The right time to sit with a laptop and concentrate on the screen is when you are on a dyno and the car is being driven by an experienced operator. Do not do this on the street

HOME TUNER

OVER SEVERAL INSTALLMENTS THE WITCH DOCTOR OF LS1 TOMFOOLERY, MARTIN DONNON, IS GOING TO SHOW YOU HOW TO TUNE YOUR OWN CAR

STORY AND PICS BY MARTIN DONNO

Never has there been a time in the history of the Commodore where tuning hardware and software has been so readily accessible to both tuners and the general public alike. As part of the wave of popularity, workshops and enthusiasts have jumped on board to offer tuning services and diagnosis in a way that would have been unthinkable only a decade ago.

All of this means if you own an LS-powered V8 Commodore and feel like having a go at tuning your car, then it's possible with only a small investment in both parts and knowledge, with the best news being you can get some truly excellent results for only a little input. Sound interesting? Then get to grips with our first part in a series that will take you from enthusiast through to basic tuner over the next few months.

TOOLS

The first thing you need to do is get together the basic tools of the 'Home Tuner' trade. These are the bits that are often overlooked by those in a rush to start out, but can often end up separating the truly successful Home Tuner from those that give up quickly due to poor results and possible damage to their own vehicle. Patience is a truly important factor here, so don't gloss over any of the required pieces.

THE LAPTOP

First up is the laptop, the most important part of the tuner's arsenal. While most any laptop with a USB connection is good enough to tune a Commodore with, there

Commodore in the first place, so the whole process is seamless and happens with very little fuss. Reading the factory image or program from your computer is as simple as clicking the 'read' button in either type of software and then waiting for a few minutes as the transfer happens. This is where you need to make sure you have plenty of charge in the laptop battery, or even better have it plugged in to power.

The question begs, though, "Which product is better to tune my Commodore with, either HP Tuners or EFI Live?" The answer isn't particularly simple though, with both of these products effectively doing the same or similar things but going about it in different ways. The main difference comes down to the user interface in the software with some finding the way EFI Live spreads out its commands and programming methodology more straightforward, and others arguing that HP Tuners uses the more logical approach.

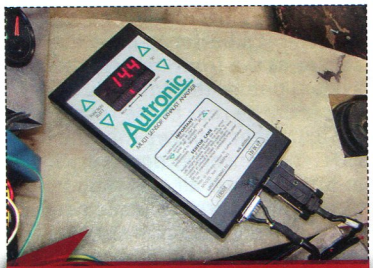
What I can tell you is that I have used both, and it all comes down to a matter of what you get used to initially, and what sort of cost you can get each product for, as both of them are good. Beware of internet forums that seem to attract fans of either product like they are football clubs and swear that one product only has the better way of getting the job done. Primarily I use HP Tuners because it's a layout that I am more familiar with. Either way, there is some great support available on forums if you search around.

THE AFR METER

There are several important pieces of feedback information your engine will give you when tuning and logging it, but one of the most important is Air Fuel Ratio (AFR), and it's also the only piece of information you will need that requires additional hardware to facilitate correctly. Where engine temperatures, ignition timing, revs and plenty of other data will come straight from the vehicles OBD communications port via your programming tool, the AFR needs an external meter to interface back to your laptop.

Back in the early days of tuning, AFR meters were incredibly expensive devices capable of setting you back over $1,500 for something that worked accurately and effectively. After all, when making tuning decisions it pays to ensure that your information is correct rather than skewed in any way. Today though the whole process is a little simpler with tuning companies offering decent quality AFR meters that will interface directly with your tuning and logging software for as little as $300.

Ensure that the AFR meter you choose has an external Analog 0V– 5V output and that it is compatible with your tuning hardware. Interfacing the AFR meter is then as simple as joining the wires and you have your very own method of looking at the all important fuel mixtures of your engine. This will be one of the most important logged parameters in your Home Tuner exercise so get it right, and then make sure you also get the location of the sensor right.



A good quality AFR meter is the heart and soul of your data gathering exercise. Spend as much money as you can afford on a proven quality AFR meter for the best results. Personally I use the Autronic, which has a great track record

The HP Tuners programming interface is a durable and cost-effective tool for Home Tuners to use, and like all of its kind has built in 'black box' logging to gather hours of data during normal driving without you even knowing it's there

Doing your own tuning and logging will enable you to run your car on different fuels and measure the real-world effect. This is just one of the advantages of being a Home Tuner

MAF versus MAFless tuning of Commodores is a debate that still rages today, and one we will be discussing in the next instalment when you 'choose your weapon'. There are good advantages either way

IT PAYS TO ENSURE THAT YOUR INFORMATION IS CORRECT RATHER THAN SKEWED IN ANY WAY

Even the latest generation Commodores (VE onwards) can be successfully home tuned. In fact, some of the later model cars are actually easier than their earlier counterparts

are some key requirements to consider if you want to be able to tune the car with some degree of safety. You see, there is nothing more dangerous to damaging the computer in the car than interrupting the communications process between laptop and engine computer during a programming session. If this happens, then there is a fair chance you can 'brick' the computer and end up with a car that doesn't run.

Even though a 'bricked' computer can be fixed, try and avoid this in every instance, by using a tuning laptop that has a good battery with a charge that lasts for over an hour, and a stable operating system like XP or similar that doesn't crash under any circumstances... or at least as little as possible. If your laptop is already a known unstable device, then go out and spend the money on something that you will use for tuning and nothing else. It makes sense, doesn't cost that much, and can save you worlds of heartache.

THE TUNING INTERFACE

There are two main choices in tuning hardware for the budding Home Tuner, and they are either HP Tuners or EFI Live. Both of these off the shelf products come with excellent tuning and logging software, along with a hardware interface that will plug directly into the communications port under the dash of your Commodore. Forget about having to pull computers out, swap Memcals or de-solder chips.

Both of these tools use the same OBD (On Board Diagnostics) protocol that the factory uses when programming your

Mounting the AFR sensor upstream closer to the engine has the advantage of more consistent readings, particularly in the case of using an aftermarket camshaft

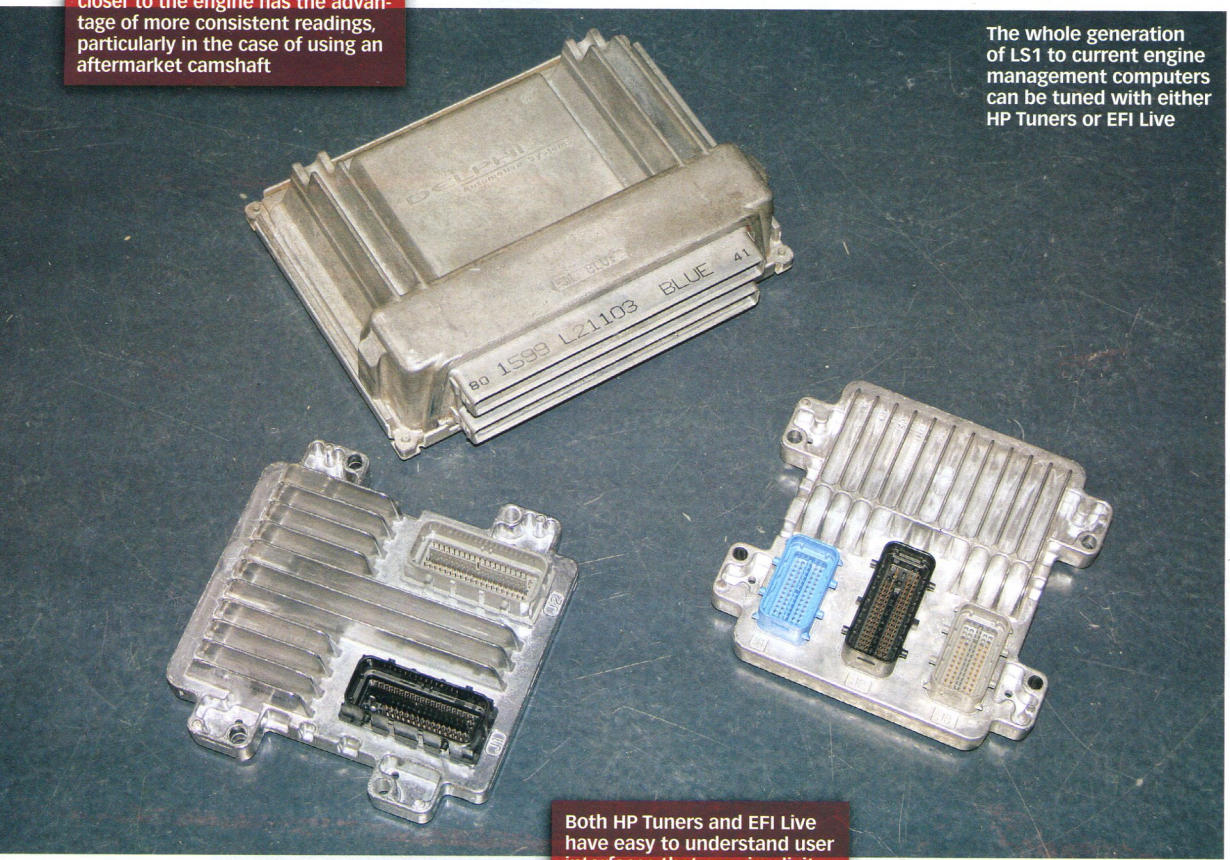
There is much argument whether it's better to have the AFR sensor at the front of the exhaust system before the catalytic converter or the rear in the tailpipe. My experience shows that the catalytic converter does very little to offset on the air fuel ratio being measured, so from a placement point of view the accuracy of reading is pretty similar, and certainly good enough to tune from. What can happen though is that in the case of big cam' or big exhaust engines there can be some cross pollution of the external air and the actual AFR which can give odd low-RPM AFR readings when the sensor is in the tailpipe.

For your own car then it's always best to go to the local exhaust shop and have an AFR sensor bung welded into the exhaust towards the front of the exhaust system, which seems to be in contradiction with what I have just written. The real reason for this 'upstream' approach is to neaten up any wiring that you have running around the car. The last thing you want to do is daily drive with a big probe hanging out your exhaust. Going further up the exhaust system will allow you to run the wiring for the sensor through into the cabin in an invisible fashion.

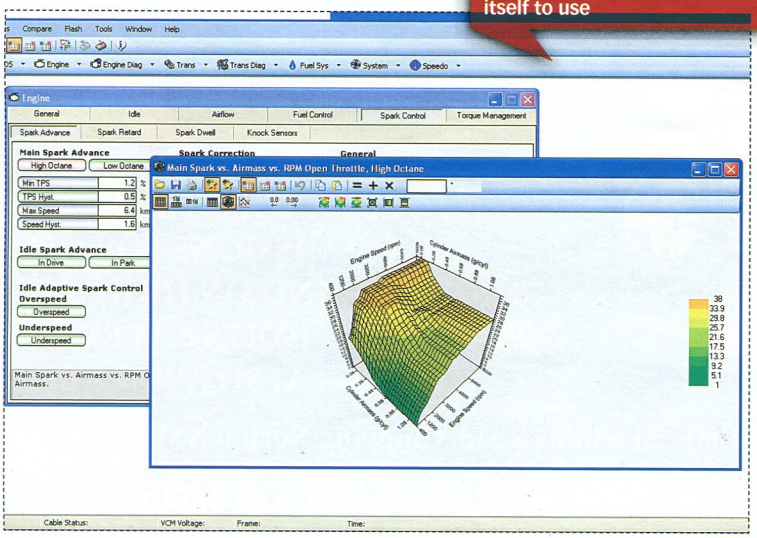
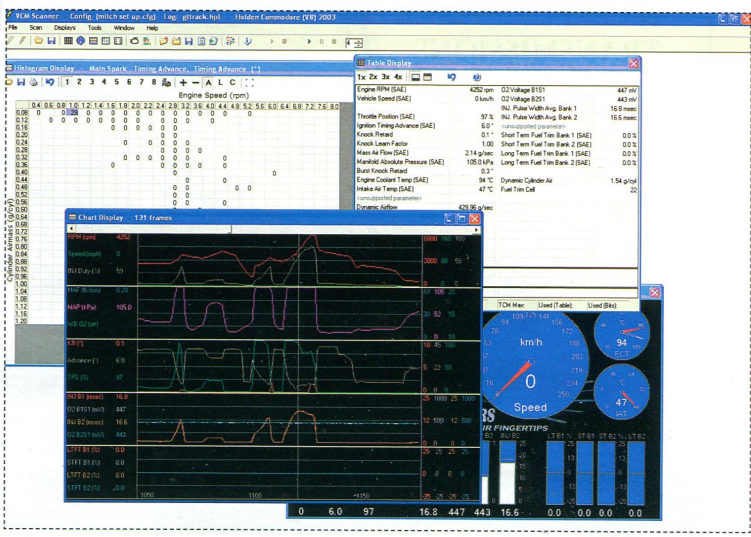
PARTNERSHIP

While some might tell you that any tuning you need to do is best done on the street, this is both a dangerous and false approach. The last thing you want to be doing is looking at a laptop when barrelling along at the speed limit, it's an accident waiting to happen, and one of your or my family might be coming the other way. Put simply don't do it and don't speed, only ever log on the street when you are not connected to the laptop and the system is in 'black-box' logging mode.

What you need to do as the last step in 'putting it together' is to find a local dyno with an approachable operator that will perform power runs for you at a reasonable rate. If you do enough logging and apply yourself to the basics that we will discuss in further instalments then tuning your car should only cost you maybe $200–$300 worth of dyno time at the max. It's now time to get started... SC



The whole generation of LS1 to current engine management computers can be tuned with either HP Tuners or EFI Live

All of the currently available tuning tools for Commodores have excellent data logging built in. You will need to learn this and learn it well as an important part of your tuning job

Both HP Tuners and EFI Live have easy to understand user interfaces that are simplicity itself to use