Fit a PC in your car

Give your car stereo the boot by installing a full PC, and you'll be able to play MP3s and DVDs, use satellite navigation and a whole lot more

You'll need this...

- A CAR
  To fit your PC in.
- CAR PC BAREBONES OR CAR PC CHASSIS
  With Mini-ITX motherboard.
- CPU
  Memory, 2.5in hard disk drive and slimline optical disk drive.
- CAR PC CONTROL SOFTWARE
  Such as Centrafuse.
- SET OF SCREWDRIVERS
  To help fit your PC.
- PATIENCE AND IMAGINATION

Cars are increasingly becoming computer controlled, but your only glimpse of all this digital power is likely to be a range estimation for the current petrol tank contents. Most of your car's computational ability is hidden behind the scenes. Aside from engine management, though, there's a lot more functionality you can add to your vehicle by fitting a PC inside it.

In-car hardware

Just as desktop PCs come in all shapes and sizes, there are many species of in-car PC. They can be hidden away in the boot, hog the glove compartment or go under the passenger seat like a stereo power amp. You can even fit them in the space where the hi-fi would normally be. But two features they all have in common are the need for low power consumption (it could all be running off your vehicle's 12V battery) and the limitation on space.

Fitting a glove compartment or boot PC is likely to be a fairly major work of car modification, but it does allow a slightly larger PC than dashboard installation. If you want to put displays in headrests for rear passengers, installation is best left to those who install PCs in cars for a living, such as In-Car PC (**www.in-carpc.co.uk**) or InCarOffice (**www.incaroffice.co.uk**). However, for the less valiant modder, a PC that fits into an existing slot is the least painful option – although still in a league of difficulty far beyond building your own desktop. Considering that your in-car PC is likely to be expanding on the features of your car stereo, this is the most obvious location for the control interface.

▲ **An in-car PC such as the Infill G4 will let you carry out a host of activities, from checking your route to receiving live weather reports.**

The DIN standard for car audio head units is ISO 7736. This specifies a face panel of 180x50mm for a 'Single DIN' unit, and 180x100mm for 'Double DIN'. In-car PC barebones are available conforming to either of these standards. However, the ISO standard doesn't specify a depth, so your chosen barebones may still not fit in your car. The only way to check is to measure the depth available and consult the vendor's specifications, leaving plenty of room for cabling.

A larger PC will fit into a Double DIN box, but it will also be a little harder to install. Your car will probably only have a Single DIN car audio head unit installed, so adjacent space will need to be found. Don't expect to be able to buy any car PC and simply slip it in as you might a car stereo. Depending on your vehicle, you may need a different fascia panel and mounting kit, and to add amplification or conversion stages to the audio output. For a PC that isn't located in the car stereo space, there will be also be plenty of cabling to perform.

There are lots of options for the actual PC. You can buy a chassis

Do this...

Install satellite navigation

Portable sat nav devices have seen enormous sales growth in the last couple of years. Being able to take your GPS from car to car is very handy, and the price significantly undercuts most pre-installed sat nav options. However, portable devices are also easy to steal and can be fiddly to position in your car. If you have an in-car PC, it makes a lot of sense to move your sat-nav requirements onto that. After all, you can still take the PC with you if you get a new vehicle.

The Infill G4 comes with a GPS built in, but you can easily add this to any in-car PC via USB or Bluetooth for as little as £38 (**www.tinyurl.com/34cvg9**). Next, add your favourite sat nav software. Centrafuse XLE comes with this facility built in and, as this is integrated into the interface, it makes for a slick experience.

▲ **Satellite navigation is one of the most powerful and useful features you can add to an in-car PC.**

However, Map&Guide's fleet navigator 4.2 (€219 from **www.cartft.com**) offers more features, such as traffic updates and remote transfer of destinations or position compared to a head office. ■

such as the VoomPC-2 and Mini-ITX VIA or Intel Mobile mainboard separately from the likes of **www.cartft.com** or **www.kustompcs.co.uk**. Alternatively, a variety of barebones are available, such as the CALU-M Fanless (**www.tinyurl.com/2jey6y**) or S631-C or HC (**www.tinyurl.com/2sg3n3**). The HC version of the S631 is tall enough to accommodate a PCI slot riser, while the C version is around the size of a 5.25in optical drive.

Although a barebones will already come with many features integrated, including graphics, you will need a processor (in the case of Intel-based mainboards), memory, hard disk and optical drive. You will also need to add an appropriate power supply which is capable of dealing with the wildly erratic DC supply from a car battery. However, the most expensive additional component will be the touchscreen, which will cost at least £200, plus more to mount. This will either be secured onto your car dashboard, or can be mounted where the stereo would have been, either as Single DIN (**www.tinyurl.com/35zxf2**) or Double DIN (**www.tinyurl.com/2m676x**). These can even include an audio amplifier (**www.tinyurl.com/2v89n2**), which is handy as otherwise you may have to purchase one separately.

Alternatively, you can buy a complete ready-built car PC, such as the Single DIN unit available from ADS Shop (**www.tinyurl.com/2novqy**), which has everything built in. However, the prince of car PC barebones is Infill's G4 (€1,198 from **www.cartft.com**), which negates many of the cable routing issues. This is a Double DIN unit based around a VIA Mini-ITX board sporting a 1.5GHz VIA C7 processor. Most functions are built in, including VIA UniChrome PRO II graphics and GPS. It has a built-in 6.5in touchscreen with an 800x600 resolution, too. This is motorised, and can be angled for comfortable usage. So all you need to add to this barebones is RAM, an optical drive and a 2.5in hard disk.

Another consideration is how you build and set up the operating system and software. Car PCs are intended to receive a 12V DC input from a car power system. However, they don't usually come with an AC adapter, or have any conventional desktop PC power connectivity. The Infill G4, for example, simply offers bare wires for connection directly to the 12V DC supply in your car audio head unit bay. The S631 barebones do ship with a test AC supply, making them easier to configure prior to car installation.

Choosing software

Windows is primarily intended to be used with a keyboard and mouse, but an in-car PC is not exactly a desk-based environment.

▲ **The Infill G4 requires a Double DIN space in your car's dashboard, which means it takes up twice the space of a regular automotive hi-fi head unit.**

This is why a touchscreen is a necessity, with a finger-friendly operating system to go with it. The Infill PC comes with its own interface software, capable of driving the majority of its abilities, but there are other options that integrate virtually every function you'll want into one environment.

Most popular is Centrafuse (**www.fluxmedia.net**), which comes in three versions. The Standard Edition (€98 from **www.cartft.com**) offers media playing, radio functions, DVD playing, a TV tuner, a web browser and audio mixing. It can also accept a feed from a rear camera and monitor information from your car's OBD-II interface. The XE version (€119 from **www.cartft.com**) includes Bluetooth support.

Top of the range is Centrafuse XLE (€289 for the European edition from **www.cartft.com**), which has all the features of the XE version, plus GPS navigation. Whichever version you choose, Centrafuse's functions are held together by a simple main interface, which places buttons for the modules in the centre and media player controls along the bottom. You can also try out Centrafuse for 30 days before taking the plunge (**www.cartft.com/community/centrafuse**).

Once you have your car PC installed, as with any computer your options are limited only by your imagination. A GPS system is an obvious choice, as is a mini wireless or USB keyboard. An OBD-II interface (see 'Monitoring your car', above) will give you on-screen information from your car's engine management system. You can download a host of Centrafuse plug-ins from **www.fluxmedia.net/downloads.aspx**. But for a true taste of luxury automotive options, why not install a camera in the rear of your vehicle (£42.99 from **www.tinyurl.com/226ojm**)? The wiring will need to be routed to your in-car PC, but this will then provide a much clearer picture of what's behind you when you park than any rear-view mirror.

▲ **Check the depth of your in-car PC before you buy, to be sure it will fit.**

Considering how much this option costs when purchasing a new car – and it's usually only available on top-end luxury vehicles – installing a system yourself underlines how a car PC can add to your automotive pleasure. So give your car its own PC and turn it into the perfect digital home away from home, or office away from the office. ■

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Spotlight on… Monitoring your car

With a PC installed, your car will have two computers – the other one taking care of engine management. It's a shame they can't join forces to rule the automotive world. Well, actually they can. Since 1996 (in the US) and 2001 (in Europe) a standard interface called OBD-II has been used for reading and writing data to and from your car's engine management system, although there are a number of standard protocols for the transmission, depending on the manufacturer.

You can buy an RS232 or USB adapter to connect the PC to your car's computer via OBD-II. Prices start at £24.99 (**www.ecufix.com**) for a dumb interface, which doesn't support the SAEJ1850-VPW, SAEJ1850-PWM or CAN protocols. ELM327 interfaces that contain the circuitry to support every possible protocol cost more than twice as much, but provide the widest range of software compatibility. The Centrafuse ELM327 even has the ability to display certain performance data within its interface. ■

▲ **Add an ELM327-based OBD-II interface between your car PC and engine management system.**