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Surveillance UAV SysML Project

By Alejandro Gastelum

System Engineering 401

Model Based System Engineering

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Imported Requirements –table view

ID	Specification
RQT_002	The AV shall have the capability to perform pre flight operations.
RQT_003	The AV shall be able to perform flight ops
RQT_004	The AV shall be able to perfom Mission Ops
RQT_004.1	The AV shall be able to perform Kill chain steps
RQT_A4.1.1	The AV shall have the capability to find a target.
RQT_A4.1.2	The AV shall have the capability to fix the target's location
RQT_A4.1.3	The AV shall have the capability to track a moving ground target
RQT_A4.1.4	The AV shall have the capability to pair other weapons system's to a target
RQT_A4.1.5	The AV shall have the capability to perform battle damage assessment
RQT_A4.2	The AV shall have the capability to perform Surveillance
RQT_A4.3	The AV shall have the capability to perform night ops
RQT_A5	The AV shall be able to perform Landing Operations
RQT_A4.2.1	The AV shall have the capability to perform broad area surveillance
RQT_A4.2.2	The AV shall have the capability to perform Detailed area surveillance
RQT_A4.2.3	The AV shall provide Laser targeting
RQT_A4.2.4	The AV shall provide Electro Optical camera
RQT_A4.3.1	The AV shall provide the capability to use thermal imaging camera.
RQT_G0	The Surveillance system shall contain a ground base to communicate with the AV.

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Imported Requirements –table view

ID	Specification
RQT_G1	The Ground Base shall perform Mission planning
RQT_G2	The Ground Base shall be able to perform Preflight operations
RQT_G3	The Ground Base shall be able to perform Departure Operations
RQT_G4	The Ground Base shall be able to communicate with the UAV
RQT_G4.1	The Ground Base shall be able to send C2 messages to the UAV
RQT_G4.2	The Ground Base shall be able to receive status messages from the UAV
RQT_G4.3	The Ground Base shall be able to receive imagery from the UAV
RQT_G5	The Ground Base shall be able to communicate with other agencies
RQT_G6	The Ground Base shall perform Mission Operations
RQT_G6.1	The Ground Base shall be able to control the image Sensors on the UAV
RQT_G6.2	The Ground Base shall be able to task the targeting sensors on the UAV
RQT_G6.3	The Ground Base shall be able to save images for one full mission
RQT_G7	The Ground Base shall be able to perform Post flight operations
RQT_S0	The system shall be capable of performing aerial surveillance, kill chain steps, gather intelligence.
RQT_TPM1	The AV shall have the capability to fly at 25000 feet of altitude.
RQT_TPM2	The AV shall have the capability to fly at 135 miles per hour.
RQT_TPM3	The AV shall have a Mission range of at least 2000 nm.
RQT_001	The AV shall be able to perform takeoff.

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Decomposed Requirements –table view

ID	Specification
	The Air Navigation Element shall perform fly to command
	The AV shall accept a takeoff command
	The Paylod Element shall perform Damage Assessment
	The Payload Element shall be able to find ground enemy
	The Payload Element shall be able to track ground enemy's movement
	The Payload Element shall be able to target ground enemy.
	The Air Comms Element shall broadcast a found entity status
	The Air Comms Element shall broadcast targeting data
	The Air Comms Element shall broadcast an entity's velocity
	The Air Comms Element shall broadcast an entity's location
	The Air Comms Element shall broadcast damage assessment

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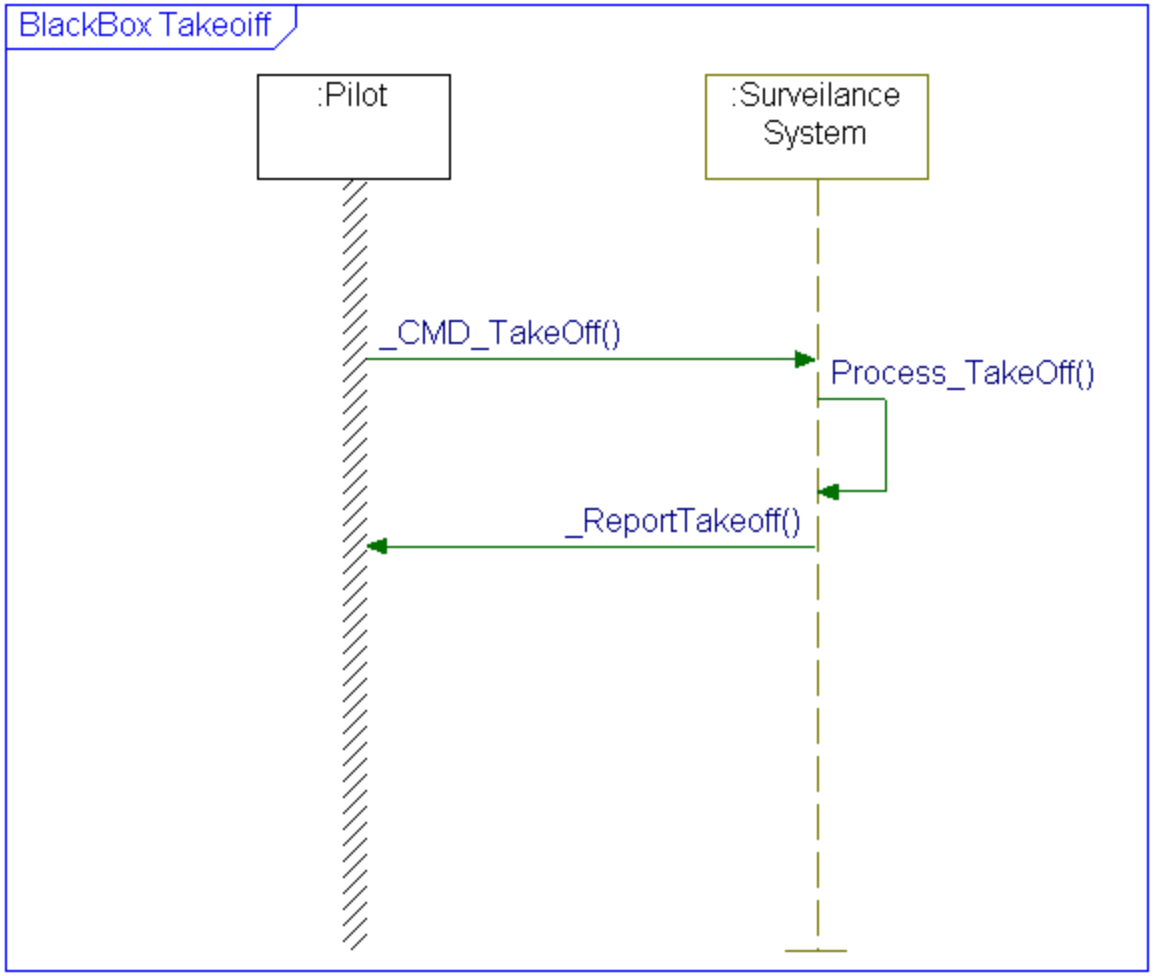
Black Box Takeoff Sequence D.



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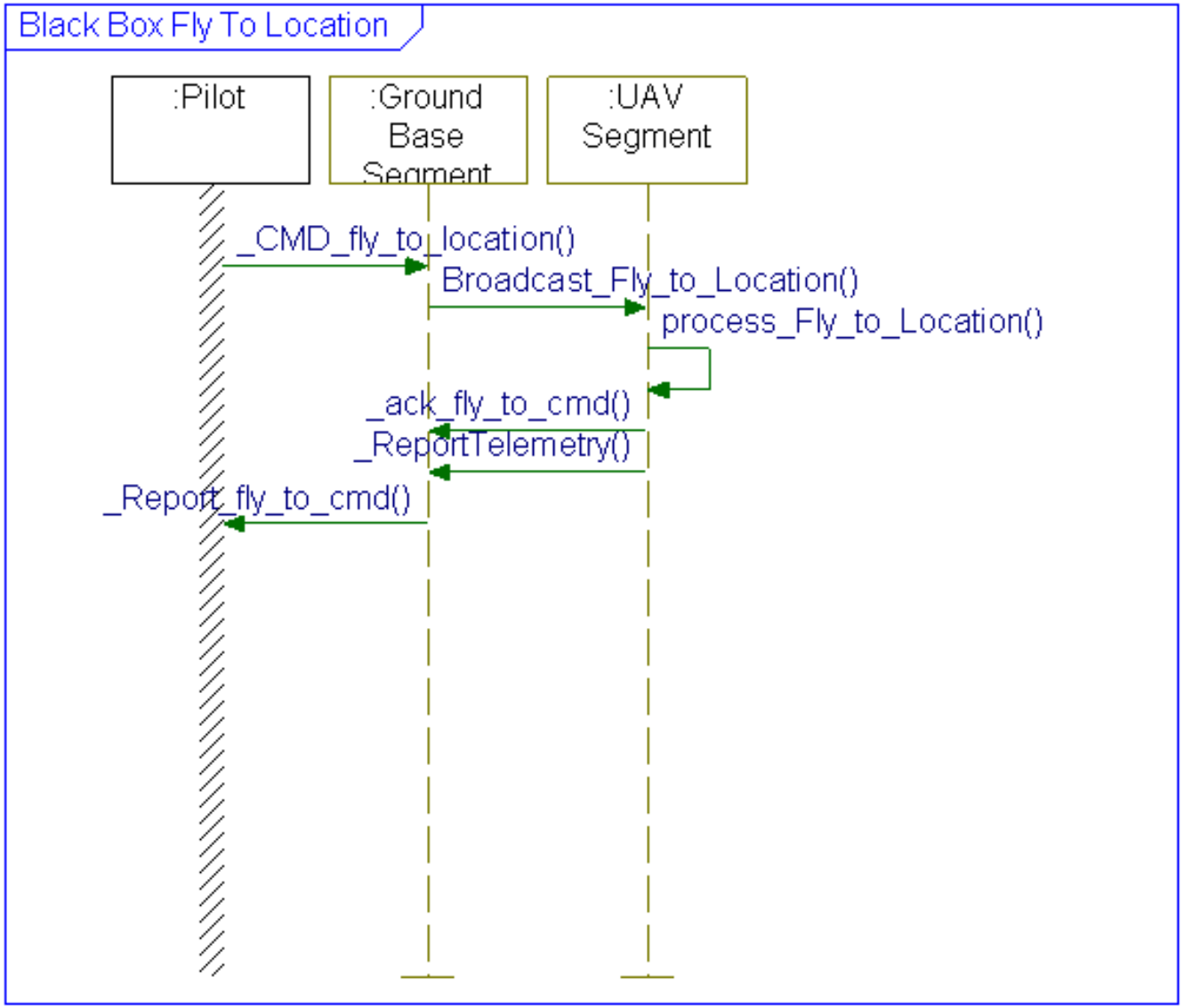
Black Box Fly to Sequence D.



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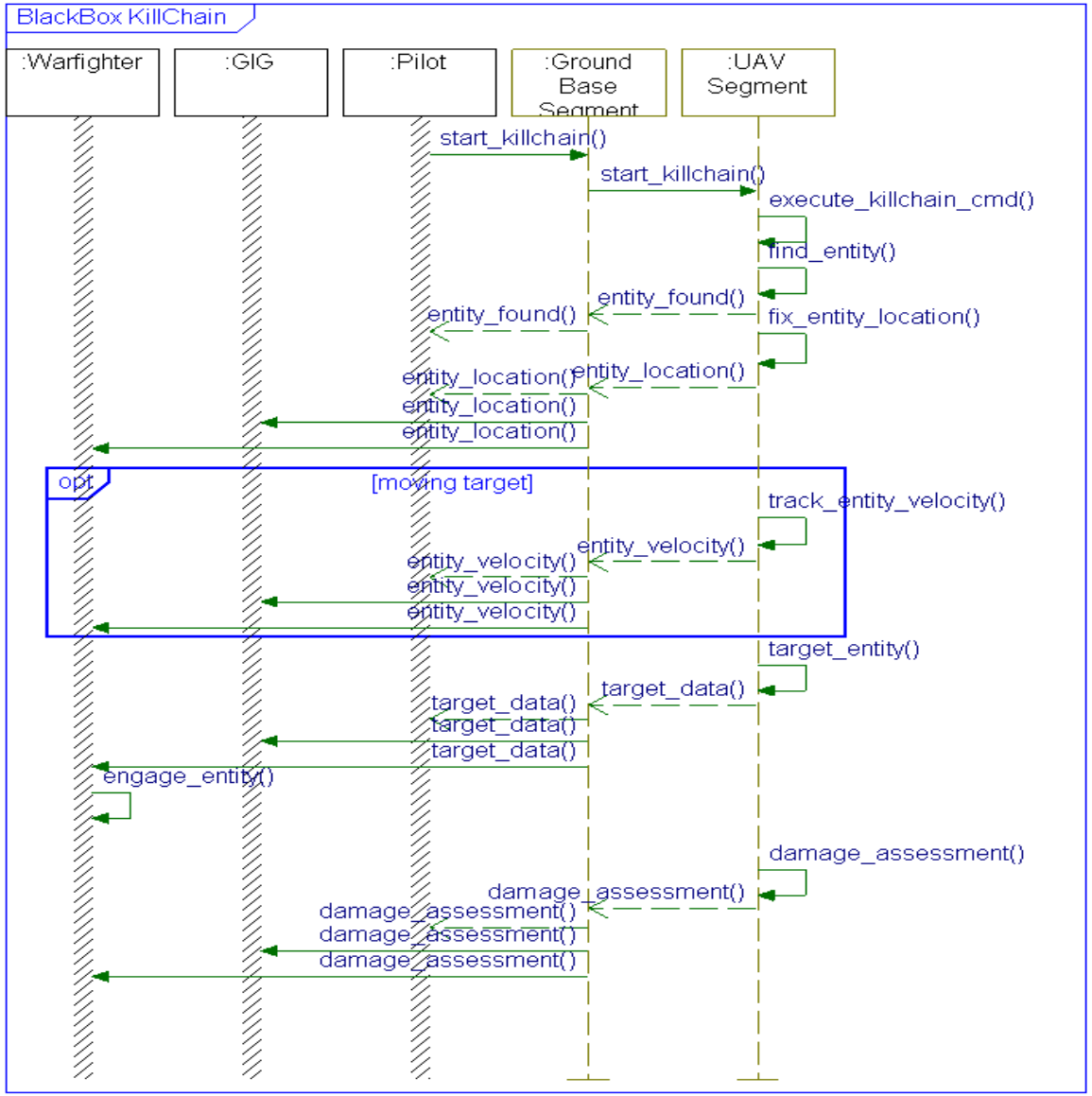
Black Box Kill Chain Sequence D.



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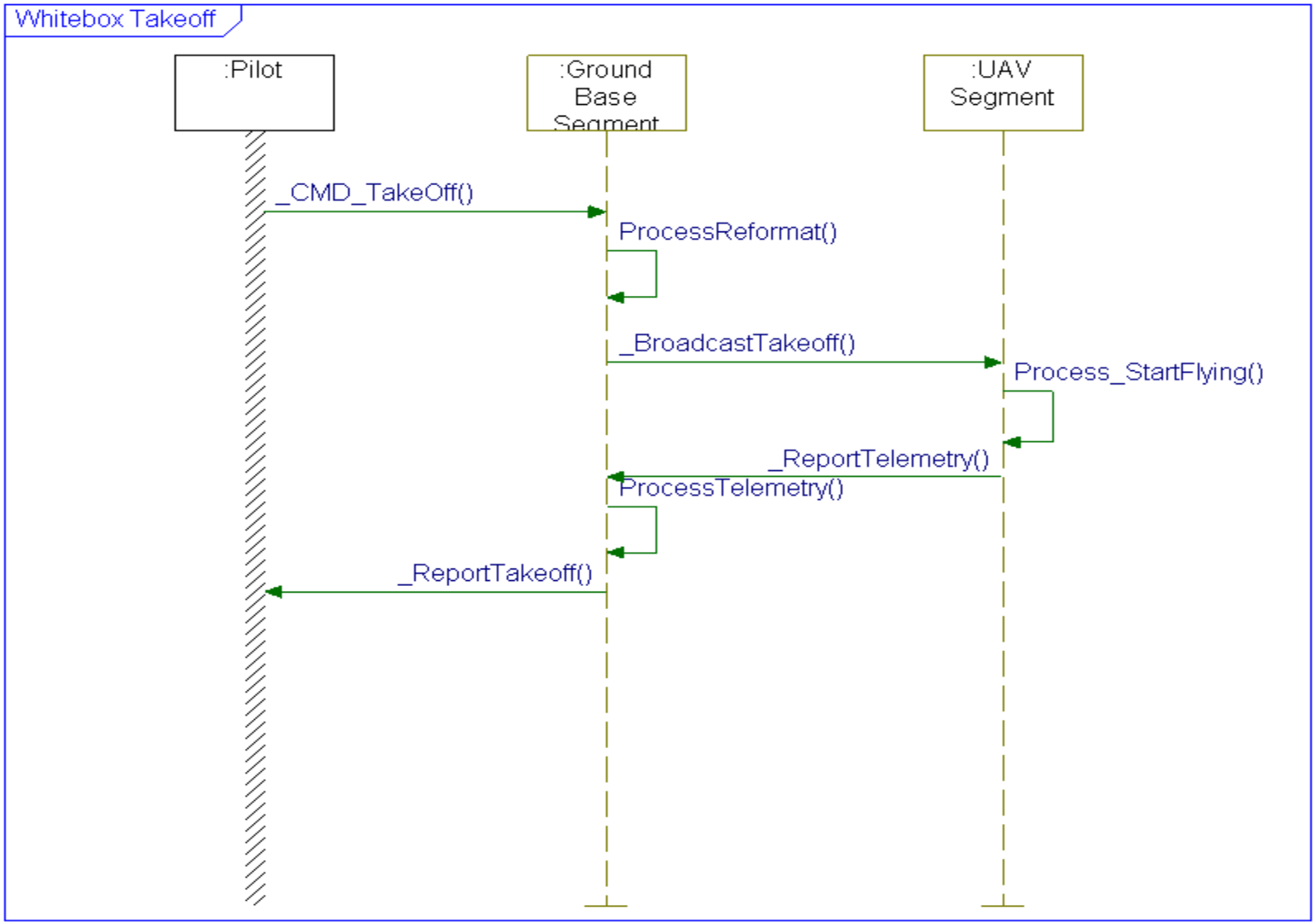
White Box Takeoff Sequence D.



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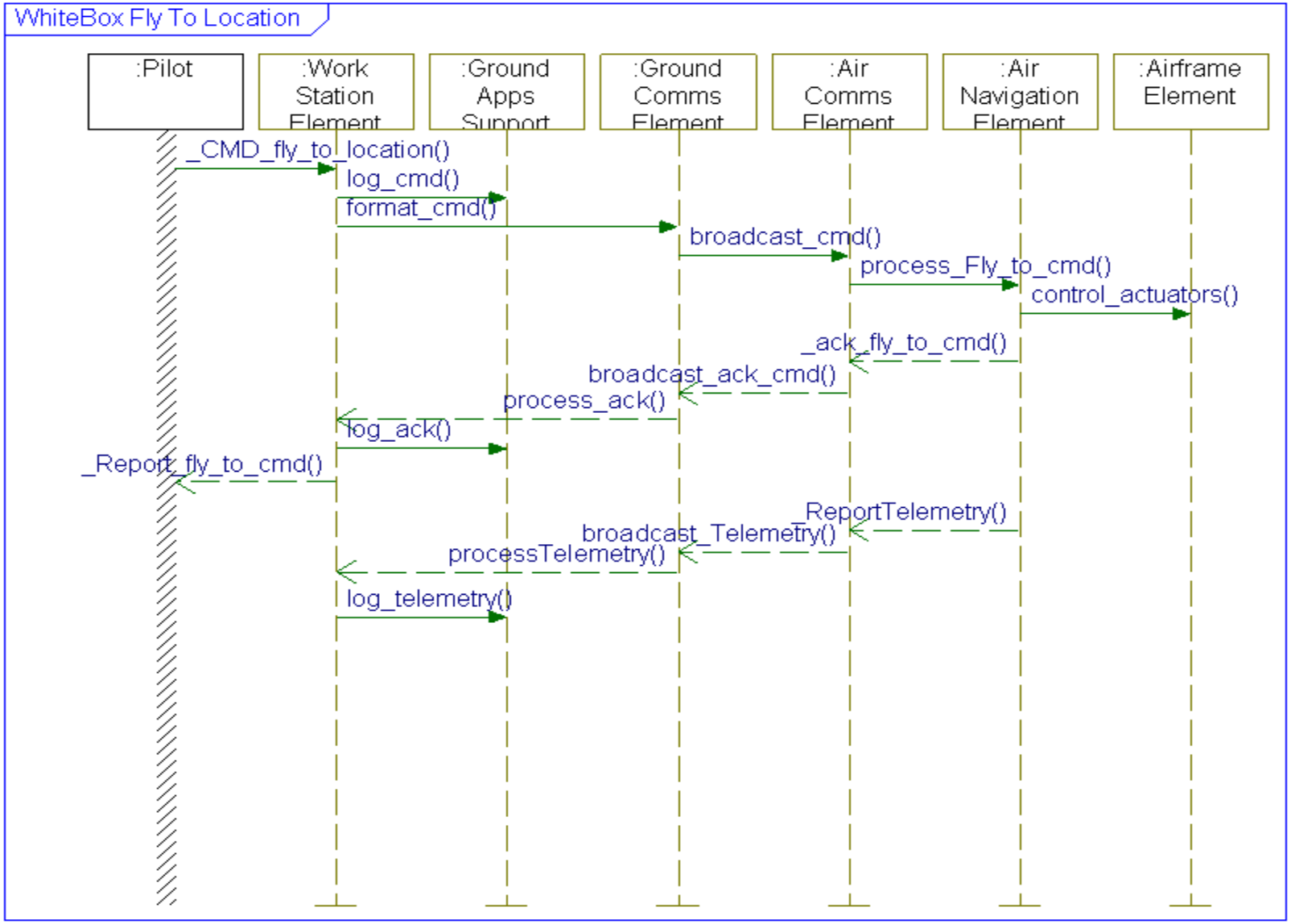
White Box Fly to Sequence D.



White Box Kill Chain Sequence

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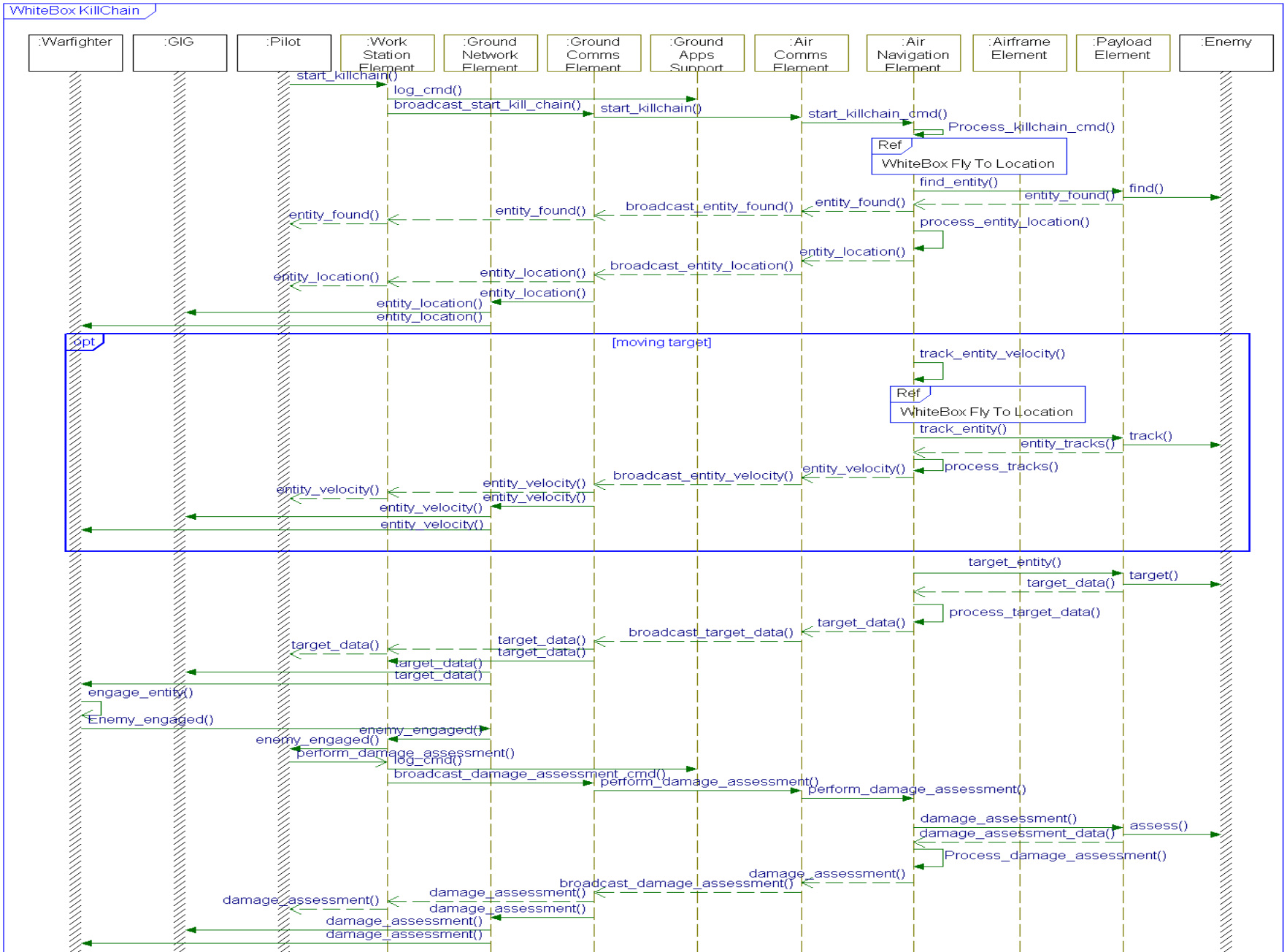

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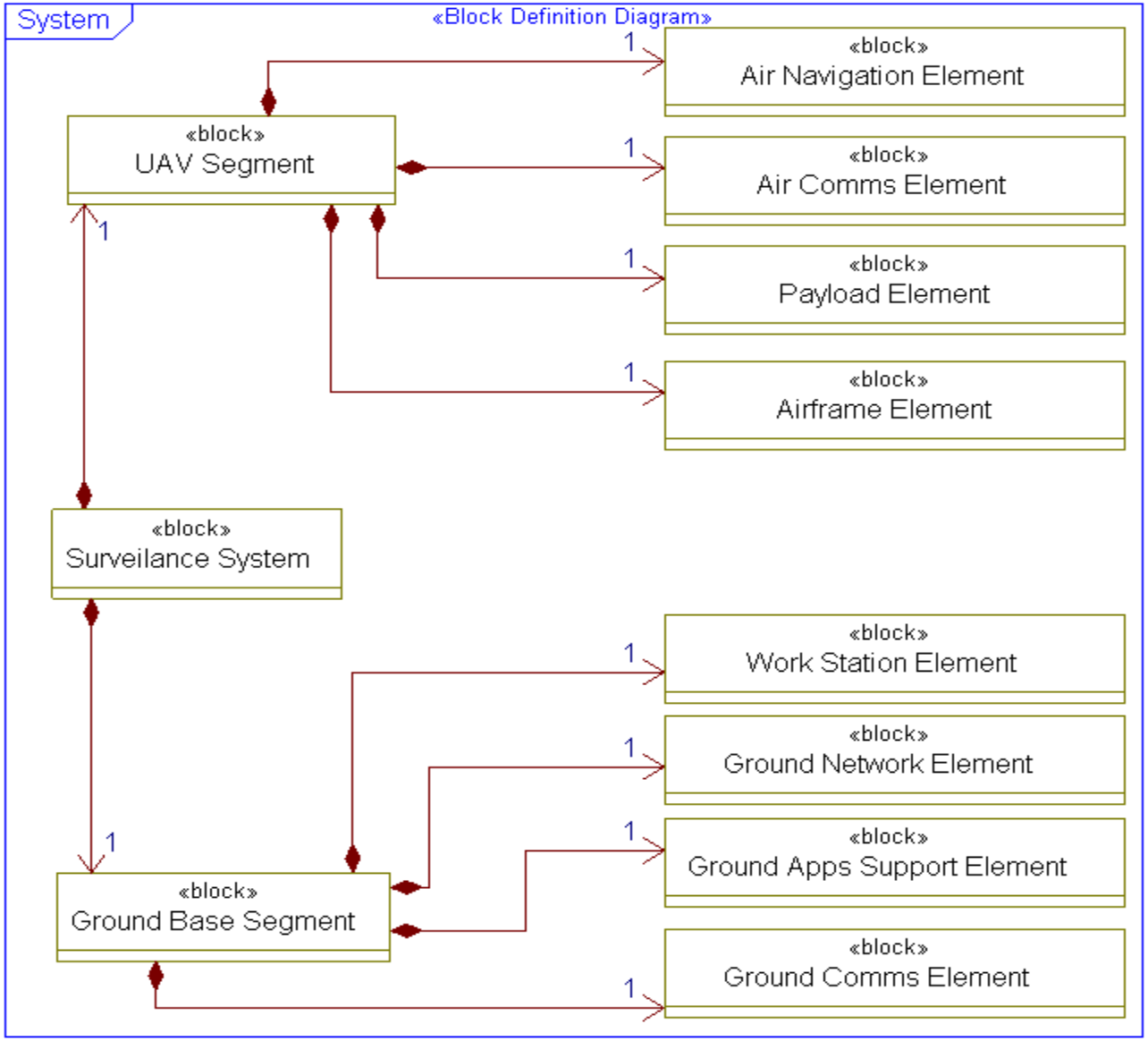
System BDD



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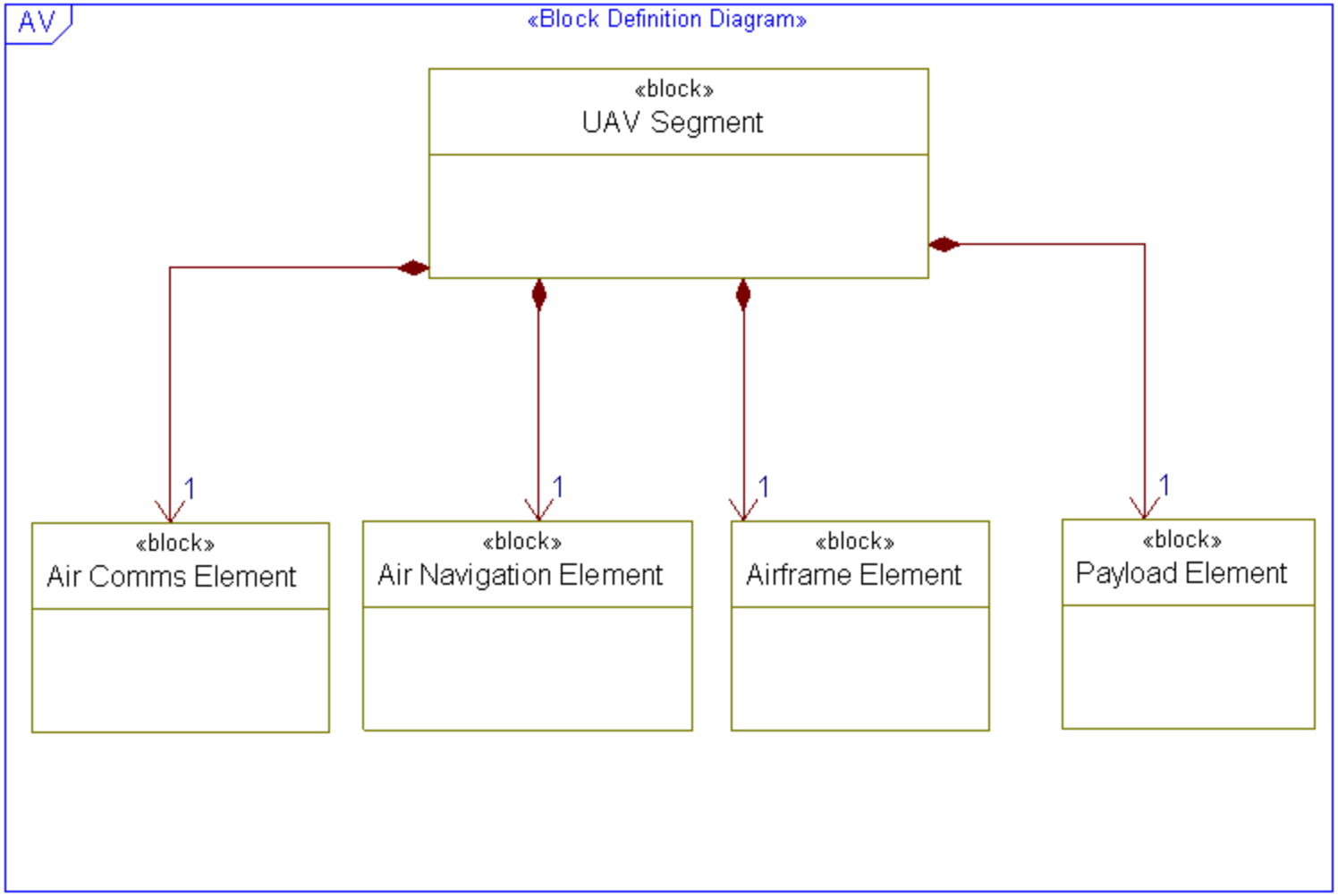
AV BDD



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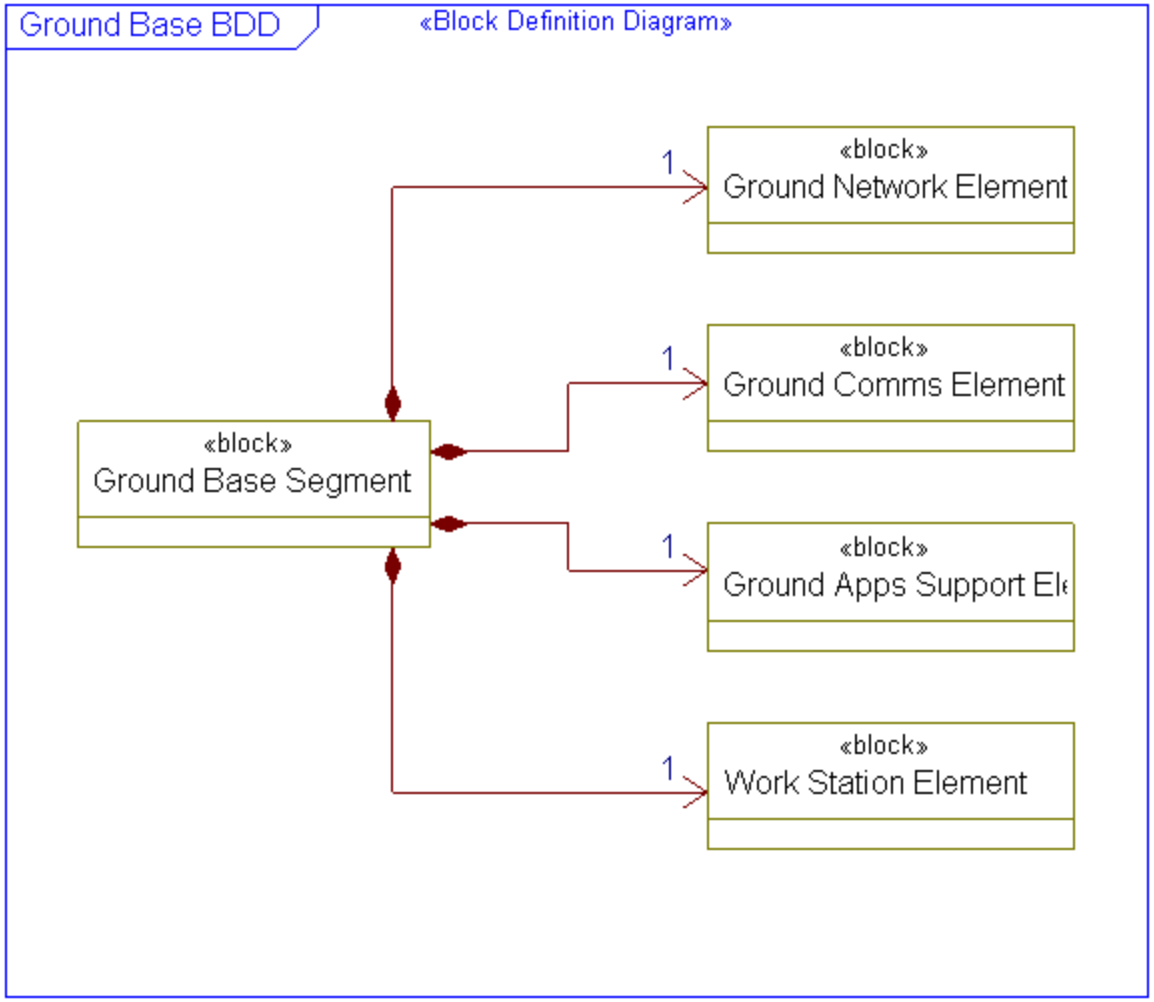
Ground BaseBDD



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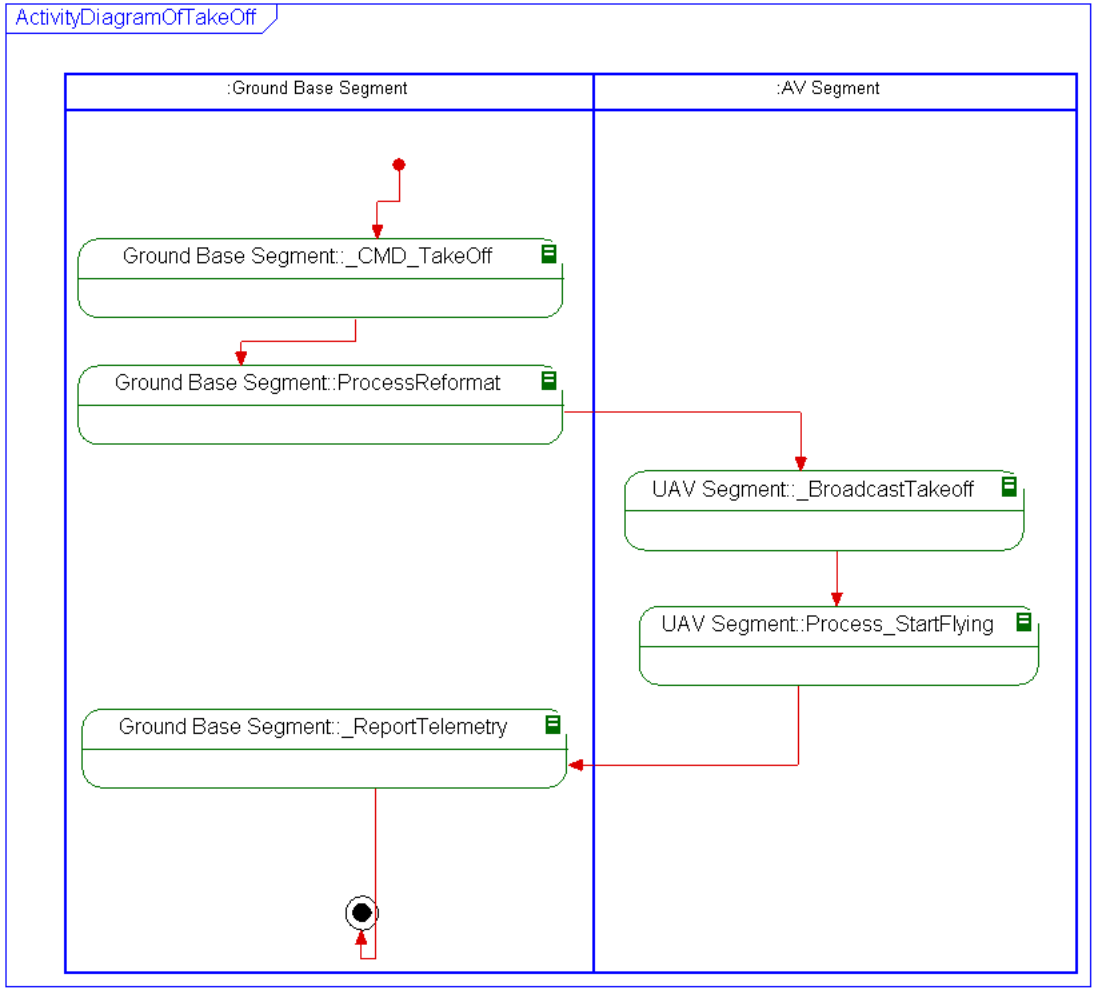
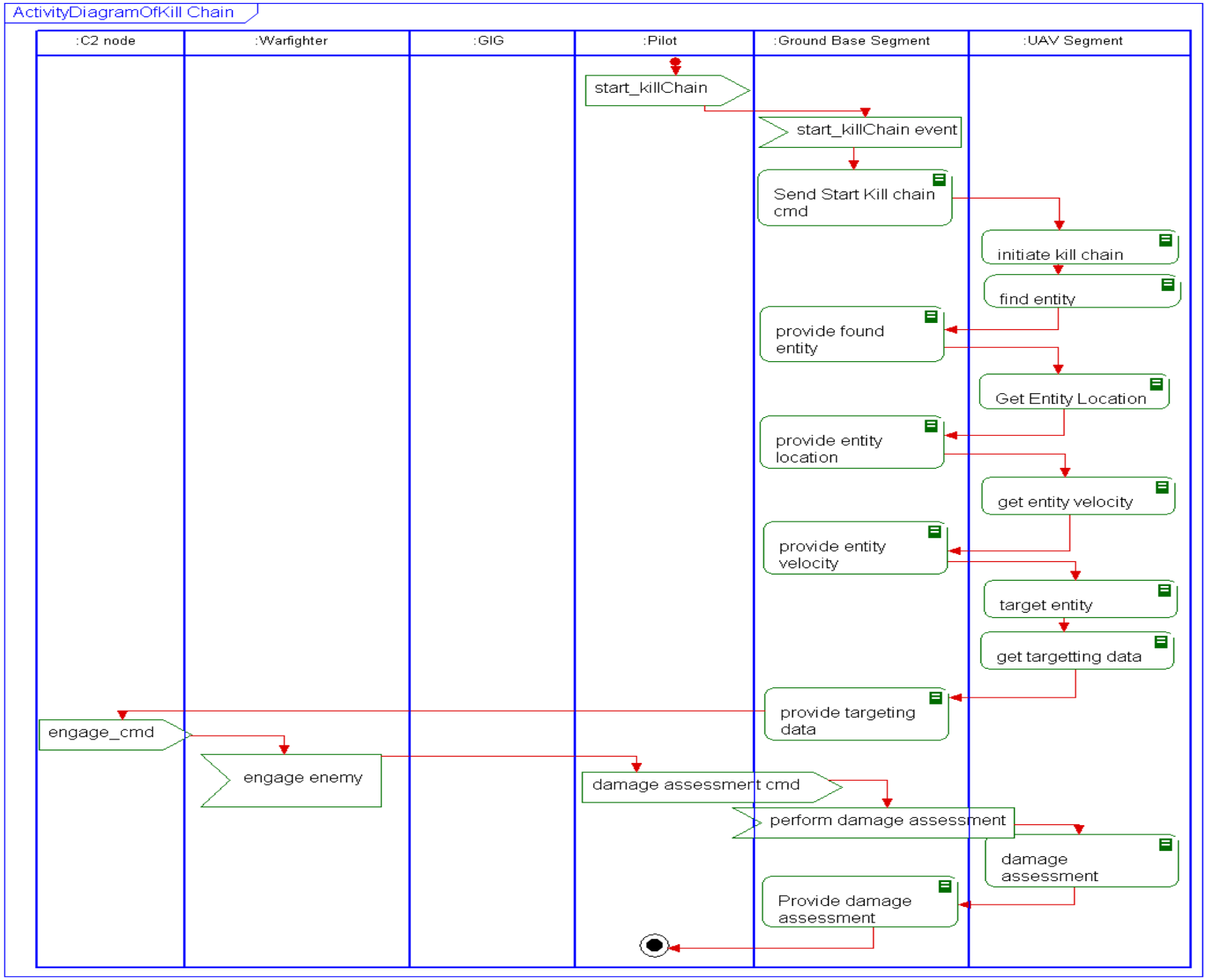
Take Off Activity Diagram



Kill Chain Activity Diagram



Fly To Derived Requirement D.

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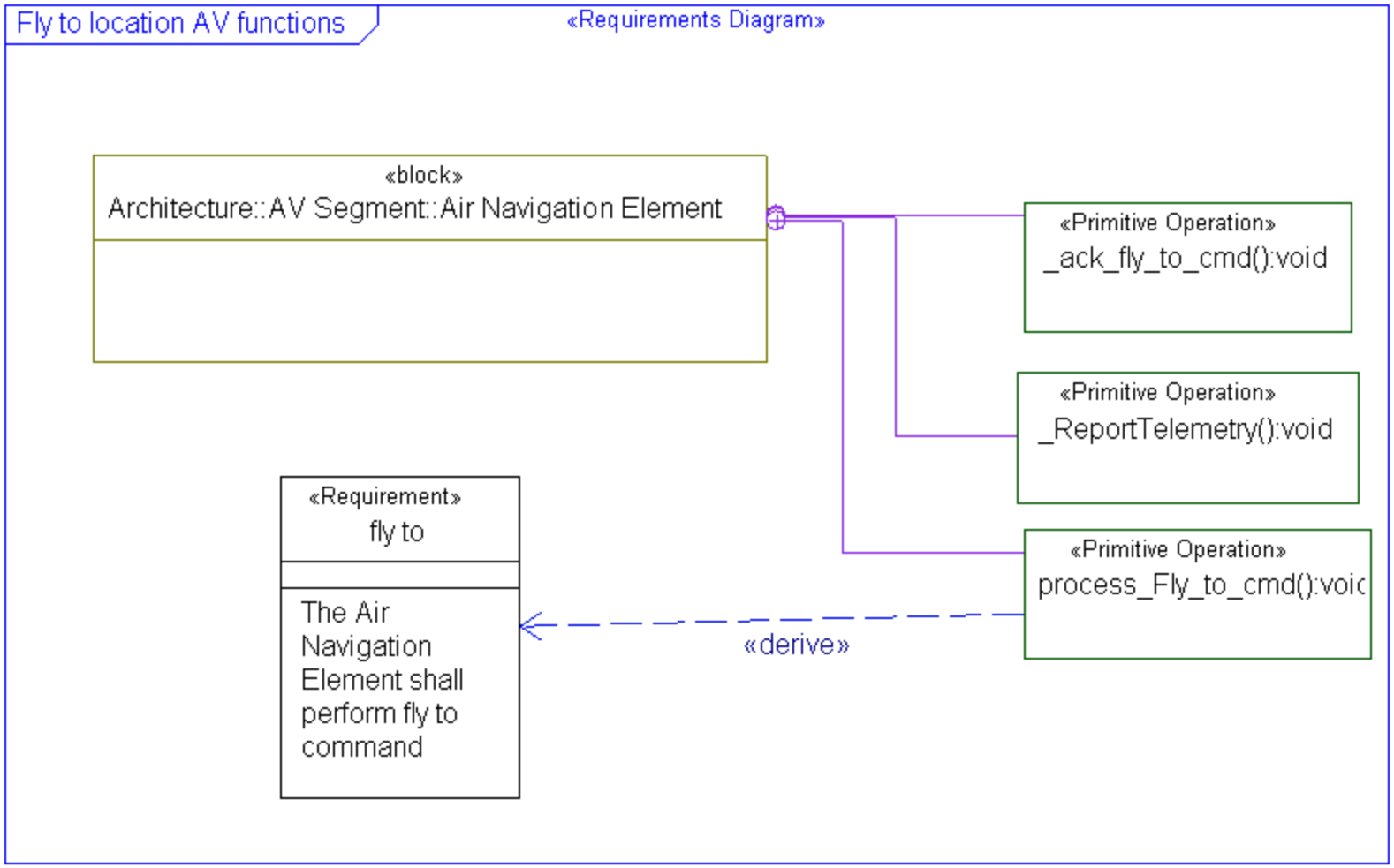

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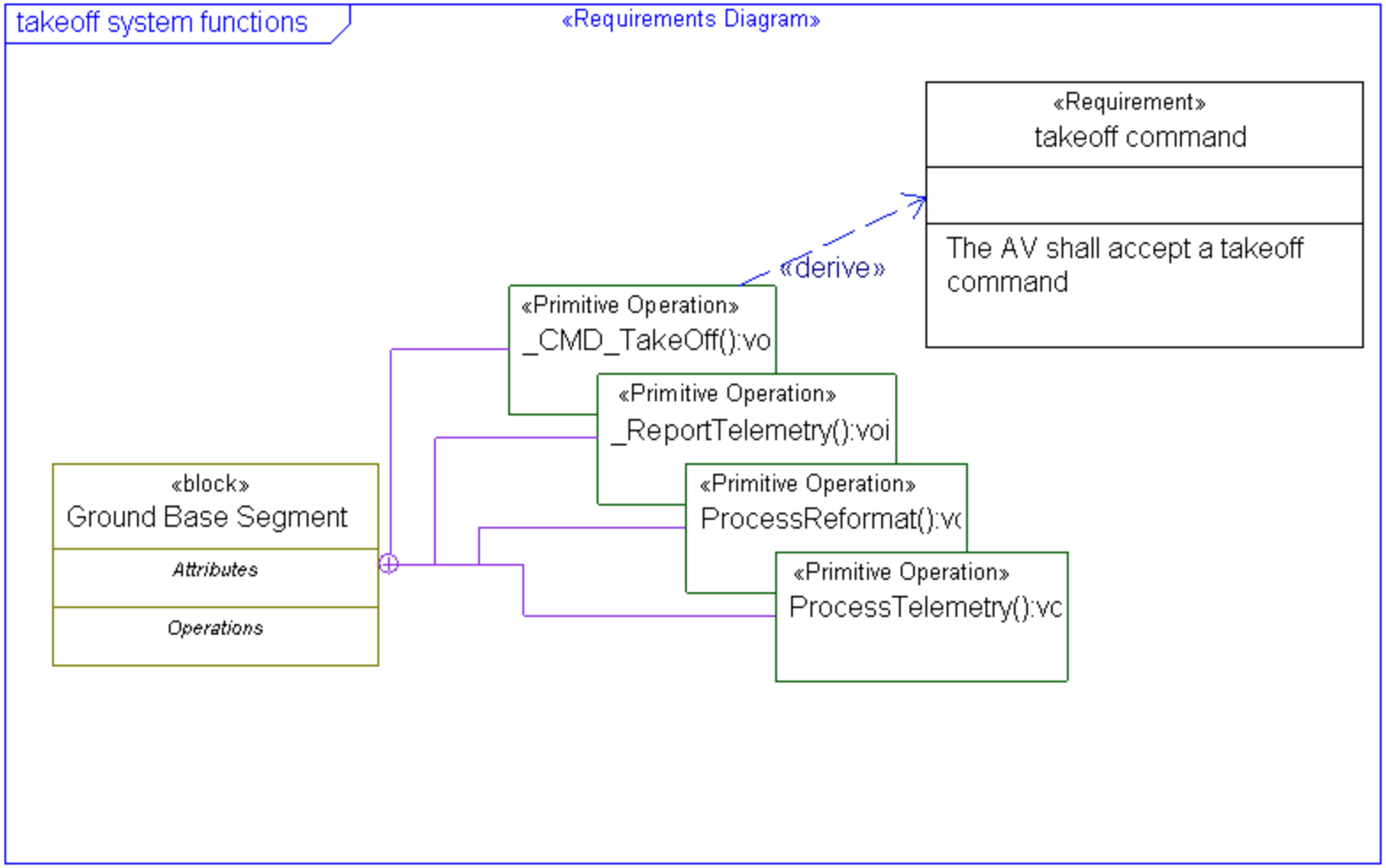
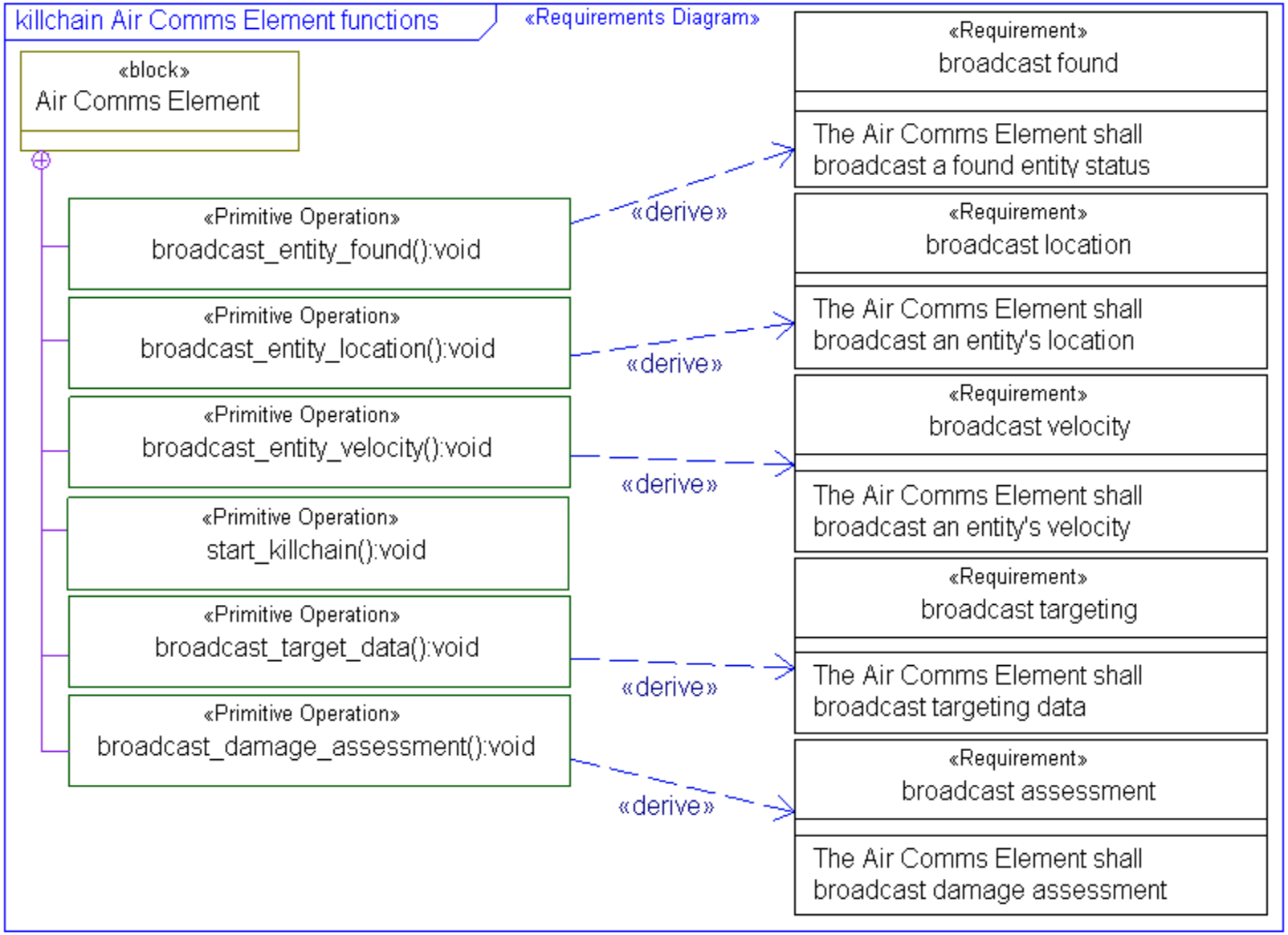
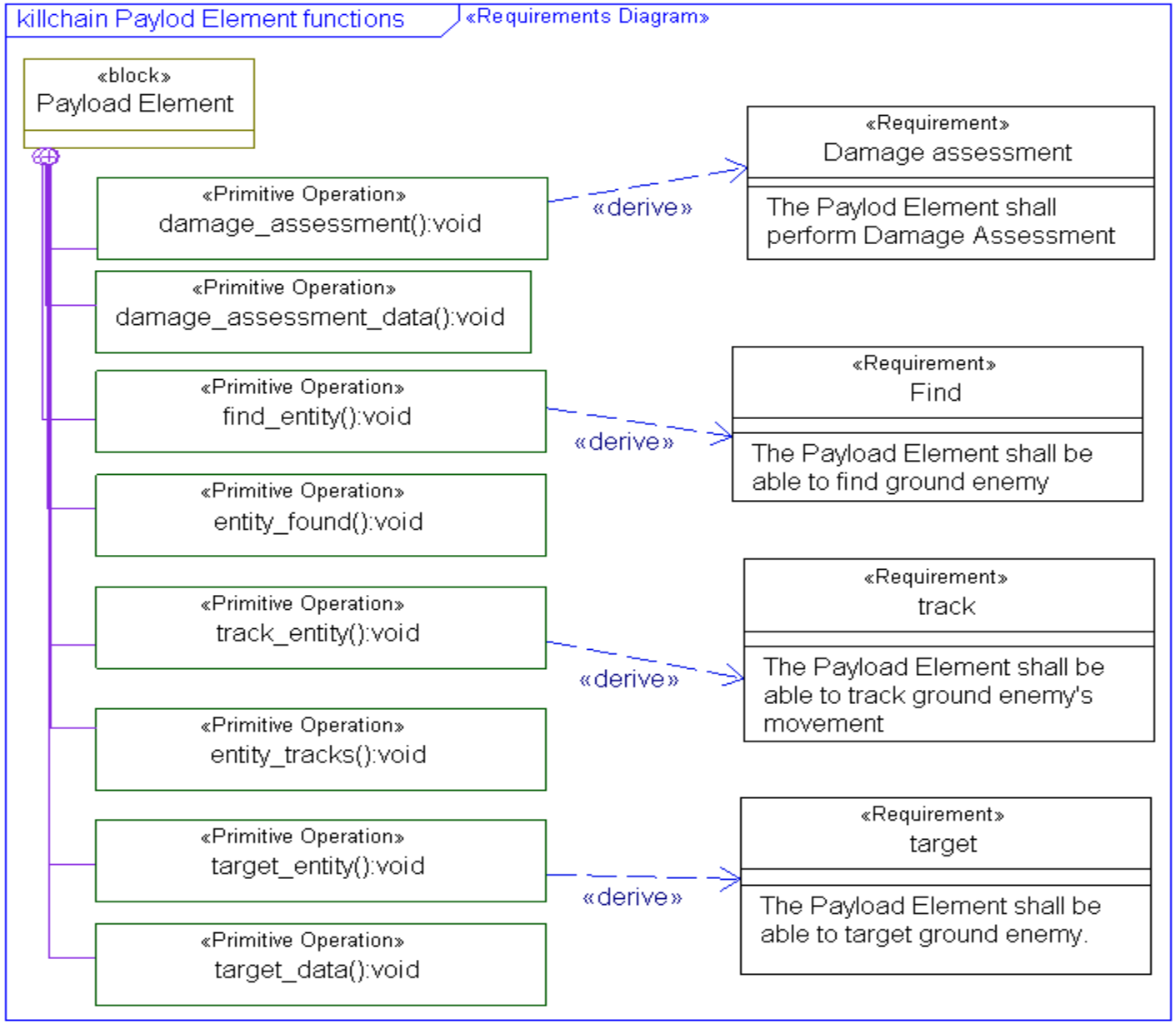


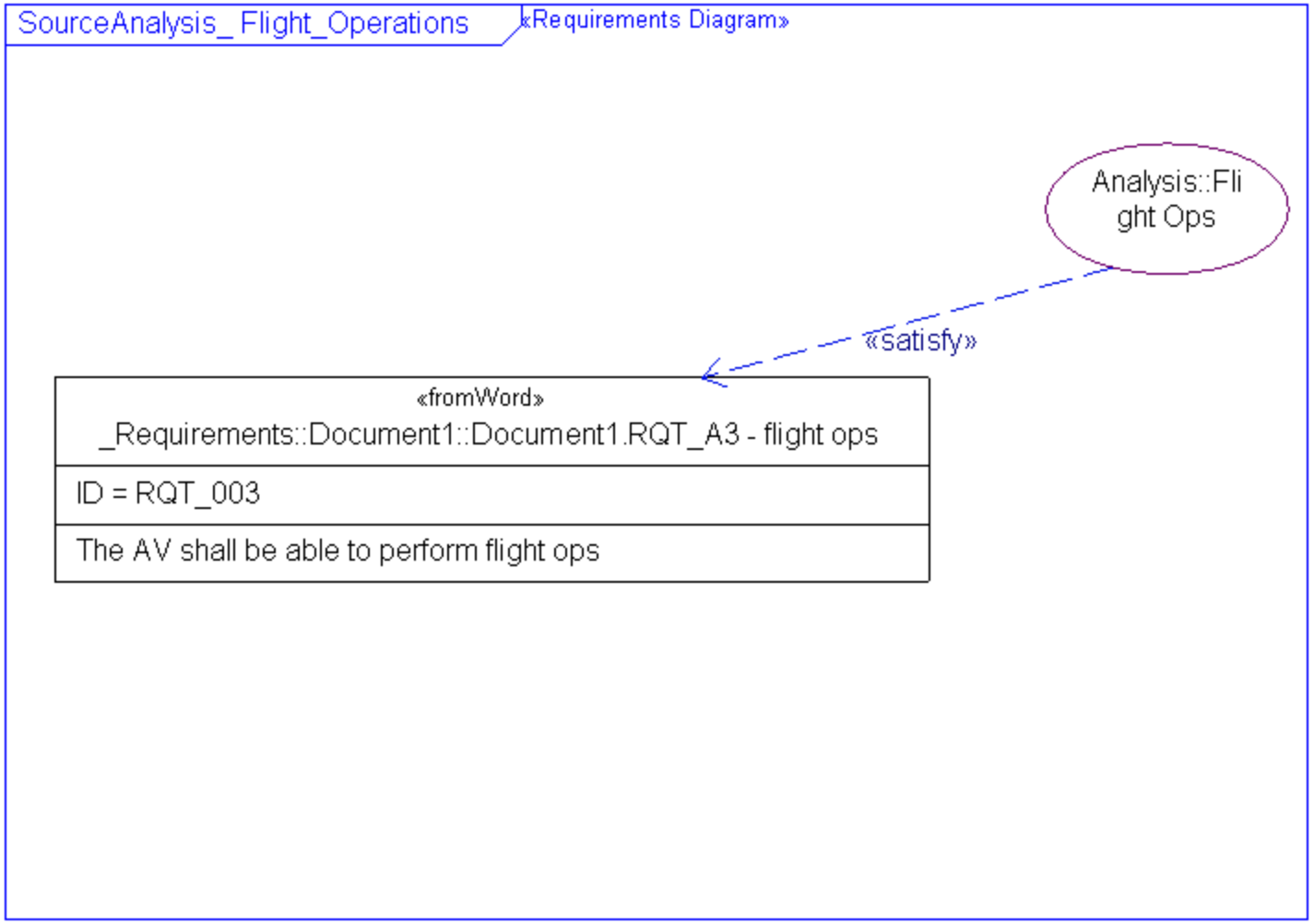
Kill Chain Air Comm Derived Requirement



Kill Chain Payloads Derived Requirement D.



Flight Ops Satisfy Requirement D.



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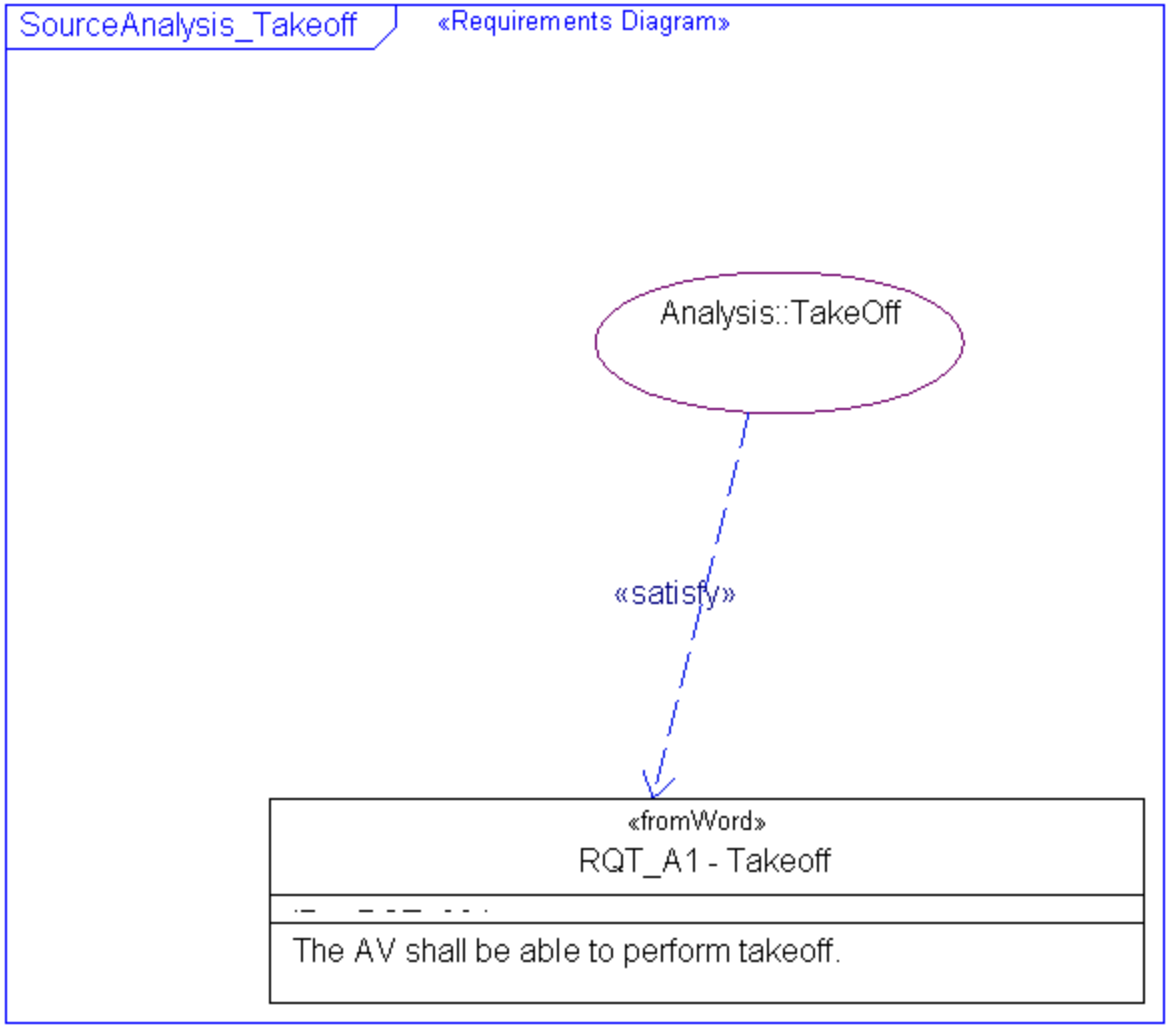
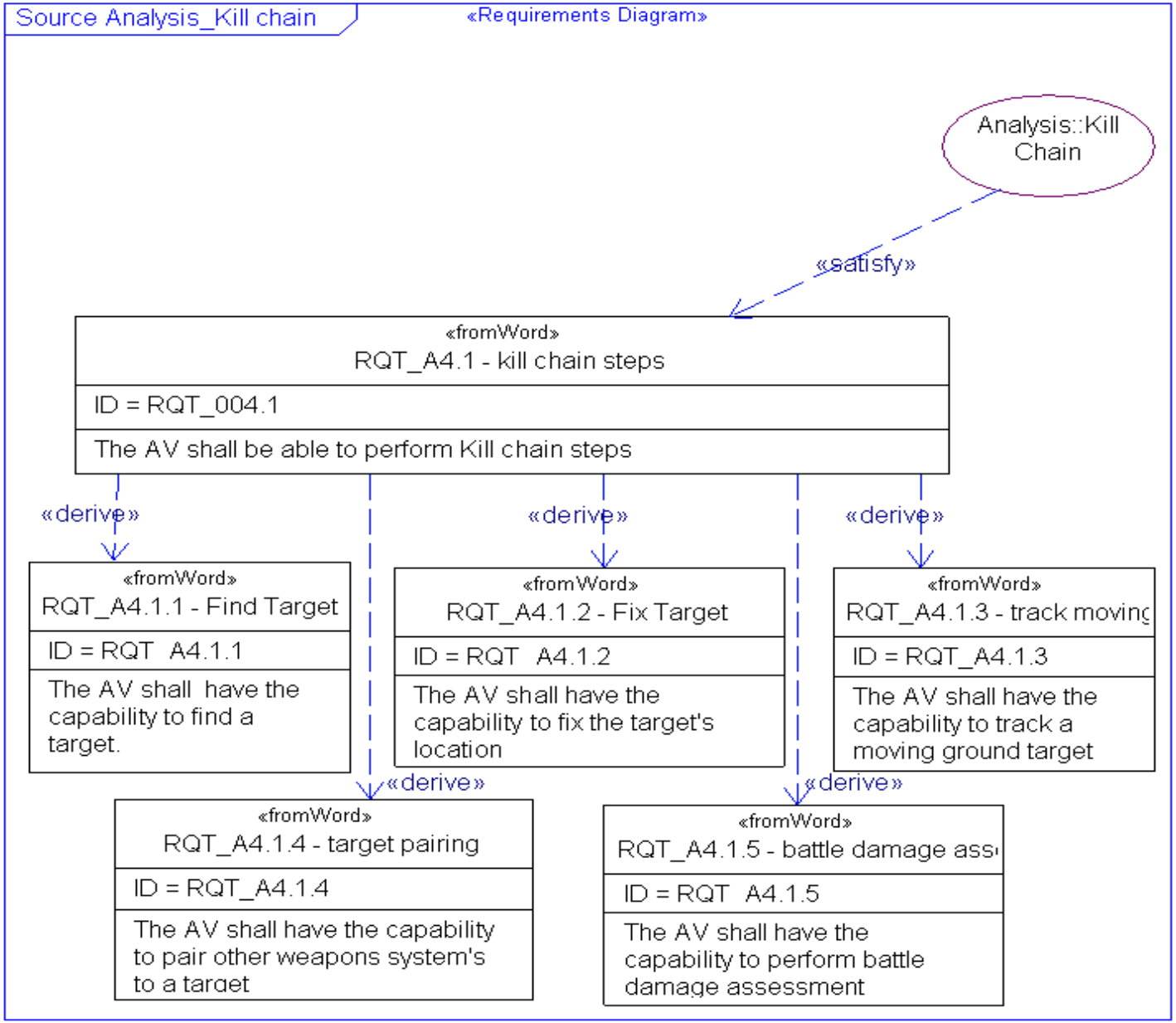


Kill Chain Air Comms Satisfy Requirement D



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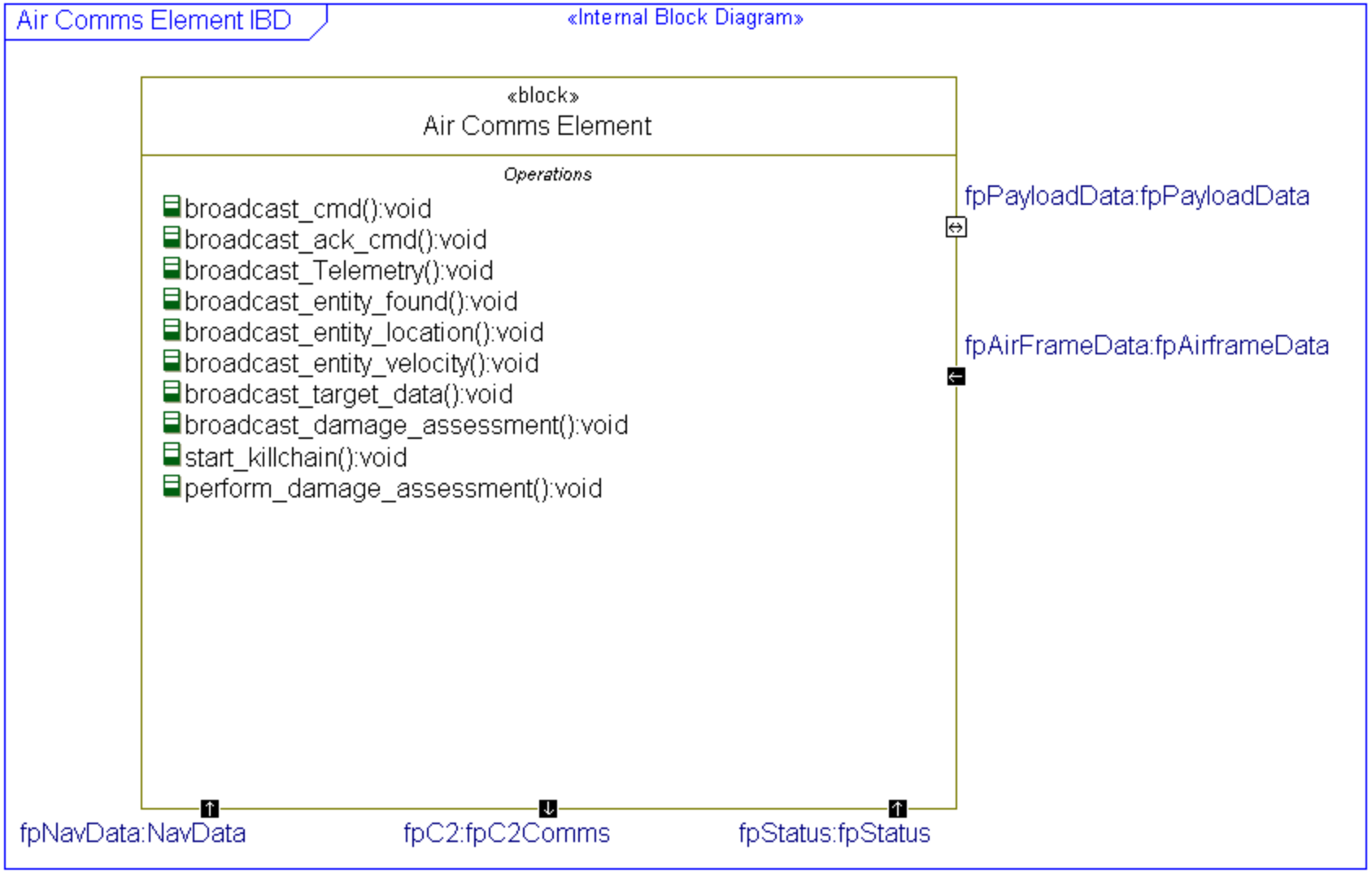
IBD Air Comms



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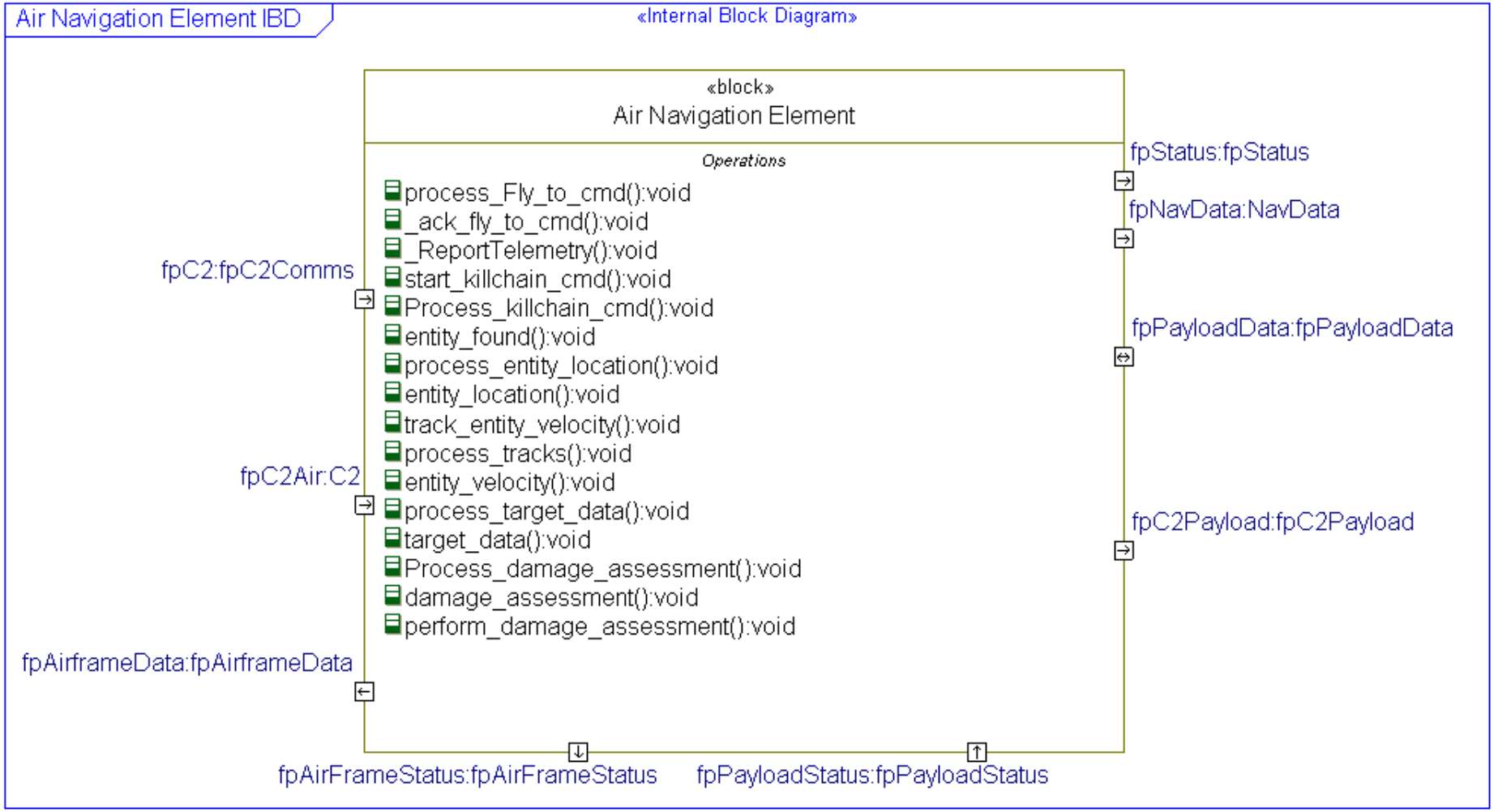
IBD Air Navigation



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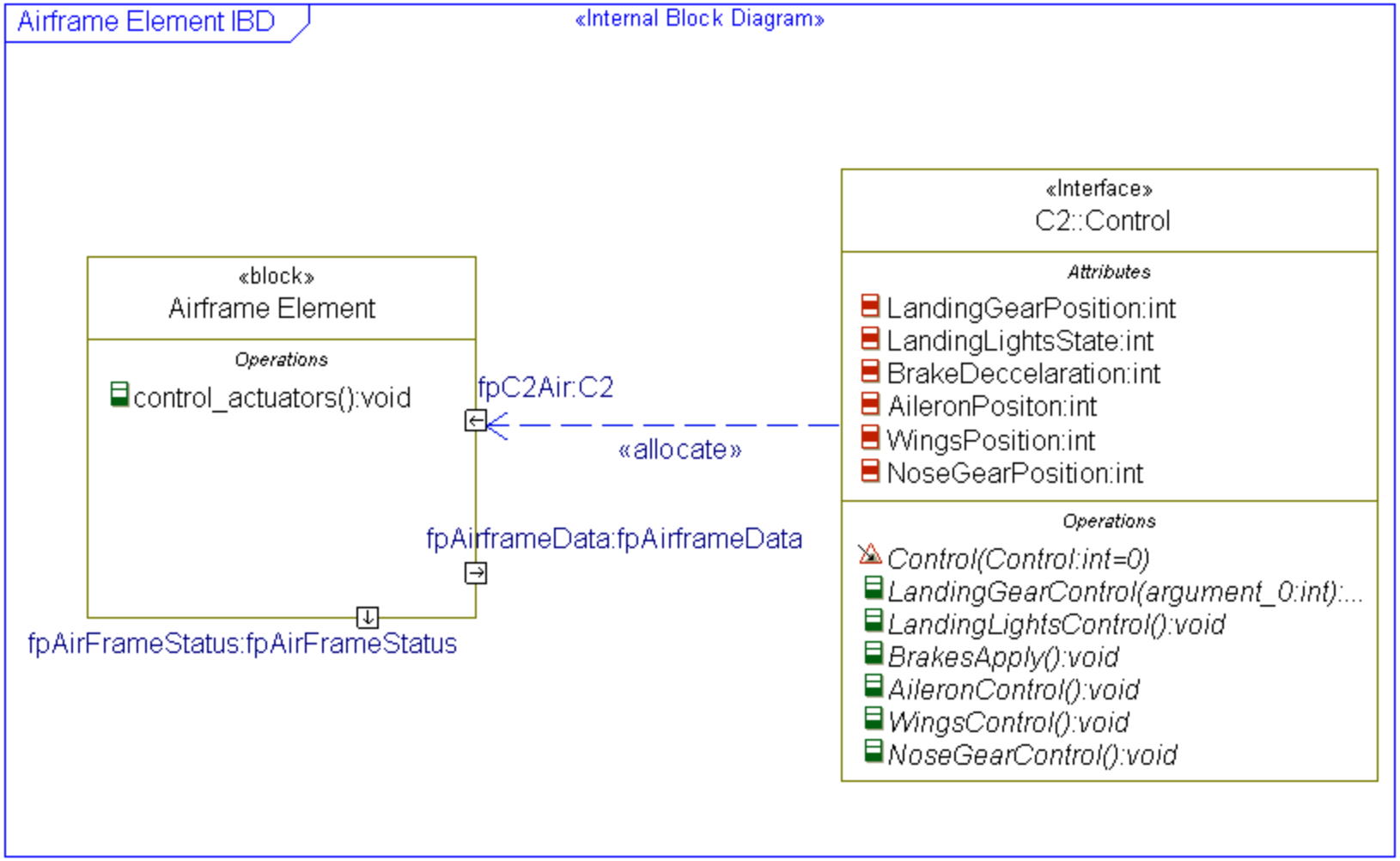
Airframe Flow Port Interface



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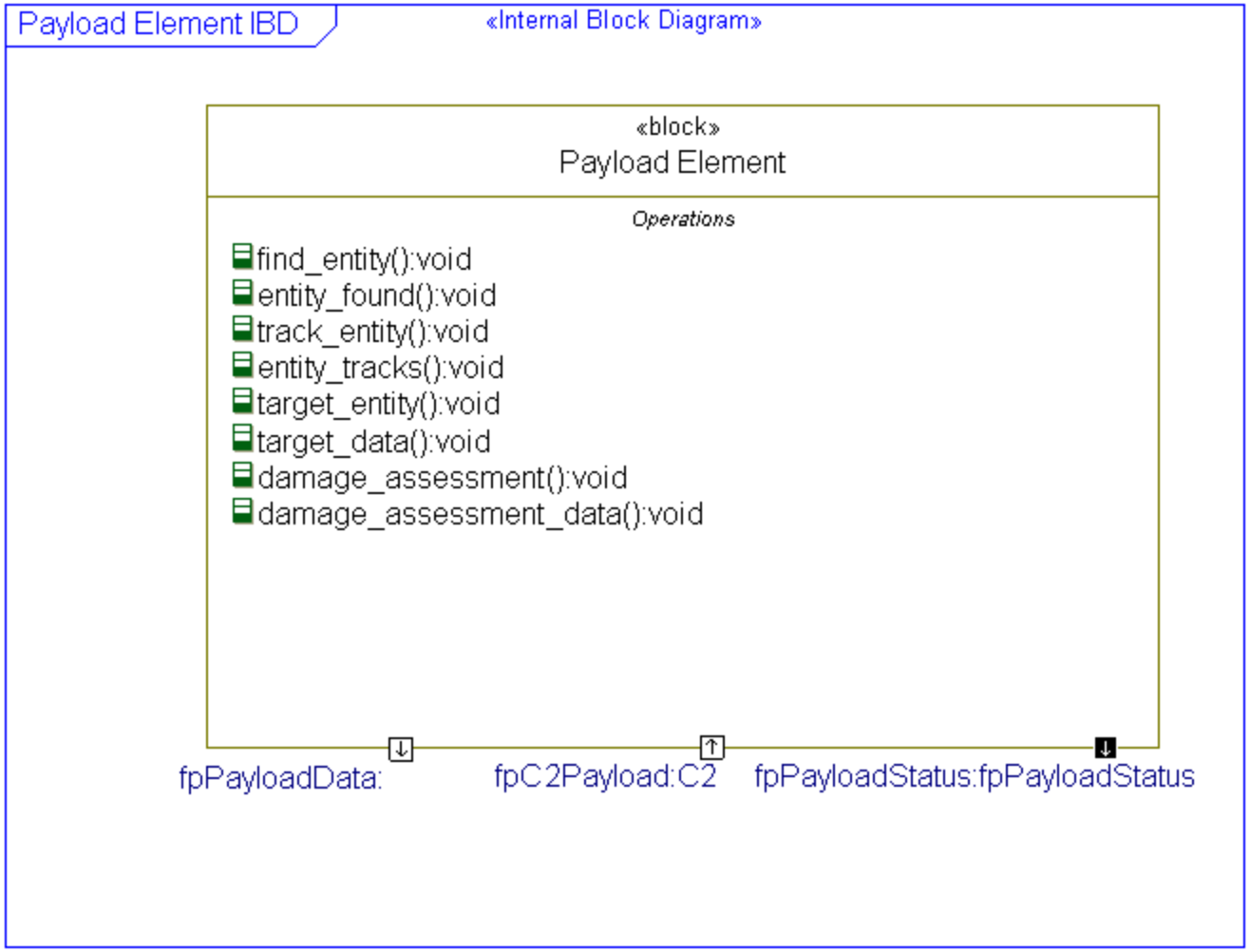
IBD Payload



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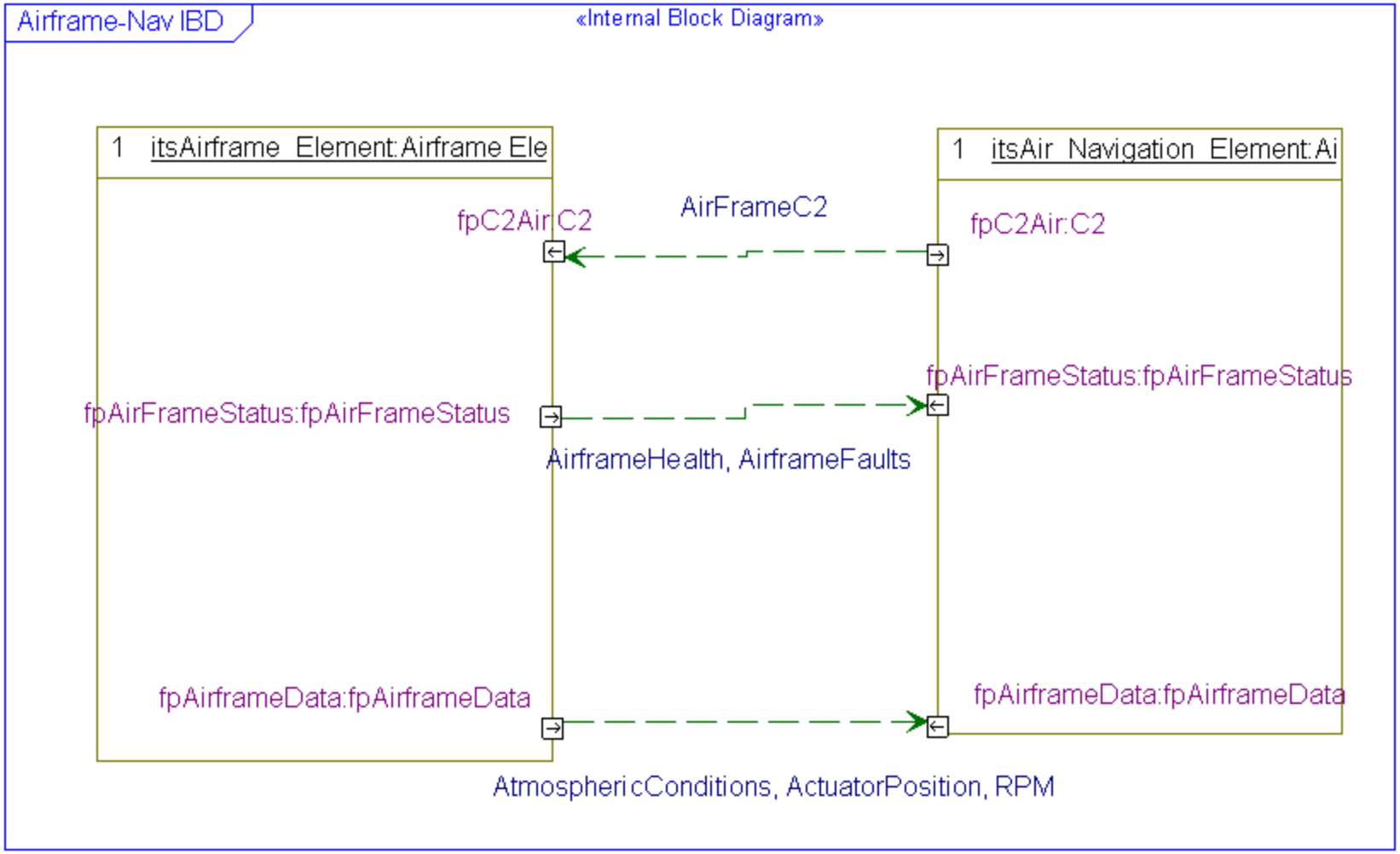
Airframe – Navigation Flow Ports



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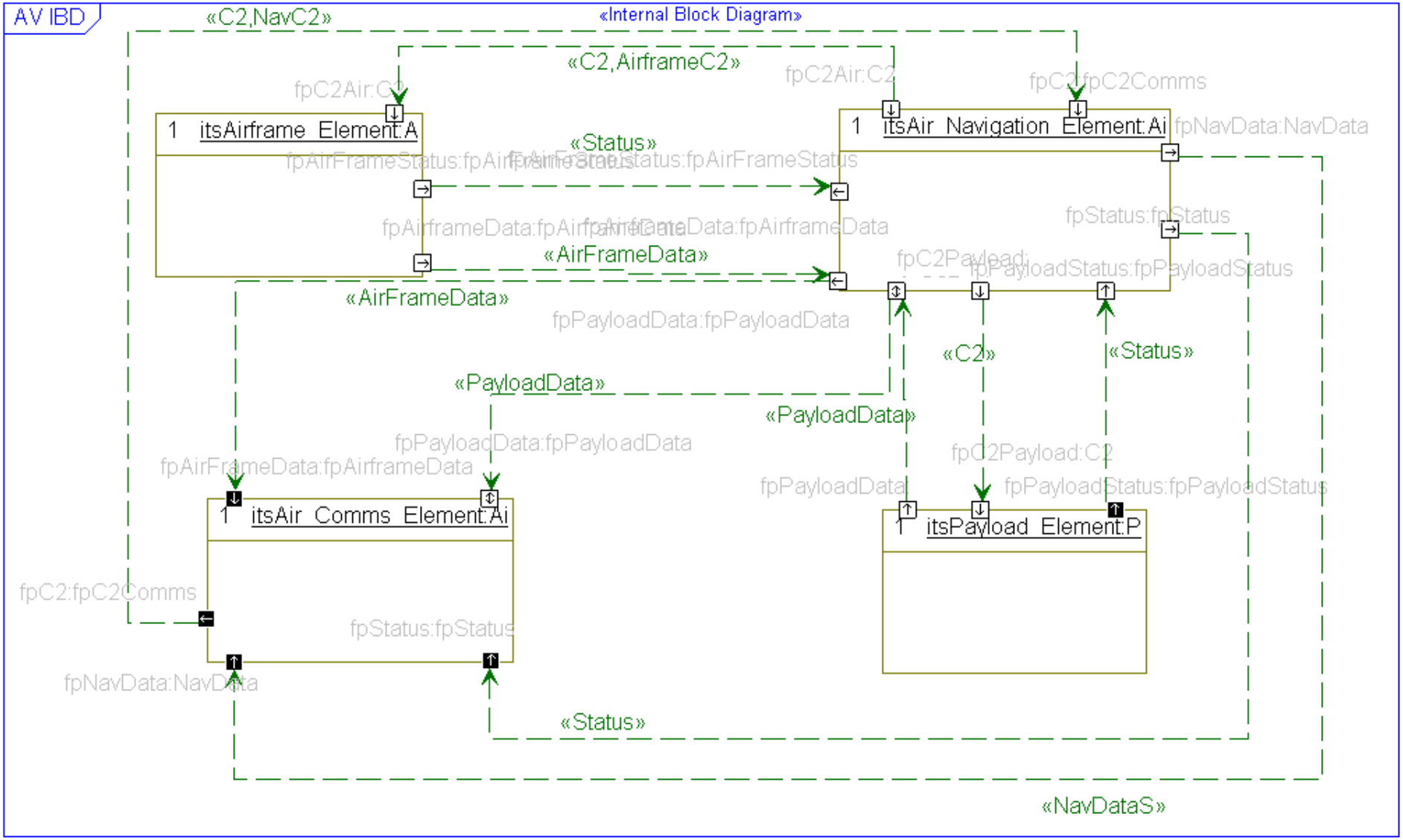
AV Flow Specification



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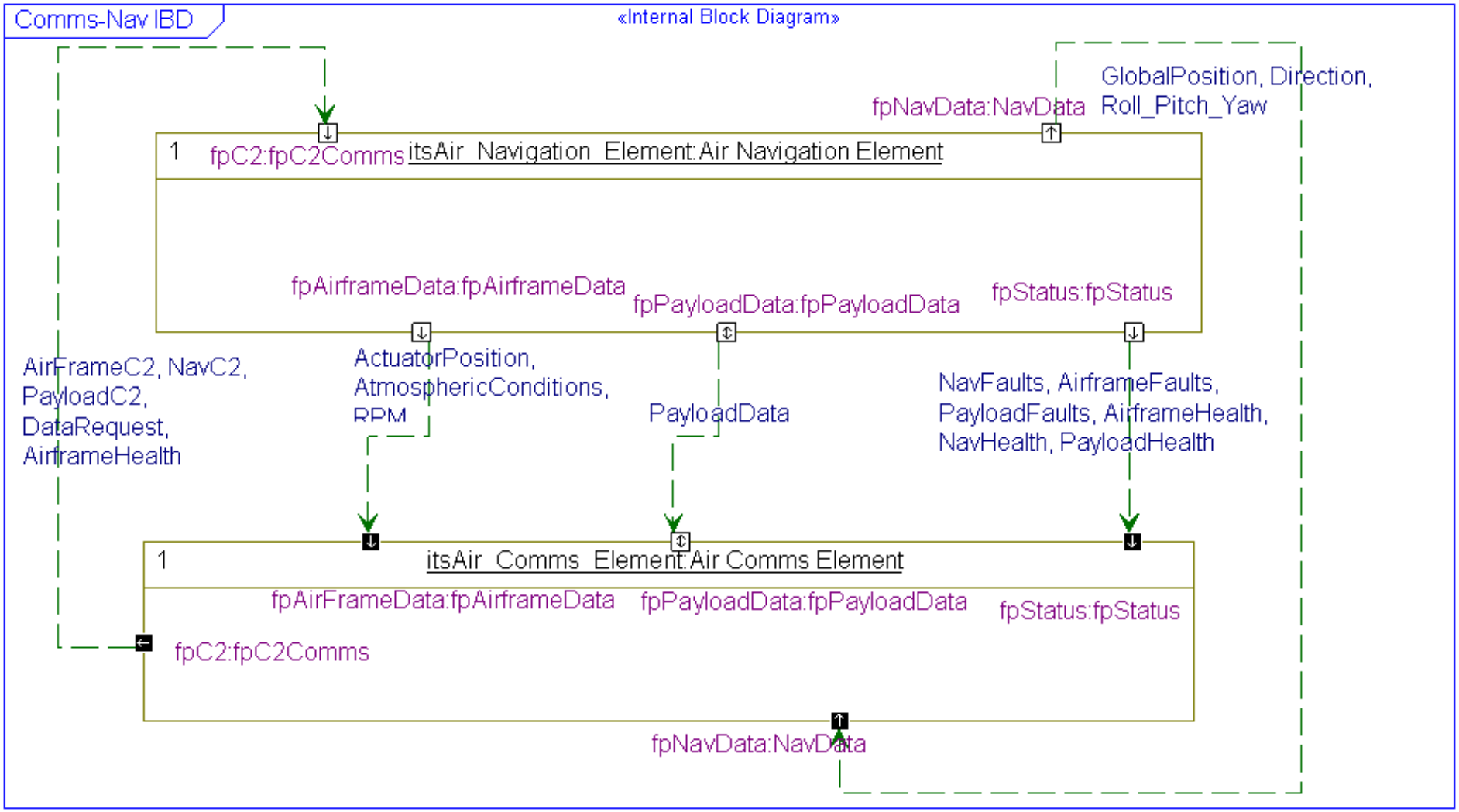
Comms – Navigation Flow Ports



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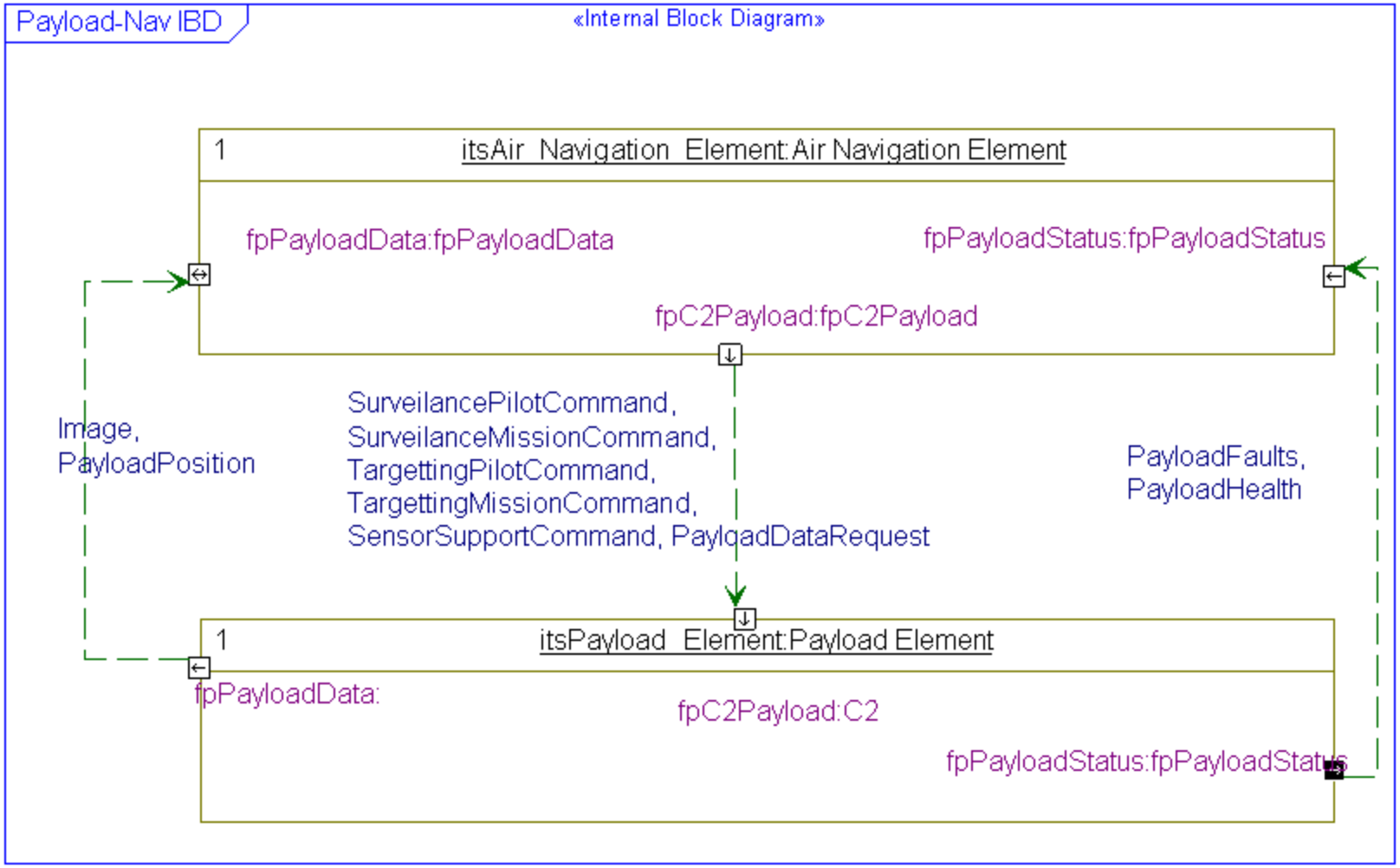
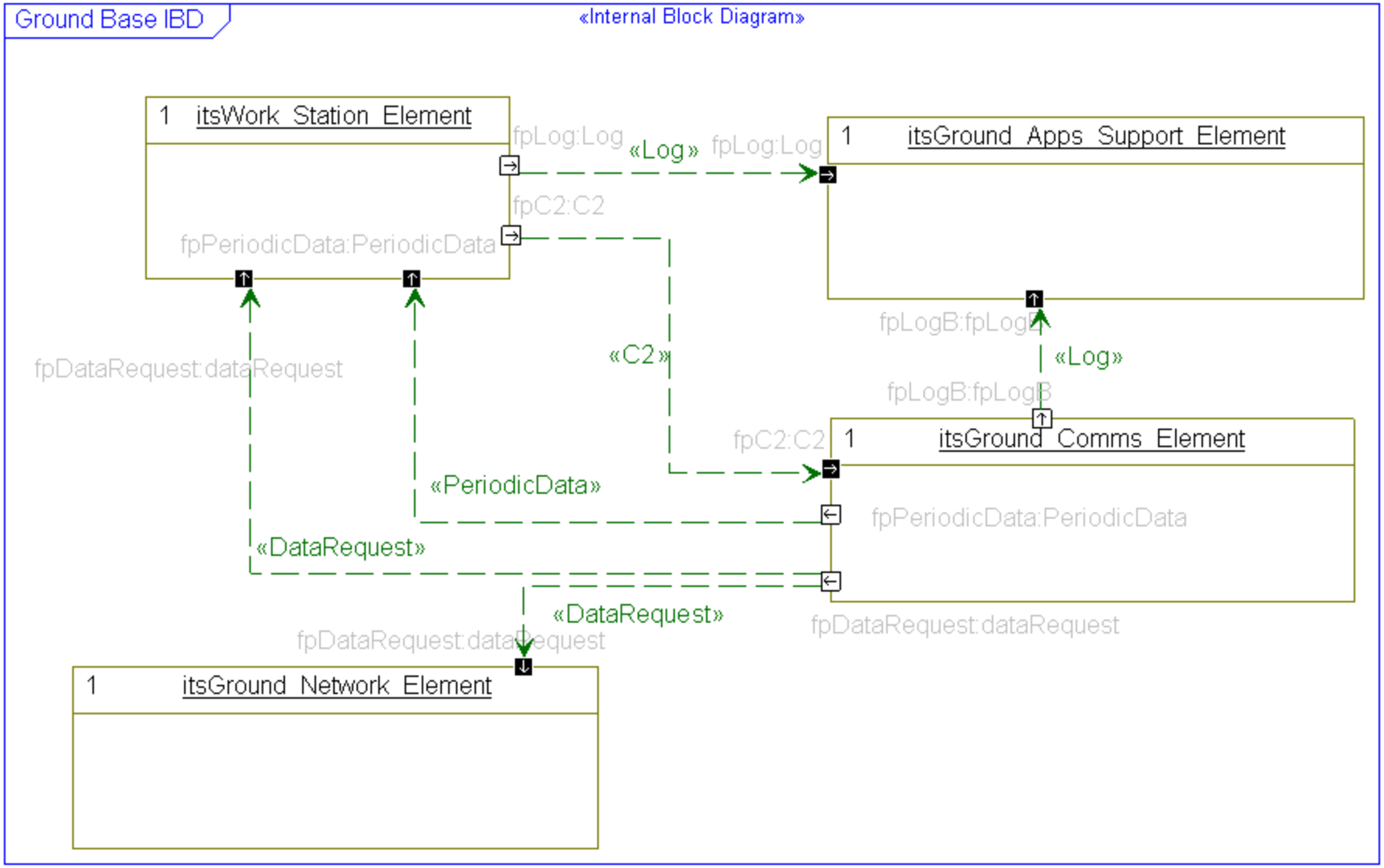
Payload – Navigation Flow Ports



Ground Base Port Specification



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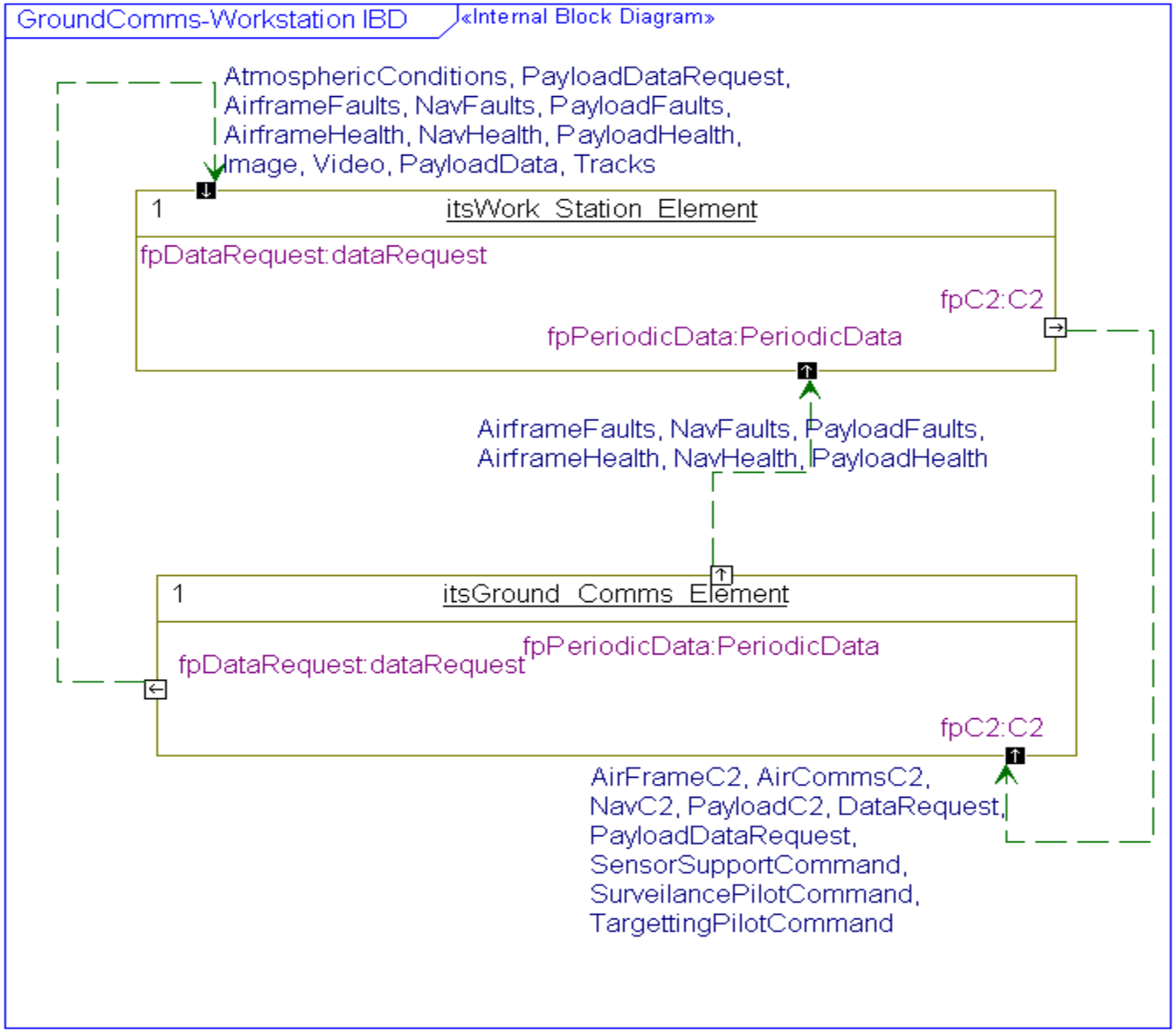
Ground Comms – Workstation flow ports



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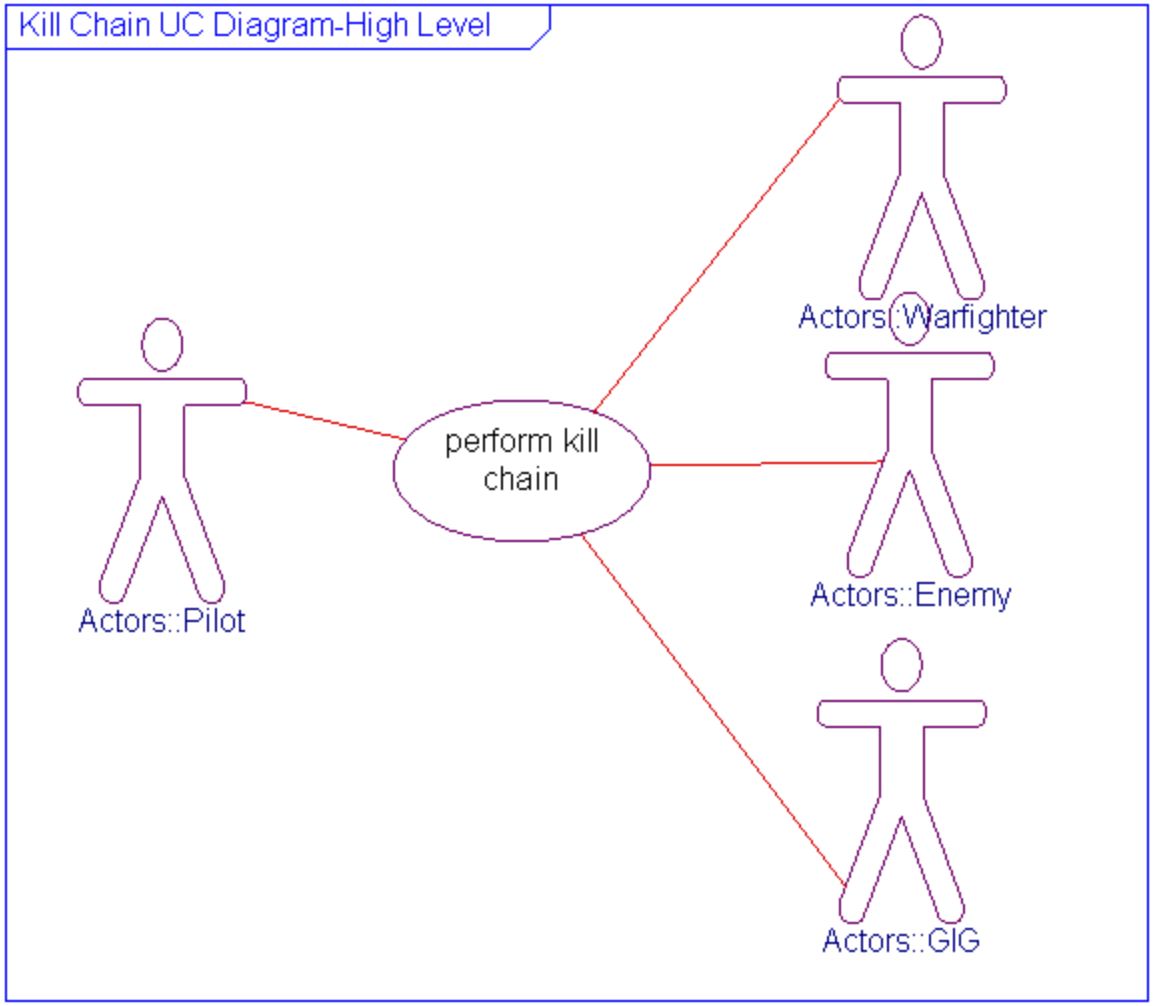
Kill Chain Use Case Diagram



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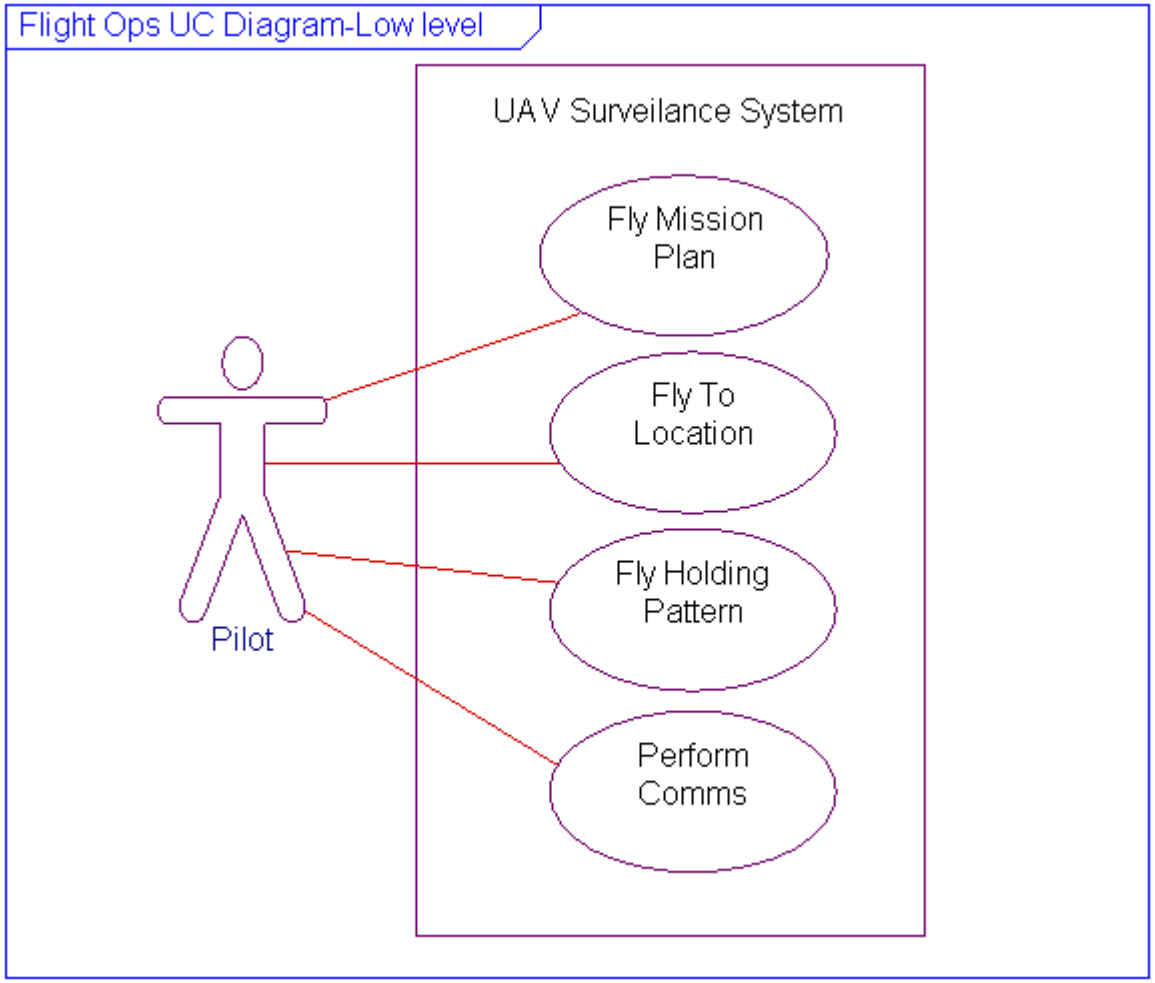
Flight Ops Use Case Diagram