Rascal-Boeing Telecon

Pre-Meeting

* What doe the mission look like
* work out a schedule for deliverables

Logistics

* Bi-weekly meeting times
  + 2-3 pm Pacific (4-5 Central) bi-weekly, on Thursdays

Eric Aler, director of Small Satellite Operations at Boeing (Huntington Beach, CA)

Philosophy Discussion

* Boeing
  + Boeing D-Prize goal is to reach out to universities, reach out for innovation, establish pipeline for hiring, build a landing pad for new hires at Boeing
  + Pull out of the completed project a mission/payload that can be sold to customers
  + Command & control from multiple locations, give students additional on-orbit hands-on experience
* Swartwout
  + Lab philosophy is to give students hands on experience with satellite development
  + Potentially very strong synergies

Agenda Items

* SLU Questions
  + As we define the mission, using the COLONY I bus, can we come up with a clear understanding on how to proceed with the mission. Looking at proximity operations with two joined spacecraft
    - BOEING: potential to deliver 1 or 2 buses, as well as contacts in the launch industry for launch opportunities
  + Primary mission driver: did not expect to have the ability to image an already existing space object, new potential for targeting other objects
  + BOEING: do you have a preference for building a spacecraft or building a payload?
    - SWARTWOUT: tremendous value in giving students flight experience; want to find flight opportunities. Critical training in the “last mile”. Essential to meet external interfaces and schedules. Providing an instrument to a partner gives 80-90% of my goals
  + BOEING: do you want to involve the students in selling the payload to customers?
    - SWARTWOUT: Interesting response from the room. Students need to be understanding of your role in a product that their company may be selling
    - BOEING: quantify room response
    - TOM: surprised that we could get that kind of opportunity
    - BOEING: that kind of experience would be invaluable, we’d be interested in being a support mechanism for such an opportunity. Customers have expressed interest in seeing this kind of program. Though we are at the mercy of our customer’s schedules
    - SWARTWOUT: even the launch campaign can turn into 36+ months, we understand that the timelines may not sync up with the academic schedules
  + BOEING: moving to technical details, going back to the mission. Initial objective was to use two cooperative spacecraft, but is it in the realm of possibility to go after more passive objects?
    - SWARTWOUT: it’s certainly an aspiration of the mission. We got a surprising amount of cooperation with imaging other spacecraft with COPPER
    - BOEING: what did you mean by allowed to (image other spacecraft)?
    - SWARTWOUT: [tells story of COPPER’s licensing adventures]
  + BOEING: what type of ground-based prox-ops testing facilities can you do? If we were to try to demonstrate the capability on the ground, could you do that?
    - SWARTWOUT: We’d like to leverage [Boeing’s] capabilities, as ours are fairly primitive.
    - BOEING: We’ll get one of our testing guys to get in touch with you about our capabilities.
    - SWARTWOUT: It sounds like the cooperative approach is the best way forward
    - BOEING: We think that the non-cooperative approach is the most likely approach to get attention from our customers, [references inspection mission]
  + SWARTWOUT: we have some challenges in mission design in that we don’t have access to state-of-the-art prox ops or contacts with customers who do. Cooperative approach solves the initial condition rendezvous problem. COLONY I is far more capable, and a non-cooperative approach may be practical. We’ll reexamine our mission design
    - BOEING: We might consider the vehicle to observe the deployment of other spacecraft.
    - SWARTWOUT: work towards an incremental demonstration: target may start as cooperative, but later in the mission become uncooperative
  + SWARTWOUT: Some questions on the COLONY 2 Bus: How agile is the spacecraft?
    - BOEING: all of our propulsion concepts are just that: concepts. Propulsion unit is up in the air, good idea to put [a SLU] propulsion unit in the payload. Subsystem was prototyped 4-5 years ago and was tested to provide 6 degrees of freedom
    - SWARTWOUT: we looked at that system before (years ago). We’ll look into spec’ing our navigation system to that system
  + SWARTWOUT: for navigation, would the algorithms stay in the payload, or would it make more sense to integrate them into the BOEING side of the spacecraft?
    - BOEING: it could go either way, though keeping image processing and the algorithms on the payload makes more sense for integration’s sake
    - SWARTWOUT: agreed, prefer a “clean” interface
  + BOEING: What are your plans for a qualification program?
    - SWARTWOUT: with the exception of things like conformal coating and final preps, our intentions would be to build a near-flight assembly unit and then a separate “pristine” flight unit. Having the engineering unit for post launch education/problem solving is extremely beneficial
    - BOEING: agreed
  + SWARTWOUT: one of the things that we recognized the need for using a video system to watch the deployment sequence to better acquire/confirm the deployment of a spacecraft, as a different application of this mission
    - BOEING: we were in the middle of that too, took us 16 days to make consistent contact and command it reliably. Recording the deployment could be useful
    - SWARTWOUT: sue the system to monitor beacons for tracking immediately after deployment, facilitate in tracking.
    - BOEING: maybe use a universal identifying code in the beacons
  + BOEING: kick-off meeting, set it up for a specific time?
    - SWARTWOUT: see bi-weekly meeting notes, above. Use it to lay out our co-ops and deliverables
    - BOEING: if you have any more technical questions, please end them to us
  + BOEING: we’d like to know what deliverables would look like and how we can measure success
  + SWARTWOUT: look forward to working on expanded capabilities
  + BOEING: next meeting in two weeks