



Troxel Aerospace Industries Company Overview

27 June 2017

Company Overview

□ Space system engineering firm focused on product development and engineering services

□ Products

- **Fault tolerant SEU/SEFI mitigation middleware**
- **HSI & HTI processing, data extraction, and compression**
- **In-pixel processing in digital focal plane arrays**
- **A few other products currently in stealth mode**

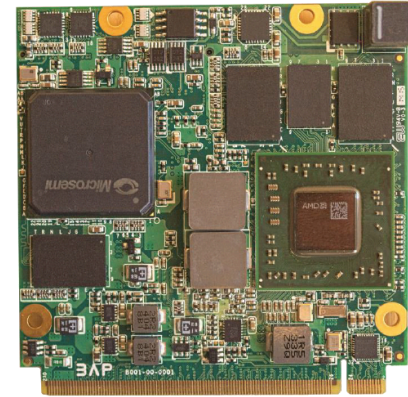
□ Services

- **Onboard processing and storage sizing/design/prototype**
- **Smallsat mission design and reliability analysis**
- **Electrical and software engineering support**
- **Radiation test support and mitigation development**

Robust Middleware

❑ Fault tolerant SEU/SEFI mitigation middleware

- COTS processors provide orders of magnitude increases in performance versus SWaP compared to rad-hard options
- TID/SEL improving for COTS but non-destructive SEEs increasing
- Troxel Aerospace middleware improves SEE performance allowing space operations by reducing impact of SEFIs
- Executing a NASA SBIR Phase 1 in support of the HPSC program
- Currently supports a Broadcom quad-core A53 processor and porting to an AMD GPU, a to be announced DSP, and a unique architecture
- SEE testing to quantify improvement planned for early next year on all processors including on-orbit system



AMD GPU
Launched May 2016
4 of 24 in orbit



Environmental Test Services

- ❑ **High-quality radiation environment qualification**
 - Cost effective, high-quality SEE testing (heavy ion, proton, and neutron)
 - TID, DDD, prompt dose, etc., but frankly traditional test houses cheaper here
 - Team has performed hundreds of successful tests (all under NDA)
 - Numerous missions from LEO to GEO, ISS to strategic to deep space
 - In-house test development/analysis and end-customer interaction
- ❑ **Electrical/thermal screening and qualification (with partner facilities)**
 - Full Grade B and S and TOR level test and up-screening and lot acceptance
 - Electrical test and reliability qual. at component and MCM/board level
 - PEM qualification and package analysis
 - Product obsolescence and counterfeit detection/mitigation services
- ❑ **Long heritage testing a wide range of relevant parts**
 - Processors (including multi-/many-core), FPGAs, DRAM, Flash, etc.
 - Particular expertise with single-, multi- and many-core architectures
 - ADC/DACs, op-amps, comparators, optocouplers, transceivers, etc.
 - Hybrids, MOSFETs, bi-polar trans., oscillators, clock buffers, etc.

Other Technology Support

❑ Dedicated smallsat launch vehicle

- Providing mission design, customer engagement, and smallsat configuration, integration, and test support

❑ Fiber optic transceivers

- Supporting system design considerations for a 3.125 to 10Gbps per lane box-to-box optical transceiver to overcome copper speed/distance limitations

❑ Precision agriculture

- Supporting a data analytics startup with spacecraft payload processing and data storage design for an HSI sensor

Contact Information

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