

KINETO Tracking Mount (KTM) Digital Control System

Single Station Control, High Accuracy, and Reliability

The new KINETO Tracking Mount (KTM) Digital Control System provides additional functionality necessary to eliminate legacy closed loop position control systems while upgrading the Servo Power Amplifier Chassis and Encoder Chassis. This system is implemented with a compact, high reliability architecture using a Pentium CPU and the QNX real-time operating system.

The Digital Control System is backward-compatible with the present Encoder chassis (P/N 712450-1) and Servo/Power Amplifier chassis (P/N 712448-1) as specified in the WSMR purchase description PD-2372-94C dated November 15, 1995. The upgrade is transparent — just plug the chassis into the existing hardware. Mating connectors are supplied.



The KTM Digital Control System includes:

- Closed Loop Position Control with PID or state space control laws, customer configurable
- Advanced servo loop control with dynamic filter and feedback estimator with a disturbance rejection estimator for optimized tracking
- Rate Loop (Velocity) Control
- Analog rate command input the same as servo power amp control
- High-speed communications for remote control via Ethernet communications
- Axis encoder functions are internal to the chassis
- Analog rate command via joystick, stiff stick, or external computer is standard
- IRIG-B time synchronization
- KTM Servo System Software Analysis Tool Box provided for mount analysis and tuning
- Built-in Test (BIT), data logging and function generator
- Built-in data logging allows post-processing analysis of performance
- High reliability architecture with hardware-executed safety functions
- Detailed installation documentation



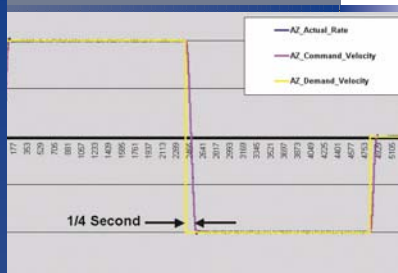
rear view



communications

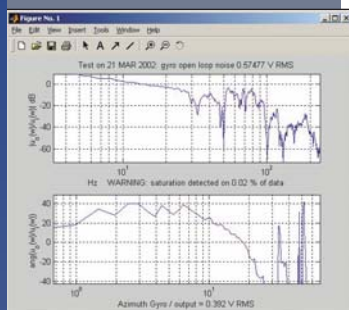
Brashear

KTM Digital Control System

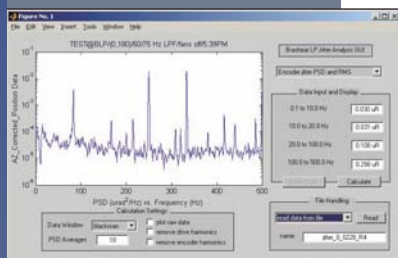


Azimuth Step Response

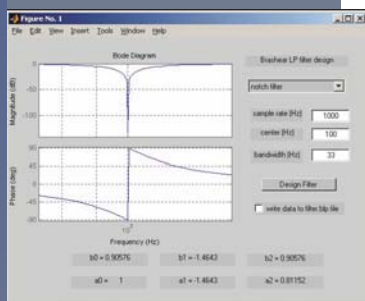
Digital Control System Features



Azimuth Plant Response



GUI Analysis Showing Jitter



GUI Design and Analysis Tool

The KTM Servo System Software Analysis Tool Box enables the field technician to tune the servo system, optimizing the position/rate/loop bandwidth, notch filter placement and time response.

Built-in function generators includes step/ramp/sine input functions to check the system time response to validate the compensation.

A built-in white noise generator can be used to determine plant and system frequency response.

High-Performance Servo Control

- Advanced dynamic filter and state variable estimator design for enhanced noise/spurious signal rejection
- Up to 1000 Hz servo loop update rate for high BW servos and excellent disturbance rejection
- Position output asynchronous for precision axis data collection and video/film annotation
- Pentium/QNX real-time operating system

Options and Expandability

- Optional Suitcase Test Tool to patch, simulate, and test I/O
- Star calibration and mount modeling options for improved accuracy and performance verification
- Axis Converter Module (ACM), pedestal-mounted, provides lower noise, resolver and Inductosyn signals and higher accuracy encoded data
- IR/TV video tracker option
- Communication via copper, fiber-optic, or microwave channels
- Deterministic error correction option improves accuracy and jitter beyond basic specifications
- Custom user interface/GUI option
- Single station remote operation control console
- Internal GPS position and timing card

Servo System Software Analysis Tool Box

- Optimize loop control and bandwidth with software test functions, data collection, and data reduction
- Detect and compensate for mount, payload, and structural resonances
- GUI design and analysis tools generate desired low-pass, notch, band-pass, etc. filter coefficients (5 filters/axis)

Fully Customized Solutions

- L-3 Brashear custom products range from a basic controller to multiple networked pedestals with a local/remote real-time TSPI processing station

Stand-Alone/Remote Capability

- Full-range network designation and reporting capability
- High-speed communications; Ethernet interface is standard

Maintenance-Friendly Architecture

- Text-based configuration files
- Built-in data-logger and virtual test instruments
- Extensive BIT/self-test capabilities

For more information, please contact:

Jim Stevenson – *Manager of Range Systems and Customer Service*
412.967.7996

E-mail: jim.stevenson@L-3Com.com

Steve Allyn – *Business Development Manager*
412.967.7580

E-mail: steve.allyn@L-3Com.com



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L-3 Communications Brashear

615 Epsilon Drive
Pittsburgh, PA 15238
Phone: 412.967.7700 • Fax: 412.967.7973
e-mail: sales.brashear@L-3Com.com

www.brashearlp.com