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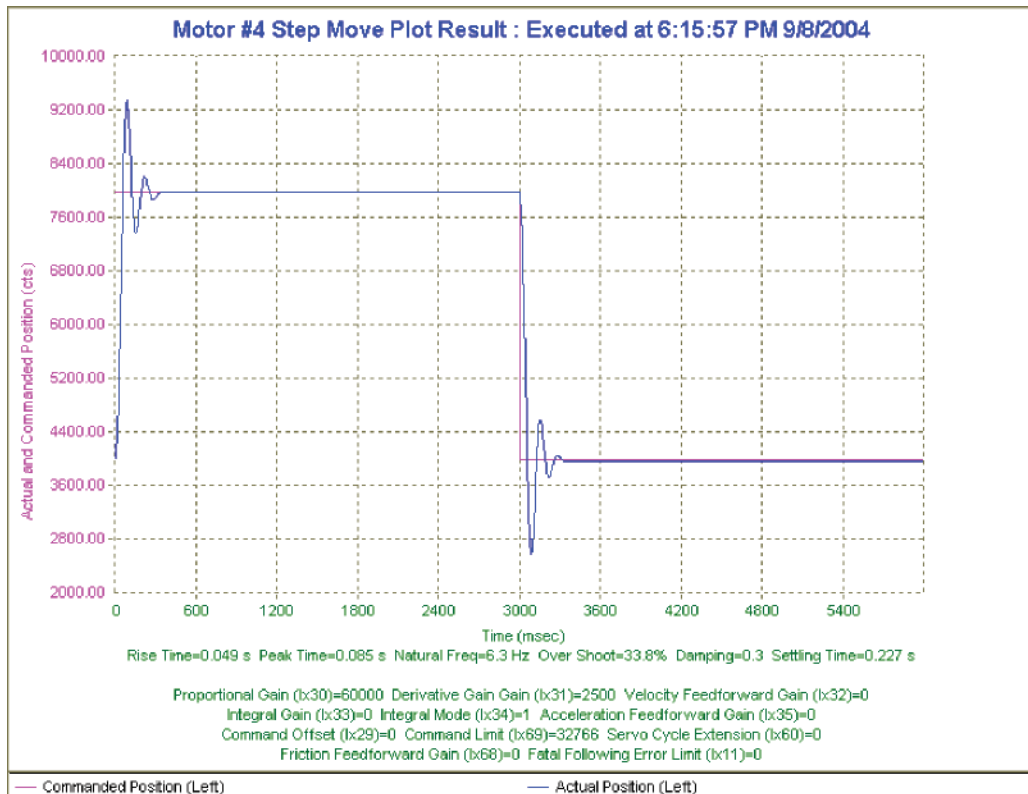
The following is unsolicited data from an independent consultant. He was hired by a manufacturer in the Surface Mount Technology (SMT) and Semiconductor Industries (SI) to test ThinGap's TG2300-120-81920E NEMA 23 Servo Motor against several high performance servos. The consultant's comments are found following the data plots.

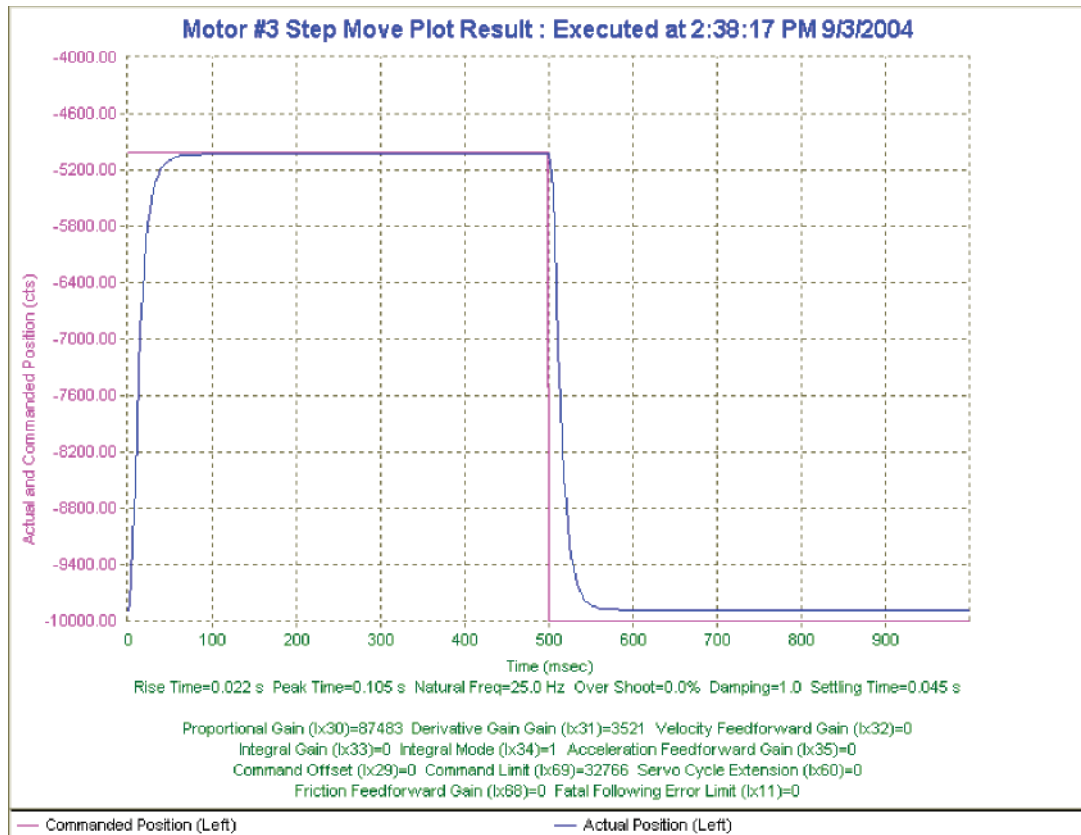
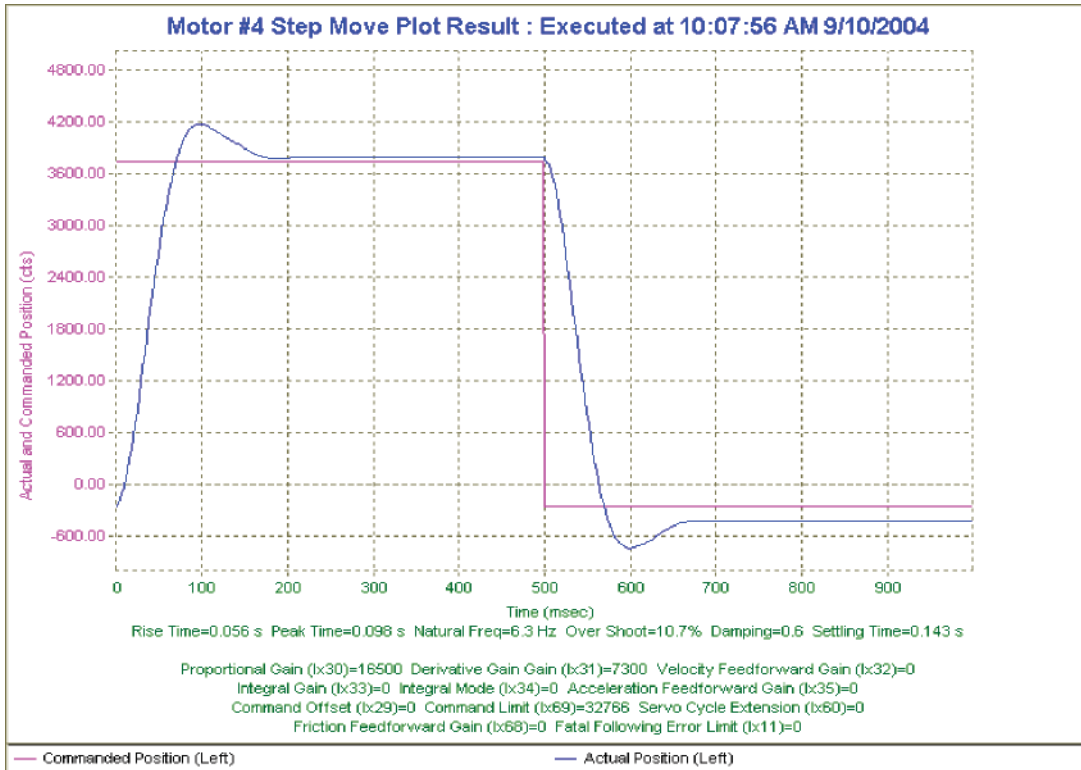
The natural frequency is the ability of the whole system to respond to step changes in input current. A higher natural frequency equates to a faster response and better performance. The mechanical system was a 15 mm diameter ball screw with a 15 mm lead and a travel of 24". The total lead screw length including bearings is 28". The load on the slide is 100 lbs.

The only difference in generating these plots is switching the BRAND C motors out with the ThinGap motor. Thus, all three motors have the same load, Delta Tau® controller, and Compumotor® OEM670 20 KHz PWM amplifiers running off a 70 VDC bus. In line, between the controller and motor, are 100 uH inductors.

These plots were taken using two different BRAND C iron core servomotors. BRAND C's MOTOR 1 is the first plot with the most ringing and exhibiting a natural system frequency of 6.3 Hz. The BRAND C MOTOR 2 is the second plot and exhibits less ringing, but still has a natural system frequency of 6.3 Hz. The ThinGap motor, which is the last plot, performed at a much higher 25 Hz natural frequency.

Note the x and y axis varies with each plot. The first line in the bottom of the graph is a summary of the performance of the motor/system.





Summary Table	ThinGap	Brand C #1	Brand C #2
Rise Time	22 ms	49 ms	56 ms
Peak Time	105 ms	65 ms	98 ms
Damping	1.0	0.3	0.6
Over Shoot	0.0%	33.8%	10.7%
Settling Time	45 ms	227 ms	143 ms
Natural Frequency	25 Hz	6.3 Hz	6.3 Hz

The summation data shows that the ThinGap Servo Motor performance is substantially better in achieving the ideal desired motion profile.

Independent Consultant's Testimonial

I have been building custom automation equipment for over 22 years and have been responsible for the controls on a wide variety of machines. They have ranged from the quick and nimble, 1/2-second cycle times, 6 g acceleration to the slow and powerful 1.5 MW wind turbines.

Throughout my years of experience I have tested good motors and bad motors, but I had not seen a motor that I got excited about. To me motors were commodities, and the differences between motors were marginal at best.

This was my opinion until I tested a ThinGap motor. From the moment that I commanded the ThinGap motor to move I had a new opinion. Without even tuning the motor, I could tell something radically different was happening to the axis on the machine. When I finished the tuning, I measured what my intuition was telling me. This motor was not a marginal improvement; it was a leapfrog past the competition.

*The tests between ThinGap and a well-known competitor used the same amplifier and load. **The ThinGap motor had better than a 30% improvement in system bandwidth.** This equates to a machine that is significantly faster, or one that follows its path significantly tighter, which equates to the machine making more money for its owner.*

I was truly amazed, not only could I push the machine faster, but also the motor was lighter than the competition. This equates to a heavier payload or higher bandwidth on the axis that carried the motor. The primary benefit of higher bandwidth is enough for me to say that on all new projects, I will recommend a ThinGap motor. From my perspective, I need to justify why a ThinGap motor should not be used.

I have been in this business for over 22 years and I have never been excited about a motor. I am excited about ThinGap® motors. I am truly impressed with the performance of this motor. It is an exceptional product.

Rory Coniglione
President, Blackstone Controls



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