Adapting a RocketCam™ Digital Video Controller Avionics Unit to be a P-POD Deployment/Monitoring Unit

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• Based on the externally mounted RocketCam™ system
• 1U CubeSat deployer
  – Can accommodate a slightly larger CubeSat
• Payload is kinematically restrained during launch
• Environmental closeout protects payload after integration
  – Nitrogen purge option available
• Access port available after integration
• Zero-G test (Sep 2004)
• Suborbital test (Aug 2008)
• Stackable modules support a variety of applications and configurations
  – Launch vehicles, spacecrafts, UAVs, marine systems, combat systems, test facilities, etc.
  – Digital Video System
  – Payload controller / Data handling unit
  – Bus controller
  – Instrument / Data acquisition controller
  – Flight control computer
  – Missile / Launch vehicle managements system

DVC-104 Avionics: Based on PCIe/104 Standard

92 Ecliptic systems launched (85 rockets; 7 spacecraft)
>230 cameras and 19 digital avionics controllers
** No known Ecliptic hardware or software failures **
Adapting DVC for Deployment Control: Genesis of Concept

- Proposed to DARPA for STTR
  - Phase I and II funded, with Cal Poly SLO as partner
  - Employ DVC capabilities to control and monitor multiple P-POD and RocketPod systems
    - Up to 8 deployments
    - Deployment video coverage
    - Environmental data capture

“RocketPod and P-POD on Steroids”
• **DVC –104**
  - Launch vehicle configuration
  - Size: 99.6mm x 98.5mm x 132.8mm
  - Mass: ~ 1.2 kg
  - 5 slice system
  - 8 NTSC camera inputs
  - 8 actuator drive outputs
    - Supports redundant outputs
  - 8 channel analog inputs
    (environmental sensors)
Optional Capabilities

- **Illuminator**
  - Independent or camera mount
- **High speed and High Definition camera**
  - Large selection of sensors from 800x600 @ 500 fps to 4872x3238 @ 3 fps
- **Primary/Secondary battery**
- **S-Band transmitter**
  - 150mW to 20W
- **Solid State Drive**
  - Store and forward applications
  - Up to 320GB
“Master P-POD” Concept:
P-POD Mk.III(+)

• P-POD + DVC + Care package
• Takes advantage of space on top of P-POD
• Mechanically repackaged DVC-104 form factor
  • Same capabilities as current DVC
  • Does not increase rectangular envelope of P-POD
• Minimal impact to P-POD design
Development Status

• Phase II STTR completion 2011 2Q
• Sequencer baselined in 2010 for (rescheduled) ADAMSat mission
  • 8 P-PODs on NPS Cul-Lite
• Development on DVC and P-POD Mk.III(+) continued since
• Deliverables expected by end of effort:
  – Launch-ready DVC + 1 cameras (up to 8)
    – Protoflight environmental testing
  – Prototype of P-POD Mk.III(+)
    – Qualification environmental testing
  – Mature EM of RocketPod
• Investigating multiple launch options
  – Environmental testing performed to envelope most launch vehicles
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“RocketCam by Ecliptic”