A Custom ECU Tune for My NC (2006) Miata.
Part 1, Tune Introduction & Pre-Tune.

While writing my previous article on ECU Tuning (Engine Control Unit, or "Computer"), I became increasingly interested in learning about the Tuning options for my "NC", 2006 Miata. Early in November I saw on Miata.net where Mike at Moto-East was offering a limited time 10% discount. I felt this was a chance to find out if a Custom Tune was worth the hype I had read about. Below are the steps I went thru to get my Custom Tune for my 2006 Miata, and my Positive results.

Please note, I have found my Custom Tune to make even my every day driving more fun. I am sure it will also be more fun for the real sporty weekend drives with our club. (I am looking forward to another "ZOOM Drive") I imagine it will be even more of a benefit if I try an Autocross again. So please don't look at this article thinking it a waste of time to read. If you have a (NC) 2006 or newer Miata, and you DRIVE IT, you could get extra enjoyment out of having this tune done for your car.

Note Mike is now offering a **10% discount** to PACE members using a discount code of: **10-OFFPACE** (Use all caps when ordering on his web page)

I recently learned that the computer is not a full "Learning Type" computer. It does not learn your driving habits for future reference, but it does learn things like engine behavior and sensor inputs. It is more of a "Reactionary Computer". When you depress the gas pedal, it looks to see how Quickly and how Far you depressed the pedal. Then it looks at what Gear you are in, how Fast you are going, and what the engine RPM is. From this data it tries to determine how much engine power you want, and then it responds with a signal to the throttle plate for more power. There is no cable going from the gas pedal to the throttle plate. This is called "Drive by Wire".

So the above paragraph explains why Mike is able to remove the power limiter in the lower gears. It is actually a "Speed Based Limiter" to keep you from getting "too much" power (determined by the computer) at a slower speed. By programming around the "Speed Based Limiter", the end result is noticeably quicker acceleration in the lower gears!

My first step in the **"Pre-Tune"** phase was to go to the Moto-East web page, http://www.moto-east.com/store/ and order the rental Data-Logger, and the "Delta-Force" interface with a Miata tune included. After placing my order, they showed up at my house in a couple of days! I was happy for the Miata.net 10% off discount too.

Mazda made a small change in the ECU starting with 2009. This means the procedure is a little different for the Miata years 2009 to present. The Data-Logger and separate Delta Force Interface only work on the 2006 to 2008 Miatas. The 2009+ has 2 different options. One option is to remove the ECU from the car, and ship it to Mike (Or drive to his shop in Easton, PA) for him to directly install the tune. The other option requires you to have, or borrow, a Laptop Computer. Then you buy from Mike the EcuTek Brand, Tuning Computer Program named: "ProECU". You install this program in the lap-top computer and use an interface cable to plug the lap-top into your car's OBD II port. At this point the laptop takes the place of both the Data-Logger, and the Interface. Using the EcuTek Brand – "ProECU" software in your laptop now works the same as if you had both a Data-Logger and the seperate Delta Force Interface with an earlier Miata. It does both the Data Logging, and the flashing of the new tune into your car.

As another note if you already have a Lap-Top computer, the EcuTek Brand – "ProECU" software will work for ALL Miatas starting with 2006 and newer. So if you have a Lap-top, this may be a good way for you to go. Or if you have a heavily modified NC Miata, like with

aftermarket Headers, Mid-Pipe, and Muffler. Or even forced Induction (Supercharger) the EcuTek Brand – “ProECU” software for your lap-top computer will give you the best results.

The Data-Logger I used is a small electronic “box” used to capture data from your Miata’s computer while the motor is running. It records things you do like depressing the gas pedal, and shifting. Then it records how the ECU responds to what you do, and then records how the engine responds to what directions the ECU sends to it. I connected the Data-Logger to my Miata’s Onboard Diagnostic Port (OBD II), set it up for my car, and hit the record button. While recording, I drove about 5 miles of country back road, then I drove 3-4 miles of highway driving. I also did a couple of Wide Open Throttle accelerations up thru the first couple gears on highway entrance ramps. Then I did a slow rev-up while parked in neutral from 1,000 rpm to 6,000 rpm and hesitated for a couple seconds every 500 rpm. This data-logger recorded the engine settings and conditions on a continuous basis. It recorded airflow, air temperature, air to fuel ratio, engine timing, engine rpm, throttle pedal position, and engine temperature. After doing my Data-Logging run, I transferred the Data Log file to my computer and e-mailed the file to Mike at Moto-East. This data was then used by Mike to determine how my OEM “tune” can be improved upon.

The “Delta Force” interface is made by a reputable ECU tuning equipment company named “Sniper Tuning”. My next step was to install the Sniper Tune Multi-loader software into my computer. This is a very small program which took less than 5 minutes to install. Next I hooked the interface to my computer, started the Sniper Tune program, and entered the security code information so I would have a licensed copy on my computer to work with. This paired my PC and the “Delta Force” interface together for the next step.

My next step was to connect the Delta Force Interface to my 2006 Miata and allow it to download the Mazda ECU Stock Tune File Template into it. The instructions were fairly simple, and in a few minutes I had the stock ECU file in my Interface unit. I next connected the interface to my PC with the USB cable, and downloaded my stock ECU file to my computer. Lastly I e-mailed my stock Template file to Mike at Moto-East. This was a simple as it sounds just following his step by step instructions.

At this point, Mike at Moto-East had the data from my Data Logging Run, and the template from the Stock ECU in my car. With these 2 items, he started creating a new Custom Tune for just my car.

Read here in next Month’s newsletter for the next part of this article. In the next articles I will focus on explaining about the custom tune itself and some of the changes made. Then later I will explain about how I transferred the new tune into my car, and the positive results I got from the new Tune in my Miata.

Zoom-Zoom! Bill Latsha