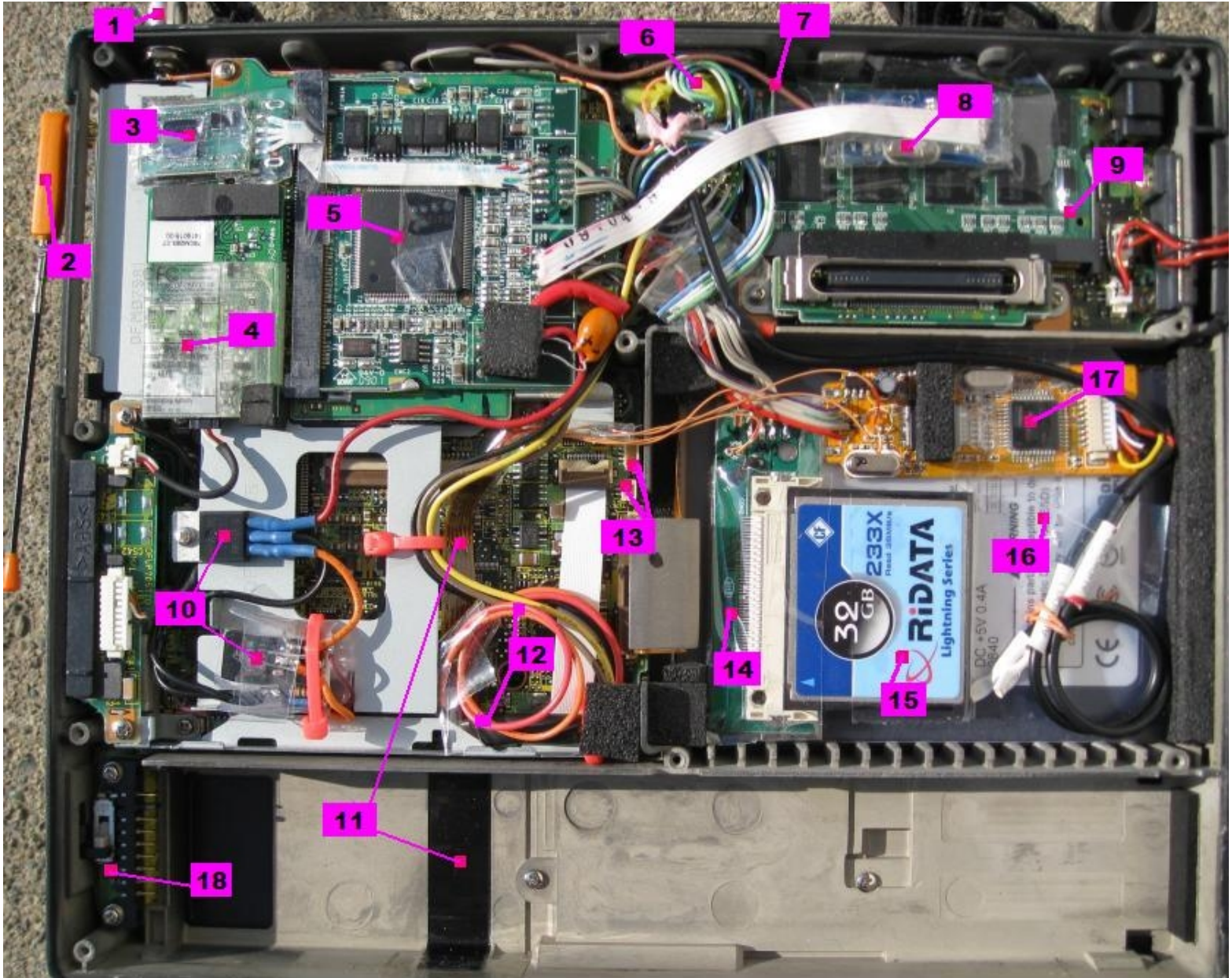# Modifications to Panasonic CFM-34 1GHz CPU model
Steve Schindler

1. External Bulkhead RCA jack for Video in to #17 USB video capture
2. 3G PCMCIA Modem WWAN
3. SanDisk 8Gb USB Flash stick. 4Gb used as Ready Boost using program called eBoostr, appears, or acts like RAM to computer.
4. Internal 56K modem, probably remove this, and use the serial port IRQ for a GPS receiver.
5. 4 port MiniPCI card, replaced the internal WiFi card.
6. 3mm Stereo jack for External Video and Audio to #17 USB video capture device
7. Feedline to external WiFi antenna now attached to the USB Bluetooth #8
8. USB Bluetooth with external antenna
9. 1Gb RAM to add to internal 256Mb of RAM for total 1256Mb (1.3Gb)
10. Power supply for MiniPCI 4 Port USB card. I'm going to redesign this to use a switching power supply with less standby current. This design has 27mA in standby.
11. Ribbon cable that goes to wireless front panel switch and LED indicators. I've wired the LED's to the various USB device LED indicators on USB devices, to show when they are powered up.

12. Wires to DIP switches to turn on/off USB devices
13. Removed HDD heater, and thermistor that turned it on/off. Must be some kind of circuit I can use that for instead, but what? Could put a small laptop fan in, but that's what I like about the CFM34, no FAN. Someone give me an idea.
14. USB Compact Flash (CF) adapter
15. 32Gb CF card (233x speed) This device is turned on when needed with one of the DIP switches next to keyboard. I use a program called Zentimo to disconnect it. It works much better than the Windows USB removal program.
16. SSD Transcend 32Gb drive. This does not have TRIM, or Cleanup, or whatever you'd like to call it. I use a utility made for Cruial SDD's that allows for cleanup like TRIM in Win 7. Don't recall the name. I'm going to replace the 32Gb with a larger drive and remove the USB CF adapter, which currently acts as a second drive.
17. USB EasyCap video/audio capture, also switched from a DIP switch, so it's only powered on when I need it.
18. DIP switches are beneath the ON/OFF switch, I had to remove the mother board to install. Switches are flush with the palm rest. Required some Dremel work, and a little epoxy.

Modifications that are not seen, and things I've learned

- Many, many ferrite beads on wires, copper foil, lots of plastic shipping tape
- Every USB device installed was also removed from it's case, with ribbon cable attached instead of the plug, LED's were removed, (if you can't see them, what good are they?)
- Since I had the mother board out, I used Artic Silver for the heat sink compound when I put it back together
- The first time I modified one of these I used +5 volts from the existing USB port. This would not allow for some USB devices to connect, because of the 500mA restriction per USB port. So I opted for a power supply to power the miniPCI 4 Port USB card.
- I've removed the USB 802.11 g,b WiFi device. It wasn't switched, and I came to realize that was a mistake, so When I reinstall, I'll probably go with a WiFi a,b,g,n device. Also the one I had, was also Bluetooth with Wifi. It never worked right. So to reinstall will also require a DTDP switch to eliminate some other USB device when I'm using the WiFi.

More modifications that I would like to do, or will happen soon

- Use the 56K modem serial port for something else.
- Use EL foil, or wire to put back-lighting behind the keyboard. I now have a miniature high voltage power supply to do this with, about the size of a pencil eraser, and will run 7 feet of EL wire.
- Paint it
- Add USB Wireless 4 channel video receiver (Internal, with external antenna)
- Add a GPS permanently to it. Problem is I don't want an antenna sticking out that can break off. The BT GPS works great, but the software to connect to it stinks.
- I have a low power FM transmitter that will do the full FM radio band. It has a LCD screen. The whole thing when removed from it's case is smaller than a AA battery. It will fit in the bezel of the CFM34 LCD screen. This mod will require 3 volt power, and switch to stereo connector, a six lead ribbon cable from the main section below the keyboard to the LCD screen section plus switch install would do it.

Programs that mesh well with the modifications

- Xport by CuriousTech. This program allows for multiple programs to use one serial port. Primarily used for one GPS to be used by many different GPS programs at the same time.
- MiniCam also by CuriousTech. Adds overlay of GPS, time, speed, other to your video as it's captured. Works great with a CarCam.
- Zentimo USB Storage Manager. I needed a way to disconnect USB devices and restart them without plugging and unplugging them, or restarting the computer. This does that, Windows USB manager doesn't come close.
- Eboostr, go to their web site, they can describe it better than me.

Specifications of this CFM-34

- 1 GHz Pentium M CPU
- 1.256Gb RAM (came with 512Mb)
- 32Gb SSD (this isn't even a fast read/write SSD, but it blazes compared to the 7200 RPM HDD I had before)
- 32Gb CF drive (also very fast, only used for back up, so is only powered on when I need it)
- 8Gb Flash Drive (4GB is reserved for eBoostr)
- Bluetooth with external antenna
- GPS Bluetooth Receiver (Good to about 10 feet away, and fast start times, it's a Holux)
- GPS serial receiver built in (soon) and yes you can run more than one GPS
- 30 fps video and audio capture (with GPS and other info, overlay) This is an EasyCap video capture
- Wireless 4 channel video receiver (soon) This will be a cool add on.
- External video port
- Stereo Audio port
- Microphone port
- Serial port
- 3G modem (upgradeable to 4G)
- WiFi (n,a,g,b, soon to be reinstalled) with external antenna
- Ethernet LAN port
- 56k modem (In case I go to a third world country)
- Serial port (serial is not dead in my world)
- USB 2.0 port
- Touch Screen
- Touchpad
- Bluetooth Mouse
- Low power FM Broadcast transmitter with LCD screen read out, good to about 15 feet. (soon, why have it on the outside, when it could be built in?)
- Start up time from cold until OS is ready 20 seconds
- Shut down time 7 seconds
- Battery life with 3G modem on (internet), Bluetooth Radio on with the BT GPS, Video capture running at 30 fps, and screen at full brightness is 2.5 hours. Battery life with just 3G modem and internet is 3.5 hours. Everything off, and just using in word, or ebook reading it only gets another 45 minutes, (4 hours and 15 min.) Shut down is at 20% capacity left, not a completely drained battery.
- Another mod I've thought about is adding the bottom of another CFM-34, and filling it with rechargeable Lithium Ion batteries