ (MCE <http://www.powerbook1.com/>)

This little light for your PowerBook plugs into your ADB port and illuminates your keyboard and/or adjacent documents. Many nights on my bicycle trip, I sat in my tent late at night using my PowerBook with lighting from a AA battery powered mini MagLite held between my teeth. I had a real problem drooling onto the keyboard. I was concerned about the power draw of this light before buying one, so wrote Jason O'Grady <www.ogrady.com>. Jason responded: "Surprisingly little juice is used by the light, I ran my 2400c for almost 2 hours last night with the light on!"

Digital Cameras

When I left Alaska on my transcontinental bicycle trip, I could only dream that my PowerBook would produce a daily website complete with digital pictures. Over the course of my 98 day trip, however, I managed to upload about 1,200 digital photos to the web, all of which were edited with Photoshop® on my PowerBook 5300c. Most of the pictures on my Tailwinds website were taken with a **Kodak DC-50**® or **Casio QV-30**® (1996), **Olympus D300L**® (1997) and

Olympus D500L® (1998). I no longer recommend the Casio -- it is a 1st generation product (sorry to "dis" one of my website sponsors, but I tell it like it is). Last year, I recommended the Olympus D300L and Kodak DC-50, as good 2nd generation products. I now recommend the Olympus D500L (Olympus is one of my current website sponsors--but my opinions are not influenced by that fact). The primary distinction is resolution. Even for Web design, you really need all the resolution you can get. To produce 72 dpi for the Web, you need to start with at least 144 dpi, but if you start even higher, you can crop quite flexibly to obtain the portion of the image that you want or do more with Photoshop filter software. If you end up wanting to print digital photos, you need at least 1024x768.

Don't buy a camera which uses the LCD as the only viewfinder (like the Casios); they can't be seen in bright sunlight. Whatever you get, you do need to have removable media if you are going to produce pictures without the PowerBook handy for downloads. And you'll need to decide whether you want a zoom lens.

There are dozens of digital cameras on the market now and it is hard to keep up with all the features. I tried out all the digital cameras that I could get my hands on at MacWorld Boston last August and chose the Olympus D500L (because it is a single-lens reflex with a 3x zoom and 1024x768 resolution). The resolution and color saturation on the D500L are excellent.

Storage Options

On a PB G3, 3400, 5300 or 190 the expansion slot allows some interesting disk storage options. And even the other models can benefit from some of the new storage choices.

VST 230 Mb Magneto-Optical Drive

<http://www2.skyworld.com/cgi-shl/cfml.exe?template=/vsttech/index.cfm>
Just a week before departing for Alaska, I bought a 230 Mb Magneto-Optical Drive from VST which I installed into the expansion slot of my PB5300 in place of the floppy disk drive. In addition to disk space needs, I was looking for a bullet-proof data backup system. MO drives are slow but, like CDs, they are impervious to influence from magnetic fields, sunlight, water, etc. My VST-MO230 drive is great. The bad news is that Fujitsu has stopped manufacturing MO drives for laptops, so VST has no source of supply. The only current alternative is the **Zip**® drive. I am not a fan of Zips. They are magnetic and thus too unreliable for my use.

MCE <http://www.powerbook1.com/> now offers all sorts of interesting hard drive options for PowerBooks. For the IDE based PBs, the choices range to a 5.1 Gb IBM drive for about $650. The latest addition to the MCE line is a PC card enclosure for your old IDE hard drive for only $129. For my PB 5300c, from MCE, I bought a <$250 2.1 Gb Hitachi hard drive, and an enclosure for the 750 Mb drive it came with. If I replace the 5300c with a 2400c/G3 and sell the 5300c, I'll reinstall the 750 Mb hard drive in the 5300 and put the 2.1 Gb drive into the enclosure for use with the new PowerBook.

Sony DiscMan® 4x CD-ROM drive

Because my PB5300c cannot handle an internal CD-ROM drive, I bought a Sony DiscMan 4x CD-ROM drive from MacZone <http://www.zones.com /Mac_Zone/Default_Mac.htm>. I am very pleased with my selection. Though much slower than the 24x CD-ROM drive on my desktop machine, the 4x Sony allows me to load large programs to my PowerBook. I purchased a rechargeable Lithium Ion battery to go with it and the whole systems became quite portable. Without the battery, the drive weighs only about 9 oz.

Modem

Global Village Platinum Pro®

<http://info.globalvillag.com/>
I have been real pleased with my Global Village PowerPort Platinum Pro® pc card modem. I use

this version so I can access my 500kbps cable "modem" via an Ethernet network at home (it works great). While there are some reported software conflict problems with Global Village PC card modems, I've solved all of mine since I installed OS-8 and reinstalled the GV fax software. To me, a modem is a lot like a telephone, in that the best thing you can say about it is that it functioned invisibly. Global Village's fax software is superb too; including excellent OCR (optical character recognition) software for use with incoming faxes. For the remote locations I travel to, 56K modems are not likely to be supported anytime soon.

Communicating on the road

Internet Service Providers

Because my trip crossed some really remote parts of the Continent, I was forced to use several different Internet service providers. In order to avoid long distance charges from locations which had no POPs ("points of presence") for local number dial-up access, I arranged for toll-free 800# access in both the US (**Earthlink** <http://www.earthlink.net/>) and Canada (**Web Networks** <http://community.web.net/>). I also had my primary Michigan ISP (**Voyager** <http://www.voyager.net/>), an Alaska ISP (**PolarNet** <http://www.polarnet.com/>) and a Yukon Territory ISP (**YukonWeb** <http://www.yukonweb.com/>). Even with all these choices, I had difficulty on occasion connecting with one or another of them and made expensive (as much as $53) long distance calls in order to perform my uploads. I also had trouble often with noisy (high static) lines. A satellite phone would be great, but right now they cost thousands to buy and as much as $3 per minute to use.

Telephones

I chose early to rely upon standard telephone lines for my uploads. I rejected acoustic couplers and cellular phones as too slow. My big worry was digital phones. Some motel telephone systems use digital phones, in which power flows through the RJ-11 jack in a configuration that could be fatal to a PowerBook logic board. I encountered several of these systems on my trip. I was lucky that I recognized the problem quickly each time. Don't rely on motel personnel to know anything about the nature of their phone system (some do, but most don't).

I have an **Inside Line™** modem adapter for business telephones (Radish, Boulder CO -- in the catalogs), which allows me to avoid the digital phone problem by connecting my modem to the telephone handset cord (RJ-9) instead of the RJ-11 cord coming to the phone. I didn't take it with me on my bicycle trip because it has an AC power supply "brick" that makes it too heavy. I've recently seen a simple pen-sized device which plugs into an RJ-11 jack and checks for a digital line. I've ordered one and will update this report when I get it. Sometimes I carry a cheap ($20) clam-shell style phone which I bought from Radio Shack. I plug it in. If I get a dial tone, the line is ok. If the line is digital, I'd rather destroy the phone than the PowerBook.

Acoustic couplers

I know several bicycle tourists who rely upon acoustic couplers for uploading their daily journals. An acoustic coupler merely covers up the telephone handset, "hearing" and "speaking" the data beeps just as you do the words. Since there is no need to physically connect to the phone line, acoustic couplers are particularly well-suited for use with pay phones, digital phones and foreign phone systems. But, acoustic couplers are slow; typically not more than 9,600 baud, so they are not a rational choice for web publishing.

Cellular Phones

I carried my Motorola MicroTac® cellular phone with me until I gave up. I learned that where there are no telephones readily accessible, there are usually no cells either. My cellular phone proved worthless over most of my trip, so I sent it home from Alberta. They are too slow too. Cellular phones are not much faster (if at all) than acoustic couplers. Over the last couple of weeks, I've been experimenting with cellular transmission speeds. I can see my cellular tower out my study window, yet the only speed I've been able to get from my Global Village 33.6 cellular-ready modem is 7,200 baud. That might work for email, but I sure wouldn't want to try uploading

a dozen graphical images per day at that speed.

The Cold

Now that winter is upon most of the United States and Canada, cold is a concern for many PowerBook users. You don't need to worry much about exposing your PowerBook to cold temperatures. PowerBooks regularly survive being exposed to temperatures in the -40° F range. When I taught at the University of Alaska Fairbanks, I exposed my desktop Macs to temperatures as low as -70° F.

You do need to worry about condensation, however, and you do need to let the PowerBook get to room temperature slowly before you use it. Condensation produced by taking a very cold object and exposing it to warm humid air can damage your PowerBook. Furthermore, different coefficients of expansion in the PowerBook component parts cause different degrees of expansion and contraction. A gradual approach to room temperature is therefore essential, so you may want to wrap the PowerBook in an insulating cover, like a coat, sleeping bag pr foam case.

If you have any comments or suggestions, please feel free to write me: <noonan@voyager.net>