Aerospace Research & Development Center (ARDC)

Test Operations

November 2009
Kelly Space & Technology, Inc. (KST)

- Private corporation established in 1993
- Aerospace, defense and technology industry sectors
- Based at San Bernardino International Airport (former Norton Air Force Base)
- East Coast Operations - Warwick, Rhode Island; 2008
- Acquired Wyle SB Environmental Test Business in October 2009: Assets & Personnel
- Separate business units for armor systems, pulsed lasers, wireless sensor communications architecture, and other R&D technologies
KST’s Outdoor Rocket Test Site
KST sublease to Wyle Inc.

San Bernardino International Airport
(Former Norton Air Force Base)

KST’s Aerospace Research & Development Center (ARDC)
30-Acres, 6 Buildings

KST’s East Coast Operations
Warwick, Rhode Island
MARKETS SERVED

- Aerospace
- Defense
- Energy
- Automotive/Transportation
- Telecommunications/Wireless
- Consumer Products
- Medical

SERVICES OFFERED

- Engineering
- Testing
- Technical Support
A few of KST customers...

- U.S. Air Force Research Laboratory
- U.S. Air Force Rocket Propulsion Lab, Edwards AFB
- U.S. Marine Corps
- U.S. Navy, Naval Undersea Warfare Center
- NASA
- Pratt & Whitney Rocketdyne
- DARPA
- General Atomics
- Honeywell
- BAE Systems
- Northrop Grumman
- L-3 Communications
Dynamics and Environmental Testing Facility

- Indoor & Outdoor Climatic Chambers
- Dynamics Bay – Electro-Dynamics

Kelly Space & Technology, Inc.
294 S. Leland Norton Way, San Bernardino, CA 92408  Tel: (909) 382-2010
2348 Post Road, Warwick, RI  02886   Tel: (401) 738-5050
Test Services

- World-class equipment and facilities in several disciplines of technology:
  - **Dynamics**: Vibration, shock, acceleration, acoustics, seismic
  - **Structural**: Static, compliant, dynamic
  - **Environmental/Climatics**: Temperature, humidity, altitude, solar, sand & dust, salt fog, wind & rain
  - **Fluid Flow**: Air, water, cryogenics, hydraulics, pneumatics, fuels, includes jet & rocket engine test
  - **Electromagnetic**: EMC/EMI
- Commercial & Product Safety Testing, electronic test
Dynamics Test Facility

- High bay facility with bridge crane
  - Three instrumentation booms
- Electrodynmaic Shakers
  - 8000 – 30,000 lbf range
- Two power amplifiers
- Automated switchgear
Climatics Test Capabilities

- Temp/Humidity Chambers From -320 to +250°F, RH to 98%
- Temp/Alt/Humidity Chamber: -320 to +300°F, Alt to 100,000 ft, RH to 98%
- Temp. Cycling: -300°F to +350°F
- Sand & Dust Test Facilities: 4000 fpm (Sand), 2000 fpm (Dust) at 200°F
- Salt Fog: Temp to 200°F, Salt Concentration to 20%
- Wind & Rain: 30 in/hr Max, 60 Mph Velocity, Temp to 95°F
- Walk-In and Drive-In Combined Environments Chamber: 36 x 16 x 16 ft
- Thermal Vacuum Chambers: Vacuum to 10-6 Torr, Temp from -320 to Ambient
- Altitude Chamber(s): Alt to 100,000 ft, 15-ft Diameter by 20’ in Length
- RF/Electrostatic Discharge Screening Room
KST’s Team provides EMC/EMI test capabilities to include:
- Interference
- Susceptibility
- Electrostatic discharge
- Radio frequency interference

System capabilities are configured to support DoD, FCC, and Bellcore test requirements

Military Standards include MIL-STD-461E and MIL-STD-1399 (Navy)
Only Commercial Indoor Jet & Rocket Engine Test Facility in U.S.

KST Propulsion System Test Facility enables low-cost, advanced technology development

...cont.
Propulsion System Test Facility

- Capable of jet engine test services ~30,000 LBF of thrust
- Capable of rocket engine test services ~20,000 LBF thrust
- Jet-A, RP-1, LOX, LCH
- Wide selection of run tanks
- Modular test stands
- Custom test configurations
- Full instrumentation and data acquisition support

JT-8 Jet Engine Being Prepared for Test in KST Test Cell
Test Engineering & Documentation Services

- Capture team support
- Program management & IPT member
- Document Review
  - Product Requirements Document (PRD)
  - Contract Data Requirements List (CDRL)
  - Data Information Document
- Test Verification Plan- roadmap of test plans
- Test Plan synthesis and development
  - Work Breakdown Structure
  - Environmental and functional test plan
  - Test Schedule
- Test Procedure development and support
- Test Inspection Report
- Safety and Hazard Analysis Report
- Customer review process support (PDR & CDR)
- Test Data & Failure Analysis & Recovery Plan

Kelly Space & Technology, Inc.
294 S. Leland Norton Way, San Bernardino, CA 92408  Tel: (909) 382-2010
2348 Post Road, Warwick, RI  02886   Tel: (401) 738-5050
Product Life Cycle Support

Program Capture | Design | Build | Test & Eval | Qualify | Manufacture | Operate & Maintain

Test Engineering and Documentation Services
- Proposal Support
- Tech Requirements
- Test Plans
- Test Procedures
- Data Analysis

Test Services
- Test Fixtures
- Instrumentation
- Test Execution & Funct. Eval
- Test Reports
  - NDI

Reliability, Maintainability, Supportability Services
- FMECA
- Reliability Eng & Analysis
- Configuration Management
- Publications
- Training
- Asset Management
- Lean
- Six Sigma
- TOC
- RCM
- NDI

FMECA = Failure Mode Effects & Criticality Analysis, TOC = Theory of Constraints, RCM = Reliability Centered Maintenance, NDI = Non-Destructive Inspection

Kelly Space & Technology, Inc.

294 S. Leland Norton Way, San Bernardino, CA 92408 Tel: (909) 382-2010
2348 Post Road, Warwick, RI 02886 Tel: (401) 738-5050