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Part 1: Scenarios

1: Flying an airplane to a location

The airplane liftoffs from the start location. The plane flies to the designated location. The plane lands at the new location.

2: Dropping a bomb from an airplane onto a ship

The holding mechanism in the plane releases the bomb. The bomb falls at an angle do to gravity and the initial horizontal velocity. The bomb collides with the ship.

3: A ship shoots a torpedo at another ship.

the holding mechanism on the ship releases the torpedo toward the other ship. The torpedo propels itself through the water in a straight line. The torpedo impacts the other ship.

4: Shooting a torpedo from a submarine to a ship

the holding mechanism on the submarine releases the torpedo toward the ship. The torpedo propels itself through the water in a straight line. The torpedo impacts the ship.

5: shooting an airplane from an airplane

the holding mechanism on the airplane releases a missile. The missile propels its self through the air toward the other airplane. The missile impacts the other airplane.

Part 2: User Stories

1.1: Moving to a different fort

As a pilot I want to travel to the other fort so that I can help there.

2.1: Attacking the enemy ship

As a pilot I want to hit the enemy so that they are destroyed.

3.1: Aiming at the enemy ship

As a captain of a ship I want to shoot a torpedo at the enemy ship to destroy it.

4.1: Aiming at the enemy ship

As a captain of a submarine I want to shoot a torpedo at the enemy ship to destroy it.

5.1: Aiming at an enemy airplane

As a pilot of I want to shoot a missile at the enemy airplane to destroy it.

Part 3: Questions

1.1.1: how does it get to the target

knowing how to reach the target will insure that the plane reaches the target

1.1.2: how is the airplane being moved

Knowing how the airplane should be moved will insure proper arrival time.

2.1.1: how is the bomb detonated

Knowing how the bomb should be detonated insures proper detonation.

2.1.2: when is the bomb being dropped

Knowing when to drop the bomb insures that it will hit the target.

3.1.1: how is the torpedo detonated

Detonating the torpedo properly will ensure that it goes off at the right time.

3.1.2: where is the enemy ship

Knowing where the enemy ship is will allow the torpedo to hit its target.

4.1.1: where is the submarine

The torpedo will have to act differently depending on if the submarine is submerged or not.

4.1.2: how is the torpedo detonated

Detonating the torpedo properly will ensure that the torpedo detonates properly.

5.1.1: how is the missile held by the airplane

Holding the missile properly will ensure that the missile get released on time.

5.1.2: how is the missile detonated

Detonating the missile properly will ensure that it detonates when it hits its target.

Part 4: Requirements

1.1.1.1: the plane must have a target

It must exist

1.1.1.2: the target must be reachable

It must be somewhere the plan can go

1.1.2.1: the airplane must have fuel

To power it

1.1.2.2: the plane must have a pilot

Someone to fly it

2.1.1.1: the bomb shall have a fuze

To set off the bomb

2.1.1.2: the bomb must have explosives

It is a bomb

2.1.2.1: the bomb shall have a target

Something to hit

2.1.2.2: the bomb shall be dropped

It must be released from the plane

3.1.1.1: the torpedo shall have a fuze

To set off the torpedo

3.1.1.2: it shall have a means of propelling itself

To be able to travel under water

3.1.2.1: the torpedo shall have a sensor

To locate the enemy ship

3.1.2.2: the torpedo shall be able to change direction

To be able to follow the enemy

4.1.1.1: the submarine shall know where it is

So, it knows how to shoot

4.1.1.2: the submarine shall tell the torpedo where it is

So, the missile knows where it is

4.1.2.1: the torpedo has a fuze

So, it knows when to detonate

4.1.2.2: the torpedo has explosives

So, it can explode

5.1.1.1: the airplane shall hold a missile

So it can shoot

5.1.1.2: the airplane can launch a missile

So that it can shoot missiles

5.1.2.1: the missile will have a fuze

So that it can tell when to detonate

5.1.2.2: the missile will have explosives

So that it can detonate

Part 5: Specifications

1.1.1.1.1: the target is with in 3D space

Planes can move in three dimensions

1.1.1.1.2: the target must be open for the plane to enter

The plane can't overlap existing objects

1.1.1.2.1: the target may not be under water

Planes can't go under water

1.1.1.2.2: it must be within no restricted fly zones

Planes can't fly in no-fly zones

1.1.2.1.1: the airplane has a full tank of jet fuel

The max amount of fuel for an airplane

1.1.2.1.2: the fuel gives the airplane power to produce thrust

To allow the plane to move forward

1.1.2.2.1: the plane has a pilot

To fly the plane

1.1.2.2.2: the pilot can maneuver the plane

So, the plane can change direction

2.1.1.1.1: the bomb will have a distance fuze

To cause the bomb to detonate at a specific distance from the boat

2.1.1.1.2: the bomb will have a distance sensor

To set off the fuze

2.1.1.2.1: the bomb will have a war head

To explode

2.1.1.2.2: the bomb power stored up in the war head

Best way to store energy

2.1.2.1.1: the target is a ship

It’s a ship

2.1.2.1.2: the target is an enemy

Must target enemies

2.1.2.2.1: the latch on the plane will open

So, the bomb can fall

2.1.2.2.2: the launching mechanism will arm the bomb

So that the bomb is live

3.1.1.1.1: the torpedo has an acoustic proximity fuze

Best fuze for under water

3.1.1.1.2: the torpedo will have an acoustic sensor

To tell the fuze when to activate

3.1.1.2.1: the torpedo will have a propeller

To propel itself

3.1.1.2.2: the torpedo has a power source for the propeller

To power the propeller

3.1.2.1.1: the torpedo has a sonar sensor

To find the target

3.1.2.1.2: the torpedo has a power source

to power the sensor

3.1.2.2.1: the torpedo has fins

To control movement

3.1.2.2.2: the torpedo has a controller

To control the fins

4.1.1.1.1: the submarine shall have a depth sensor

To tell how deep it is

4.1.1.1.2: the submarine shall have a sonar senor

To tell where it is relative to its surroundings

4.1.1.2.1: the submarine has a controller

To talk to the torpedo

4.1.1.2.2: the submarine has a torpedo

To launch

4.1.2.1.1: the torpedo has an acoustic proximity fuze

Best fuze for under water

4.1.2.1.2: the torpedo has an acoustic sensor

To tell the fuze when to activate

4.1.2.2.1: the torpedo has a war head

To detonate

4.1.2.2.2: the torpedo has an actuator

To activate the war head

5.1.1.1.1: the airplane has a missile hatch

To store a missile

5.1.1.1.2: the airplane holds a missile

To be launched

5.1.1.2.1: the airplane has a controller

To launch the missile

5.1.1.2.2: the airplane can open its hatch

To deploy the missile

5.1.2.1.1: the missile has a thermal proximity fuze

To set off the warhead

5.1.2.1.2: the missile has a thermal sensor

To activate the fuze

5.1.2.2.1: the missile has a war head

To detonate

5.1.2.2.2: the missile has an actuator

To activate the war head

Part 6: Requirement Verification

1.1.1.1.A.1: does the plane have a target?

1.1.1.2.A.1: is the target reachable?

1.1.2.1.A.1: does the plane have fuel?

1.1.2.2.A.1: does the plane have a pilot?

2.1.1.1.A.1: does the bomb have a fuze?

2.1.1.2.A.1: does the bomb have explosives?

2.1.2.1.A.1: does the bomb have a target?

2.1.2.2.A.1: can the bomb be dropped?

3.1.1.1.A.1: does the torpedo have a fuze?

3.1.1.2.A.1: can the torpedo propel its self?

3.1.2.1.A.1: doe the torpedo has a sensor?

3.1.2.2.A.1: can the torpedo change direction?

4.1.1.1.A.1: does the submarine know where it is?

4.1.1.2.A.1: does the torpedo know where it is?

4.1.2.1.A.1: does the torpedo have a fuze?

4.1.2.2.A.1: does the torpedo have explosives?

5.1.1.1.A.1: does the airplane have a missile?

5.1.1.2.A.1: can the airplane launch a missile?

5.1.2.1.A.1: does the missile have a fuze?

5.1.2.2.A.1: does the missile have explosives?

Part 7: Specification Verification

1.1.1.1.1.1: is the target in #D space?

1.1.1.1.2.1: is the target space occupied?

1.1.1.2.1.1: is the target under water?

1.1.1.2.2.1: is the target in a restricted fly zone?

1.1.2.1.1.1: does the airplane have a full tank of fuel?

1.1.2.1.2.1: does the airplane have power?

1.1.2.2.1.1: does the plane have a pilot?

1.1.2.2.2.1: can the pilot maneuver the plane?

2.1.1.1.1.1: does the bomb have a distance fuze?

2.1.1.1.2.1: does the bomb have a distance sensor?

2.1.1.2.1.1: does the bomb have a war head?

2.1.1.2.2.1: is there power stored in the war head?

2.1.2.1.1.1: is the target a ship?

2.1.2.1.2.1: is the target an enemy?

2.1.2.2.1.1: can the latch open?

2.1.2.2.2.1: is the bomb armed?

3.1.1.1.1.1: does the torpedo have an acoustic proximity fuze?

3.1.1.1.2.1: does the torpedo have an acoustic sensor?

3.1.1.2.1.1: does the torpedo have a propeller?

3.1.1.2.2.1: does the torpedo have power to the propeller?

3.1.2.1.1.1: does the torpedo have a sonar sensor?

3.1.2.1.2.1: does the torpedo have a power source?

3.1.2.2.1.1: does the torpedo have fins?

3.1.2.2.2.1: does the torpedo have a controller?

4.1.1.1.1.1: does the submarine have a depth sensor?

4.1.1.1.2.1: does the submarine have a sonar sensor?

4.1.1.2.1.1: does the submarine have a controller?

4.1.1.2.2.1: does the submarine have a torpedo?

4.1.2.1.1.1: does the torpedo have an acoustic proximity fuze?

4.1.2.1.2.1: does the torpedo have an acoustic sensor?

4.1.2.2.1.1: does the torpedo have a war head?

4.1.2.2.2.1: does the torpedo have an actuator?

5.1.1.1.1.1: does the airplane have a missile hatch?

5.1.1.1.2.1: does the airplane have a missile?

5.1.1.2.1.1: does the airplane have a controller?

5.1.1.2.2.1: can the airplane open its hatch?

5.1.2.1.1.1: does the missile have a thermal proximity fuze?

5.1.2.1.2.1: does the missile have a thermal sensor?

5.1.2.2.1.1: does the missile have an war head?

5.1.2.2.2.1: does the missile have an actuator?