



# Tuning with CROME

The Complete Guide to tuning Honda Vehicles with Cui's ROM Editor

## *Requirements*

### Recommended Requirements

- Laptop running Windows XP
- CROME Professional
- Moates Ostrich
- Moates Burn1
- Moates HondaLog/Hulog
- Compatible Honda OBD I ECU ([See Supported ECUs](#))

### Minimum Requirements

- Laptop running Windows 98 or Higher
- CROME
- Moates Ostrich or Other Emulator
- Moates Burn1 or Other EEPROM Burner
- Moates HondaLog/Hulog or other datalogging adapter
- Compatible Honda OBD I ECU ([See Supported ECUs](#))

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## *Installing CROME*

- 1) CROME can be found in one of two places:
  - <http://forum.pgmfi.org/>
  - <http://www.tunewithcrome.com/>
- 2) Download, Extract and run the setup file to install CROME on your system.



**Note:** CROME was developed in conjunction with pgmfi.org. For this reason, legitimate install packages will require 'pgmfi.org' as the password.

- 3) Once installed, CROME can be launched by clicking:  
**Start>Programs>CROME>CROME**



**Note:** The free version of CROME available for download does not have data logging capabilities. However, there are other data-logging packages available free of charge from [www.pgmfi.org](http://www.pgmfi.org) that will allow you to data-log outside of CROME.

You will be able to modify fuel maps and even use your Ostrich to change maps Real-Time. However you will not be able to see live engine parameters from within CROME. Most noticeably, you will not see the purple box indicating your position in your maps.

To use these features requires a CROME Pro License costing \$149.

- 4) To upgrade to CROME Pro, Launch CROME then click:  
**Help->Register->Get Reg String**
- 5) You will be directed to a webpage where you can purchase a CROME Pro license.

## Hardware Setup

### Installing Drivers from the CD-ROM



**Note:** All Moates Hardware uses the FTDI chipset for USB Communication. This means you only have to install the drivers once for all Moates Hardware. For the absolute latest drivers, visit FTDI and download the D2XX drivers: <http://www.ftdichip.com/>

1. Insert the CD-ROM that came with your hardware.
2. Connect your Moates Hardware
3. When prompted for Driver Installation, select **Install from a list or specific location**, then click next.
4. Check **Include this location in the search**, then click browse.
5. Expand your CD-ROM Drive, and then click **USB Drivers**.
6. Click Ok, then next, and Windows should find the drivers and install them accordingly.

### Uninstalling Drivers



**Note:** If FTDI Serial Converter Drivers is not listed, follow the steps below on Uninstalling Drivers using FTClean.

1. Goto **Start -> Control Panel -> Add/Remove Programs**
2. Select **FTDI Serial Converter Drivers**
3. Click **Change/Remove**
4. Click **Continue**
5. Click **Finish**

### Uninstalling Drivers using FTClean





**Note:** The FTClean utility can be found at:

<http://www.ftdichip.com/Resources/Utilities.htm>

1. Double Click **My Computer**, and then Double Click your **CD-ROM drive**
2. Double Click the **USB Drivers** folder
3. Double Click **FTClean.exe**


## Connecting Hardware to the PC

 **Note:** In order to remain compatible with a variety of tuning packages, Moates Hardware uses Virtual COM (Serial) Ports. It is important to note that COM Ports are generally assigned by USB Port and not by the Device itself.

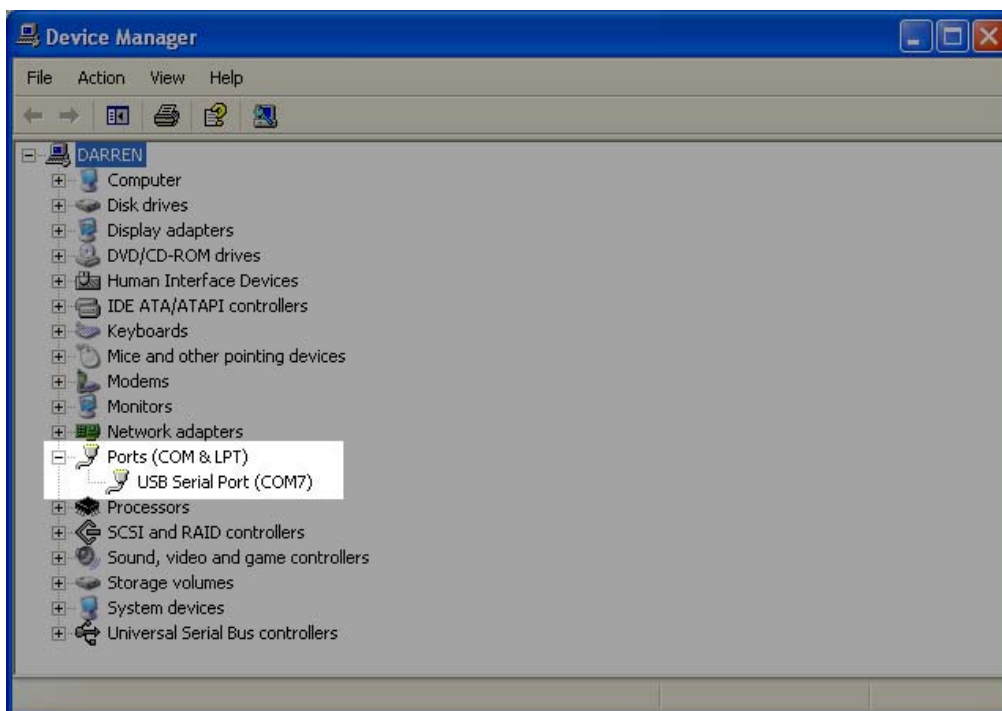
For example, if you have two USB  Ports on your laptop, a top and a bottom port, if the top port is assigned COM1 the first time, it will generally remain COM1 no matter what Moates Device is used.

In future revisions, the COM port will remain with device, eliminating the need to remember which COM Port each USB Port is assigned.

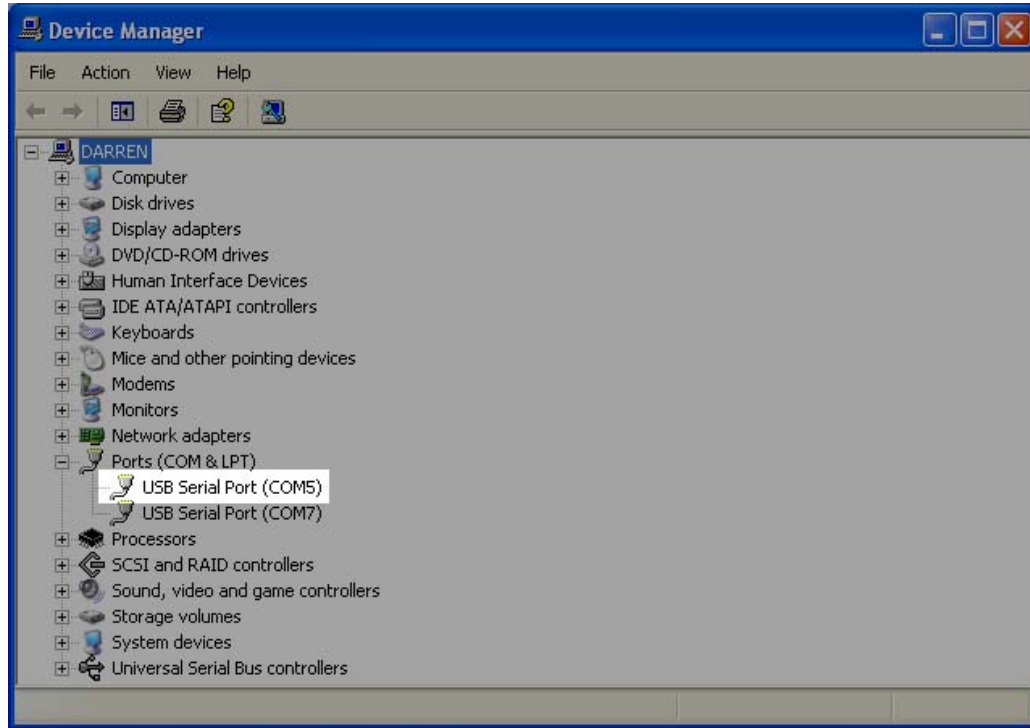
1. Start by plugging the Ostrich into any USB Port.

 **Note:** If the drivers have been preinstalled correctly, Windows will **Find New Hardware** and install the drivers in the background. Once the drivers have finished installing, Windows will notify you that Your Hardware is Ready for Use.

2. Right-Click on **My Computer**, then click **Properties**
3. Click the **Hardware** tab, then click **Device Manager**
4. Expand **Ports (COM & LPT)** and look for **USB Serial Port (COMX)**



5. Make a note of what number X is, as we will use it to configure CROME shortly.  
In our example, the Ostrich appeared as COM7.
6. If you plan on using CROME Pro to datalog, keep the Device Manager open, and plug in your **Hondalog** or **Hulog**.



7. Also make a note of which **COM Port** this device is assigned.  
In our example, the Hondalog/Hulog Device appeared as COM5
8. Next, see [Configuring Hardware](#) for information on setting up the devices in CROME

## Configuring Hardware

### Configuring Ostrich

1. Launch CROME
2. Go to the **Settings Panel** by clicking **File** then **Settings**
3. To Configure the your **Ostrich** or **Burn1**, click **Real Time Programming**
4. Under **Hardware Type** select **Moates Ostrich/Burn1**
5. Under **Port**, Select the **COM Port** you noted for the **Ostrich** earlier



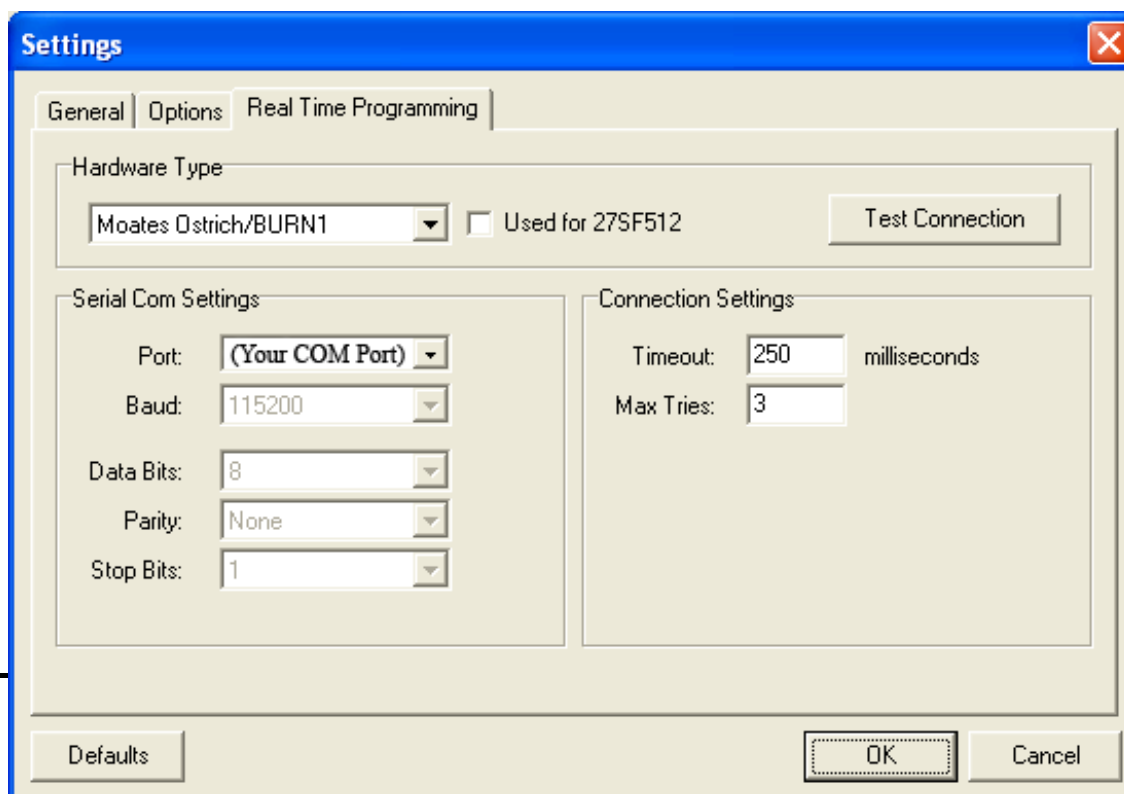
**Note:** Ostriches ordered after January 2007 require a Baud Rate of 920,000 in CROME. This allows for downloads 8x faster than previous revisions. Please ensure you have this selected before testing the connection.

For old Ostrich users wishing to utilize the higher speeds, simply update the firmware on the Ostrich and connect using the higher baud rate.

The latest Firmware and Update Utility can be found here:

[http://www.moates.net/documentation.php?documentation\\_id=22](http://www.moates.net/documentation.php?documentation_id=22)

6. Click **Test Connection**
  - a. If you are unable make the connection, refer to the [Troubleshooting](#) Section of this document.



## Configuring HondaLog/Hulog (CROME Pro)

1. In the **Setting Panel**, Click the **Tuner Comm** tab
2. Under **Serial Protocol**, select **PGMFI OBD1**



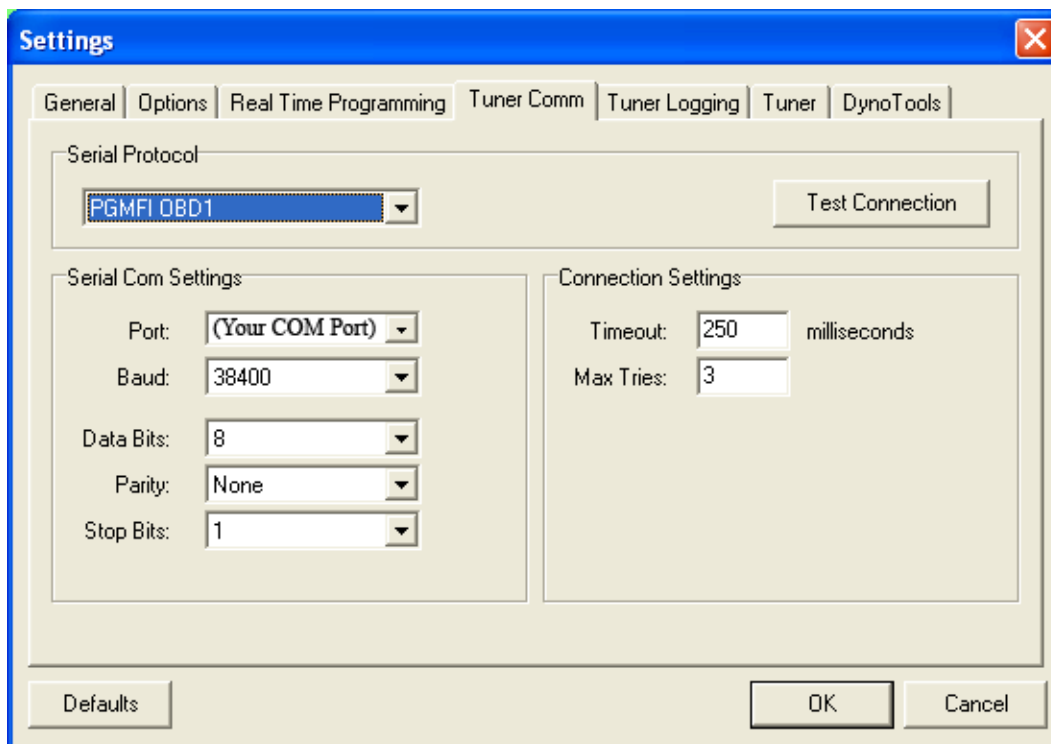
**Note:** The Developers on pgm-fi.org have developed a data-logging routine that is much more efficient than the stock routine. In order to take advantage of it, first make sure J12 is cut/removed from your ECU. This is to enable high speed bi-directional communication. Secondly, use a P30 or a P72 as your base ROM since the PGM-FI routine only works on these ROMs. Finally to add the routine to your ROM, Click:

Plugins->Enhancements-> Quickdatalogger +RTP

3. Under **Port**, select the **COM Port** you noted for your **HondaLog/Hulog**
4. Ensure the **Baud Rate** is set for **38400**



**Note:** The Test Connection feature may fail even if your hardware is configured properly, because it requires the ECU to first be running a data-logging compatible ROM. For this reason, we do not advise using it unless you have already added Quickdatalogger +RTP and Put it to the ECU.



The screenshot shows the 'Settings' dialog box with the 'Tuner Comm' tab selected. The 'Serial Protocol' dropdown is set to 'PGMFI OBD1'. The 'Serial Com Settings' section includes: Port: '(Your COM Port)', Baud: '38400', Data Bits: '8', Parity: 'None', and Stop Bits: '1'. The 'Connection Settings' section includes: Timeout: '250' milliseconds and Max Tries: '3'. There is a 'Test Connection' button next to the Serial Protocol dropdown. At the bottom are 'Defaults', 'OK', and 'Cancel' buttons.



## Connecting Hardware to the ECU

### Connecting the Ostrich

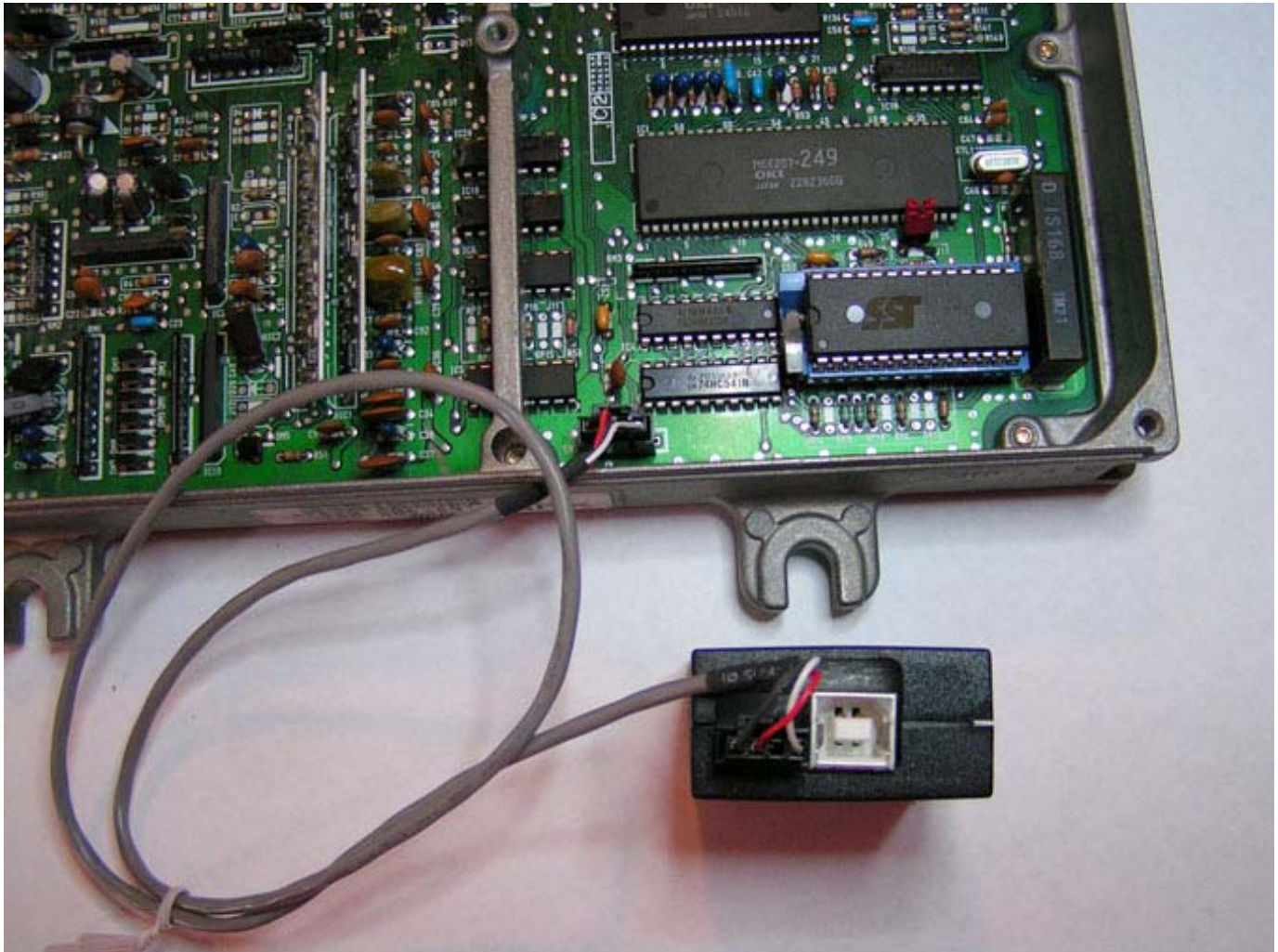
- 1) Now that the Ostrich is plugged into the PC, we must ensure proper connection to the ECU. With the ECU plugged into the vehicle, ensure the ignition is off, and then proceed to plug the Ostrich into the ECU with the cable in the following orientation.



**Note:** Conventionally speaking, the red line on ribbon cables corresponds to Pin 1 on the connecting device. Pin 1 is usually the pin directly to the left of the half moon cut out on most chips and sockets. For this reason, the red line on the ribbon cable for the Ostrich should be on the same side as the half moon cut out on your socket.

## Connecting Hulog to the ECU

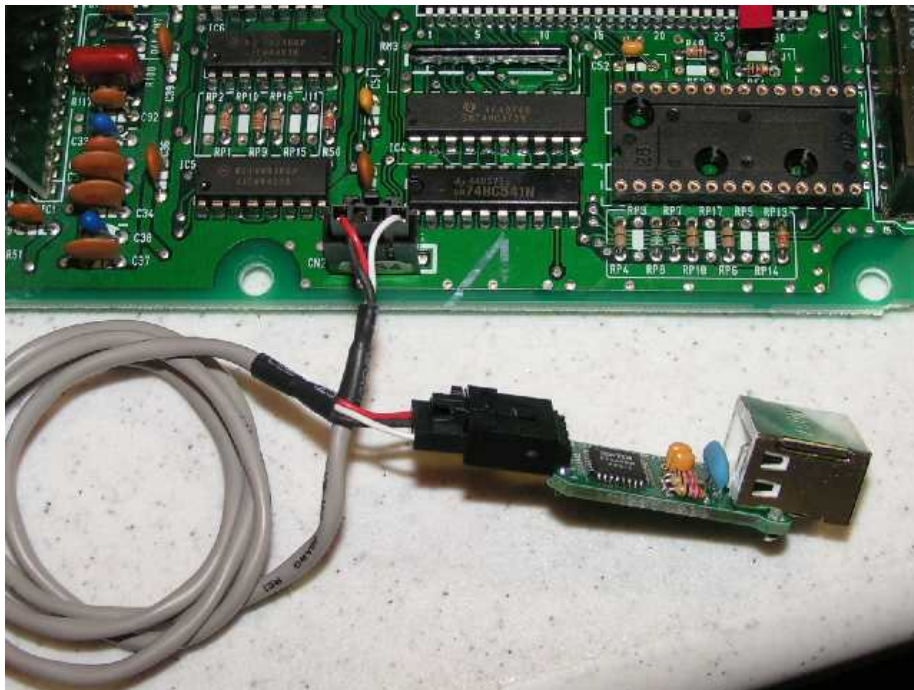
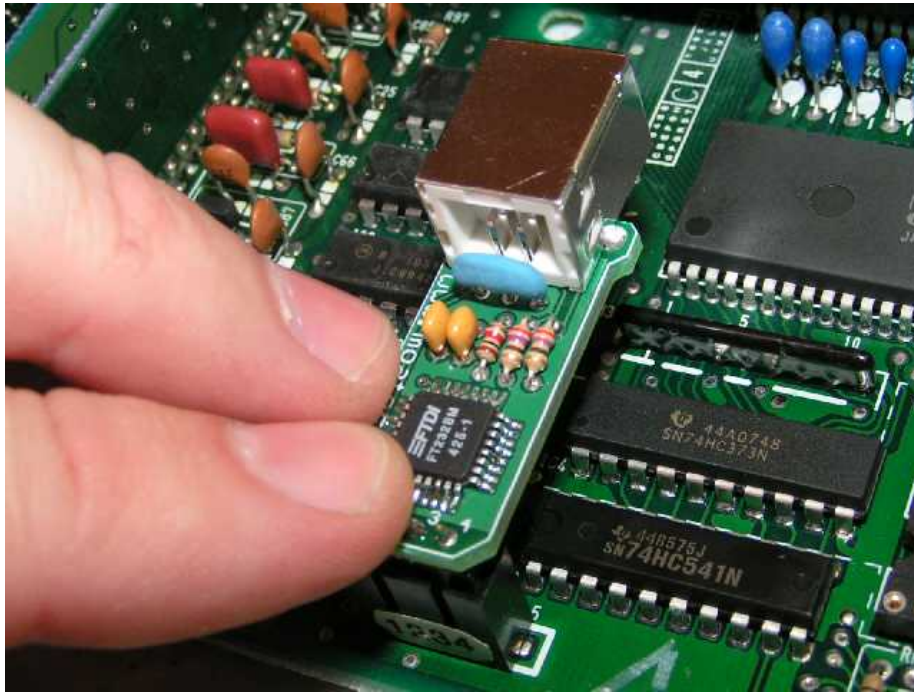
1. The Hulog is connected to the ECU as shown below






## Connecting HondaLog to the ECU

1. The HondaLog connects to the ECU in the following fashion:



## ROM Creation

- 1) From the list, Select the **Base ROM** that best matches your engine

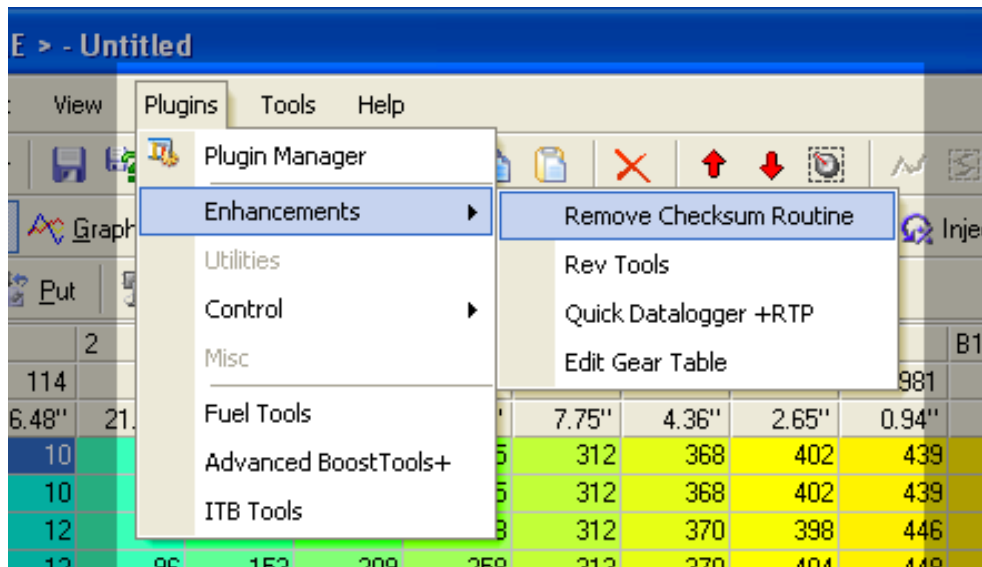
 **Note:** If you plan on fully tuning the ROM, the Base ROM you choose does not depend on your engine code. Instead, choose a Base ROM that will support the features you require. For example, if you have a D16Y8, but you would like to data log, don't choose the P28 as your Base ROM as it is not Data-logging compatible.


If you are not satisfied with the ROMs listed, visit:

<http://www.pgmfi.org/twiki/bin/view/Library/EcuDefinitionCodes>

If you do wish to start with a P30/P72 base and use the original values from another ROM, you can copy and paste these values, but keep in mind that the scalars (RPM values and Pressure values across the left and bottom of the map) are typically different for various ROMs and should be changed accordingly after pasting the new values.

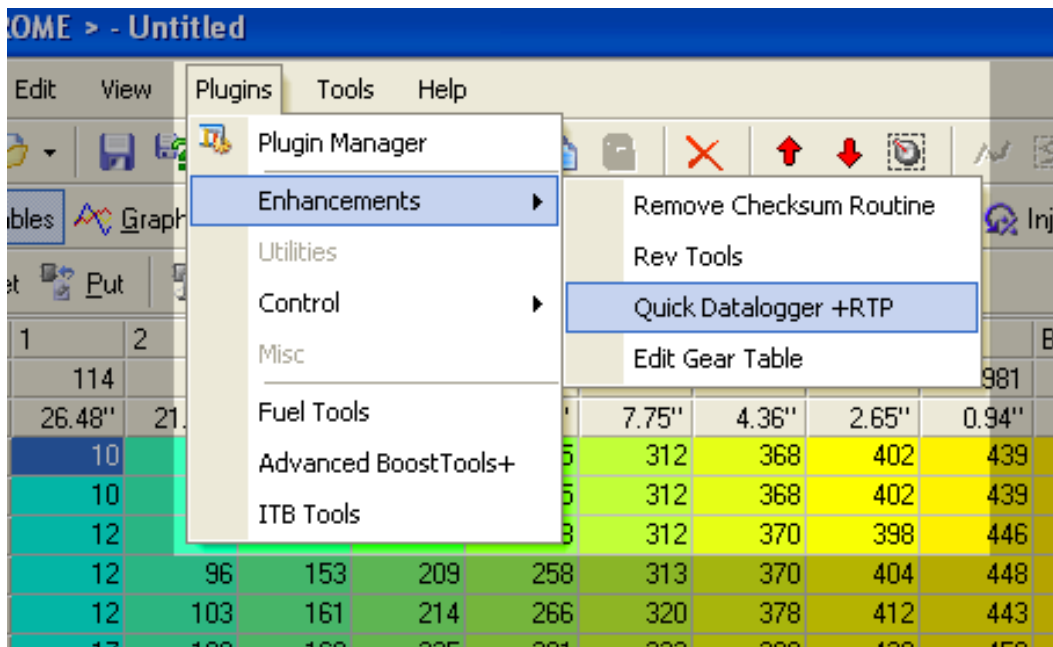
- 2) Next, **Remove the Checksum Routine** from the ROM by clicking **Plugins->Enhancements-> Remove Checksum Routine**



 **Note:** Removing the Checksum Routine is required because Honda includes a routine within the ROM that instructs the ECU to add up every byte in the ROM and check it against a predetermined number at the end of the ROM every few seconds. If they match, the ROM is valid.

When tuning, these numbers will very rarely match since we are constantly changing the data in the ROM. We remove this routine from the ROM to prevent the ECU from defaulting to limp mode every time a change is made.

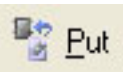
- 3) If you plan on Data-logging, click  
**Plugins->Enhancements-> Add Quickdatalogger +RTP**




- 4) This is a good time to save your ROM, since we are ready to Connect to the ECU.

- 5) Click the  on the toolbar.

- 6) The Real-Time Programming toolbar will appear.


- 7) To send the ROM you just created to the Ostrich, Click  **Put**

- 8) Then, to Enable Real-Time changes, Click  **Realtime Update**

- 9) If you are running CROME Pro, continue to the next step, otherwise at this time, turn the key to the second click and you're connected and ready to tune.



**Note:** Once you click Put the first time, as long as Realtime Update is enabled, you should not have to do it again. It is good practice, however, to Verify the ROM intermittently during the tuning session to ensure hardware failure hasn't occurred. If the ROM does not verify, simply press Put, and cycle the ignition to apply the changes.

- 10) To Enable Data-logging, click the  on the toolbar.
- 11) You will notice the Data-logging Toolbar appear at the Bottom of the screen:



**Note:** At this point, make sure you have added Quickdatalogging +RTP to the ROM. If you are unsure of how to do this, see Configuring HondaLog/Hulog in this documentation.

- 12) Click **Live Tuning...** and then a Window should appear at the right containing a list of active readings from the ECU. If this Window fails to appear, see the [Troubleshooting](#) section in this documentation.
- 13) At this point you are ready to tune!

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## *Burning Chips with CROME*

To configure the Moates Burn1, we use the exact same procedure as we did for [Configuring the Ostrich](#):

1. Open the Device Manager
2. Connect the Burn1 (Disconnecting the Ostrich if necessary)
3. Note which COM port the device was assigned
4. Launch CROME
5. Goto File->Settings-> Real Time Programming
6. Set the COM Port to the port you noted in step 3.



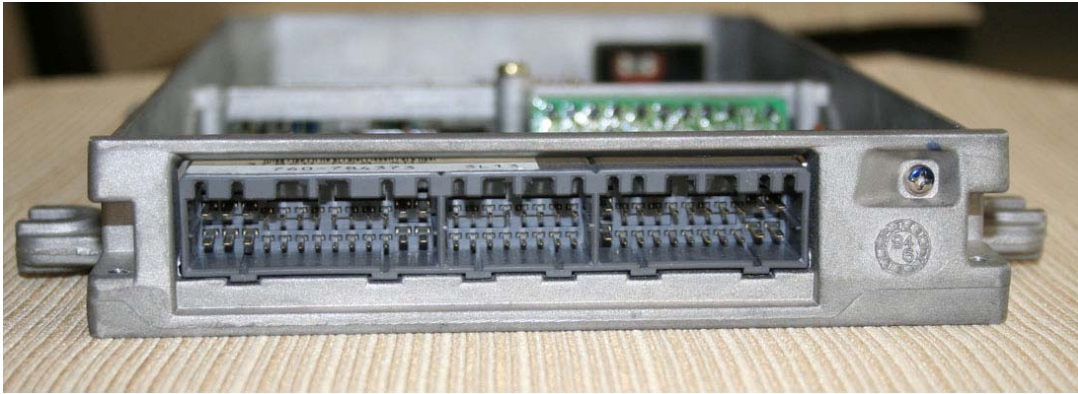
**Note:** Since the traditional Atmel 29C256 chips have been long since discontinued, the Burn1 and CROME both fully support the replacement SST 27SF512 chips. In order to use this type of chip, make sure you Check “Used for 27SF512” under the Settings->Real Time Programming

7. Click Test Connection  
If this Test Fails, refer to the [Troubleshooting](#) section of this document.
8. Click OK
9. Click 
10. When you click Put, the open ROM will be burned to the chip in the burner.



## *Identifying Your ECU*

While CROME can open OBD 0, I, and some II ROMs, it is specifically designed to work with OBD I. The first thing you should do is make sure you have an OBD I ECU. You can tell by looking at the main connector, it should look like this:



**Note:** All 1992 – 1995 Hondas were equipped with OBD I ECUs. If your vehicle is older down to 1989 or newer up to 2001, the vehicle can be adapted to accept an OBD I ECU by using a commercially available conversion harness.

Secondly, make sure you have a compatible Honda ECU. Use the label on the outside of the case and reference it to the [Supported ECUs](#) page in this document. Here is an example of the outside label on a P28.





## Supported ECUs

Model	Vehicle	Features
P05/P06	92-95 Civic DX	
P08	JDM SOHC VTEC (Square Case)	<ul style="list-style-type: none"> <li>• VTEC</li> </ul>
P28	92-95 Civic Ex/Si	<ul style="list-style-type: none"> <li>• VTEC</li> </ul>
P30	94-95 Del Sol VTEC/92-95 JDM B16 Vehicles (Square Case)	<ul style="list-style-type: none"> <li>• VTEC</li> <li>• Knock Sensor</li> </ul>
P61	92-93 Integra GS-R	<ul style="list-style-type: none"> <li>• VTEC</li> <li>• Knock Sensor</li> </ul>
P72	94-95 Integra GS-R/JDM GS-R	<ul style="list-style-type: none"> <li>• VTEC</li> <li>• Knock Sensor</li> <li>• Intake Air Bypass (IABs)</li> </ul>
P74	94-95 Integra RS/LS/GS/SE	
P75	94-95 Integra RS/LS/GS/SE	
PR4	92-93 Integra RS/LS/GS/SE	



**Note:** If you have a 96-01 (OBD II) Honda or Acura, you will need a purchase an OBD II to OBD I conversion harness in order to run the aforementioned ECUs. If you have a 96-98 Civic or 94-99 Integra, you will need an OBD IIa to OBD I harness, if you have a 99-00 Civic or 00-01 Integra, you will need an OBD IIb to OBD I conversion harness.

The rule of thumb, if your Honda has the Immobilizer, (Chip in the Key, and Green Key Light on gauge cluster when starting vehicle) it is OBD IIb. This of course does not apply to vehicles newer than 2001, as these use a completely different engine/ECU setup.

The harnesses are available through vendors such as <http://www.xenocron.com/>

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## Chipping/Preparing a Stock ECU



**Note:** This guide is for a standard P28 ECU. Other ECUs, such as the P72, will not require the resistor included with your kit. Note, if you have a JDM (square case) ECU, your kit will require surface mount components. Unless you have soldering experience, it is recommended you have these ECUs chipped professionally by Moates.net.

### Required Tools:

- Moates Honda ECU Chipping Kit
- Soldering Iron (Any RadioShack Iron will work)
- De-Soldering Iron (RadioShack Model: 64-2060)
- Wire Cutters
- Thin Rosin Core Solder
- Philips Screwdriver

### Optional Tools:

- Cheap Carburetor/Choke Cleaner (Do not use B12-Chemtool)
- Electrical Tape
- Old Toothbrush

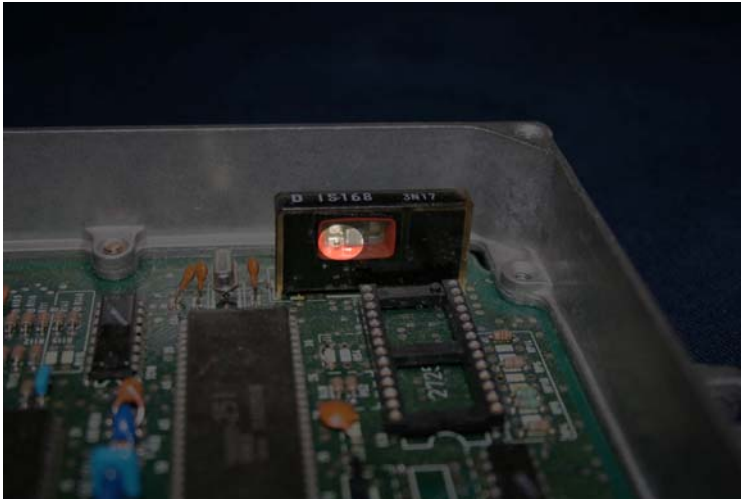


**Note:** In this process, we use Carburetor/Choke Cleaner to remove the plastic coating found on the circuit board before desoldering, and also after to remove the residual rosin left by the solder.

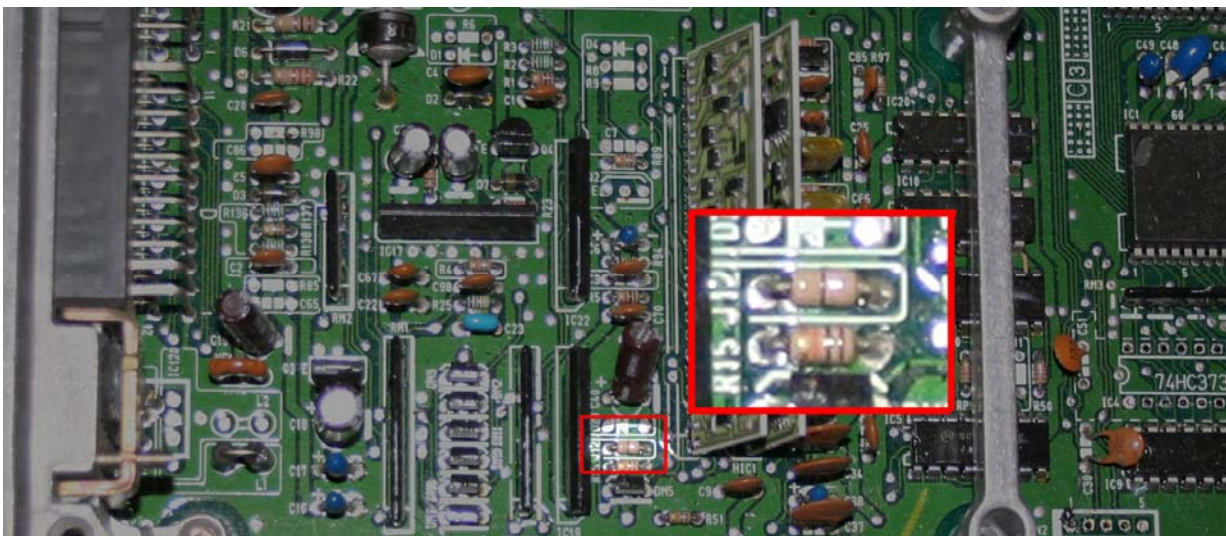
1. Remove both top and bottom covers from the ECU.
2. Remove all screws holding the circuit board in place, and loosen the screw holding the main voltage regulator to the case.



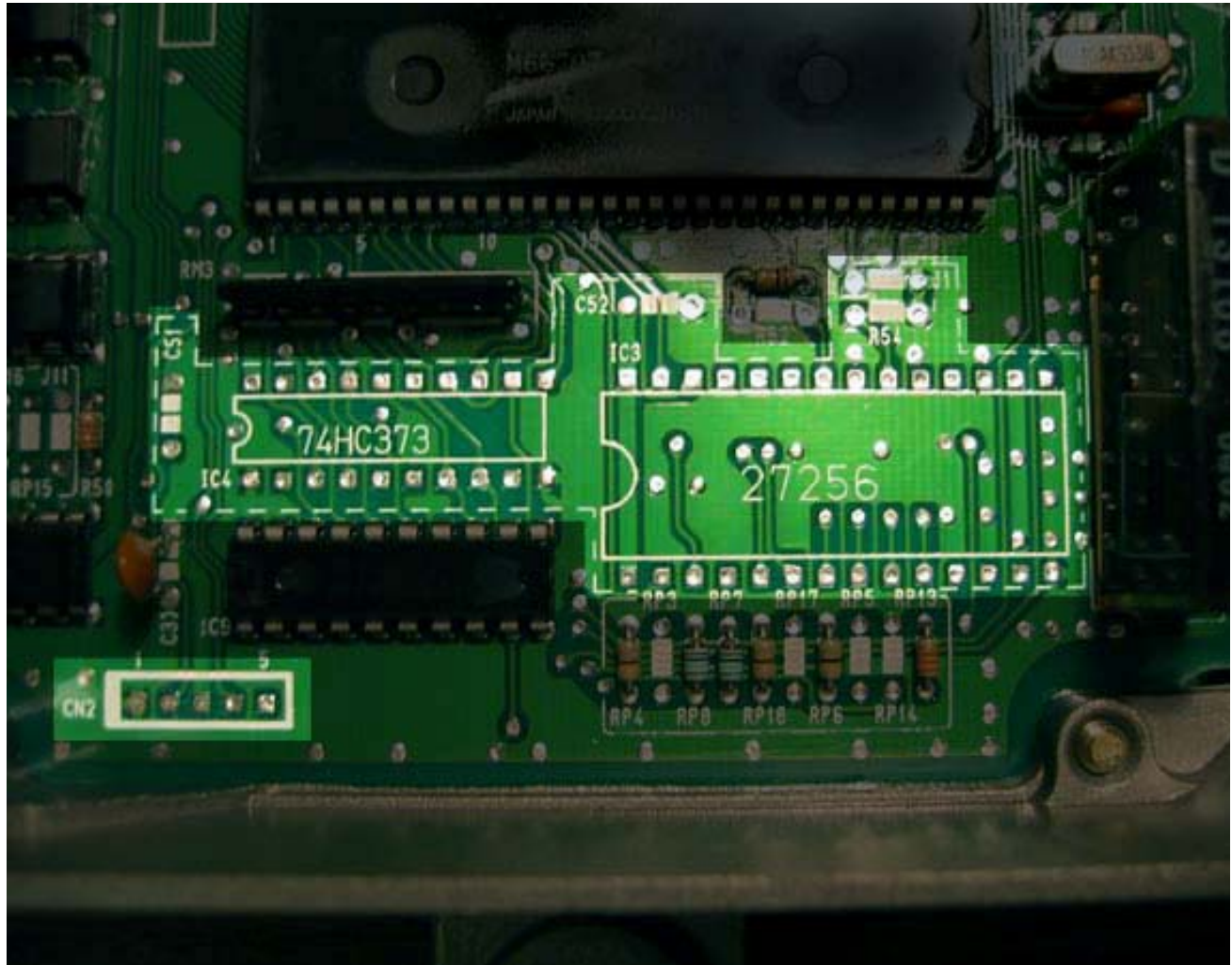
3. Remove the circuit board, and use the electrical tape to cover the small hole on the barometric pressure sensor



4. Spray the lower half of the ECU with the Carb Cleaner and use the toothbrush to scrub the plastic coating off. This usually takes about three iterations before it is clean. Clean both the front and the back. Also clean the area around J12 (or J4 on a JDM ECU)



5. Once clean, Desolder the items outlined in this illustration:





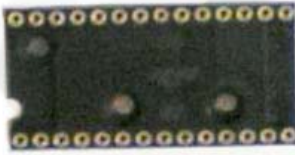




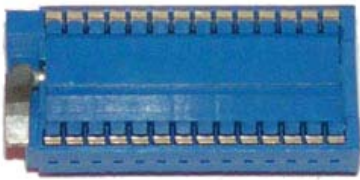
6. Remove J12 (or J4 for JDM ECUs) as we saw above.



**Note:** Desoldering some of the joints can be tricky. Adding solder to the joint will often help. Adding solder causes rosin to be added to the existing joint, allowing easier flow into the desoldering iron.

7. Solder the following components included in your kit to the indicated location in the ECU.



ECU Location	Illustration	Description
27256		
74HC373		CMOS Latch
27256		28-Pin DIP Socket
CN2 (Pins 1 - 4)		4-Pin Straight Header
R54		1k Resistor
C51 & C52		.1uF Capacitor
J1		Red Jumper Header
27256		28-Pin ZIF Socket

8. Insert the Blue ZIF Socket into the 28-Pin DIP Socket
9. Reinstall Circuit Board into the case, remembering to tighten up the screw on the Voltage Regulator.

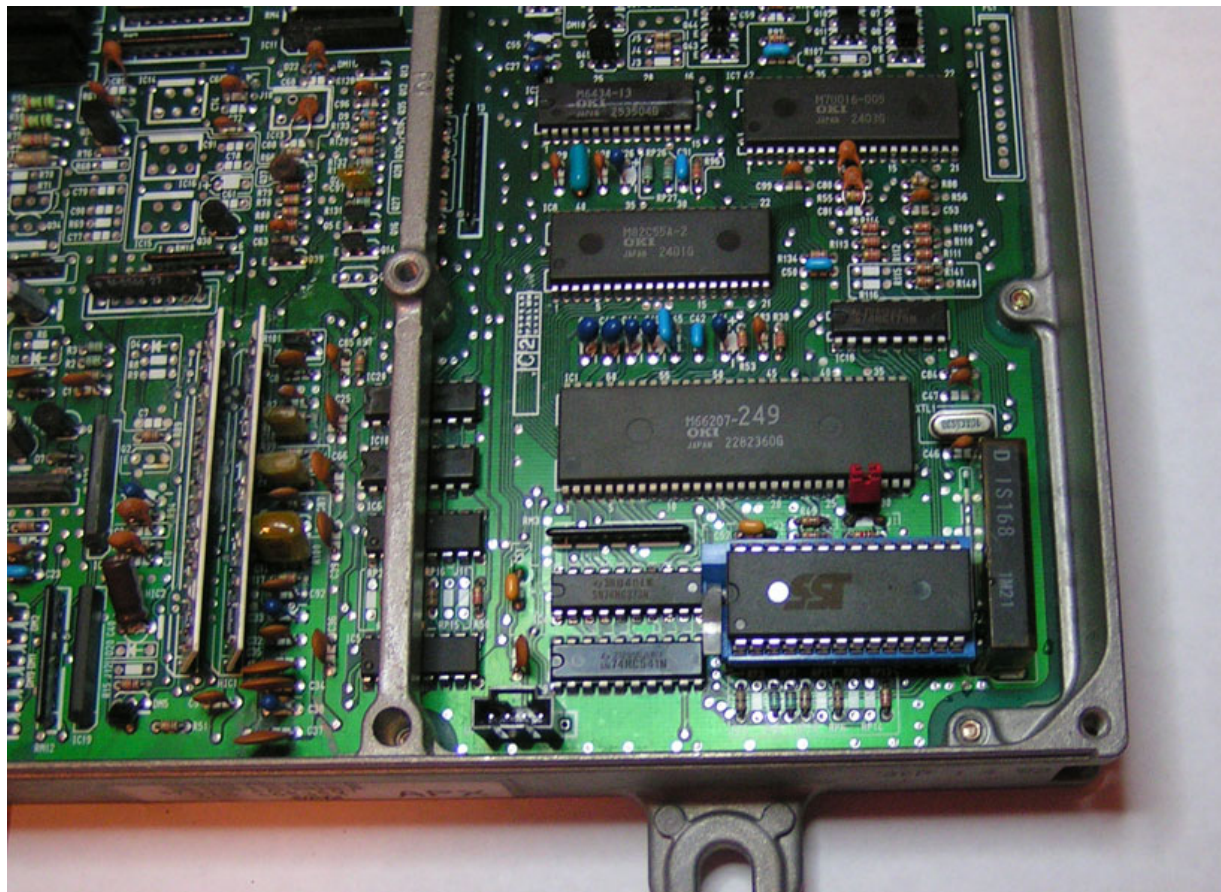


Figure 1: Finished Product

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## Troubleshooting

Problem	Solution
When I click test connection under Real Time Programming, I get a message stating, "Unable to Connect to the ECU"	This indicates failed communication to the Ostrich. Make sure you are using the COM port to which the Ostrich is assigned. You can check this by disconnecting all Moates devices except for the Ostrich, then check Device Manager to see which COM ports remain. The one remaining port will be the Ostrich.
When I click Live Tuning... I get an error message stating, "Unable to Connect to the ECU"	<p>First make sure you have added Quickdatalogger +RTP to your ROM (See <a href="#">ROM Creation</a>)</p> <p>Make sure the ROM with Quickdatalogging +RTP is actually on the ECU by clicking Put, then verify, then cycle the ignition.</p> <p>Next ensure your Hondalog/Hulog is configured for the appropriate COM Port with the Baud Rate set at 38400. (See <a href="#">Configuring HondaLog/Hulog</a>)</p> <p>Make sure J12 is cut on your ECU to enable Full Duplex communication.</p>

<p>When I click test connection under Tuner Comm, I get a message stating, “Unable to Connect to the ECU”</p>	<p>See Previous Solution</p>
<p>When I click Put... The progress window comes up then an error message appears stating, “The operation failed after 3 attempts...”</p>	<p>This error usually occurs due to a glitch in CROME. First try clicking the Chip Icon to disconnect from the Ostrich, then click again to reconnect. Click Put to load the most recent changes, then click Real-Time Update. If this does not work, save your work, then restart CROME.</p>
<p>I do not see any Serial Ports listed under Device Manager</p>	<p>Ensure you have a Moates Device Plugged in then restart the computer. If this does not correct the problem. Uninstall then reinstall the drivers according to the <a href="#">Hardware Setup</a> section of this document.</p>



<p>The Check Engine light stays on.</p>	<p>Remove the Checksum Routine from the ROM. (See <a href="#">ROM Creation</a>)</p> <p>Ensure you have disabled any sensors you may have disconnected. (I.E. Oxygen Sensor)</p> <p>If you are not sure, jump the Service Check Connector located in a green rubber grommet above the ECU kick panel to determine the trouble code. For complete instructions and a Code List, Reference:</p> <p><a href="http://www.honda-tech.com/zerothread?id=1171263">http://www.honda-tech.com/zerothread?id=1171263</a></p>
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