Jet Propulsion Laboratory
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ERO MSR Payload Accommodation Concepts

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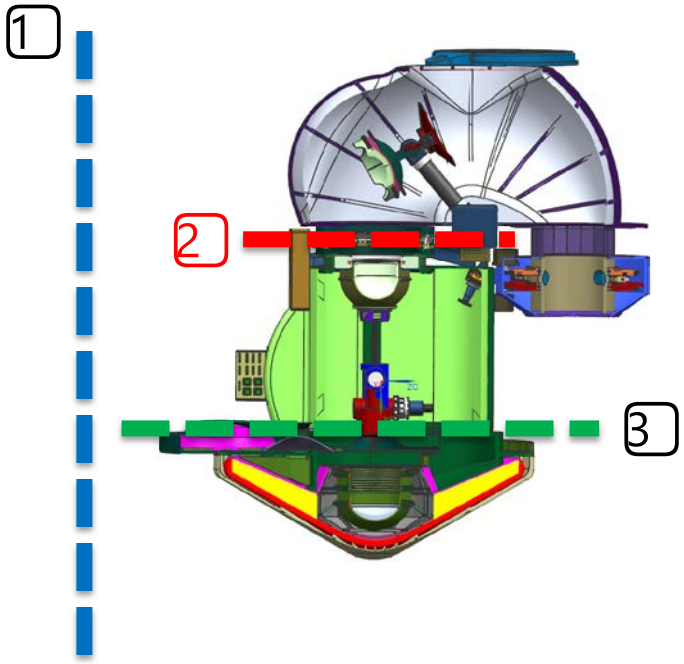
Pre-Decisional Information – For Planning and Discussion Purposes Only

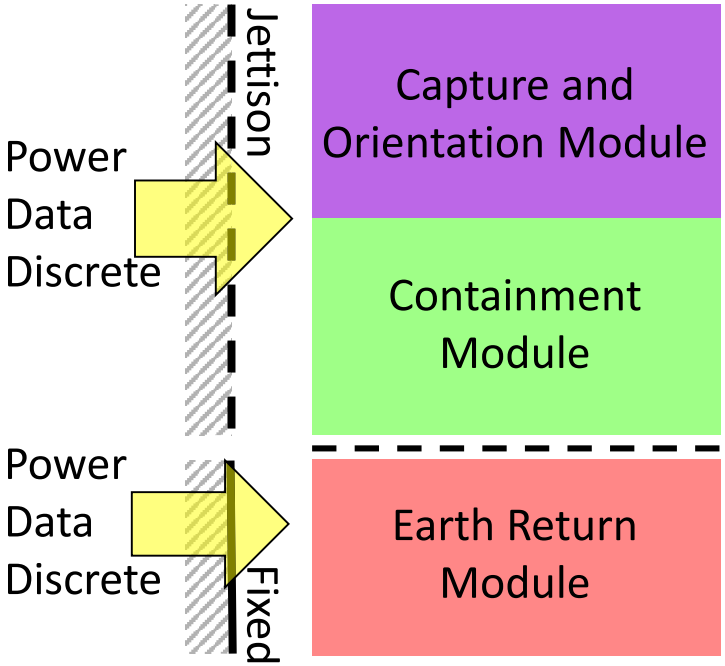
Introduction: Payload Interface Considerations

- The configuration of the ERO MSR payload has not been determined, nor have the roles and responsibilities for the design
- Potential orbiter accommodations for the payload include:
  - Jettison maximum mass at Mars after capture and containment activities are complete
    - Jettisoned portion expected to be major components of the rendezvous, capture and orientation functions
  - Return portions of the payload including: EEV, spin/eject mechanisms, Micrometeroid and thermal enclosures

Potential Interface Concepts



- Component Modules of the Payload
- Some to be jettisoned after use
- Fixed portions to be returned



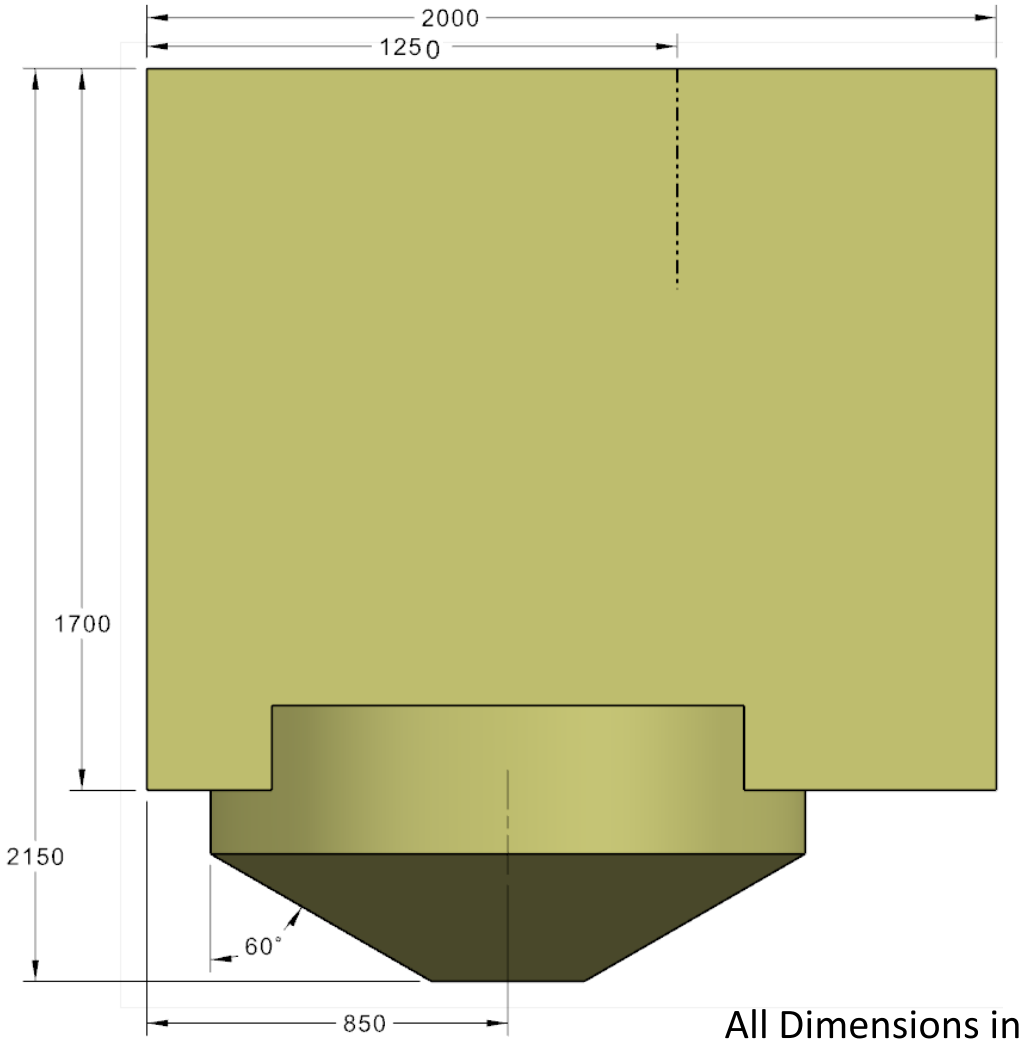
Potential interfaces:

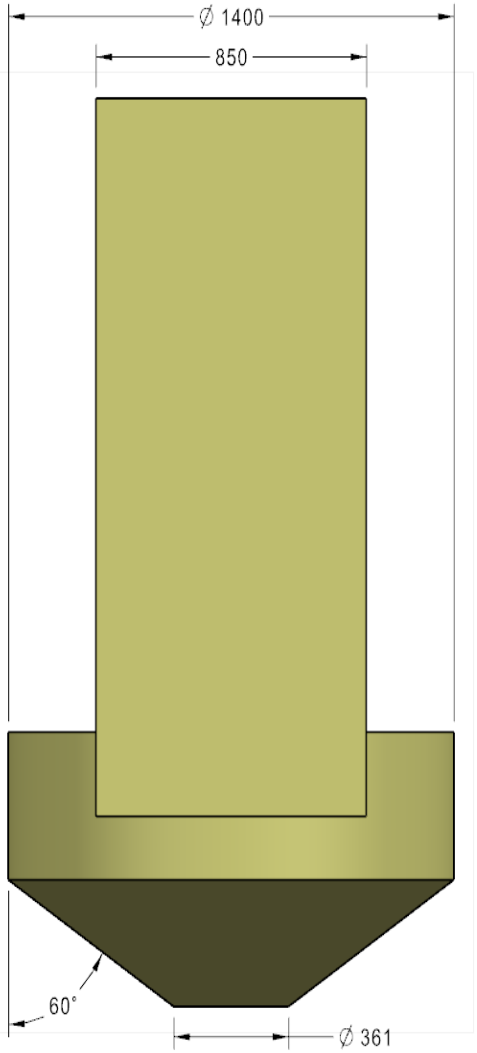
1) Orbiter to Payload

2) Capture&Orientation to Containment

3) Containment to Earth return

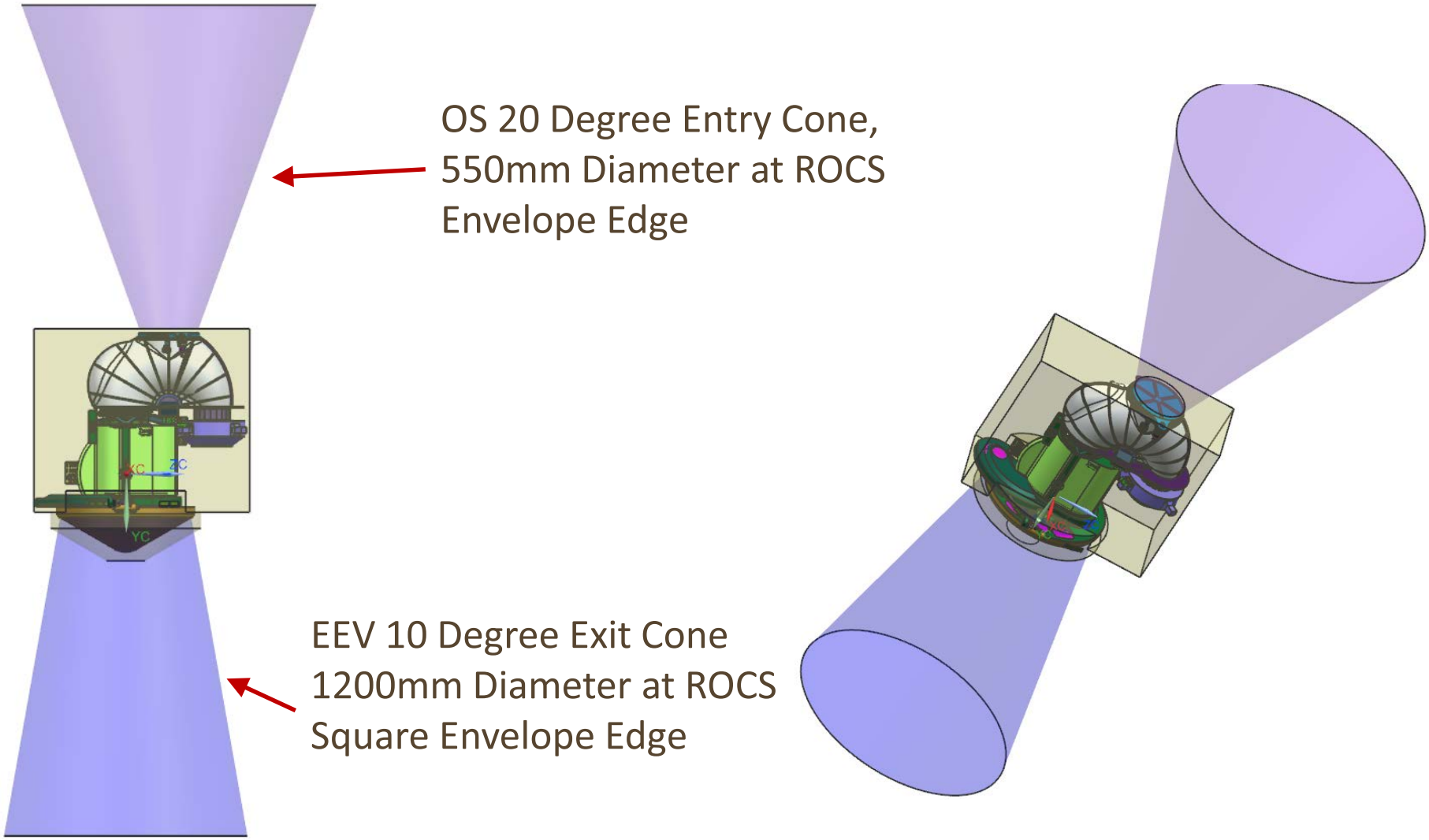
ROCS Accommodation Envelope





All Dimensions in mm.

Notional OS Entry and EEV Exit Corridors



Interface Assessment

Interface Types	Approach
1)Structural	Attach jettisonable and fixed payload elements to S/C such that jettisons could separate without damaging the fixed Earth return elements.
2)Mechanical (jettison)	Capture, Orient, BTC portions should be Jettisoned to save return mass - Jettison Mass of approximately (CBE) 323 kg - Returned mass of approximately (CBE) 120 kg
3)Power	Power needed to run sensors and actuators/controllers. Bio-container seals, if done by brazing, would need high power for several minutes once in the mission (with TBD second attempts). - 28V unregulated power - 7 kW unregulated (at different voltage if needed, includes margins). - 2 MJ energy needed for brazing (includes margin)
4)Data	Rendezvous sensors, capture sensors, actuator monitoring, BTC validation sensors, TBD
5)Discretes	separation mechanisms, launch (un)locks, Heaters, temps, latches
Notes	ROCS elements have been assuming all computation, commanding and feedback loops would be provided by the orbiter. Some distributed actuator controllers with local feedback control are under consideration.