# Storyboard of Project with SAAB AB

## Mission Trainer

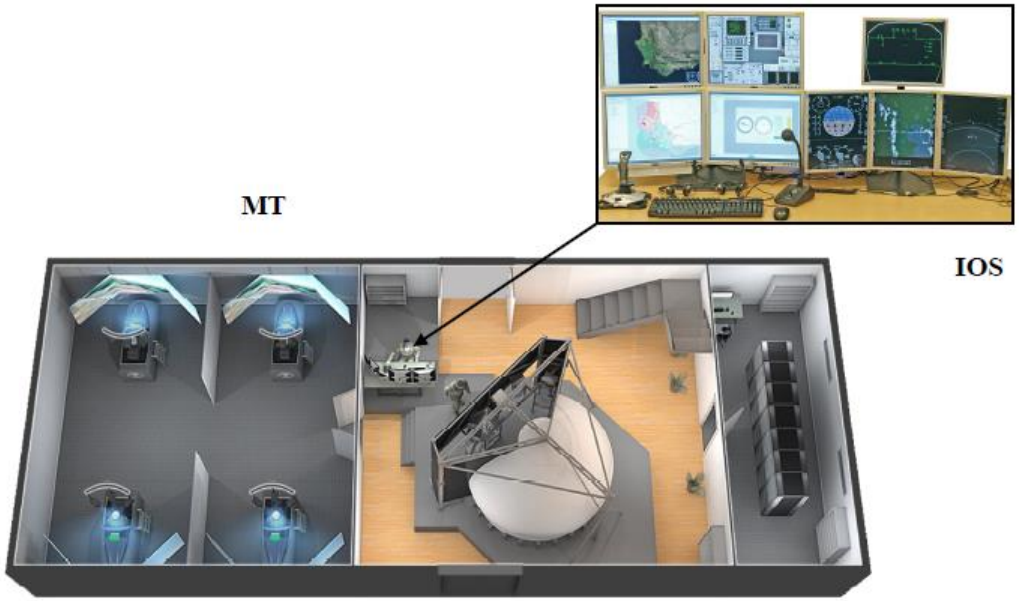
*(The presentation does not involve any confidential data from SAAB and we used the same data as students while doing the project)*

# Introduction

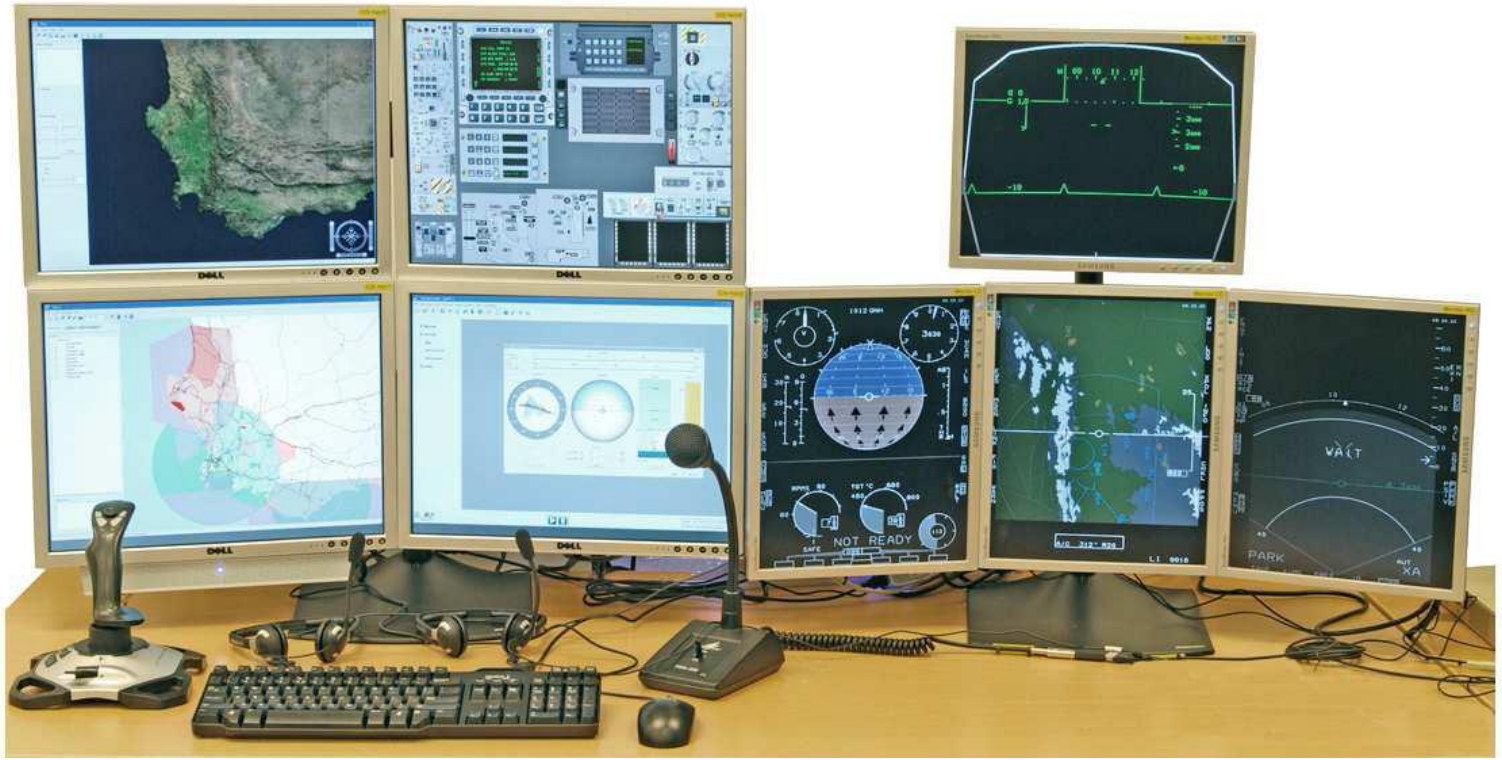
**Mission Trainer (MT)**

- A training simulator for a modern fighter jet.
- support all phases of pilot training, general aircraft handling, tactical training and
- mission rehearsal.
- Stand-alone or in a network.
- Dedicated instructor and operator station (IOS)
- The instructor - experienced fighter pilot (domain expertise command & control or close air
- Support)
- Adequate training environment for tactical environment roles as ATC, wingman and C&C.
- High mental workload on instructor (multitasking scenario control and role playing).
- Tactical scenario consists of simulated entities (CGF)
  pre-defined routes
  basic autonomous behaviours such as fighter, reconnaissance or wingman.
- Hard to see exactly what is going on in a complex scenario
- Training situations demand quick and very precise control of individual entities in the simulation.

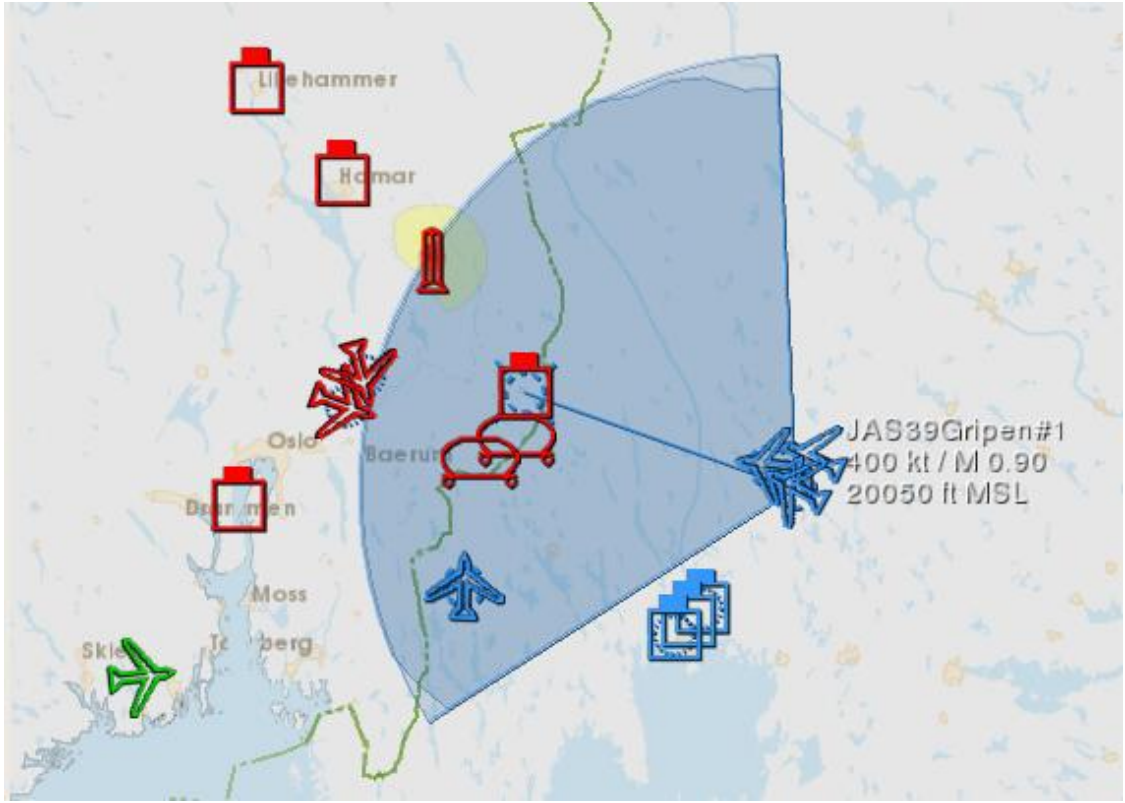
# Mission trainer and IOS



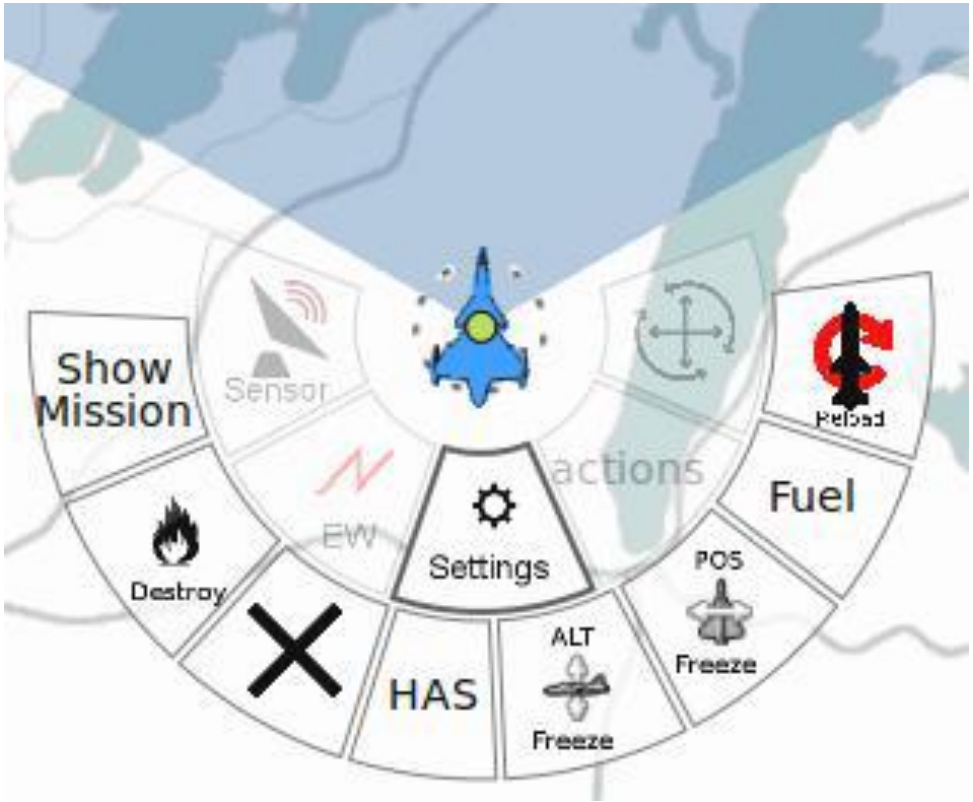
# Instructor and operator station



*Example image of a tactical scenario on a 2D map.*



*Example image of entity functions available in context menu.*



## *Design problem*

The instructor will interact with the simulation in a map-centric way.
A large number of
tools/functions will be available directly in the map.
Most of the functions will be
represented by icons that should be recognizable and distinguishable.
A large part of the
interaction will be done using context menus in the form of radial menus.

## Expected output

ð Icons and/or graphical elements with a set of rules to combine these elements into icons.
ð Design principles for radial menus. How should the functions be grouped? How many levels should be allowed for the context menus? Use icons and/or text for the functions?

## Examples of functions

***High level commands*** such as *"attack target"* or *"conduct evasive maneuver"* are available in radial context menus.

***Low level manipulation*** such as *"lock onto target using specific radar program"* are available in radial context menus and various functional windows.

**Common functions** such as "remove entity", "destroy entity" are available for all entities.

Other commands are specific to entity types.
***Visualization controls*** such as *"show priority targets"* are available in toolboxes in the map.

## Constraints

The icons should be in vector format. They should as far as possible use icons from an icon library called Glyfz Office 2016 (flat) style.

If a specific icon can’t be found in Glyfz use icons from other libraries similar to Glyfz such as Metro.

Many icons will be domain specific and cannot be found in Glyfz, Metro or any other icon library and has to be created from scratch.

## Examples


*Examples of icons from the Glyfz Office 2016 library*

| Function | (tmp)Icon | Semantics |
|---|---|---|
| Create air entity |  | The user initiates creation of entity that belongs to the Category air. |
| Create Ground entity |  | The user initiates creation of entity that belongs to the Category ground. |
| Create Life form entity |  | The user initiates creation of entity that belongs to the Category life form. |
| Create Structure entity |  | The user initiates creation of entity that belongs to the Category structure. |
| Create surface entity |  | The user initiates creation of entity types that belongs to the Category surface. |
| Simulate scenario |  | The whole scenario will be sent to simulation. |
| Remove all entities |  | All entities in the simulation will be removed. |
| Simulate single entity |  | The chosen entity will be sent to simulation. |
| Reset and restart |  | The simulation will be cleared and restarted from the beginning. |
| Connect to simulator | | Connect to the simulator and fetch available data |
| Disconnect from simulator | | Disconnect from simulator and clear local simulation data |
| Clear simulations history |  | Clear history from scenario tool. |
| Velocity |  | When activated it will show entities velocity in the map |
| Behavior information | | When activated it will show information about the entities behavior in the map |
| Sensor FOV |  | Sensors and jammers Field Of View |
| Point of interest | | |

# Solution

Peter Sköld and his colleagues were presented with this idea.

# Design Ideologies

## Colors

Monochromatic schema for the main content

Some prominent colors for certain icons

Visibility of bold black system can be very useful over a colorful map

Future possibility of having a translucent background

# Fine structure

Using the current system shapes and ideas

Minimal changes to the system for the ease of use

Icons with clear meaning in layman

Freedom for all areas to carry information

# Grouping

Groups formed correspond to meaningful aspects of the data

Proving some visual cues to the user in the groups

Ease of having similar icons under one category

# Initial state or Zero state

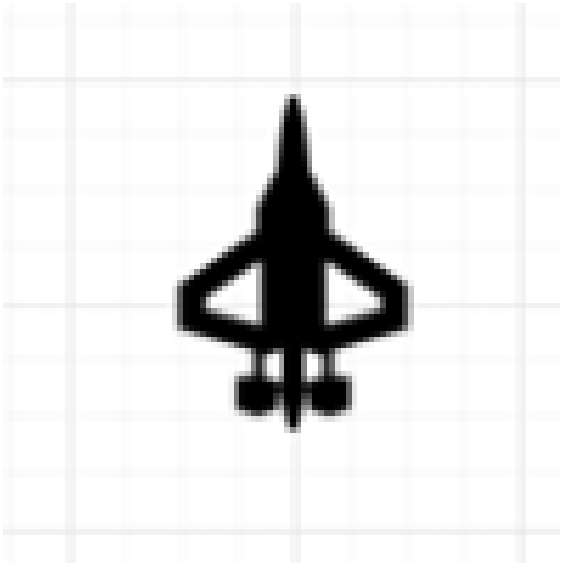
Depicted by a plane.

There are two possibilities

1- Single Right mouse click to open the selection menu

And Single left mouse click to open the selected options

2. Single and Double Left mouse clicks.

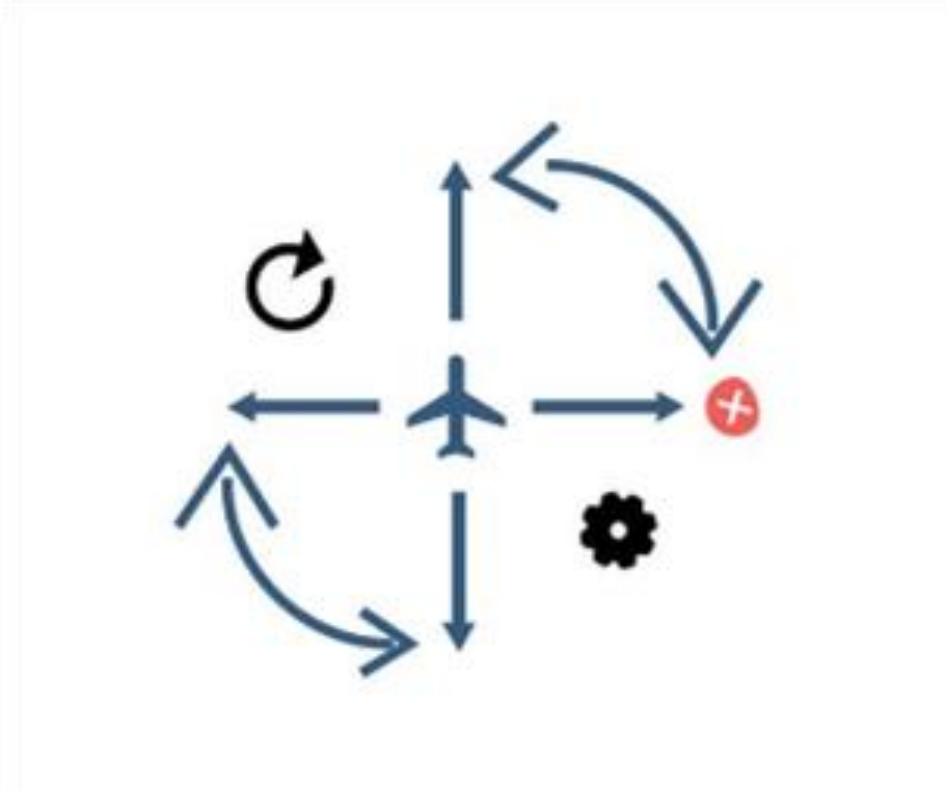


# The Left Click

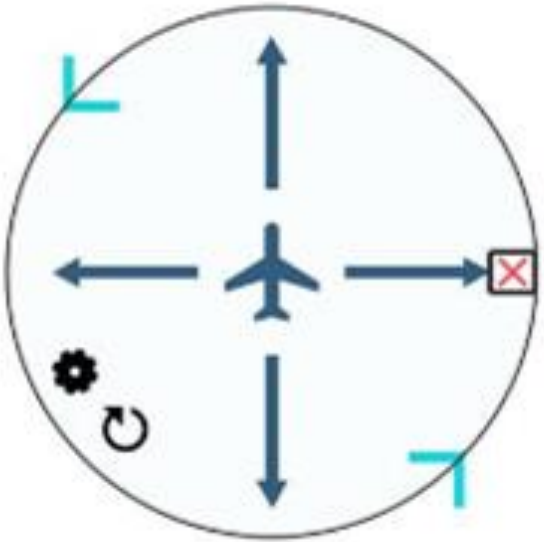
Single left click using the mouse on the plane icon will open the frequently required HAS function.

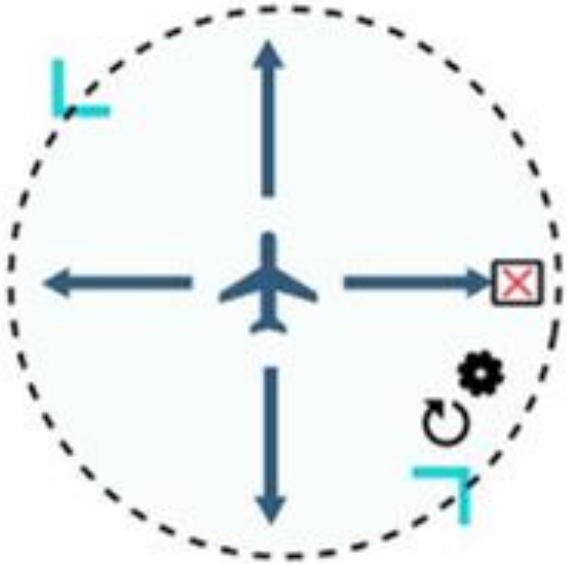
On selection the plane color changes into a shade of dark blue.

Other icons reload, settings and close.



# Other design ideas





# Second Click

Second left or right click?

Opening of a new world with more options

-HAS

-Refuel

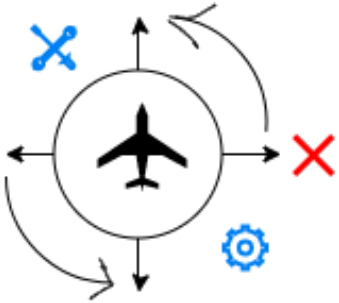
-Reload

-Malfunction

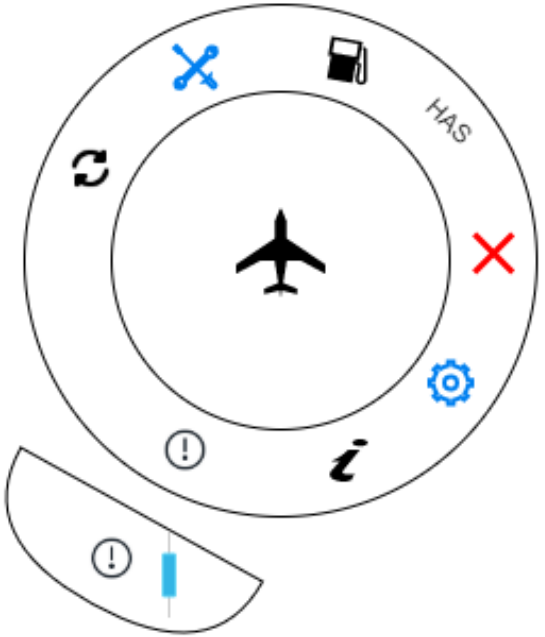
Defaults included

# Developing Idea : third level with a scroll feature

zero state



Active HAS function
(single left click on Jet vector will open the sides)



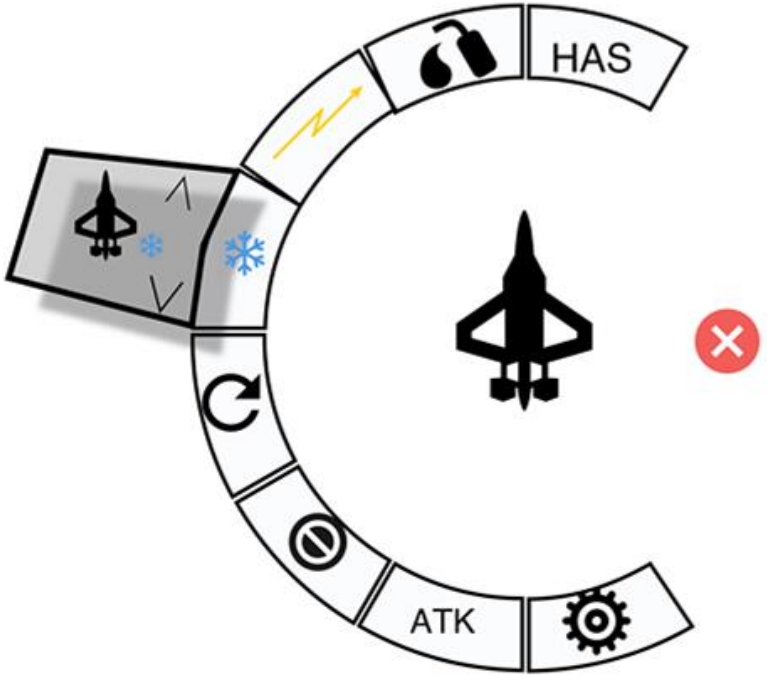

radial pie menu with scroll for later shells

# The “Third” level

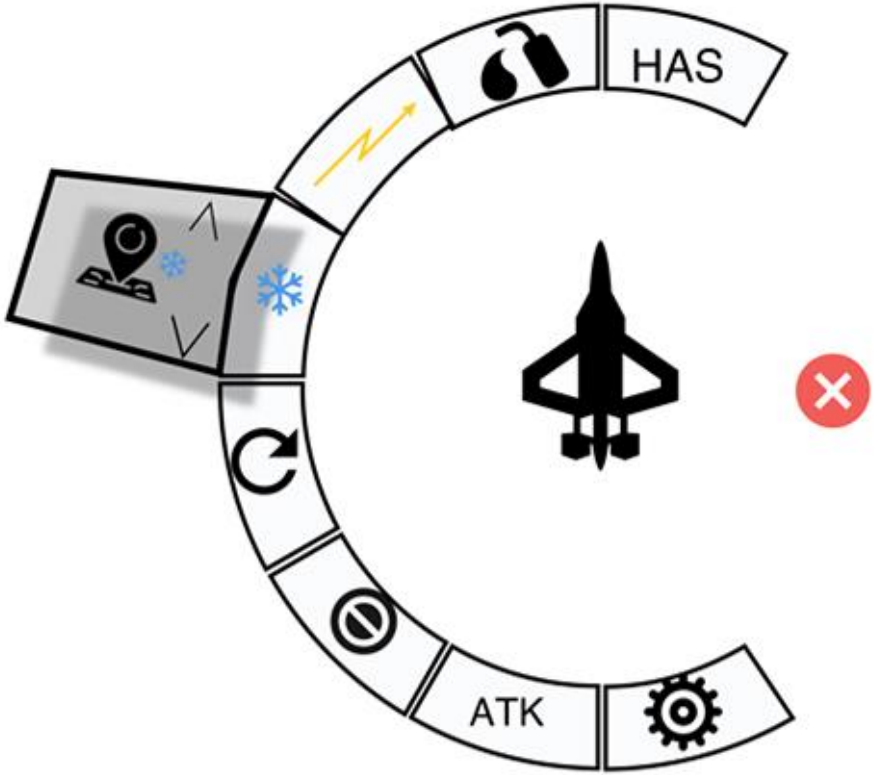
For ease of access

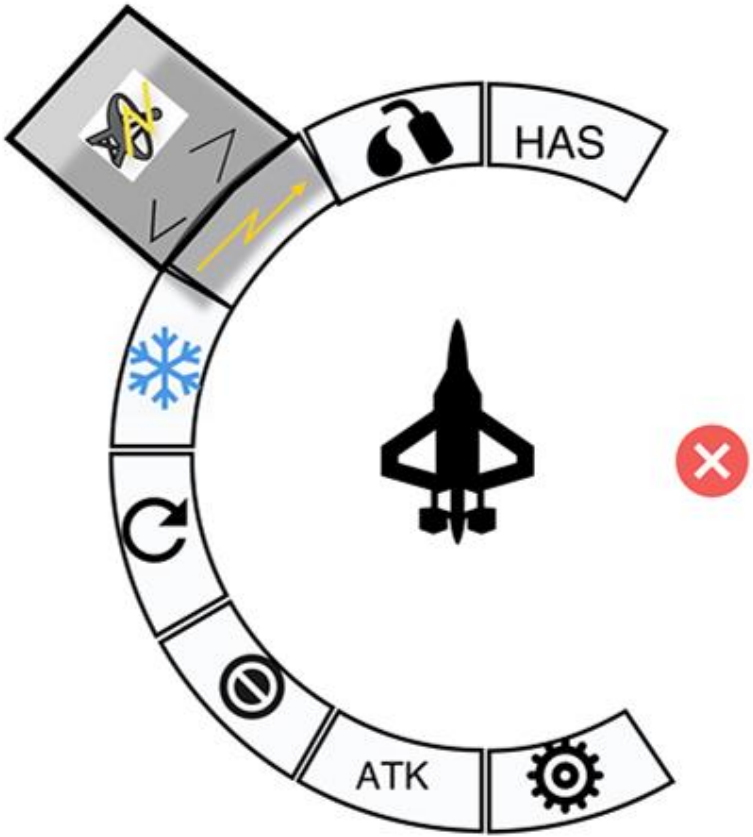
Grouping of similar entities

- For malfunction
- Various freeze options
- Settings options

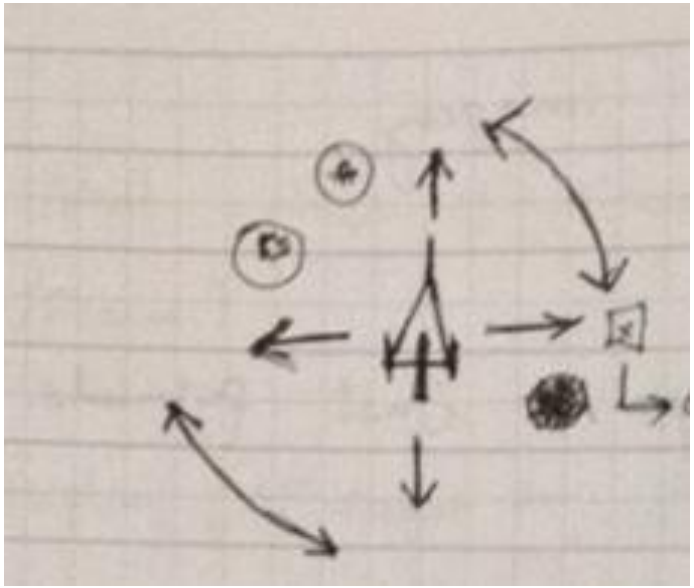


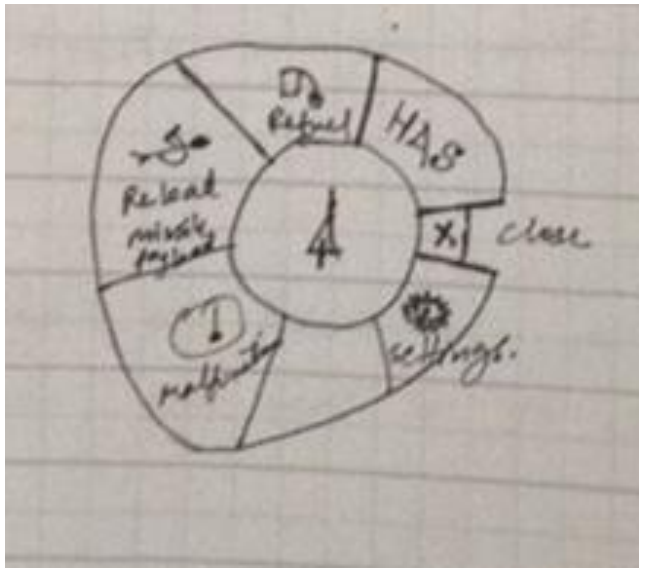
# Final design idea

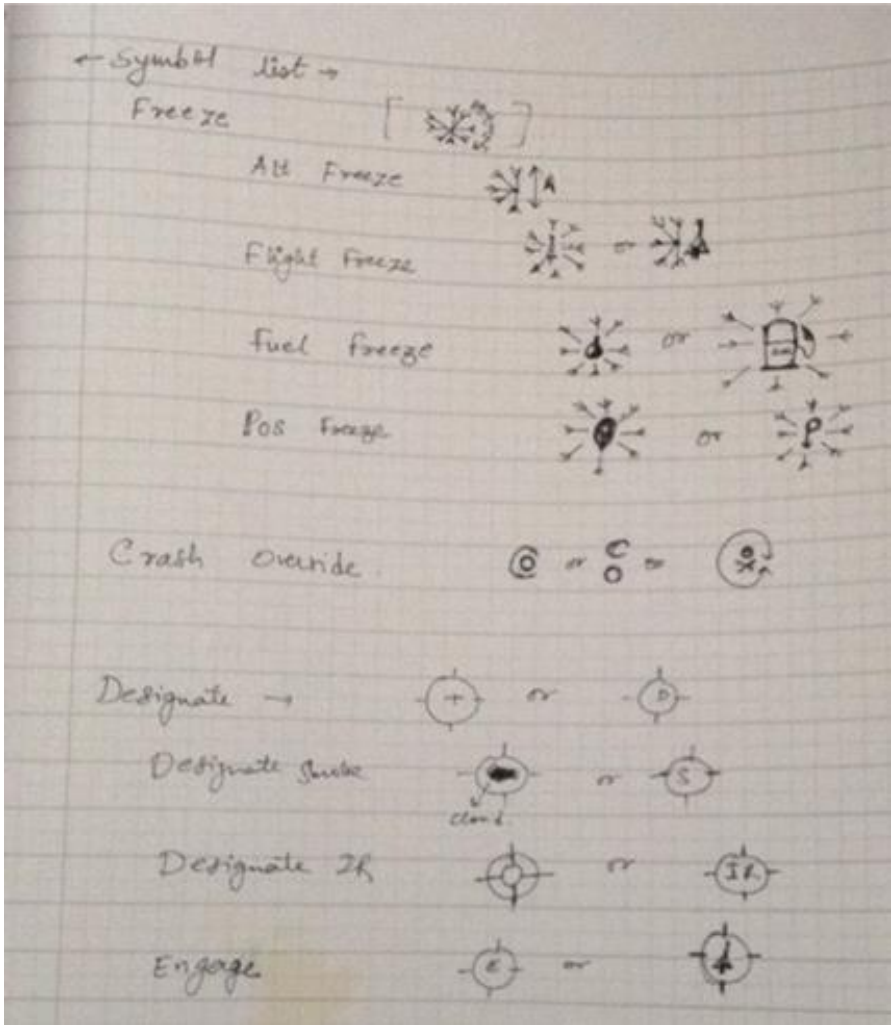



HAS
ATK

# Initial Icon Ideas: paper model






← Symbol list →
Freeze
Alt Freeze
Flight Freeze
Fuel Freeze
or
Pos Freeze
or
Crash override
or
Designate →
or
D
Designate Smoke
or
S
click
Designate IR
or
IR
Engage
or
E

# Icon List

Electronic Warfare

Spike

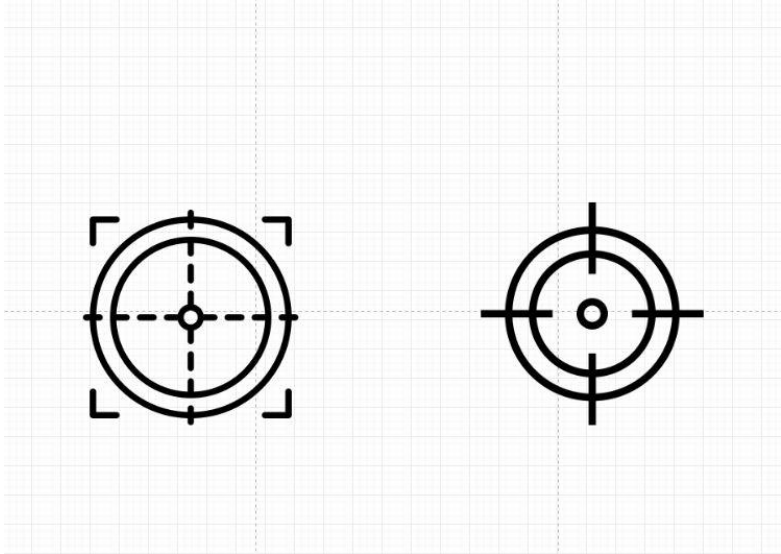
JAM

Spot

# Attack

Engage

Designate



# Freeze

## Location Freeze

## Flight Freeze

## Fuel Freeze

# Functions in Settings: no changes made

| Function | (tmp)Icon |
|---|---|
| Create air entity |  |
| Create Ground entity |  |
| Create Life form entity |  |
| Create Structure entity |  |
| Create surface entity |  |
| Simulate scenario |  |
| Remove all entities |  |
| Simulate single entity |  |
| Reset and restart |  |

Any Questions?

Thank you :)