

TEAMWORK IN THE GRIPEN F TWO-SEATER

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OBJECTIVE AND CONTENT

- To discuss early design issues from a usability perspective.
- Gripen Fox is a two-seater for pilot training and tactical use.
- Gripen Fox is part of the Gripen NG contract with Brazil to be delivered in the 2019-2024 timeframe.



GRIPEN FAMILY

- Gripen C (Charlie), Single seater in operational use
- Gripen D (Delta), Two-seater in operational use
- Gripen E (Echo), Single seater to be operational 201x
- Gripen F (Fox), Two-seater to be operational 202y
 - Launch customer: FAB, the Brazilian AirForce

NG

- Characteristics:
 - Omni-Role Single Engine Mach 2 Combat Aircraft



DESIGN STUDY - GRIPEN FOX USABILITY

- Cockpit Study performed
 - September 2015 – still ongoing
 - Saab Engineers
 - Saab Pilots
- Tech Transfer
 - On The Job Training, Embraer
 - Initial Design
- Method
 - Task Analysis
 - Usability Analysis, e.g. Personas
 - Architecture
 - System Design
 - Analysis
 - Iterate, iterate, iterate

Pedro Correa da Silva

Student Gripen Pilot

Background:

Age: 27

Task: Studying to be a Gripen Pilot.

Education: Graduated in Aeronautics Science (certified by Brazilian Air Force Academy), Brazilian Fighter Pilot (certified by Brazilian Joker Squadron 2°/5° GAV)

Computer skills: Normal computer skills and MSS training

Goals:

- Perform a flight missions
- Practice tactic to be better pilot
- Be able to perform Air to Air Refueling
- Be able to perform night flight missions

Wishes:

- Plan and rehearse flight missions on the Gripen A/C
- Evaluate performed flight missions on the Gripen A/C
- Lead the group that perform the mission on the Gripen A/C

Description:

Pedro started his career in the Brazilian Air Force 7 years ago, when he was 20 years old. First, he started his 4 years training in the Brazilian Air Force academy to become an ordinary Pilot. In this initial phase, he flew the A/C T-25 Universal for basic training and the A/C T-27 Tucano for advanced training. After finishing this training, Pedro was certified as a Pilot and graduated in Aeronautics Science.

At the end of the training course, Pedro was chosen to become a fighter Pilot. Thus, he started his fighter Pilot training in the Brazilian Joker Squadron 2°/5° GAV. During this 1 year training he flew over 100 hours on the A/C A-29 Super Tucano. He learned how to fly in different operational scenarios such as Air to Air combat mode including dogfight exercises, Air to Ground combat mode, Advanced Navigation, Night conditions using Night Vision Goggles (NVG), Electronic Warfare, etc.

Before been considered as a fighter Pilot and be able to integrated the fighter squadron and fly A/C such as F5 (modernized), A1M (modernized) and Gripen E/F (in the future), Pedro has spent 2 years flying and studying in the Air Base placed in Campo Grande city to become a flight leader.

Finally, after 7 years of preparation Pedro is integrating the first line of Brazilians fighter Pilots in the Air Base located in Anapolis city and he is ready to start his training for becoming a Gripen Pilot.



Student
Gripen
Pilot

TEAM WORK IS KEY TO SUCCESS – DESIGN IT!



USABILITY - **PILOT TRAINING**

Typical training sorties include:

- Initial training: takeoff and landing, including both visual and instrument approaches.
- Intermediate training: degraded systems, formation flying, basic fighter maneuvers and night flying.
- Combat readiness training: Air to air operations, e.g. BVR and WVR. Air to surface operations, e.g. guided / unguided munition and reconnaissance

Mostly proven already in Gripen Delta

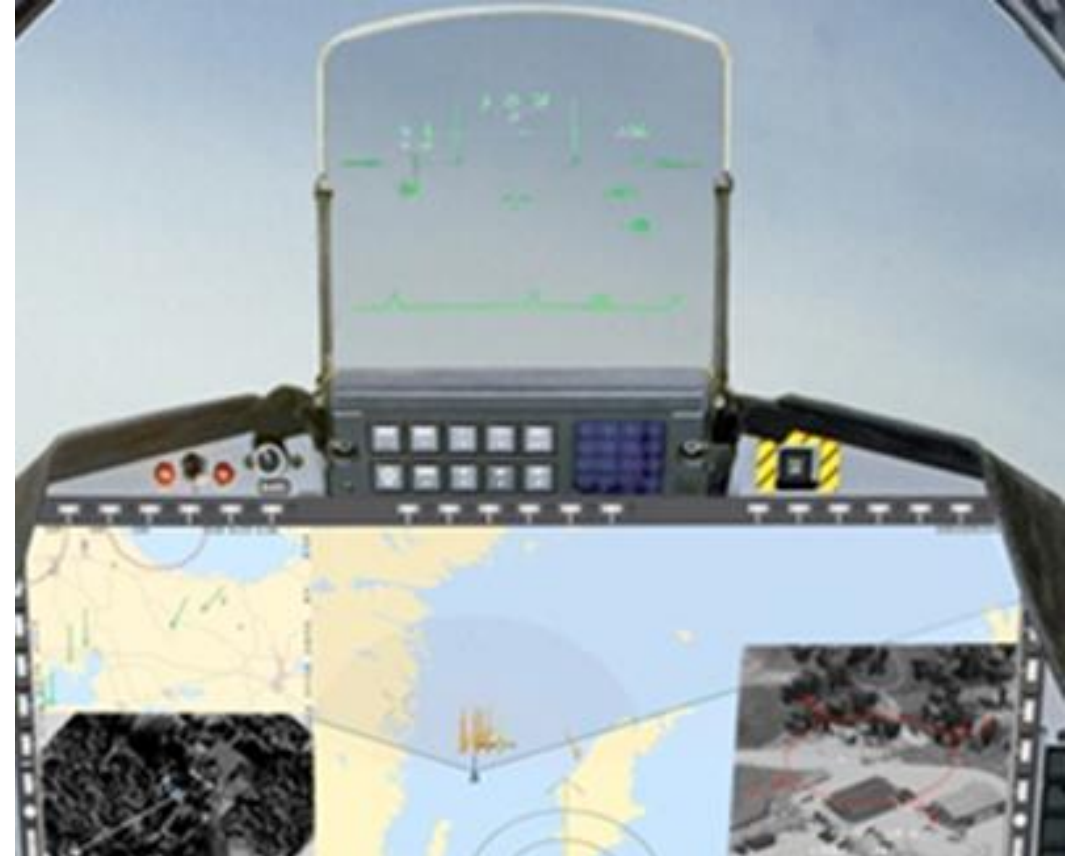
Train as Gripen Echo added



USABILITY – **TACTICAL MISSIONS**

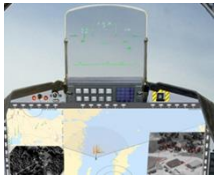
- Skills
 - Weapon System Officer: both pilots active in combat. Resource sharing and priorities.
 - Electronic Warfare: supporting skills for a specific tactical mission. High level of system interaction → Two-seater.
 - Mission Commander: Commanding a group of aircraft over a radio network.

A new objective defined for Gripen Fox

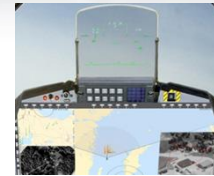


LEVEL OF INTEGRATION? – **COMMONALITY!**

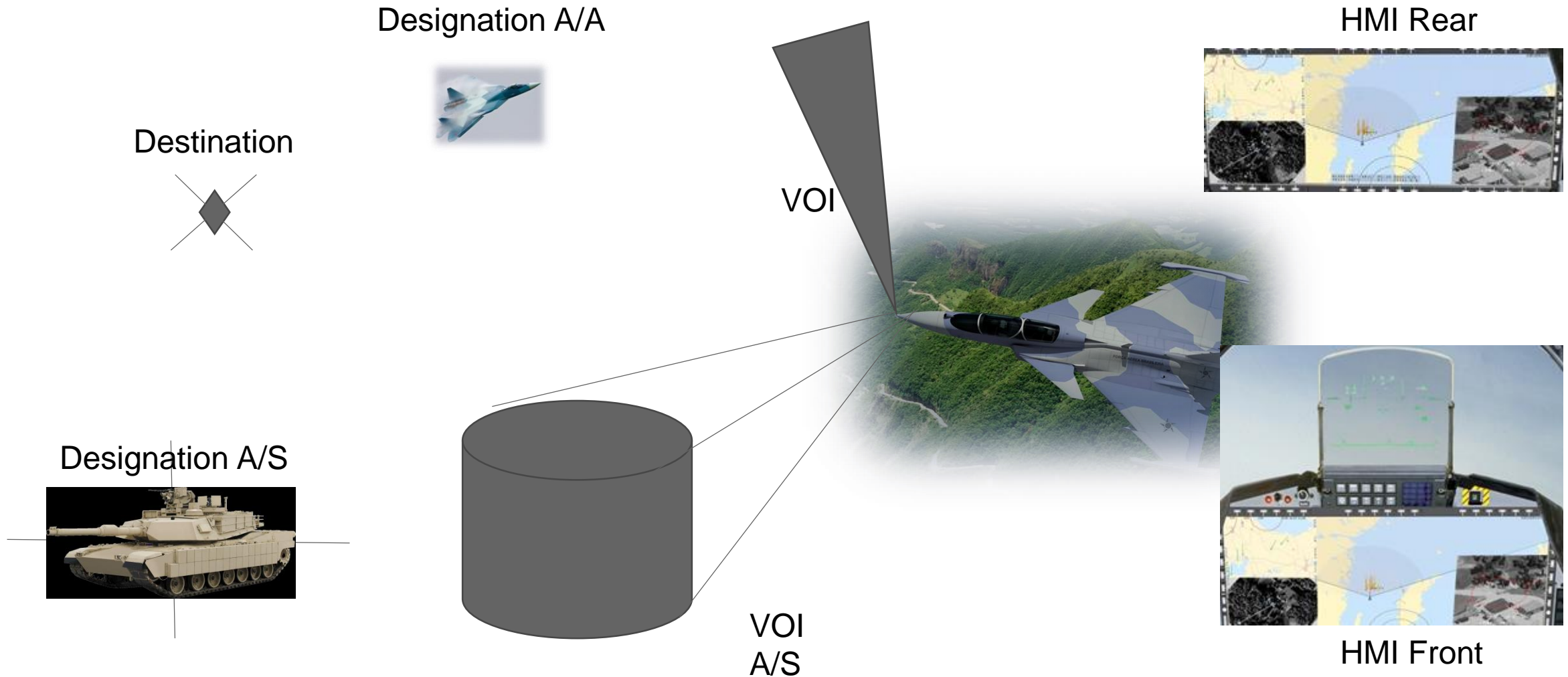
Gripen Echo – "Full Integration"



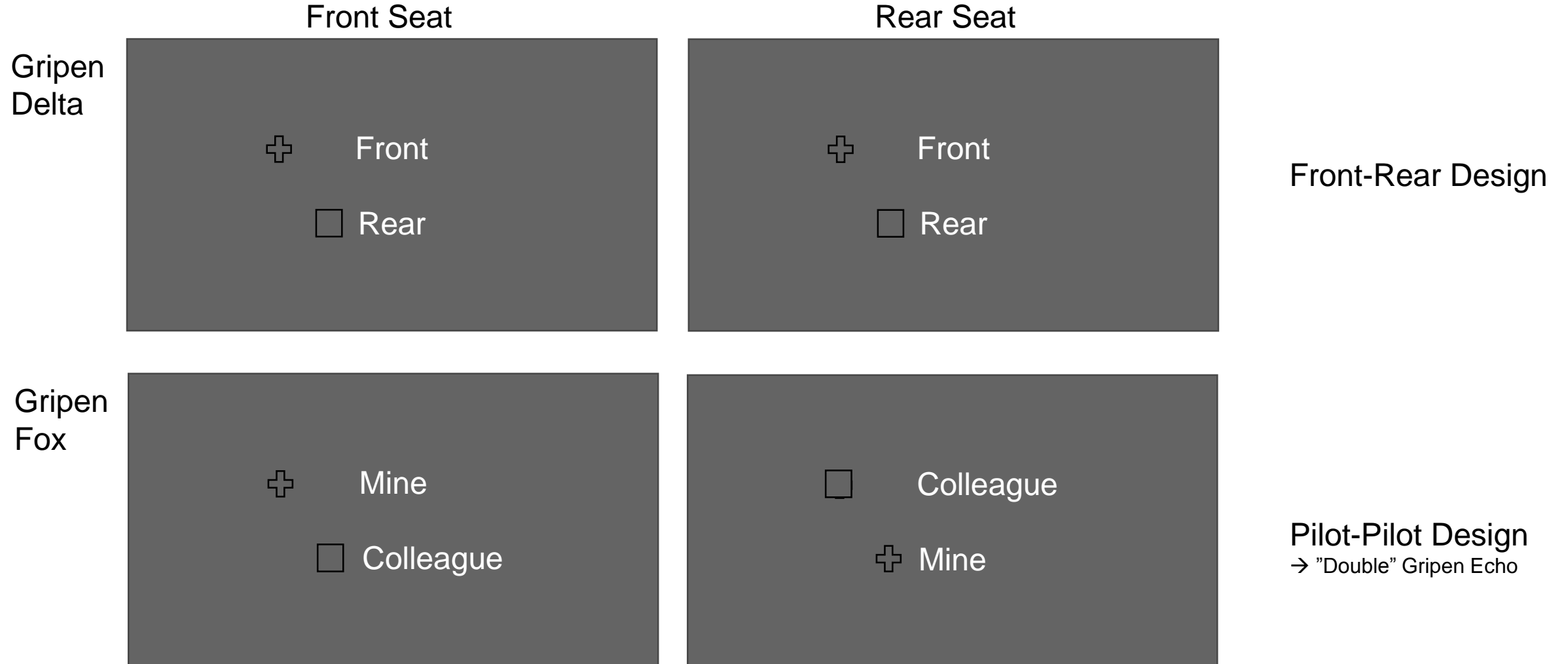
Gripen Fox
"Two Aircraft – One Position"



GRIPEN FOX "TWO AIRCRAFT - ONE POSITION"



EXAMPLE: CURSOR DISPLAY ATTRIBUTE



RESULTS

- Training Missions
 - Initial Training
 - Intermediate Training
 - Combat Readiness Training
- ”Two Aircraft - One Position”; Two Independent Cabins for Tactical Use
→ Pilot Teamwork
 - Electronic Warfare: Dedicated Task
 - Weapon System Officer: One Destination, Multiple Designations
 - Destination → Navigation → Flight Authority
 - Designation → Targeting Air to Air + Air to Surface
 - MC: Assigning Targets within a unit of multiple Gripen Aircraft
- Gripen Fox
 - Flying Authority and System Safety as Gripen Delta
 - Tactical Operandi and Systems Architecture as Gripen Echo

THANK YOU FOR LISTENING!

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