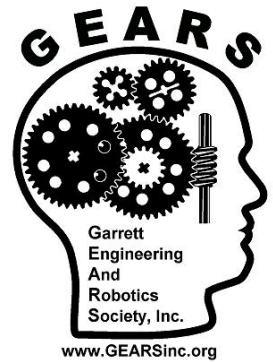


## **Garrett Engineering And Robotics Society (GEARS).**

P.O. Box 277

Mc Henry MD, 21541



HiTechnic DC Motor Controller speed test.

This test was performed because FTC teams 2818 and 4240 were getting unexpected behavior when setting the speed for “encoder based” moves.

Our tests indicate:

- 1) When using the Constant Speed mode of the DC Controller, the actual measured motor speeds were relatively linear in the range 0-100 %.
- 2) When using the Run To Position mode of the DC controller, the actual measured speeds were linear up to approximately 65% of full speed, and then after that, no significant speed increase was measured.

This behavior was verified using a LabVIEW test-bed program. The test setup was a TETRIX chassis with a single free-running DC motor connected to an optical encoder and DC Motor controller.

The program performed two measurements for each requested speed in a range of 10 to 100. The tests were:

- 1) Drive the motor at the given Constant Speed for 10 seconds and then measure the change in encoder value. Calculate counts per second.
- 2) Command the motor to move 12000 counts at the given Constant Speed. Measure how long it takes to move 10000 counts (to eliminate any end breaking effects). Calculate counts per second.

The results are plotted automatically and are shown below:

This effect is also clearly “heard” in the tone of the motor.

Based on the “HiTechnic Motor Controller Brief” I would expect to be able to command 100% speed on a run to position command and still get near to the full rated speed of 1000 Deg per second most of the time.

Our question is: What’s going wrong here, and is there anything we can do about it, other than implementing our own “Run to position” VI.?

Test code can be provided if requested.

Phil Malone.

