DG's Guide to Programming AEM EMS Electronic Boost Control V 2.01

1. Plumb the solenoid as described in the AEM manual. There are a number of different configurations, each of which is optimum for a specific wategate design.

2. Open up AEMPro and select the **Boost Control** template from the menu bar. This will open three windows: the **Boost WG Base Duty** map, a set of **Options** for Boost Control, and a list of **Parameters**.

3. Select the entire **Boost WG Base Duty** map and set all cells to zero (0.00)

4. In the **Options** window, match Fig. 1. (*Fuel Cut Load* should be a value greater than your wastegate spring open pressure, but still safe. In this example, wastegate spring pressure is 6 PSI)
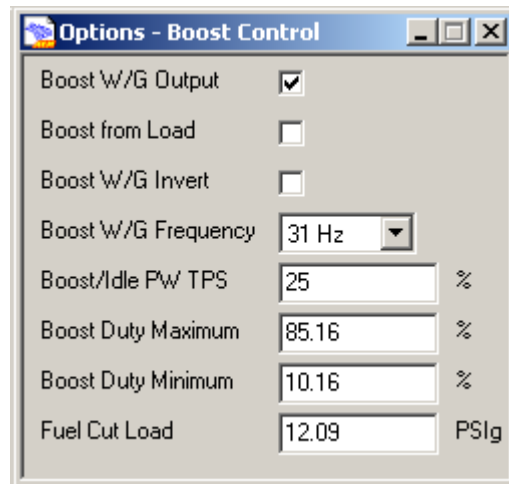

Fig 1 – Boost Control Options

5. Go for a short test drive at Wide Open Throttle (WOT), and log or monitor *MAP As Load*. If you hit the *Fuel Cut Load* (you'll know immediately; it is pretty violent) this means that 0% solenoid duty equals **maximum** boost. If instead you hit wastegate pressure and it doesn't boost any higher, you know that 0% equals **minimum** boost. Which one it is is dependent on how the solenoid was plumbed.

6. Select the entire **Boost WG Base Duty** map and set all cells to 100%. Again, go for a short drive at WOT. The behavior of the car should be reversed from what it was in Step 5.

7. We want the controls set so that 0% "Duty Cycle" equals minimum boost, and 100% "Duty Cycle" equals maximum boost. Note that the *actual* duty cycle may differ, but having a small number mean low boost and vice versa makes it easier to keep track of what is going on. Accordingly, if the car hit the *Fuel Cut Load* in Step 5, check the box *Boost W/G Invert.*

8. Select the entire **Boost WG Base Duty** map and set all cells to 50%.

9. Open the **VSS Dependant Boost Template** by selecting **Boost Control** > << **Advanced Boost >>** > **Boost Target Methods** > **VSS Dependant** > **VSS Dependant Boost** from the drop-down menus. This will open eight different windows.

10. Find the **Boost Target Speed** table (Fig. 2) and set all values to a low boost amount slightly over your wastegate spring pressure. In this example, with a 6 PSI wastegate spring pressure, we use 7.20 psi. What this is telling the controller is that for all vehicle speeds, limit boost to 7.20 PSI.
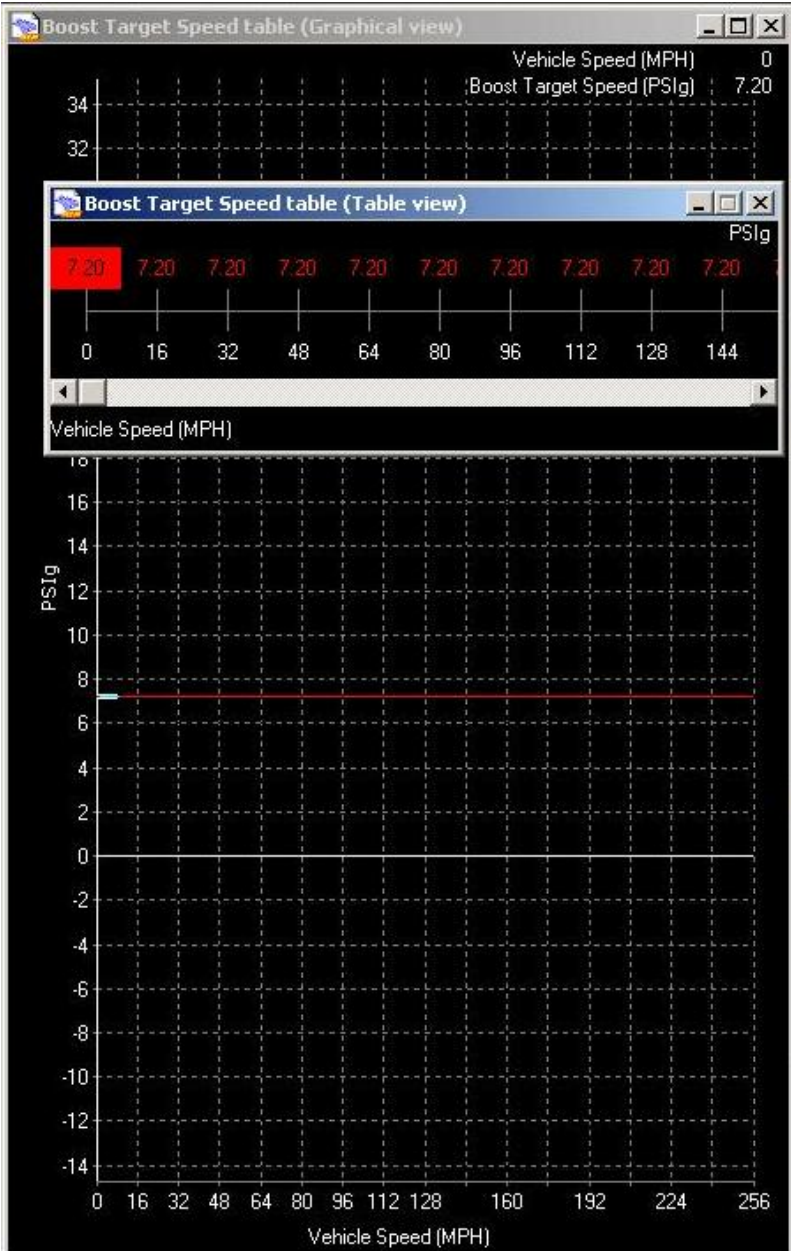

Fig. 2 – Boost Target Speed Table

11. Locate the **Options** window and check both boxes to enable feedback and the VSS function (Fig. 3)
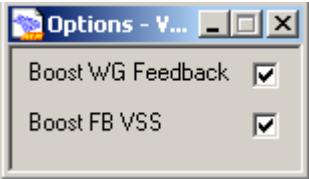

Fig. 3 - VSS Boost Control Options

12. Locate the **Boost Target Comp** Table (Fig. 4). This table sets the amount of change from the **Boost WG Base Duty** map per boost target cell.
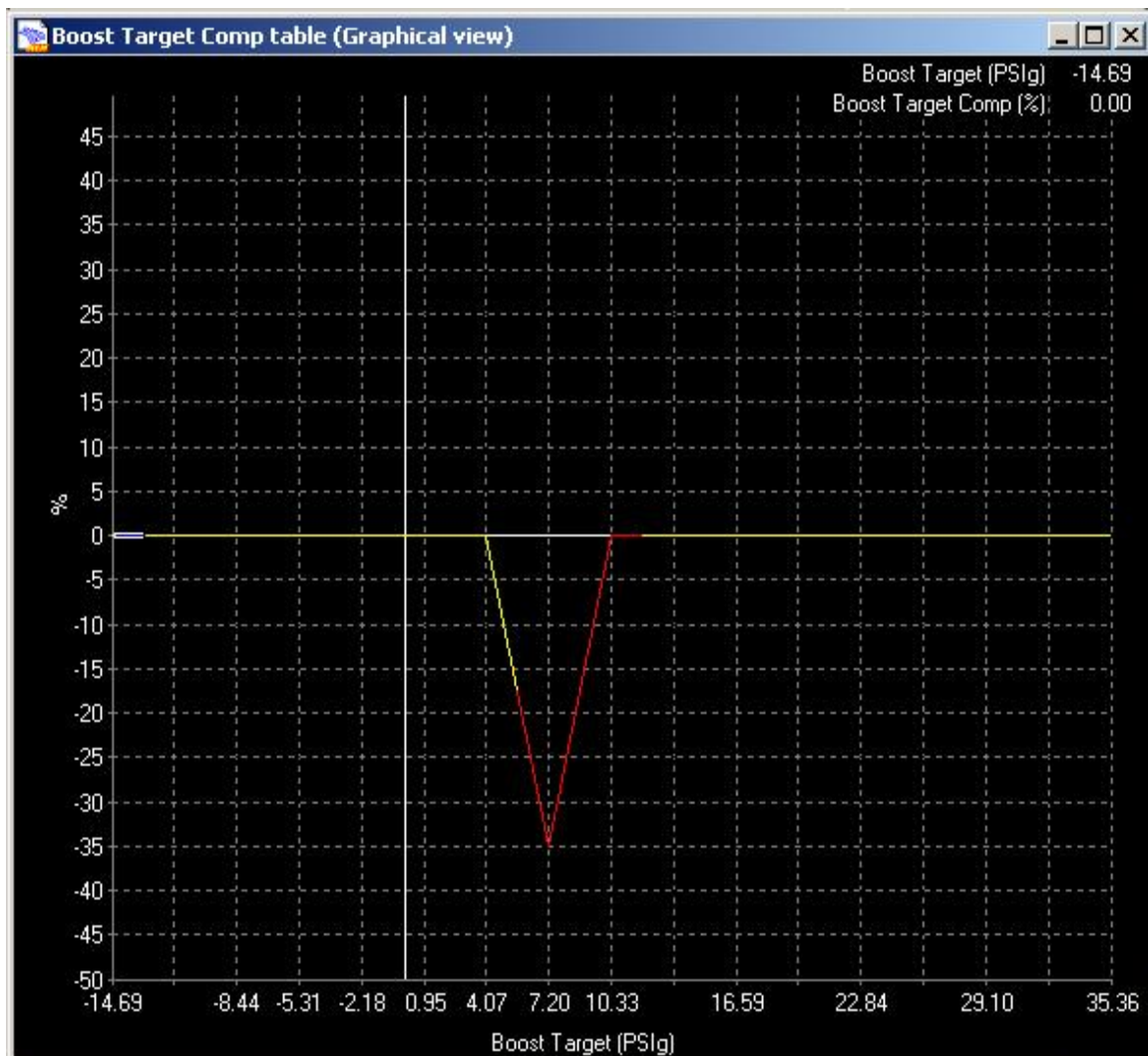

Fig. 4 - Boost Target Comp table

Locate the *Boost Target* cell that you set the **Boost Target Speed** table to in Step 10 (in this case, 7.20 PSI) and set it to a low number. Then, take the car out for WOT runs and adjust the value in this cell up and down until the boost produced matches the target value. (This example worked out to about -20 once tuned)

13. Return tho the **Boost Target Speed** table and set all cells to the highest value you intend to use, in this case 13.46 PSI .

14. Move back to the **Boost Target Comp** table (Fig. 5) and set the duty cycle value for that boost value to something low. Intermediate values can be set roughly in-between for now. In this example, the value for 13.46 PSI is set to -35, and the value for 10.33 is set to roughly 28.
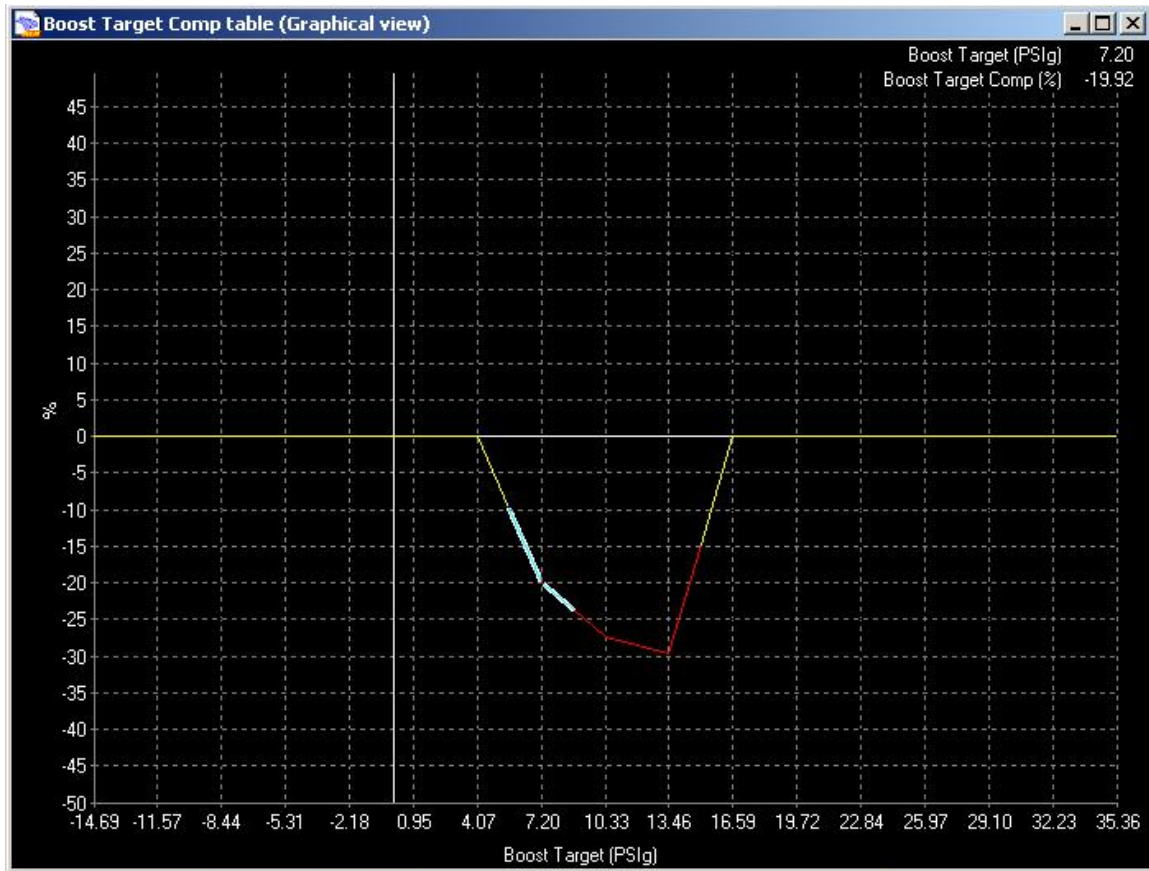

Fig. 5 - Setting the High Boost Target Comp value

15. Test the car at WOT and adjust the Boost Target Comp value at the high boost value (13.46 PSI in this example) until boost holds steady at the target value.

16. Put the **Boost Target Comp** table into *Table View*, select the 2 load points that were tuned and all cells in-between, and then right click and click Calculate. (Fig. 6) This will interpolate all the values in-between the tuned values to a linear curve.
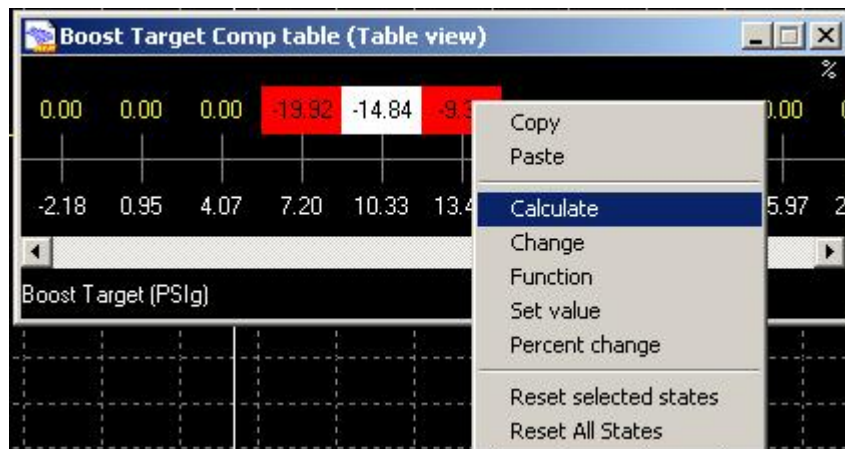

Fig. 6 - Calculating Intermediate Cells
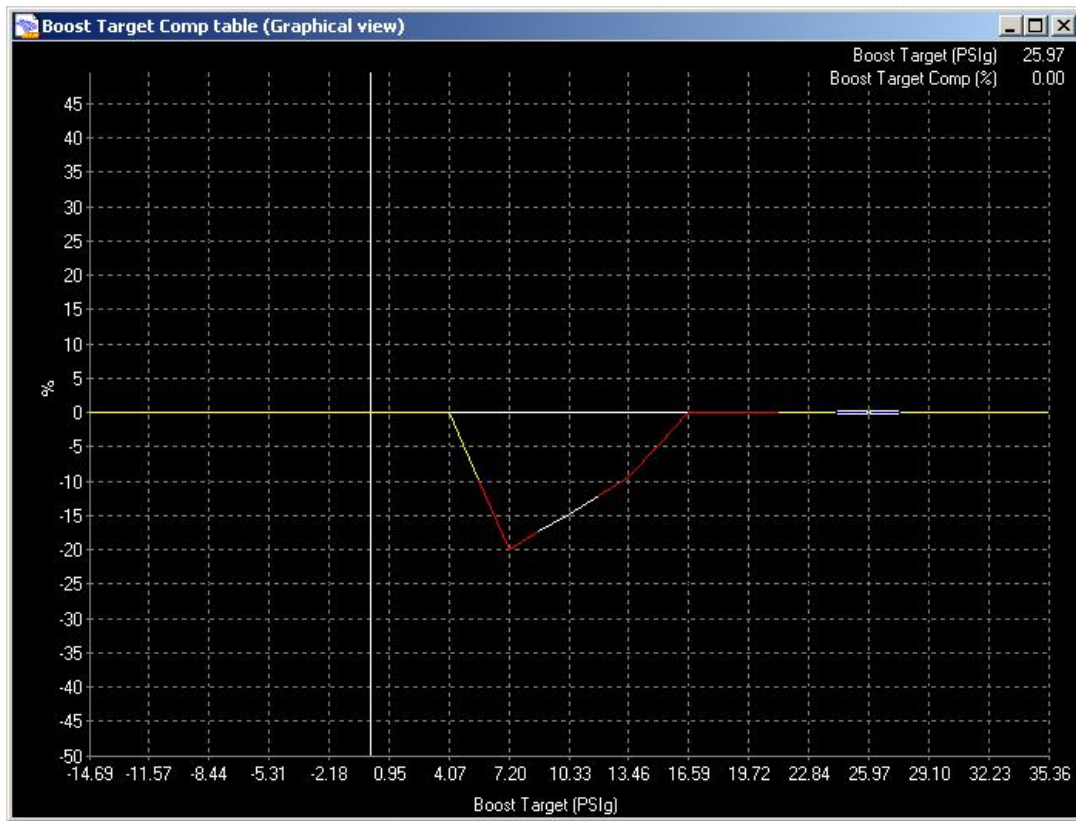
With the result similar this this. (Fig. 7)

Fig. 7 - Results After Calculation

17. At this point, you should be able to set the boost target value in the **Boost Target Speed** table to any value in-between wastegate open pressure and the max boost value and the AEM should get pretty close. Each in-between cell can be tuned by hand to get even closer.

18. Depending on your tuning goals, you can set all values in the **Boost Target Speed** table to the same value (replicating a manual boost controller) or you can use a lower boost target at slower speeds to reduce power as a form of traction control.

19. If you have a loud and annoying boost solenoid, you can set all cells below wastegate opening pressure in the **Boost WG Base Duty** map to 0% (or 100%, depending on the way your wastegate solenoid is plumbed) so that the wastegate solenoid is inactive off-boost. If the solenoid is plumbed so that an inactive solenoid is max boost, this will also help spool by reducing the amount of wastegate crack-open while spooling.

20. With VSS Feedback enabled, you can program the **Boost HI/LOW Switch** option to set a new boost target value based on the setting of a manual switch. A good use for this function is to set the target to wastegate spring pressure (as low as you can go) as a bad gas / poor weather / valet or garage / girlfriend boost reduction switch.

21. For additional accuracy, you can enable **Boost FB On Error**, which activates the **WG Error Duty** Map feedback mechanism. (Fig. 8) NOTE – I have yet to get this to work – look for an update in the future on setting this correctly.
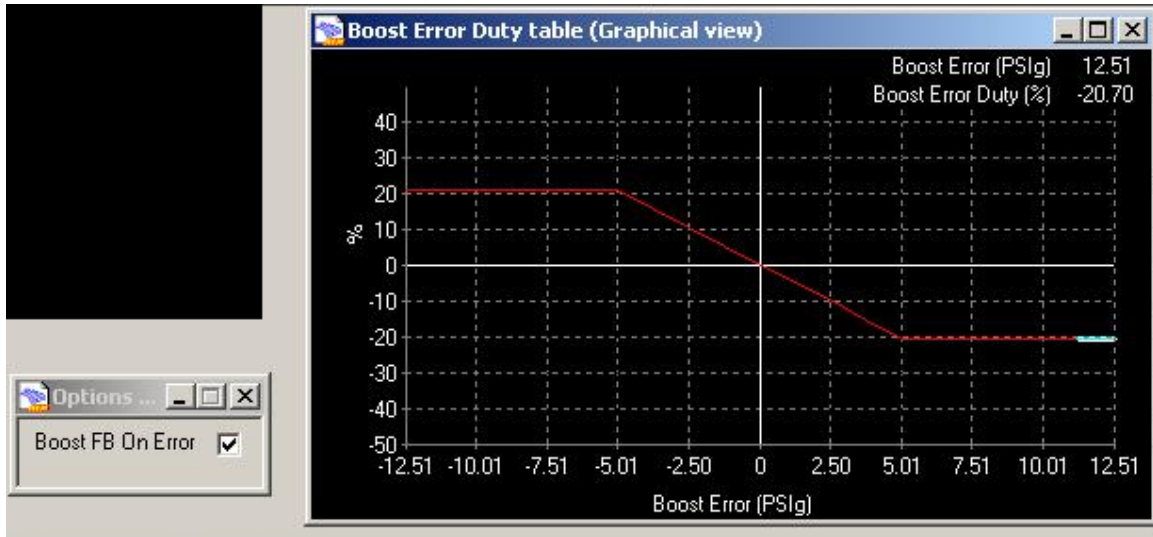

Fig. 8 - Wastegate Error Feedback Controls