



# DELTA TAU

Data Systems, Inc.

## DELTA TAU'S ZIP-ZING NO BANG!

The Zip-Zing, No Bang! demo showcases Delta Tau's UMAC controlling 8-axes of tightly synchronized rotary & linear motion. This demonstration showcases UMAC's ability to digitally interface to Delta Tau Geo PWM input amplifiers and provide digital current loop control and motor commutation.

UMAC, running in a stand-alone capacity, not only synchronizes and closes the position and velocity loops for all 8-axes, but additionally performs the *commutation and digital closure of the current loops* for the 8 brushless motors. The link from the UMAC to each Geo Drive amplifier is a command cable carrying direct digital PWM commands to switch the top and bottom halves of each power transistor. This allows the amplifier to function as a compact, cost effective, and essentially dumb power stage.

The Geo Servo Amplifier accepts the direct PWM commands from UMAC to switch its IGBTs, and provides UMAC with current loop feedback information. Consequently, this permits the advanced fully digital UMAC algorithms, such as sinusoidal commutation, vector control, field-oriented current-loop closure, field weakening, third-harmonic injection, and I<sup>2</sup>T protection, to operate directly on the motor. This ideal mating of brains and brawn results in increased performance, easier system setup (there are no personality modules, pots to tweak, or software variables to set in the amp), and additionally a slight decrease in overall system cost!

The Zip-Zing Demo is synchronizing loads at speeds up to 40 inches-per-second (impressive considering the short fields of travel of the linear axes and the 110V AC input voltage the system works with), Delta Tau's Zip-Zing, No Bang demo illustrates the performance which can be achieved with a UMAC and full digital PWM command interface. **The demo was awarded as Best Demo of Show at the 1996 Motion Expo Show held April 23-25 in Chicago.**

### ZIP-ZING Demonstration Components

- PMAC HMI
- UMAC
- Geo Drive
- Motor #1: Rotary Baldor with 1000 line encoder (4000 cts w/ x4 decode)
- Motor #2: Rotary Baldor with 1000 line encoder (4000 cts w/ x4 decode)
- Motor #3: Rotary Baldor with 1000 line encoder (4000 cts w/ x4 decode)
- Motor #4: Rotary Baldor with 1000 line encoder (4000 cts w/ x4 decode)
- Motor #5: Linear Trilogy Stage, Sony Magniscale (2540 cts/inch w/ x4 decode)
- Motor #6: Linear Trilogy Stage, Sony Magniscale (2540 cts/inch w/ x4 decode)
- Motor #7: Northern Magnetics Brushless Linear (25400 cts/in w/ x4 decode)
- Motor #8: Baldor 1 Hp AC Induction Motor (4096 cts/rev w/ x4 decode)



UMAC



GEO DRIVE PWM



3U SERVO AMP



PMAC HMI

**Single Source Machine Control/**

**Power // Flexibility // Ease of Use**

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