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*Guest Editor Lionel Felix takes another look at making you car a little more modern - this time by adding a full-blown PC into the mix.*

LIONEL FELIX --Car DVD players are so 5 minutes ago. DirectTV in the car, old news. X-Box in the back seat, puhleez. Any car enthusiast worth their salt has a computer in their car. That doesn't include the old laptop you "forgot" to give back to that we're-all-gonna-be-rich dot com before it folded.

Only a few years ago, putting a working PC in a car meant wedging a desktop PC in whatever vehicular orifice one had available, and performing DC/AC gymnastics to get the beast humming. There was also the issue of where exactly on your dashboard do you put a 15" monitor. All said and done, even a finished product wouldn't be terribly useful, but the CPU would make a nice projectile in a head-on collision.

A new generation of car specific fanless cases, power supplies, screens and input devices have made installing a fully functional computer as simple as adding a new stereo. No bodywork required. No projectile computers.

The compelling argument comes from the fact that a modern computer can do anything a car stereo can do and much, much more. Currently you can install name brand DVD, MP3, TV, radio, XM and navigation hardware into your car, costing you thousands and the possibility that it wont all work together. A computer in your car can offer up all those options and lots more to make sure you're distracted enough to plow through a farmers market. Internet access, encoded movies, gigs of MP3s, email, web browsing, in-car gaming, and even, \*gag\* office applications are just some of the things that a little box in the trunk can offer.

Integrating the audio with your existing system is as simple as using an **AUX** input adapter.

All of the systems listed here come with or have optional touchscreens. Touchscreens run about \$375. Well worth the price but if you're going lo-dough, a regular 7" TFT with VGA input will do you just fine. Lilliput and Xenarc screens are available through **Xenarc** and **Logic Supply**. These brands are the standard in car PCs as they have VGA inputs rather than composite, which will look like sheep snot in comparison.



Standard I/O devices like Keyboards also come with or are options with all systems. **Gyration** sells an RF keyboard and pad-free air mouse. Using it while driving may scare other drivers. Some even come with an IR or RF remote that controls numerous functions without having to whip out the QWERTY. Earn your nerd stripes by using a PocketPC **Rudeo** or **Niveus** remote.



Mounting the PC is pretty straight forward. One Xenarc PC model is single DIN sized so it fits in most factory radio slots. The rest are small enough to be mounted where one would put a CD changer, although these are often smaller than changers. Some units could, with a little dash-hackery, mount in larger Chrysler / GM sized factory radio holes. Power requirements are handled by DC/DC 12V mainboards so no power supply needs to convert the power from AC to DC per your home behemoth. No need to get your panties in a twist about when the car turns off, most systems have power management that makes the PC go nightey-night after a few minutes. Ones that don't come with that option from the factory can be upgraded with a part from **Opus Solutions** that puts the PC into a sleeper hold.



What's the point of having your PC on the road if you cant crank up that old Interweb. Options are aplenty for getting that TCP/IP stack humming. Before the WiFi geezers get their hands on it, let's say that you want a **Modem**. Talk to a USB or PCI

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their Depends askew, lets cover that gray area of [wardriving](#). Latch on a USB or PCI 802.11 card (PCMCIA if you got it) and start sucking down that bandwidth from those unsuspecting folks who cant manage to assign a WEP key. The de-facto standard software for Wardriving is Netstumbler. In order to get any range at all, its important to get a WIFI card that takes an antenna attachment. PCI is preferable as most of those cards use standard connectors that let you crank up the gain a few Dbi with a [stronger antenna](#) The NetStumbler store has a whole slew of combos for you. It's best to buy it all as a kit since all of the parts are mated up and mating is important stuff. 5Dbi omni directional is the minimum you want for an antenna. Avoid directional antennas as they are just that, directional, so its only good if you know where the access point is, while you're moving, in a car. Nuff said.

Another way to get that coveted bandwidth is to use that vibrating nuisance in your pocket. Most modern wireless phones have a USB cable (and yes some jackass phone makers \*still\* sell serial adapters as if I were going to TTY into the phone) that along with their connection software let you use their GPRS / PCS to surf the web. The downside is some providers charge you astronomical prices per MB. Check out the pricing structures before signing up for a data plan.

The foolproof method is to buy a PCMCIA data access card from a wireless provider. Sprint has 3 different connection cards. Verizon also has 3 cards, some using older networks and the Sierra Wireless AC580 which does a very respectable 2Mbps. At \$350, it should. AT&T only has one card but its the Sony Edge card which I've used and it kicks all of the other cards shiny flat butts. At \$free and \$79/mo its hard to argue with it, in spite of my feelings about AT&T customer service. Yeah, its 130Kbps but unless you're downloading off of Giganews.com driving down the highway, its plenty. The only difficulty using these cards is that their little antennas may not be able to get great reception if locked up in the trunk. Most of the wireless Internet providers offer a [Sierra Wireless](#) connection card. Sierra, thinking about the many possible uses, makes a bunch of [antenna extenders](#). They run about \$40 which is easier than extending the PCMCIA slot out to some other place in your car.



Sound reproduction and the ability to process complex decoding allows for a very broad range of audio options. A few the car PC's have some sort of 5.1 digital audio out. Car amplifier maker Phoenix Gold makes a new line called [Octane](#) which takes Digital Coax and TosLink optical in and decodes / distributes Dolby Digital and Pro Logic.



I harken back to the day dad bought me a black and white 4" tube TV that worked in the car. Oh the joys of watching the shifting snow that I could almost make out as Barney Miller. Over-the-air TV is still kinda crappy but for only \$100, [BAM!](#) All done. Barney Miller may still look like a gray snowy blur.

Remote mounted slim form-factor DVD drives are available so as to avoid stopping to get into the trunk to change out movies stored on physical media. Weird, I know, but some people don't encode all their movies. Jack Valenti is rolling in his future grave.

One of the big savings in setting up your car system is that the cost of adding a navigation "system" is nominal. There are a ton of USB GPS adapters available so its simpler to find the one that offers what you want than to list them all. For the sake of simplicity and hitting most of the marks, the Earthmate USB GPS hooks you up with a nice yellow (yellow makes anything more rugged and outdoorsy) dingus replete with on/off LED and a copy of Street Atlas 2004. [Car CPU](#) has this for \$119 or \$1500 for the Alpine. Your choice.



For whatever reason, XM decided to make a USB, computer specific radio. I'm not complaining at all, I just didn't expect that kind of subtle genius from a big company. The [XM PCR](#) for \$50 is smallish and easy to hide in the car amongst the multitude of other devices. The antenna is made for home PC use but its not huge and can be hidden in the package tray under some fabric if not right behind a headrest. If you have XM, its only \$6.99 more to add another unit. I said Unit, heh.

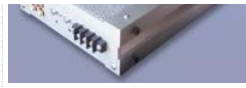


A few companies have the forethought to address most if not all of the needs of a car PC user. From a bare bones kit to a turn-key system, there are more than enough options. Prices start as low as \$300 for a small form-factor unit and go up near 3K for the Macguyver do-it-all models.

[CarBot PC](#) Takes a more whole media experience approach telling us we don't need a distracting, accident causing display to enjoy the benefits of having a PC in your car. That



said, the unit has a standard VGA out and can use a touch screen that gives you access to their custom designed interface. The whole system is set up to be controlled through a custom designed RF remote doing away with the need for an IR flasher. Their UI is designed to be easy to use while in motion. Fortunately, the remote can be used to access most functions. It also has a spiffy voice feature so you don't need to look at a screen at all. Swanky and a good deal at \$1600



**CarTFT** offers up a "complete" solution that includes a 7" touchscreen TFT (nach) DVD player, 2.8GHz processor, 60GB HD, 512MB RAM and a GPS maus. Seriously, they actually call it a maus. They slay me. At 1499 Euros, you would expect a real maus and keyboardenzi (I made that up) along with some sort of remote, IR sensor, WIFI, PCMCIA. It does include "espacially created memory" (*sic*) and you know we all need that.



The **CarCPU** Elite system, is just that, you know, 133t. A well thought out package that offers up just about everything possible in one box. The external DVD, GPS, IR Remote, smart power supply, WIFI, Gyration keyboard / mouse and touchscreen and USB Audigy 2 NX. The Audigy 2NX decodes 5.1 and 7.1 allowing you to use the above mentioned Phoenix Gold amp to give you the full cinema surround sound without faking it. All you would want to add is the TV / FM tuner and XM radio.



At \$2849, its a touch on the pricey side but you get the whole enchilada. The Lite, low carb version has less goodies but saves you a bit at \$1959 with screen.

**Xenarc Technologies** has a broad offering of car specific computers from a 1DIN (the only 1DIN specific model I found) to larger fanless models made to go into more cramped spaces with less ventilation. Fanless doesn't mean cram it under the rear seat, its still a computer and they do get hotter than your run-of-the mill car amp. The CP-1000 1DIN model could be the end all be all but for some odd reason they have a MMX-266MHz CPU which will limit it from being able to run modern applications and operating systems. Linux hax0rs can rejoice if they need a dash-mounted BASH prompt.

Their next up is the MP-FL8 which packs a 2GHz proc in a fanless chassis. It would also be a big winner except for its lack of PCMCIA slot which is critical for AT&T/Verizon/Sprint wireless internet cards. No PCI slot either, so any WIFI will need to be done via USB and I don't know of any USB WIFI adapters that can take an external antenna to extend range. I guess that model would be called the FL8io.



The big baby in the bunch MP-SC6 is larger but does offer a single PCMCIA slot. Enough for that wireless access card but still relegating your WIFI to USB if you choose to use both.

**Cappuccino PC** Slimpro boxes look just like the ones over at Xenarc. Someone here is "borrowing" from someone else. Not that I'm pointing any fingers either way... What makes the offerings from Cappuccino different is that most of the models have PCMCIA making them oh so friendly for wireless internet. Cappuccino offers almost turn-key solutions and a ton of ways to roll your own. Since putting together the other parts to make the whole system sing isn't a huge stretch, this is a good starting point for do-it-yourselfers. If the Mini-ITX form factor is just too big, they also sell micro-ITX 12/12CM mainboards. No cases included, so dealing with the annoying guy at Radio Shack may be required to source a project case. That might be a deal breaker.



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