CONOPS 2

Deployment, Acquisition, & Checkout

# Deployment

The Interceptor and Target spacecraft are structurally connected on ejection from the launch vehicle’s upper stage. Activated by the separation switch, both spacecraft wait 45 minutes after deployment before they begin beaconing, then await contact from the ground for further instructions.

# Acquisition & Checkout

Initial checkouts begin when the ground station receives the spacecrafts’ beacons. Checkout allows the ground station to assess spacecraft health and determine when to execute the mission objectives.

Phase 1: Cooperative Rendezvous

Cooperative Rendezvous means that all visual markers for the image processing system are active and the Interceptor spacecraft has access to the Target’s GPS data.

# Separation

Separation is initiated by command from the ground station. Both spacecraft engage pointing control prior to separating to minimize the change in orbit resulting from the separation. Immediately after separation both spacecraft use pointing control to slow and stop the resulting tumble.

# Docking Demonstration

After the first separation the two spacecraft are allowed to drift apart before beginning the docking maneuver. Both spacecraft use pointing control to achieve the proper docking alignment, and the Interceptor spacecraft maneuvers back towards the Target for docking.

# Second Separation, Inspection, & Fine Stationkeeping

A second separation command is sent, following the same procedure as the first. The Interceptor spacecraft moves out to a maximum distance of 10 meters before conducting an inspection of the Target using the image processing payload. Fine stationkeeping is maintained at this distance for [TBD time 1].

# Coarse Stationkeeping

The Interceptor spacecraft moves to the maximum stationkeeping distance and maintains this position for [TBD time 2].

# Cooperative Rendezvous

The Interceptor spacecraft uses GPS receiver data and data from the image processing payload, using visual markers mounted on the Target, to rendezvous within 10 meters of the Target spacecraft.

# Inspection & Fine Stationkeeping

The Interceptor spacecraft maneuvers to within 10 meters before conducting an inspection of the Target using the image processing payload. Fine stationkeeping is maintained at this distance for [TBD time 1].

# Second Docking Demonstration

Both spacecraft again use pointing control to achieve docking attitude before making contact.

Phase 2: Partial Non-Cooperative Rendezvous

Partial non-cooperative rendezvous deactivates some or all of the visual markers on the Target spacecraft. The Interceptor spacecraft still has access to data from the Target’s GPS receiver.

# Final Separation

The spacecraft separate for the final time and the Target deactivates the visual markers.

# Coarse Stationkeeping

The Interceptor spacecraft moves to the maximum stationkeeping distance and maintains coarse stationkeeping for [TBD time 2].

# Partial Non-Cooperative Rendezvous

The Interceptor uses data from the GPS receivers and from the image processing payloads to rendezvous within 10 meters of the Target, without the benefit of the visual markers.

# Inspection & Fine Stationkeeping

The Interceptor spacecraft maneuvers to within 10 meters before conducting an inspection of the Target using the image processing payload. Fine stationkeeping is maintained at this distance for [TBD time 1].

Phase 3: Non-Cooperative Rendezvous

Non-cooperative rendezvous deactivates all visual markers on the target spacecraft and its GPS receiver. The Interceptor must conduct rendezvous without any assistance from the Target spacecraft.

# Coarse Stationkeeping

The ground station commands the Target spacecraft to turn off its GPS receiver and activate the Non-Cooperative Mission Countdown as the Interceptor moves out to the maximum stationkeeping distance. Coarse stationkeeping is maintained for [TBD time 2]

# Non-Cooperative Rendezvous

The Interceptor spacecraft uses only the image processing payload without the benefit of any active visual markers to guide its approach to the Target.

# Inspection & Fine Stationkeeping

The Interceptor spacecraft maneuvers to within 10 meters before conducting an inspection of the Target using the image processing payload. Fine stationkeeping is maintained at this distance for [TBD time 1].

Phase 4: Extended Operations & End of Life

# Extended Operations

More proximity operations may be conducted if enough ΔV remains after completing the primary mission.

# End of Life

Both spacecraft fall back to Earth within 25 years