SSN: Roadmal V2.1 (DVB-150112)

Objective: Prospect a Near Earth Asteroid.

Here is our Roadmap, V2.1:

1. Software Requirements Analysis
    a. CAD Software
        i. 3D Printing Software
    b. Simulation Software
    c. IDE
2. Ground Station
    a. Hardware (H/W) Requirements
    b. Software (S/W) Requirements
    c. Diagnostic Systems Requirements
        i. Simulation - Stand-Alone
        ii. Simulation - w/ Prototype-Hardware-in-the-Loop
        iii. Simulation - w/ Sat System-in-the-Loop
    d. Strategic Partnerships / Outsourcing
3. Sat-1 (**Son-of-Sputnik**)
    a. Requirements Analysis
        i. Recruit Ham radio builders & operators
    b. Basic PocketQube (PQ) Satellite Bus.
    c. Software Radio to allow flexibility wrt frequency and bands.
        i. Ham Radio Transceiver for ARRL amateur radio tracking
        ii. UKube-I & UKube-II capabilities
        iii. Gamification Option (TBD)
4. Sat-2 (**First Light**)
    a. Requirements Analysis
        i. recruit amateur & professional astronomers
    b. CubeSat with Sat-1's PQ Bus.
    c. Solar Arrays to collect at least 30W (unto 57W?)
    d. Computer controlled 300W LED strobe
    e. Power Management System and "Super Capacitors" to strobe the LEDs when appropropriate
        i. At night (in Earth's shadow)

    ii. When sufficient power available
    iii. When passing over populated areas
    iv. When requested from Ground Station(s)
  f. Attitude Control System to keep LED pointed toward Earth.
  g. Provides the possibility of a novel communication strategy using the LEDs as transmitters.
  h. Gamification Option (TBD)
5. Sat-3 (**ScopeSat**)
  a. Requirements Analysis
    i. Recruit amateur & professional Astronomers who can design & build telescopes, both refractors & reflectors.
  b. Use one or more 35mm optical sensors
  c. Refractors must be less than 4" on a 1U, e.g 2" lens with extendable tube, or deployable 94mm lens.
  d. Refractors or reflectors greater than 4" will require novel deployment mechanisms, arms, etc.
  e. Deployable new novel space mirror reflector technology to be tested.
  f. 3U form-factor offers a superstructure for a larger mirror, e.g. deployable 28" reflector.
  g. An intersting experiment is to use the LEDs of Sat-2 with these reflectors to form an optical transceiver.
6. Sat-4 (**PackSat**) Wolf pack multi-satellite mission
  a. Requirements Analysis
    i. Research NASA Global Express mission
  b. Research Quadcopter autonomous swarm software
7. Sat-5 (**NEASat**)Mission to prospect a Near Earth Asteroid.
  a. Requirements Analysis
  b. Depends on the success of Sat's 1 through 3
  c. CubeSat relay radio stations may be necessary for communications.
  d. Optical Transceivers of Sat-3 could provide communication w/o the relays.