Integration Testing Plan 1

1. Overview

Present the overall focus and goal of the integration test activities. Write your assumptions about the design specifications.

The aim of the integration testing lab is to build the airplane within the timeframe. We strive to have a good communication and to not rely too much on the assumptions made since we actually do not know

1. Steering system - François
2. Rear fuselage - Joakim
3. Front fuselage - Linn
4. Wing - Tobias
5. Landing gear - Rickard

Note takers:

1. Alexandre
2. -
3. Filip
4. Dennis
5. -

Dependencies:

The steering system needs to be assembled first. The rear and front fuselage-groups are then installing their components. When these are integrated the wings can be installed. Lastly, the landing gear is assembled with the rest of the aircraft.

Assumptions:

General assumptions:

- The base is 32*6 knobs
- There are 4 pairs of girders

Steering system

- Everything shall be placed on the upper side of the black base platform

Rear fuselage:

- That the ventilation units must be horizontally and vertically aligned.
- All control module boxes must be between the ventilation units.

Front fuselage:

- The radar must have exactly 4 exposed sides at the front. These exposed front may not be interrupted by cavities. The radar must be built in a single group of knobs.
- The red girders only need to be covered by the canard-wings outside of the fuselage.

Wing:

- The wing will cover 3 pairs of girders
- The back of the wing will be will be aligned with the rear-most pair of girders
- The shape and area of the wing is the same as the wing depicted in the instructions

Landing gear:

- The module on which the hydraulic system is to be mounted is identical to the picture provided.

2. Test cases

Present a sequence of test cases, a person responsible for conducting them and the desired end result, according to the interfaces identified

TAKE A PHOTO BEFORE INTEGRATION

Steering system:

1. Black box
    a. orange 2x2
    b. installed in the front end of the base platform.
    c. connected to the wiring which start from CPU.
2. Wing control
    a. CPU
        i. white 2x2
        ii. installed in the front end of the base platform
        iii. connected through (white 1x2) to wings control modules (same as b.ii)
    b. Wings control modules
        i. 2x(white 2x2)
        ii. installed between first and third girder
        iii. installed on left and right fringes of base platform
        iv. connected through (white 1x2) wiring to CPU (same as a.iii)
3. Steering system
    a. Junction box 1
        i. yellow 2x2
        ii. installed in the front end of the base platform
    b. Junction box 2
        i. yellow 2x2
        ii. installed adjacent to the engine
    c. Wiring
        i. link junction boxes with exactly 28 knobs
4. The steering system does not protrude in behind row four as seen from the front.
5. The steering system has at least one steering system girder adjacent to each red girder supporting the canard-wings.
6. The steering wiring must be on the center line on the port side (dependency from the rear fuselage)

Rear fuselage:

1. Check that one ventilation unit is located on the port side fringe and one ventilation unit is located on the starboard side fringe.
2. Check that ventilation units are aligned horizontally and vertically.
3. Place stub for steering wiring on the third line from the port side, between the ventilation units.
4. Count control module boxes so that 4 knobs are on the port side and 7 on the starboard side and that all control module boxes are between the ventilation units.
5. Check that the steering unit is placed on the module as close to the line of center as possible.

Front fuselage:
Create a driver for the steering system by sectioning off the module (or on a *mock* base plate) starting on the fourth row from the front and ending on the ninth row.

1. The radar system shall consist of 12 knobs in a single group.
2. The radar exposes exactly 4 knobs of sides to the front.
    a. The exposed sides are not interrupted.
3. The canards consist of 9 knobs each and fully cover the girders they are mounted on.

Landing Gear:

1. Check that for the piping. each knob only has 2 other adjacent knobs (Except for 3 at T-connections)
2. Count that the piping has 22 knobs (excluding the hydraulics unit and the hydraulics box)
3. Check that the hydraulics units are connected to the hydraulics box and one of the middle knobs in front of the module.

Wing:

1. Count that the weapons system attachment is 9-11 % of the total wing area

3. Test data

According to the dependencies you identified, identify who will be responsible for providing information to someone else as you build and test. Will scaffolding be needed?

Steering system:
Front and rear fuselage as well as the wings are depending on the steering system. Thus, this group needs to inform the other groups about anything that differs from the assumptions.

Front fuselage:
Needs information on the steering systems configuration and location. This can be used to create a mock up as described in the internal test in section 2.

Rear fuselage:
Will need information from the steering system if any of the assumptions made about the base plate are false.

Wing:
Needs information about the exact spacing between the girders. This can be used to create scaffolding for when making the wing attachment.

Landing gear:
Is, as far as we know, only depending on the underside of the base and will need information about changes. Will use scaffolding for the attachment to the base.

4. Acceptance criteria

Identify how to verify that a test is passed, and the severity of a failure.

Steering system:

1. Refers to tests cases
2. Everything is Severity: Critical, because all depends on it

Front fuselage:

1. The radar consists of 12 knobs in a single group. Severity: High.
2. The radar has 4 knobs worth of exposed sides facing the front without interrupting cavities. Severity: High.
3. The canard-wings consist of 9 knobs each. Severity: Medium (easy fix).
4. The red girders supporting the canard-wings are not visible from above. Severity: Low.
5. Adjacent steering system girders for each red girder supporting a canard-wing. Severity: Critical.

Landing Gear:

1. Each knob only has 2 other adjacent knobs (Except for 3 at T-connections)
2. The piping has 22 knobs (excluding the hydraulics unit and the hydraulics box)

3. The hydraulics units are connected to the hydraulics box and one of the middle knobs in front of the module.

Rear fuselage:

1. The ventilation units are located on the fringes and shall be aligned horizontally and vertically. Severity: high.
2. Stub for steering wiring shall be located on the third line from the port side, between the ventilation units. Severity: high.
3. 4 knobs of control module boxes are on the port side and 7 knobs are on the starboard side and all control module boxes are between the ventilation units. Severity: high.
4. The steering unit is located as close to the line of center as possible. Severity: low.

Wing:

1. The wing attachment consists of exactly 40 knobs (attached to the underside of the wing), with 20 knobs on each side of the line of center
2. The weapons are attached with 9-11 % of the total wing area
   (if area=286, then they're 26 <= weapons < 31)

5. Testing schedule

When will you conduct tests, what specific order will you have for your tests? Use your analysis of dependencies here.

1. Steering system
2. Rear fuselage
3. Front fuselage
4. Wing
5. Landing gear

Tests:	**0:00-5:00**	**5:00-10:00**	**10:00-15:00**	**15:00-20:00**
Internal 1	x			
Internal 2	x			
Internal 3	x			
Internal 4	x			
Internal 5	x			
Integration 1 & 2		3		
Integration 1, 2 & 3		2		
Integration 1, 2, 3 & 4			1	
Integration 1, 2, 3, 4 & 5			4	
				Buffertime

6. Environment

How will you organize yourselves to make optimal use of your time for building and testing?

We want one big table to work around to enable good communication as well as short distances between us during the integration.