Barrett Technology™ Inc.

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Proposed WAM Software Training Package.
2014-March-25

Day 1:
- 9:00am: Arrival Introductions
- 9:30am: Review System Setup
  - Connection to WAM
  - Programming IDE
  - Operating Environment
  - Programming Environment
- 10:00am: Review Procedures
  - Maintenance Routines
    - Checking Cable Tensions
    - Checking Zero Calibration
    - Verifying Gravity Compensation
  - Libbarrett Architecture
    - Building: Libbarrett, Applications
    - Navigating: Source, Headers, Configuration Files
  - Additional resources
- 11:00am: Application Design Concepts
  - Simulink-style System design
  - Real-Time vs. Non Real-Time Design
- 12:00pm: Lunch
- 1:00pm: More Libbarrett Concepts
  - Systems
  - Templating
  - Barrett Units
  - Execution managers
  - Product managers
  - Supervisory controller
  - The Standard Main Function
  - Tuples and tuple grouping
  - Control loop timing & statistics
  - Controllers
  - Transforms
- 2:30pm: Open Ended Session – Take in questions to consider over night.

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Day 2:
- 9:00am:
    - Morning Question and Answer Session from Previous Afternoon
- 10:00am: More Advanced Application Development Concepts
    - Socket Communication Design
    - Data Logging features of libbarrett
    - How to share data safely between RT and non-RT threads
    - Changing the WAM mounting orientation
    - Adding your own tool
    - Safety system
    - Cartesian Control
    - Current vs. Voltage Control
    - Software Control of Activation
    - Multi-core: managing CPU thread affinity in Xenomai
    - Control distinctions
    - Replacing Libbarrett's PID controller with your own controller
    - Building your own real-time WAM PC
    - Compiling and running libbarrett without Xenomai
    - Debugging
        - Common Mistakes with WAM
        - Trouble Shooting Methods
    - Python support
    - ROS support
    - Upgrades
- 12:00pm: Lunch
- 1:00pm: Extended Application Use Programming
    - Distribution of Cable and Pulley Wear
    - Individual Motor Acceleration Levels
    - Periodic Auto-tensioning
    - Balancing Application Needs vs. Maintenance
    - Puck Heat
    - Joint Limit Avoidance
    - Syslog Information
- 2:30pm: Open Ended Session – Q/A