The original XBOX is a great platform for hacking. In fact, there is a large underground community of Xbox hackers on the Internet.

Using the Xecuter3 mod chip and some heavy rewiring I showcase an Xbox that is modified for a 12volt system for car use. No 120volt inversion is used, the original power supply is replaced with a direct 12v DC-DC converter. A new 80GB laptop hard drive provides lots of space for mp3s and game play with much less power consumption. The modified Xbox runs Xbox Media Center, an open-source media player for music, videos and pictures that displays on the car's roof mounted LCD display.

Hacking the XBOX Boot

In order to run anything other than Microsoft approved code on the Xbox you must bypass the normal Xbox bootup sequence contained in the internal ROM with a hacked version. This is done by using a debug feature Microsoft put in the Xbox for manufacturing reasons. It is largely suspected that it is also used to test the Xboxes as they come off the assembly line. An Xbox mod chip takes advantage of a discovered loophole by supressing the ROM bootup and forcing the Xbox to run the bootup sequence contained on the mod chip's flash ROM. From my own research the Xecuter3mod chip is the most advanced mod chip on the underground market. From personal experience modding over half a dozen Xboxes, it works every time and provides many advanced features.

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title=|Showing the wiring harness for video and power fed directly from the car battery|}images/stories/articles/xbox/xbox-harness.jpg{/rokzoom}

Installing the Xecuter3 mod chip

After some practise, it now takes me about 10 minutes to install a mod chip. For earlier Xbox models version 1.0 to 1.5(?) you simply have to solder a header onto the Xbox motherboard and plug the mod chip in. For versions 1.6a and 1.6b, Microsoft unwired some of the LPC header the mod chip plugs into. This is solved using a small thin PCB provided with the Xecuter3. This PCB solders onto the Xbox motherboard and repatches the missing signals to the header again. This takes about 2 minutes for anyone with a mild amount of soldering experience. A small control panel is wired to the front of the Xbox to provide some switches for extra features of the Xecuter3.

Since selling chips that would include any original Xbox code is not legal, there are no Xbox mod chips that work as shipped by the seller. In a sense, they all come as blank mod chips with no ability except perhaps to reflash thier internal flash ROM. It is up to you to track down a hacked version of the Xbox firmware and flash onto the mod chip. This can take longer than the physical install. You will probably only find the file you are looking for in an xbox IRC channel.

Upgrading the Hard Drive

The original hard drive in the Xbox is only 10GB. One reason for upgrading to a larger hard drive is you can copy many of your games, music and videos onto the hard drive. However, the primary reason for upgrading in this case is to use a laptop hard drive that requires much less power since we are powering off a car's electrical system. I chose an 80GB hard drive but today you might instead want to look at Solid State Hard Drives that would lower the power requirements considerably more and also not be sensitive to mechanical vibrations during driving.

Replacing the Power Supply

The most common method people use to power an Xbox in a car is a 12volt to 120volt inverter. This is *horribly* inefficient! The power lost in the conversion loads the car's alternator or when the car isn't running drains the battery fast. The 800w inverter I tried beeped a lot indicating possibly a low battery voltage or high current draw. It also got quite hot!

I later chose to try a 12v DC-DC power supply that is intended for powering an ATX

motherboard off a car's electrical system. The ATX power cable provides all the right voltages for the XBOX but is missing one signal. The DC-DC converter board also has the benefit that it monitors the battery voltage and will shut down if the battery goes too low that the car might not start. It will also survive a crank-over so the Xbox does not reset when the car is started. I had to add a small signal regulator and a logic circuit to translate a POWER GOOD signal from the DC-DC supply into the XBox power input.This was small enough to be wired directly into the patch cable and shrink wrapped.

Mounting the DC-DC power supply was a little tough. It was just slightly larger than the original power supply and would not fit lying flat. I instead had to mount it on its side against the right side of the Xbox. This also meant the original Xbox hard drive or its plastic carriage could not be placed back into the Xbox as it now interferes with the power supply. I mounted the laptop hard drive on its side too against the right side of the Xbox and between the power supply. I used tall standoffs to offset the power supply and to fit the smaller hard drive between it and the right side of the Xbox.

I have one bug in the power sequence. It can sometimes take a few hits of the power button to turn the Xbox on. Sometimes it starts to light up but then powers back off. I have deduced that this is due to the POWER GOOD signal the system supervisor of the Xbox is monitoring on power up and sometimes the signal from the DC-DC converter is not active fast enough. The solution to this would be to use a small 8pin PIC chip that resequences the xbox power startup, specifically it would first signal the DC-DC converter to power up, then when the POWER GOOD signal is right it would signal the system supervisor that the power button was pressed. No damage is done by the current power up sequence so I haven't gotten around to fixing it for a small anoyance.

The ATX to XBox Power Adapter

Link to Bunnys "Hacking the XBox"

Wireless Network

To make it easier to move media between my home computer and the car's Xbox I installed a wireless Xbox module into the car and hid the wiring through the car's snap panels. Now my car is part of my home wireless network and transfering files is as simple as ftp!

Power Consumption

I used a current meter to monitor the current draw while doing different tasks with the Xbox. The

highest current consumption was during spinning of the DVD-ROM. Since the DVD ROM is rarely used this is not a problem. I removed the DVD-ROM completely, but it didn't make any appreciable difference so long as the DVD-ROM is not spinning.The laptop hard drive lowered consumption by about an amp over the original hard drive. Gaming proved to draw the most current, which is to be expected. During gaming my modded xbox drew about 1.8 amps, and during normal Xbox Media Center usage it drew only 1.2-1.4amps. I've played the xbox for more than an hour at a time without having any noticable effect starting the car again. I got about 15-20 minutes using the inverter.

It's nice to hop in the back of the car and play a game when I find myself waiting in the car...or waiting for wind at the beach before going kiteboarding!