

# Assignment 1

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Fighter pilots are known for incredible situational awareness and quick thinking. While in air, they need to process a lot of information without a room for error. In order to help them, engineers try to improve the interface in the cockpit so that it is more intuitive, straightforward and easier to retrieve valuable information.

## Bad interface

A cockpit of a soviet MiG-29 fighter jet is an example of a bad user interface. Its main objectives were to describe the state in which the aircraft was in. Figure 1 shows how the cockpit looks like.



Figure 1: MiG-29 cockpit

It consists mostly of simple analog indicators (1) which are very difficult to read and appear in seemingly random locations. In addition to that, there are a lot of switches and buttons on both sides of the aircraft (2) which can be accidentally dragged in the heat of action.

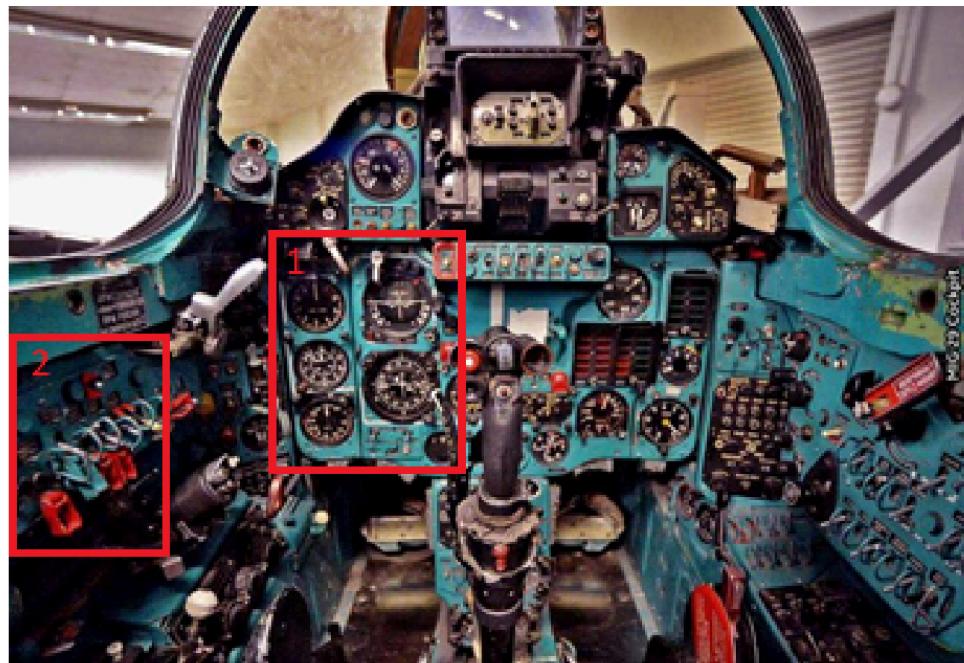


Figure 2: MiG-29 cockpit with attention to the interface

On the good side, these analog indicators are very robust and follow the rule of soviet/russian engineering design of simplicity over comfort. The weight of the construction is reduced compared to it's digital counterparts resulting in better performance in combat. Another positive aspect is that it is significantly less prone to failure, even after receiving damage. It is also easier to maintain and repair.

This interface emerged as a continuation of previous cockpit designs, available technology and doctrines. Prioritizing ease of manufacture and simplicity of construction over pilot's comfort and accessibility to different measurements, this design can be classified as bad design from a user interface point of view.

## Good interface

On the other hand, the Swedish JAS-39 Gripen presents one of the best cockpit designs currently available. With user comfort in mind, all the analog indicators have been replaced by digital screens.



Figure 3: JAS-39 Gripen cockpit

The interface of a Gripen consists mostly of digital screens (1), with buttons on the sides (2) which change the information displayed at the moment. This reduces the information cluster and allows the pilot to focus on the task at hand. The introduction of screens made possible for the new functionality to be implemented, such as tactical map and targeting pod visualisation.

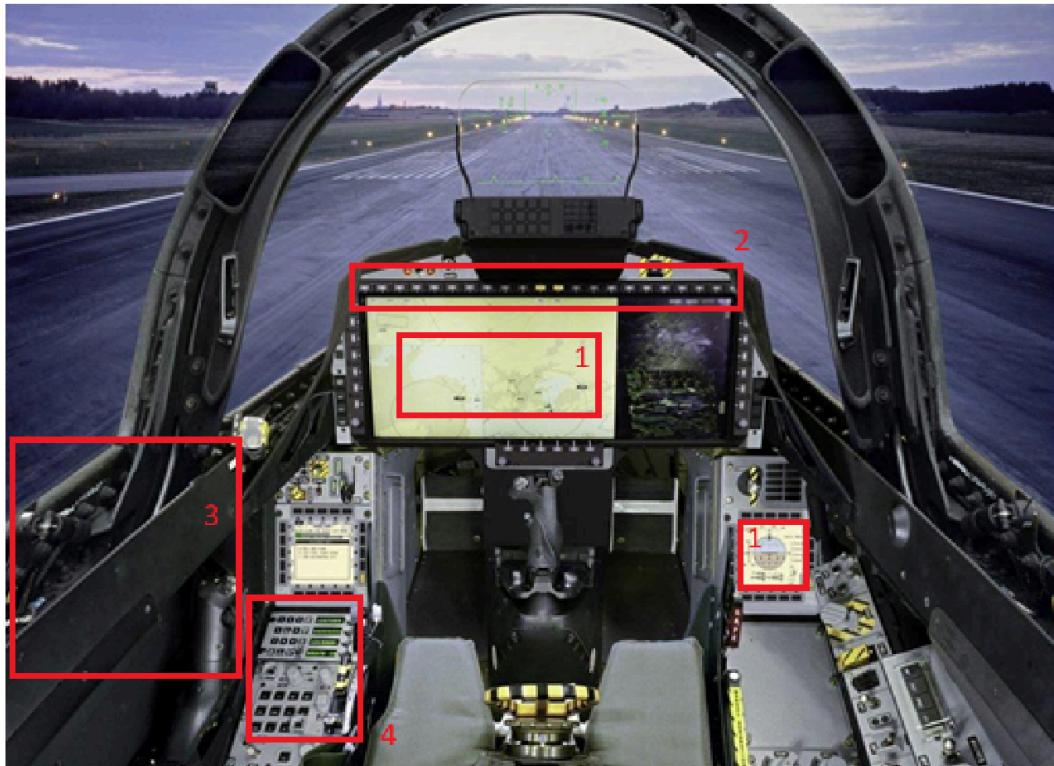


Figure 4: Gripen cockpit with attention to the interface

The lack of any switches on the sides (3) prevents the pilot from unintentionally changing the state of an aircraft during combat. Compact design of the buttons (4) near the instruments to the left (left hand of the pilot is usually free) improves ease of use and makes the cockpit more intuitive. In addition to graphical interface, the aircraft is equipped with different sounds and voice commands from the computer that inform the pilot of any incoming danger, further improving their situational awareness.

With attention to pilot's comfort, the cockpit design of the Gripen presents itself as a strong example of a good interface, that other manufacturers strive for.