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CSCD 350 – Software Engineering

Project Part 2

CREATIONAL TESTS

I.A.1

Description: Create a rudder rudder1 with limit 45, speed 10, and acceleration 0.1

Command:

```
Create rudder rudder1 with limit 45 speed 10 acceleration 0.1
```

I.B.1

Description: Create elevators elevator1 and elevator2 with limit 30, speed 10, and acceleration 0.1

Commands:

```
Create elevator elevator1 with limit 30 speed 10 acceleration
0.1
Create elevator elevator2 with limit 30 speed 10 acceleration
0.1
```

I.B.2

Description: Create an elevator elevator3 with limit 30, speed 10, and acceleration 0.15

Command:

```
Create elevator elevator3 with limit 30 speed 10 acceleration
0.15
```

I.C.1

Description: Create ailerons aileron1 and aileron2 with respective up and down limits 90 and 40, speed 5, and acceleration 0.1

Commands: `Create aileron aileron1 with limit up 90 down 40 speed 5 acceleration 0.1`

`Create aileron aileron2 with limit up 90 down 40 speed 5 acceleration 0.1`

I.C.2

Description: Create ailerons aileron3 and aileron4 with respective up and down limits 90 and 30, speed 5, and acceleration 0.15

Commands:

`Create aileron aileron3 with limit up 90 down 30 speed 5 acceleration 0.15`

`Create aileron aileron4 with limit up 90 down 30 speed 5 acceleration 0.15`

I.C.3

Description: Create ailerons aileron5 and aileron6 with respective up and down limits 90 and 35, speed 5, and acceleration 0.2

Commands:

`Create aileron aileron5 with limit up 90 down 35 speed 5 acceleration 0.2`

`Create aileron aileron6 with limit up 90 down 35 speed 5 acceleration 0.2`

I.C.4

Description: Create ailerons aileron7 and aileron8 with respective up and down limits 90 and 45, speed 6, and acceleration 0.25

Commands:

`Create aileron aileron7 with limit up 90 down 45 speed 6 acceleration 0.25`

`Create aileron aileron8 with limit up 90 down 45 speed 6 acceleration 0.25`

I.D.1

Description: Create split flaps flap_split1 and flap_split2 with limit 50, speed 5, and acceleration 0.15

Commands:

```
Create split flap flap_split1 with limit 50 speed 5 acceleration
0.15
```

```
Create split flap flap_split2 with limit 50 speed 5 acceleration
0.15
```

I.D.2

Description: Create a split flap flap_split3 with limit 50, speed 4, and acceleration 0.15

Command:

```
Create split flap flap_split3 with limit 50 speed 4 acceleration
0.15
```

I.D.3

Description: Create Fowler flaps flap_fowler1 and flap_fowler2 with limit 55, speed 4, and acceleration 0.1

Commands:

```
Create fowler flap flap_fowler1 with limit 55 speed 4
acceleration 0.1
```

```
Create fowler flap flap_fowler2 with limit 55 speed 4
acceleration 0.1
```

I.D.4

Description: Create a Fowler flap flap_fowler3 with limit 50, speed 4, and acceleration 0.1

Command:

```
Create Fowler flap flap_fowler3 with limit 50 speed 4
acceleration 0.1
```

I.E.1

Description: Create engines engine1, engine2, and engine3 with speed 10 and acceleration 0.2

Commands:

```
Create engine engine1 with speed 10 acceleration 0.2
Create engine engine2 with speed 10 acceleration 0.2
Create engine engine3 with speed 10 acceleration 0.2
```

I.E.2

Description: Create an engine engine4 with speed 10 and acceleration 0.25

Command:

```
Create engine engine4 with speed 10 acceleration 0.25
```

I.F.1

Description: Create a nose gear gear_nose1 with speed 10 and acceleration 0.1

Command:

```
Create nose gear gear_nose1 with speed 10 acceleration 0.1
```

I.F.2

Description: Create a nose gear gear_nose2 with speed 10 and acceleration 0.15

Command:

```
Create nose gear gear_nose2 with speed 10 acceleration 0.15
```

I.F.3

Description: Create main gear gear_main1 and gear_main2 with speed 10 and acceleration 0.1

Commands:

```
Create main gear gear_main1 with speed 10 acceleration 0.1
Create main gear gear_main2 with speed 10 acceleration 0.1
```

I.F.4

Description: Create a main gear gear_main3 with speed 10 and acceleration 0.2

Command: `Create main gear gear_main3 with speed 10 acceleration 0.2`

STRUCTURAL TESTS

II.A.1

Description: Declare a rudder controller rudder_controller1 with rudder1

Command:

`Declare rudder controller rudder_controller1 with rudder rudder1`

II.B.1

Description: Declare an elevator controller elevator_controller1 with elevator1 and elevator2

Command:

`Declare elevator controller elevator_controller1 with elevators elevator1 elevator2`

II.B.2

Description: Declare an invalid elevator controller elevator_controller2 with elevator1 and elevator3

Command:

`Declare elevator controller elevator_controller2 with elevators elevator1 elevator3`

II.C.1

Description: Declare an aileron controller aileron_controller1 with ailerons aileron1 (primary) and aileron2

Command:

```
Declare aileron controller aileron_controller1 with ailerons
aileron1 aileron2 primary aileron1
```

II.C.2

Description: Declare an aileron controller aileron_controller2 with ailerons aileron1 (primary), 3, 5, 7, then 8, 6, 4, 2

Command:

```
Declare aileron controller aileron_controller2 with ailerons
aileron1 aileron3 aileron5 aileron7 aileron8 aileron6 aileron4
aileron2 primary aileron1
```

II.C.3

Description: Declare an aileron controller aileron_controller4 with ailerons aileron1, 3 (primary), 5, 7, then 8, 6, 4, 2, with 7 mixed at 80% of 3, 5 at 50% of 7, and 1 at 75% of 5

Command:

```
Declare aileron controller aileron_controller4 with ailerons
aileron1 aileron3 aileron5 aileron7 aileron8 aileron6 aileron4
aileron2 primary aileron3 slave aileron7 to aileron3 by 80
percent slave aileron5 to aileron7 by 50 percent slave aileron1
to aileron5 by 75 percent
```

II.C.4

This test has been eliminated.

II.C.5

Description: Declare an invalid (?) aileron controller aileron_controller5 with ailerons aileron1 and aileron2 (primary)

Command:

```
Declare aileron controller aileron_controller5 with ailerons
aileron1 aileron2 primary aileron2
```

II.C.6

Description: Declare an invalid aileron controller aileron_controller6 with ailerons aileron1 (primary) and 3, then 2 and 5

Command:

```
Declare aileron controller aileron_controller6 with ailerons
aileron1 aileron3 aileron2 aileron5 primary aileron1
```

II.C.7

This test has been eliminated.

II.D.1

Description: Declare a flap controller flap_controller1 with flap_split1 and flap_split2

Command:

```
Declare flap controller flap_controller1 with flaps flap_split1
flap_split2
```

II.D.2

Description: Declare an invalid flap controller flap_controller2 with flap_split1 and flap_split3

Command:

```
Declare flap controller flap_controller2 with flaps flap_split1
flap_split3
```

II.D.3

This test has been eliminated.

II.D.4

Description: Declare a flap controller flap_controller4 with flap_fowler1 and flap_fowler2 inboard and flap_split1 and flap_split2 outboard.

Command:

```
Declare flap controller flap_controller4 with flaps flap_split1
flap_fowler1 flap_fowler2 flap_split2
```

II.D.5

Description: Declare an invalid flap controller flap_controller5 with flap_fowler1 and flap_split2 inboard and flap_split1 and flap_fowler2 outboard

Command:

```
Declare flap controller flap_controller5 with flaps flap_split1
flap_fowler1 flap_split2 flap_fowler2
```

II.D.6

This test has been eliminated.

II.E.1

Description: Declare an engine controller engine_controller1 with engine1

Command:

```
Declare engine controller engine_controller1 with engine engine1
```

II.E.2

Description: Declare an engine controller engine_controller2 with engine1 and engine2

Command:

```
Declare engine controller engine_controller2 with engine engine1
engine2
```

II.E.3

Description: Declare an engine controller engine_controller3 with engine1, engine2, and engine3

Command:

```
Declare engine controller engine_controller3 with engine engine1
engine2 engine
```

II.E.4

This test has been eliminated.

II.F.1

Description: Declare a gear controller gear_controller1 with nose gear gear_nose2 and main gear gear_main1 and gear_main2

Command:

```
Declare gear controller gear_controller1 with gear nose
gear_nose2 main gear_main1 gear_main2
```

II.F.2

This test has been eliminated.

BEHAVIORAL TESTS

III.A.1-4

Commands:

```
commit

@clock 1

do rudder_controller1 deflect rudder 45 left

@wait 43

do rudder_controller1 deflect rudder 45 right

@wait 65

do rudder_controller1 deflect rudder 0 left

@wait 45

do rudder_controller1 deflect rudder 30 left

@wait 10

do rudder_controller1 deflect rudder 45 right

@wait 70

@exit
```

III.A.1-4: Rudder Behavioral Commands
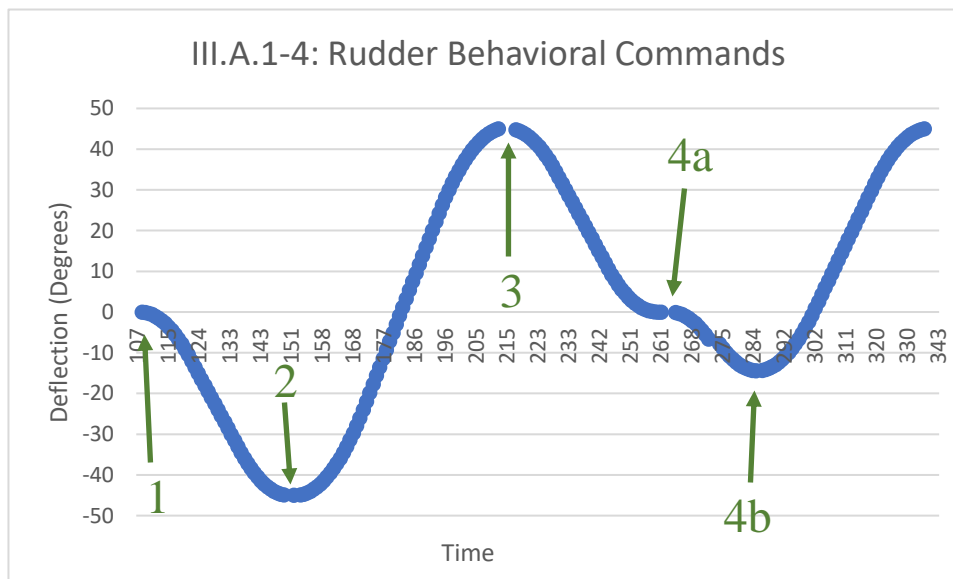
The behavioral tests for Rudder were successful.

III.B.1-2

Commands:

```
commit

@clock 1

do elevator_controller1 deflect elevator 30 up

@wait 37

do elevator_controller1 deflect elevator 30 down

@wait 60

@exit
```


III.B.1-2 Elevator I Behavioral Commands
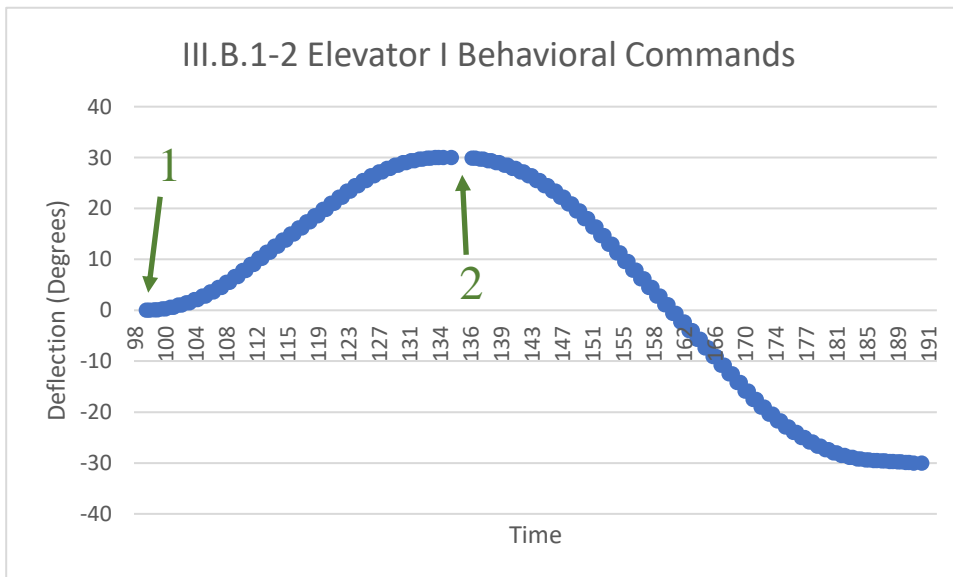
The behavioral tests for Elevator I were successful.

III.C.1-2

Commands:

```
commit

@clock 1

do elevator_controller2 deflect elevator 30 up

@wait 37

do elevator_controller2 deflect elevator 30 down

@wait 60

@exit
```


III.C.1-2 Elevator II Behavioral Commands
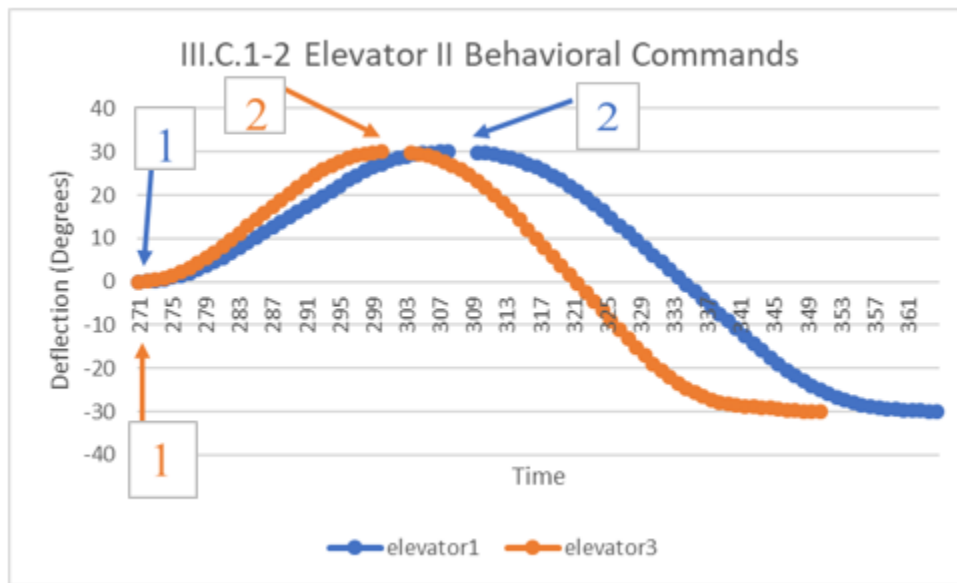
The behavioral tests for Elevator II were successful.

III.D.1-2

Commands:

```
commit
@clock 1
do aileron_controller2 deflect ailerons 45 up
@wait 35
do aileron_controller2 deflect ailerons 30 down
@wait 60
@exit
```
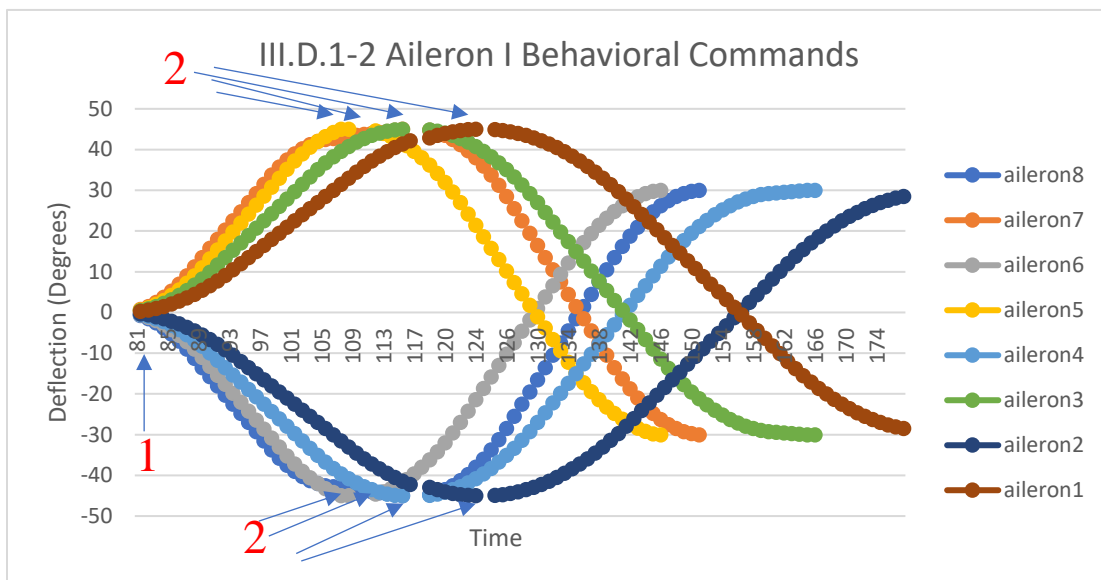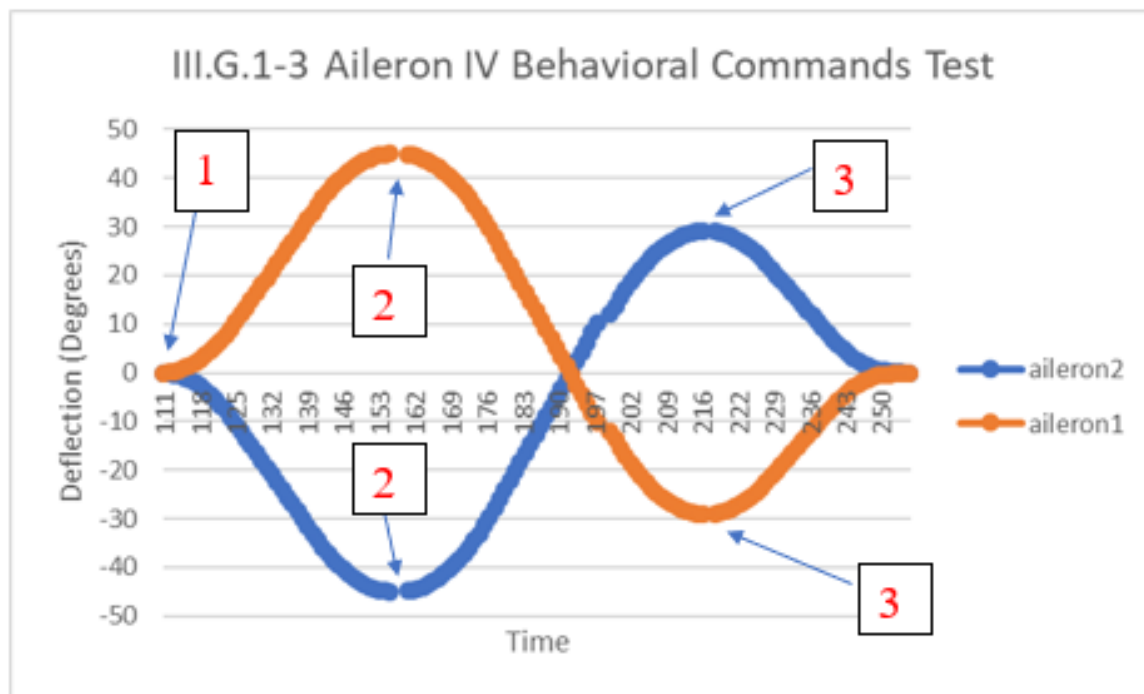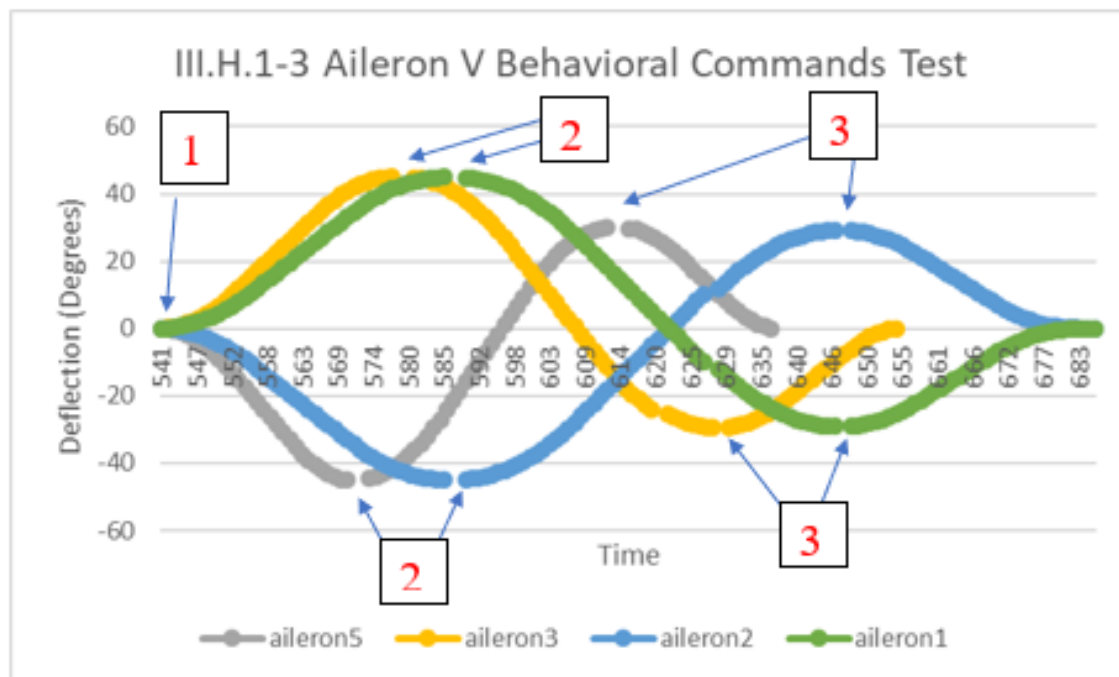

The behavioral tests for Aileron I were successful.

III.E.1-2

This test has been eliminated.

III.F.1-2

Commands:

```
commit
@clock 1
do aileron_controller4 deflect ailerons 45 up
@wait 45
do aileron_controller4 deflect ailerons 30 down
@wait 100
@exit
```


III.F.1-2 Aileron III Behavioral Commands Test
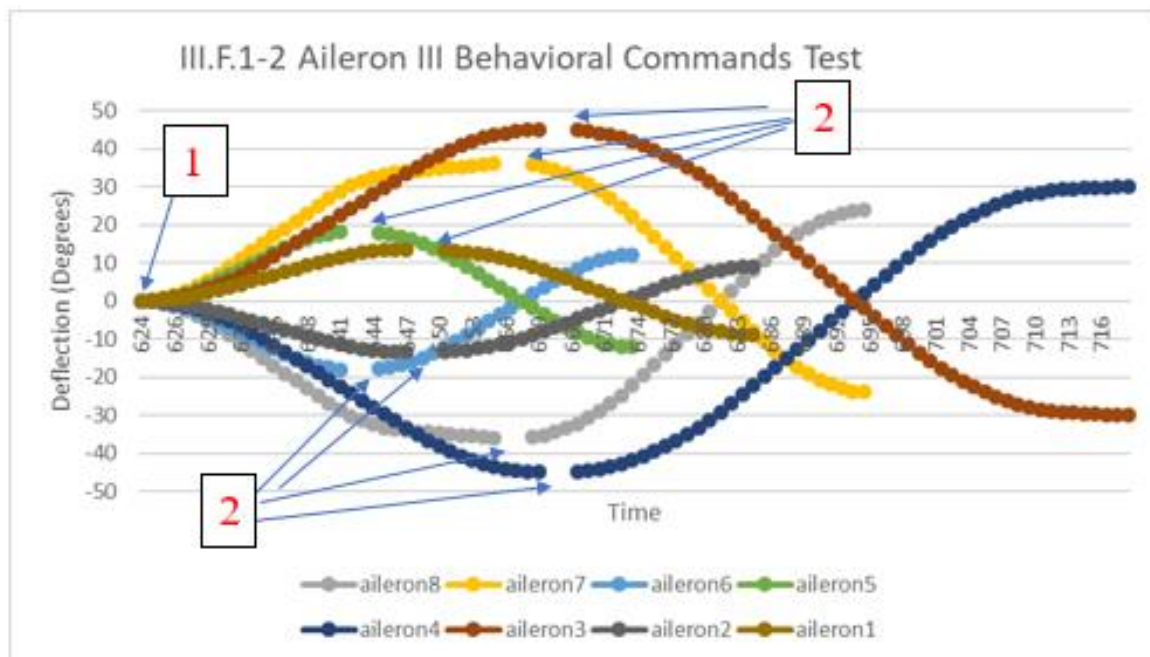
The behavioral tests for Aileron III were successful.

III.G.1-2

```
commit

@clock 1

do aileron_controller5 deflect ailerons 45 up

@wait 48

do aileron_controller5 deflect ailerons 30 down

@wait 37

do aileron_controller5 deflect ailerons 0 down

@wait 60

@exit
```


III.G.1-3 Aileron IV Behavioral Commands Test

The behavioral tests for Aileron IV were successful.

III.H.1-2

```
commit

@clock 1

do aileron_controller6 deflect ailerons 45 up

@wait 48

do aileron_controller6 deflect ailerons 30 down

@wait 37

do aileron_controller6 deflect ailerons 0 down

@wait 60

@exit
```


The behavioral tests for Aileron V were successful.

III.I.1-2

Commands:

```
commit
@clock 1
do aileron_controller4 speed brake on
@wait 55
do aileron_controller4 deflect ailerons 0 down
@wait 80
@exit
```
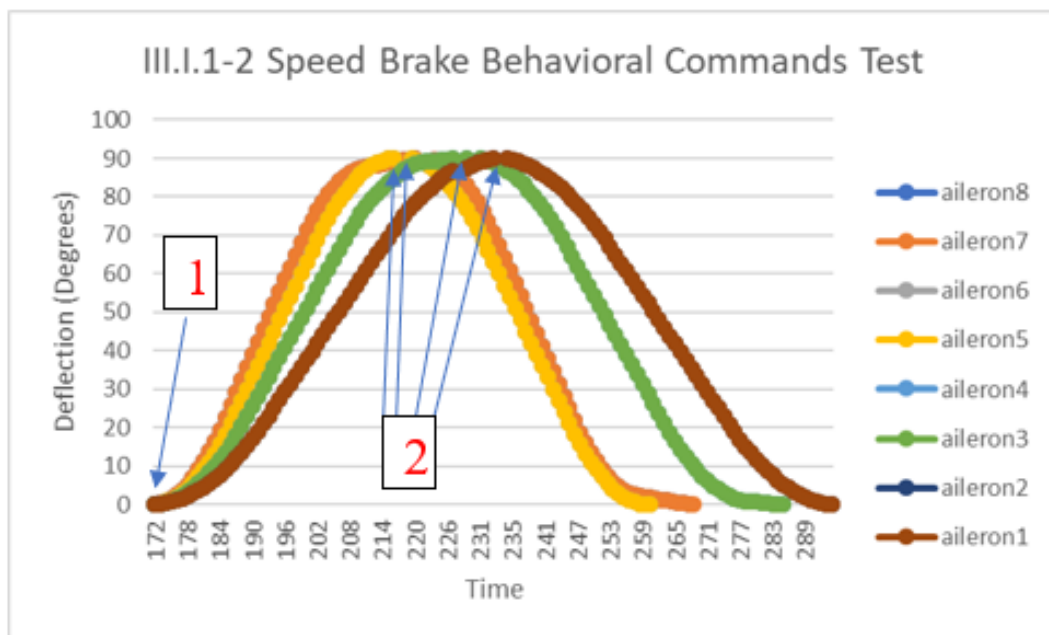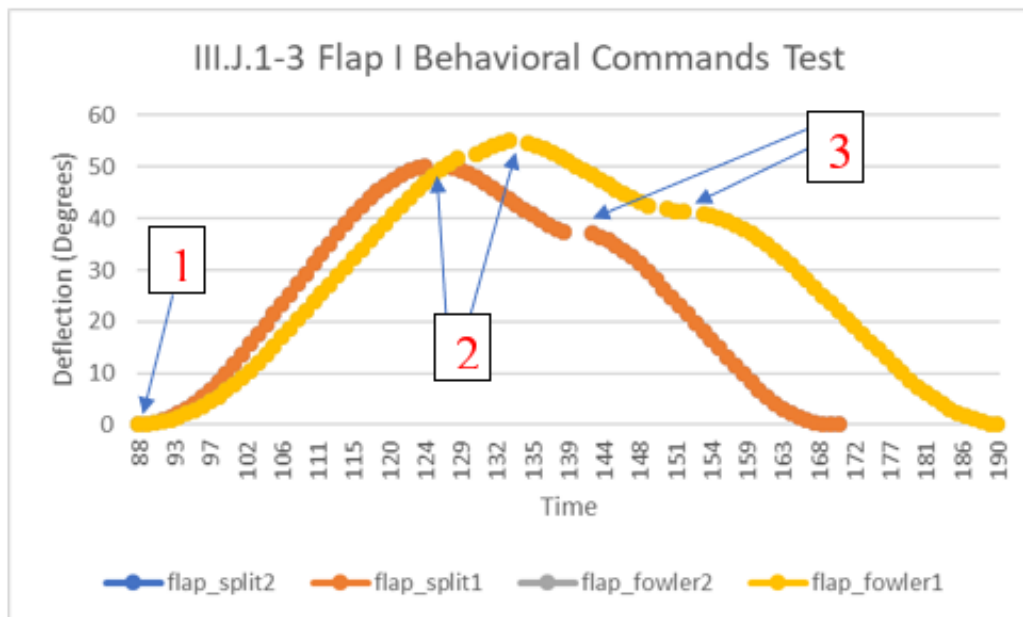

NOTE: The line for aileron1 obscures the line for aileron2, aileron3 obscures aileron4, aileron5 obscures aileron6, and aileron7 obscures aileron8.

The behavioral tests for Speed Brake were successful.

III.J.1-3

```
commit
@clock 1
do flap_controller4 deflect flap 4
@wait 40
do flap_controller4 deflect flap 3
@wait 20
do flap_controller4 deflect flap up
@wait 40
@exit
```
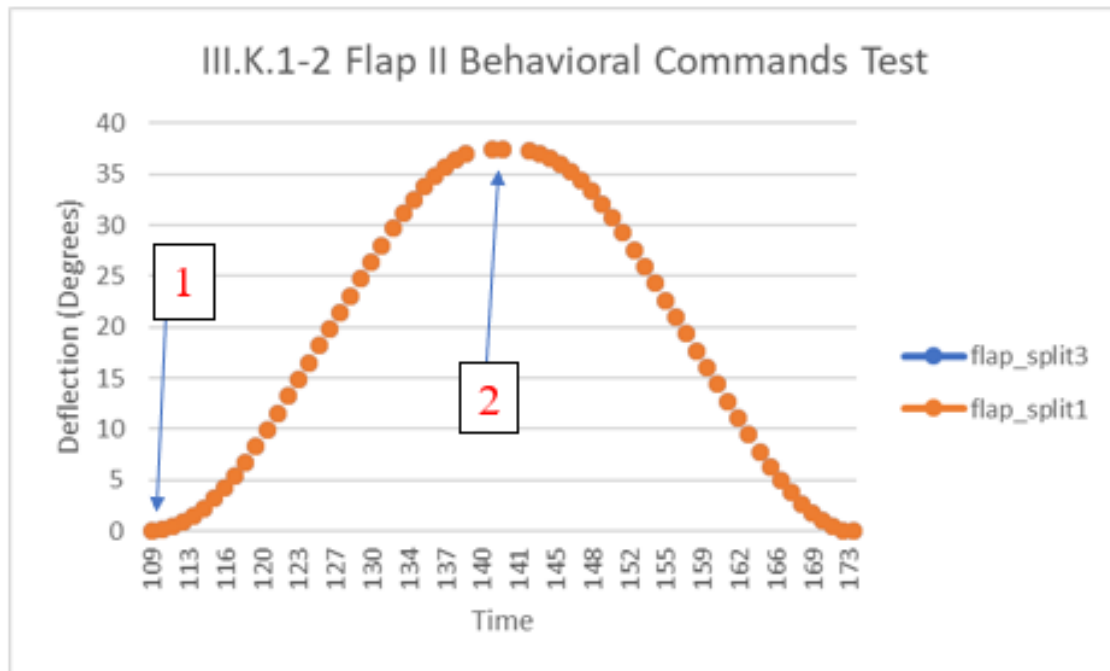

NOTE: The line for flap_split2 is obscured by flap_split1 and the line for flap_fowler2 is obscured by flap_fowler1.

The behavioral tests for Flap I were successful.

III.K.1-2

Commands:

```
commit
@clock 1
do flap_controller2 deflect flap 3
@wait 30
do flap_controller2 deflect flap up
@wait 40
@exit
```
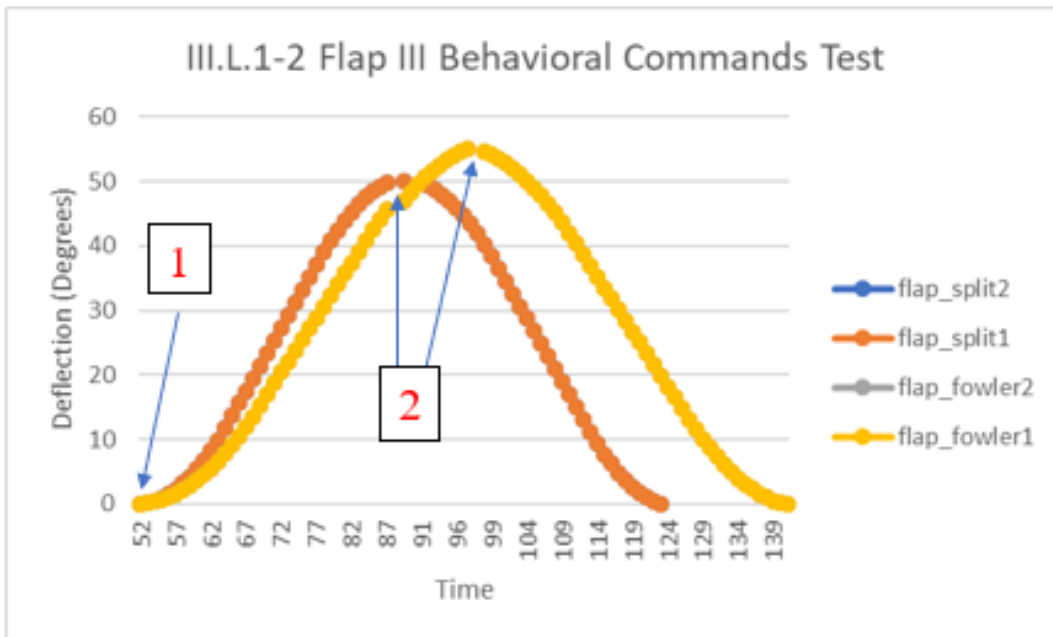

NOTE: The line for flap_split3 is obscured by flap_split1.

The behavioral tests for Flap II were successful.

III.L.1-2

```
commit
@clock 1
do flap_controller2 deflect flap 3
@wait 30
do flap_controller2 deflect flap up
@wait 40
@exit
```
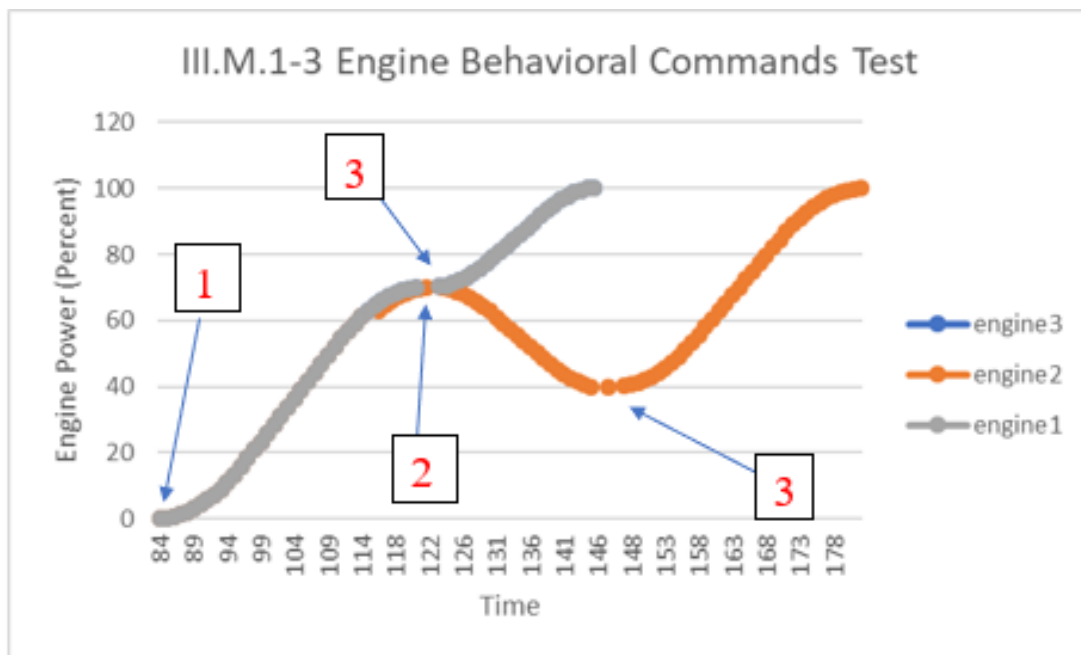

NOTE: The line for flap_split2 is obscured by flap_split1 and the line for flap_fowler2 is obscured by flap_fowler1.

The behavioral tests for Flap III were successful.

III.M.1-3

```
commit

@clock 1

do engine_controller3 set power 70

@wait 30

do engine_controller3 set power 40 engine engine2

@wait 30

do engine_controller3 set power 100

@wait 40

@exit
```
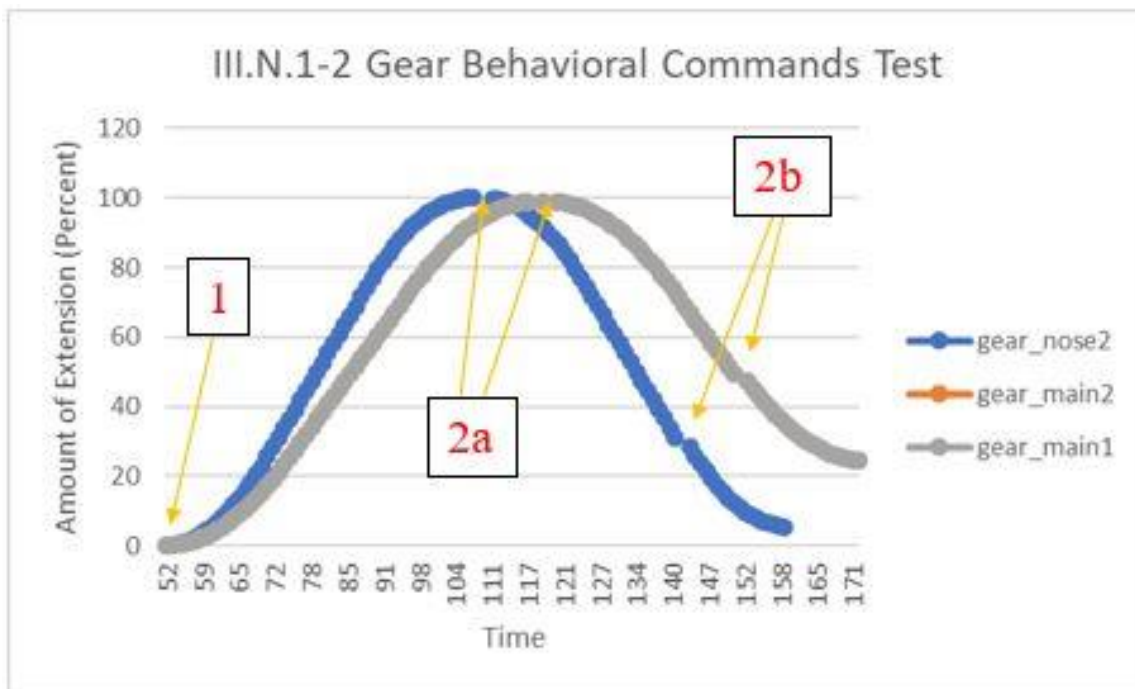

NOTE: The line for engine3 is completely obscured by engine1 and the line for engine2 is partially obscured by engine1 up until it hits 60 on the vertical axis.

The behavioral tests for Engine were successful.

III.N.1-2

Commands:

```
commit
@clock 1
do gear_controller1 gear down
@wait 65
do gear_controller1 gear up
@wait 33
halt gear_controller1
@wait 40
@exit
```


III.N.1-2 Gear Behavioral Commands Test

NOTE: The line for engine3 is gear_main2 is obscured by the line for gear_main1.

The behavioral tests for Gear were successful, however, according to the specs, submitting the HALT command should stop the gears immediately. This is not actually how the HALT command worked in the implementation, it acted as a gradual decline as shown in the graph.