to achieve this desired result. This may take a few runs to get to the desired maximum speed. Record the setting for CV5 and the speed. Repeat the step above for each locomotive that will be in the consist. If any units will be run backwards in the consist, it will be best to make these tests and adjustments with those units running backwards.

Next, take each locomotive in the lot and find where it will start moving consistently at speed step 1 (the first notch of the throttle) by adjusting V-Start (CV2). If it does not run consistently at speed step 1, put a number in CV2, say 15 or 20. Try it again. If it does not start and run consistently at speed step 1, put a larger number in CV2 and repeat the process. Once you have found a number where it starts and runs consistently without stalling, you may be able to back down this setting to get it to run slower at speed step 1. I have often enjoyed fine tuning locomotive mechanisms so that you can watch them creep and count the seconds between ties. However, there are practical considerations. Slow running is good; however, find a compromise where you can move equipment fast enough and also have soft coupling. It is a matter of personal taste. Record the setting for CV2 and the minimum speed. Repeat this step for all locomotives in the consist.

Set V-Mid by averaging the numbers for V-Start and V-Max and putting that number in V-Mid (CV6). (Note: some decoders do not have CV6 or even CV5 because they are not required features to obtain NMRA compliance and are optional.) This should complete the settings. You may now turn on BEMF and the momentum. When you set momentum, you should put in the same numbers in CV3 and CV4 for all locomotives and see what adjustments may need to be made later.

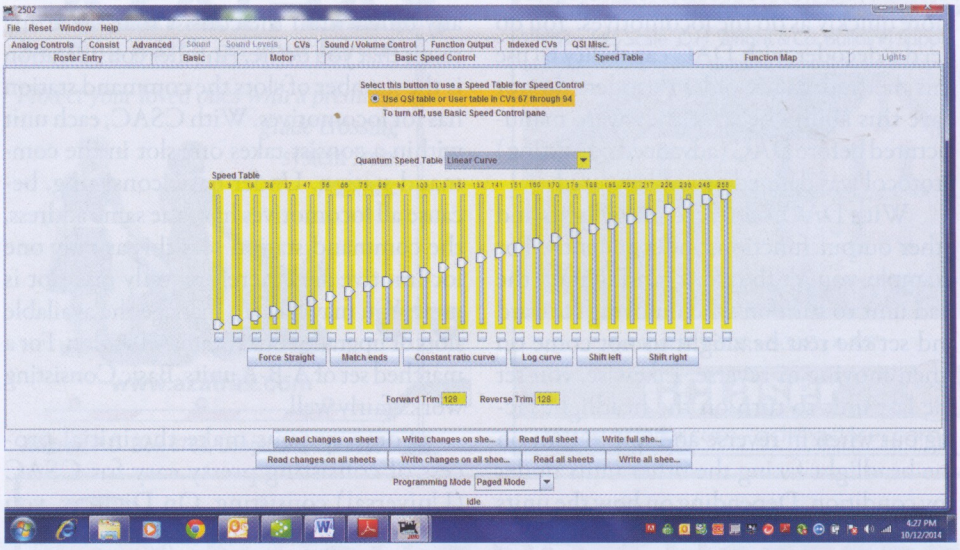
You may want to set up a speed table (CV25) so that at all points of the throttle range all units are moving together. Setting up a speed table will give you the best results, but it takes more time and is a little more complicated. Using Decoder Pro 3 by JMRI makes this a lot easier (see screenshot).

Now that locomotives are running together, it is time to connect within the DCC system so that they are under the control of one throttle. There are three basic types of consisting with DCC. Many different terms are used to describe the types of consisting. Each manufacturer uses different terminology. I will use the nomenclature used by JMRI here because I think it clearest.

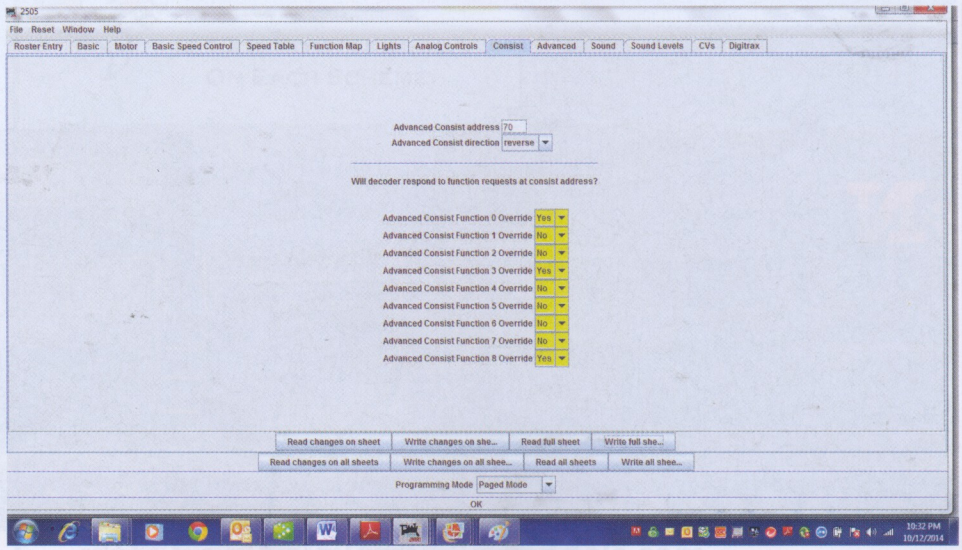
In Basic Consisting, you set each decoder address the same. You can use the short address (CV1) or long address (CV17 and CV18). It is the simplest way to consist and is most like the old DC systems where two locomotives were on the same block and responded to the same throttle. If you have an A-B or A-B-A set that will always run together, this may be a good option. Yes, both sets of headlights and any other functions will operate simultaneously on each locomotive. In this example, there is no rear headlight, and this should not be an issue. However, if you are sound-equipped, blowing the horn will have a calliope effect. Basic consisting is the least flexible method, but it is simple and saves locomotive slots within the command station (more about that later).

The second is Command Station Assisted Consisting (CSAC), sometimes referred to as Universal Consisting, Brute Force or Old Way Consisting. The command station assigns the consist, keeps track of the consist, and sends a set of commands to each locomotive each cycle through. If you have only a few locomotives and a few consists, this isn't much of a problem. However, if you have a large railroad and many consists, this can potentially slow down the bus communication on the railroad, and you could see delayed responses from locomotives. The other difficulty with CSAC is that if you move this consist to another railroad with a different command station, the consist will be lost and not recognized by the new command station. All of that information is back within the old command station.

The last is Decoder Assisted Consisting (DAC), sometimes called Advanced Consisting. It has several advantages over CSAC. Each locomotive has the decoder address (CV1 or CV17 and CV18) and also a consist address held within CV19, which is specifically defined for this purpose. If



Above: Decoder Pro Speed table



Above: Decoder Pro 3 screen shots Consisting