**IS-1 Commissioning plan**

* Phase 1: IS-1 checkout
* Verify we can establish communication (No Hello-IS1 script required, since satellite beacons autonomously, receiving beacon is a proof of telemetry link) Hello-IS1 created
* Check aliveness (PHOENIX or SAFE)
* Transition to safe (should be autonomous if power positive)
* Stop Solar Panel and Antenna Deployments
* Reset Launch Delay Threshold

* Phase 2: Spacecraft commissioning
  + Set s/c and ADCS time
    - * Update the ADCS time with current time
  + Playback deployment data
  + Load ephemeris and test fine point

* Phase 3: Instrument commissioning
  + Instrument aliveness
  + Transition to science mode

**Note**: Contingency Management Plan to be worked out.

1. Scenarios for sending S/C Reset Command. (This is a reset of the complete spacecraft)
2. Scenarios for Turning ON/OFF any particular subsystem. Following subsystems can be turned OFF via command:
   1. DAXSS
   2. CIP
   3. ADCS
   4. S-BAND
   5. Heater

**Phase 1**

**GOALS**

* Verify communication
* Bus is working and is power positive

Sequence of Post Launch Operations:

1. When beacons are received during the first pass, check the mode.
   1. If SAFE: Run Commissioning\_Aliveness\_SAFE
   2. If Phoenix: Run Commissioning\_Aliveness\_Phoenix
   3. If Neither : (Contingency mode, try putting S/C in SAFE mode)

Scripts

1. **Hello\_IS1:** Script to keep waiting for the first beacon to arrive from IS-1
2. **Commission\_aliveness\_safe** script does the following:
   1. Set Beacon Packets to UHF with Rate = 3 Seconds
   2. Confirm if the satellite is in SAFE mode, If not set it to SAFE mode manually
   3. Perform Telemetry Checks
      1. commission\_cdh\_tlm\_check
      2. commission\_eps\_tlm\_check
      3. commission\_comm\_tlm\_check
      4. commission\_adcs\_tlm\_check
   4. Reset launch delay counter
      * 1. First Enable mode\_hk packet to verify status of deployments.
      1. Once the s/c has launched and the initial long delay has elapsed, ground should send a command to set the delay to ten seconds to prevent another large delay upon s/c reset.
      2. Verify launch delay from mode\_hk packet
   5. Set Launch Delay Counter
      1. UHF Deployment: Can be cancelled since beacons are being received
      2. Solar Panel Deployments: Check Panel Current (display the currents and operator can proceed accordingly), IF current are above (??), Cancel the deployments
      3. Verify deployment flags from the mode\_hk packet
      4. Disable mode\_hk packet
   6. Set Beacon Packets to UHF with Rate = 30 Seconds

1. **Commission\_aliveness\_phoenix** script does the following:
   * 1. Set Beacon Packets to UHF with Rate = 3 Seconds
     2. Confirm if the satellite is in Phoenix mode
     3. Perform Telemetry Checks
     4. commission\_cdh\_tlm\_check
     5. commission\_eps\_tlm\_check
     6. commission\_comm\_tlm\_check

1. Cancel Deployment Retries
   1. First Enable Mode\_HK packet to verify status of deployments.
   2. UHF Deployment: Can be cancelled since deployments are being received
   3. Solar Panel Deployments:
      1. Check Panel Voltages: IF voltages are above (??), Cancel the deployments
   4. Verify deployment flags from the mode\_hk packet
2. Set Launch Delay Counter
   1. Once the s/c has launched and the initial long delay has elapsed, ground should send a command to set the delay to zero to prevent another delay upon s/c reset.
   2. Disable mode\_hk packet
3. Set Beacon Packets to UHF with Rate = 30 Seconds

**Phase 2:**

1. Commission the s/c
2. Commission\_set\_spacecraft\_time
   1. Set DAXSS time in this script
   2. Look at MINXSS set time script
3. Commission\_set\_adcs\_time
   1. Use cmd\_adcs\_Time\_SetCurrentTimeUtc
   2. Grab system time through a different short method
4. Playback deployment data – depends on time since launch
   1. Pass the partition number and previous write pointer as an argument to the code
   2. Captures the current write pointer for beacon partition
   3. Downloads data in bursts of 300 packets in timeout of 10 seconds.
   4. Also has an option to download contiguous data at a timeout of 5 minutes instead
5. Commission ADCS
   1. Commission\_set\_ephemeris
      1. Ephemeris would typically persist for long (around 1 month)
      2. Check on a repass if the satellite is in fine point, if not then reload a new ephemeris
      3. May be a good thing to upload latest time to DAXSS as well
   2. Commission\_test\_fine\_point
      1. Go to fine sun point
      2. Check solar panel values/ ADCS telemetry adcs\_att\_cmd\_adcs\_mode should go to 1/ FINE\_POINT

**Phase 3**

Checkout instruments

1. Commission\_instrument\_aliveness\_DAXSS
2. Commission\_science\_mode
3. Commission\_x123\_threshold
4. Commission\_instrument\_aliveness\_CIP
   1. Check with Amal for CIP team for CIP commissioning