Planning Your Projects

chapter 1

Let's face it, geeks don't like to plan—we get into the thick of it quickly. If you don't plan these projects, you may go broke before you start. Know what you're getting into before you do this, and know where you want to go with it when you're done.

In this chapter you will learn how to:

- Plan out your projects
- Save money on equipment by keeping things in scope
- Learn how to mitigate extreme heat and cold concerns
- Protect your investment and learn about security
- Address warranty and legal concerns
- Buy your equipment before starting a project

Some of the projects in this book require a fair amount of equipment and processes. It will help tremendously if you read through a project's entire chapter first and make your decisions on what to purchase beforehand. In many cases, once you start installing items in your car, you'll end up having to finish the project, too, unless you want a big mess. If your dash is torn apart and you have a red cord in your hand, it's a bad time to decide which operating system to install on the computer. To help you through this, each project lists all of the equipment you should need before starting each project, as well as all preinstallation steps. Don't worry, I won't ask you to build a computer outside!

in this chapter

- ☑ Planning projects
- ☑ Saving money
- ☑ Considering heat
- ☑ Securing your project
- ☑ Warranty and legal concerns
- ☑ Where to go next

Keep Things in Scope and Save Money

For many of the projects in this book, there are a lot of choices when it comes to equipment. However, a lot of that equipment may do a lot more than what you may actually need. For example, a gaming console and audio/video (A/V) system setup only requires a low-resolution, low-power, analog screen. The computer projects, on the other hand, could get by with that same low-cost screen and analog output if you're just using them for

playing music and video. Buying a high-resolution digital extended graphics array/adapter (XGA) screen with touch-screen abilities may sound cool, but it's overkill and could easily be three or more times the price of a regular screen!

Keeping projects in scope doesn't mean you can't expand later. Many of the projects I've included have interchangeable parts. If you build a computer with an analog screen, you can always swap that screen out with a higher-resolution digital one later and sell the old one on eBay®. I will try to not lock you into any particular technology. Like any good chef, you can (and are encouraged to!) improvise and make these projects truly your own.

Watch Out for Heat!

Computer and electronic equipment are obviously very sensitive to heat. In your own home, a poorly ventilated computer can overheat and shut down, possibly damaging components and losing data. Cars are an order of magnitude more complex in this case because they aren't continuously environmentally controlled like your home. For example, on a sweltering summer day, you may run the air conditioning to keep yourself a cool 70 degrees. Once you've parked your car, however, the inside temperature of your car could soar to hundreds of degrees and damage all of that equipment you've bought!

To help mitigate the heat threat, there are a few things to keep in mind:

- Keep the computers, game consoles, CDs, catridges, tapes, and other components in the shade, and preferably in a much cooler area, like the trunk. Only particular portions of the PC really need to be exposed, such as the optical drive, USB ports, and so forth. Those ports can be extended to areas of the car using longer cables.
- Consider tinting your windows if you are keeping electronics out in the open, like an LCD display on your dashboard. Make sure you purchase LCD displays made for cars. Do not place a home computer LCD display in your car because direct sunlight can easily damage it.
- A black or dark color car will absorb heat much more quickly than a white or lighter color car.
- Metal computer cases can heat up very quickly, and black cases can be even worse, especially in direct sunlight. See Chapter 4, "It's So Hot in Here: Dealing with Heat" for additional information to consider when choosing computer cases.
- Before starting your electronics in a hot car, allow the equipment to cool for a few minutes. Remember, that hot air circulating through your vehicle will run over the processor, across disk drives, and so forth and could possibly damage them! Speaking of heat, let's discuss how to provide power to our creations.

Make Sure You Have Enough Power

Unless you have an AC jack in your car, you are going to need to purchase some sort of adapter to make home equipment work in your vehicle. In many cases this will be through an AC inverter, but in some cases there will be special boards you can buy to control power (such as in the case of the car computer projects). If you have a car with a small engine, the drain on your vehicle's generator and your fuel may be higher, so be prepared. This is all explained in detail in Chapter 3, "Giving Your Creation Life: Power Considerations."

Make sure to verify that the power sources you are using have a high enough amperage or current rating to handle the tens to hundreds of watts of additional electornics you are installing. When in doubt, check with your car dealer or a professional service manual to make sure you do not overextend a crucial car circuit—such as brake lights or engine computers.

Keep Security in Mind

If you're going to put all of this equipment in your car, don't forget there are people out there who may want to steal it! I know it sounds paranoid, but just as much as someone will steal a radio out of your car, an LCD display on your dashboard and game controllers all over your car scream "TAKE ME!" (hey, there's an LED display chapter in this book, you could use that to flash the words). Either way, keep in mind where you put things. The keyboard and mouse can easily be tucked away in door side panels as shown in Figure 1-1.

Figure 1-1: Keep the wireless keyboard neatly tucked away in the door's pocket where it's harder for thieves to see but still very accessible.

The LCD display, shown in Figure 1-2, should be dismountable so you can hide it in your glovebox. The easily disconnected cables can be placed on the floor, under the seat.

FIGURE 1-2: The display is mountable and can be removed just by turning a knob and is also small enough to fit in the glove compartment.

Having a security system in your car is a good idea as well. If your car does not already have an alarm, look for one that disables the engine and makes lots of noise. It's not a bad idea to park in a public, well-lit place, either. A dark alley where few people pass by is surely a better place to break into a car than a well-lit shopping mall parking lot. Furthermore, the crime you want to avoid is "Smash 'n Grab," where a thief breaks your window and quickly grabs whatever he or she can. If everything is mounted exceptionally well, a thief is less likely to take the time to remove equipment, so make sure everything is very well mounted or out of site in a locked compartment. Regarding car insurance, an alarm system often may lower your premiums. Taking the steps given here may prevent your car from getting broken into in the first place, which will save you the hassle of dealing with your insurance company.

Don't keep sensitive or irreplaceable documents and files on your car computer. Not only can thieves take your computer and files; heat, water, accidents, and extremely cold weather can damage them, too!

Don't Void Your Warranty

If you are installing this equipment in a new car, I would like to suggest that you check with your dealer beforehand to determine whether any projects would void your warranty. If you have to make any modifications to your car's power system, for example, it's not only potentially dangerous; it could damage some equipment in your car if you're not careful. Such damage could void your warranty and may even create a dangerous situation under the hood, endangering both you and your passengers.

Many of the car projects can have portions installed by dealers, with you doing the rest. So, if you do not feel comfortable modifying your power system or installing a new head unit (a.k.a. stereo), you can have that done by qualified professionals and still connect the other necessary equipment to make your project work. Nobody has to know that you didn't do it all!

Learn the Law

Another very important subject to take into consideration is the rule of law. Some communities may not allow a display to be mounted on your dashboard. Others may have regulations over the use of LED message displays or flashing lights on vehicles. The last thing I want to have happen is for you to get a ticket or get hurt, so please be aware of the law when choosing projects to build. I've tried to compile a nonexhaustive list of laws for you in Appendix A, "Legal Concerns," to give you an idea of what to expect.

When it comes to LED displays and flashing lights on your car, use common sense. You're going to make our friends in blue angry if you put expletives on display boards. Flashing blue and red lights to make your car seem like a police car may not only get you pulled over; it could get you arrested.

Safety First!

Many of these projects have displays and interfaces that may distract you while driving. Although they are cool to look at, I don't want you to get in an accident or violate any "distracted driving" laws.

When working with the projects in this book, please be aware that some projects are meant to be controlled by a passenger—not by the driver! Some displays and controls may distract you while you drive.

The National Highway Traffic Safety Administration (NHTSA) did a survey on distractions and how they relate to accidents. I suggest you read it—just go to `www.nhtsa.gov` and go to the "Driver Distraction" area. More details of the NHTSA report can be found in Appendix A, "Legal Concerns."

Furthermore, some of these projects may require you to work with power systems in your vehicle and other live wires. Be careful in working with these projects. Wear gloves and protective gear when necessary. If you do not feel comfortable working with power connectors and so forth, fear not! Many of these projects can be built outside of the car and then installed by various dealers for, most likely, reasonable fees. I want you to get the most you can out of this book, but I don't want you to get hurt!

Summary

This chapter discussed planning your project, mitigating heat, and protecting your investment via security. It also discussed saftey and legal concerns over projects you may build.

For more details, you can turn to the following sections. If this is your first time tackling projects such as those in this book, I suggest you read all of the chapters in order to familiarize yourself with the issues you will most likely deal with and to learn a lot of stuff you can amaze your friends with!

- For money-saving hints and tips, turn to Chapter 2, "Saving Money"
- For power considerations, turn to Chapter 3, "Giving Your Creation Life: Power Considerations"
- For heat considerations, turn to Chapter 4, "It's So Hot in Here: Dealing with Heat"
- For cabling considerations, turn to Chapter 5, "Working with Cables"
- For shock, vibration, and G-force considerations, turn to Chapter 6, "Physics Man, Physics: Preparing Home Electronics for the Road"
- For legal considerations, turn to Appendix A, "Legal Concerns"