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LEOPARD BATTLE TANK

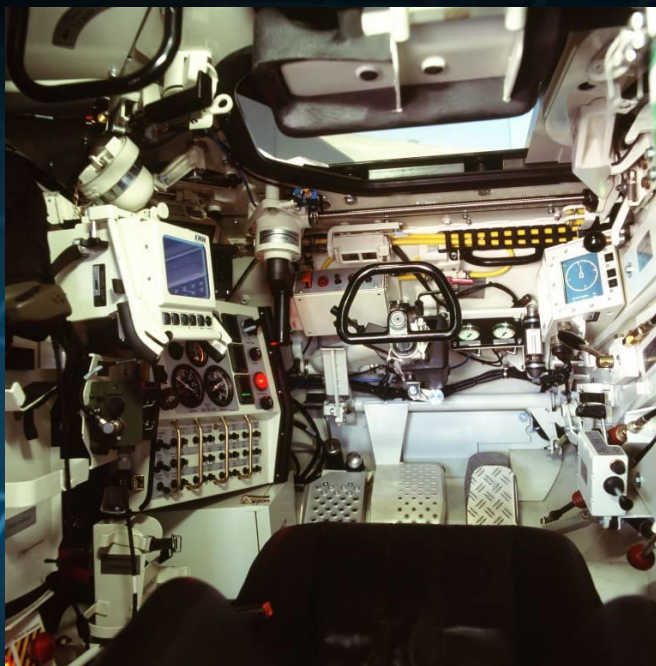
3D DRIVING SIMULATOR OPERATION TRAINING

Recommended & Enforced Products

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- 3D Driving Simulator



Recommended & Enforced Products



- Commander & Gunner Trainer

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LEOPARD BATTLE TANK Driving Simulator

Recommended & Enforced Products

Driving Simulator

Training goals:

- Introductory training for new drivers
- Controls operation
- Exercises in different conditions and environments
- Advanced training
- Enough accuracy to fulfil these goals

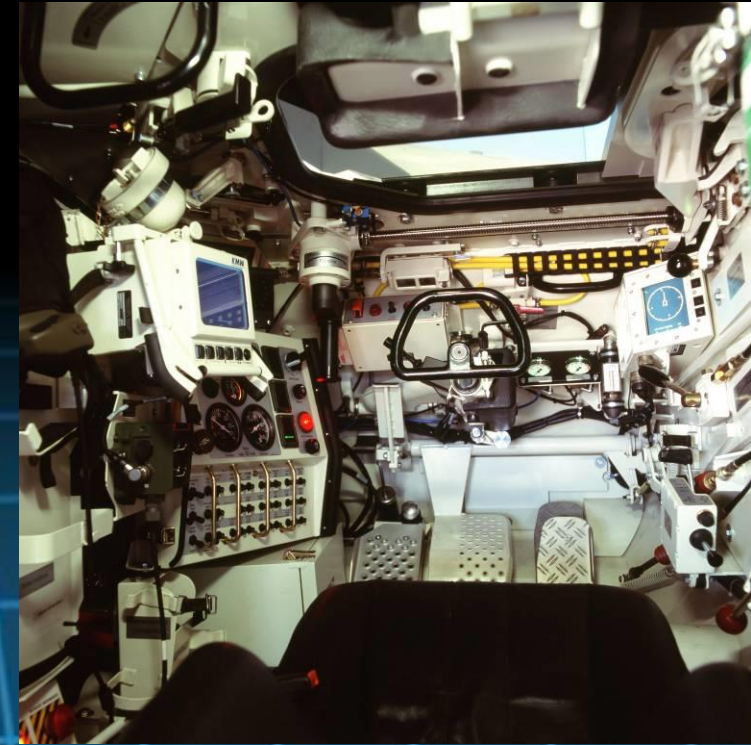


Features:

- Full-scale reproduction of the real vehicle cabin (Closed hatch).
- Cabin equipped with real controls.
- Cabin with closed structure & Motion System
- Steering wheel with Control Loading System.
- Visual System
- Vehicle sound simulation

Driving Simulator: Cabin Real Parts

- Driver Instrument Panel (Original panel, instruments, indicators and switches - Simulated fuses)
- Firefighting System Control Box (Original housing, knobs, indicators and switches - Modified cabling)
- Light Selecting Lever (Original)
- Episcopes (Simulated)
- Driver's Hatch (Simulated. Light weight based on original)
- Parking brake (Original)
- Fire extinguisher bottles with manometer (Original empty bottles with modified manometer)
- Fire extinguisher emergency switching (Original)
- Gear and direction selector (Original)
- Accelerator pedal (Original modified to allow sensing and passive force control)
- Brake pedal (Original modified to allow sensing and passive force control)
- Episcopes washing rammer (Original or simulated without functionality)
- Funnel for filling of the episcopes washing-liquid tank system (Original or simulated without functionality)
- Emergency hatch (Mock-up)
- Interphony control box (Original modified or simulated to allocate a specific trainer intercom board)
- Night vision periscope (Original housing modified to allocate a commercial TFT)
- Heat regulating knob for the driver's station (without functionality)
- Drainage valve control (Mock-up)
- Driver's seat with headrest (Original)
- General warning light, driver (Original)
- Voltage indicator (Original)
- Turret's position indicator (Original)
- Ceiling light (Original)
- Selecting lever for episcopes washing (without functionality)
- Steering wheel with positioning lever (Original modified to allow sensing and active force control)
- Footpump for hatch sealing system (Original or simulated connected to trainer specific pressure accumulator)
- Fording hydraulic- system indicator manometer (Original modified)



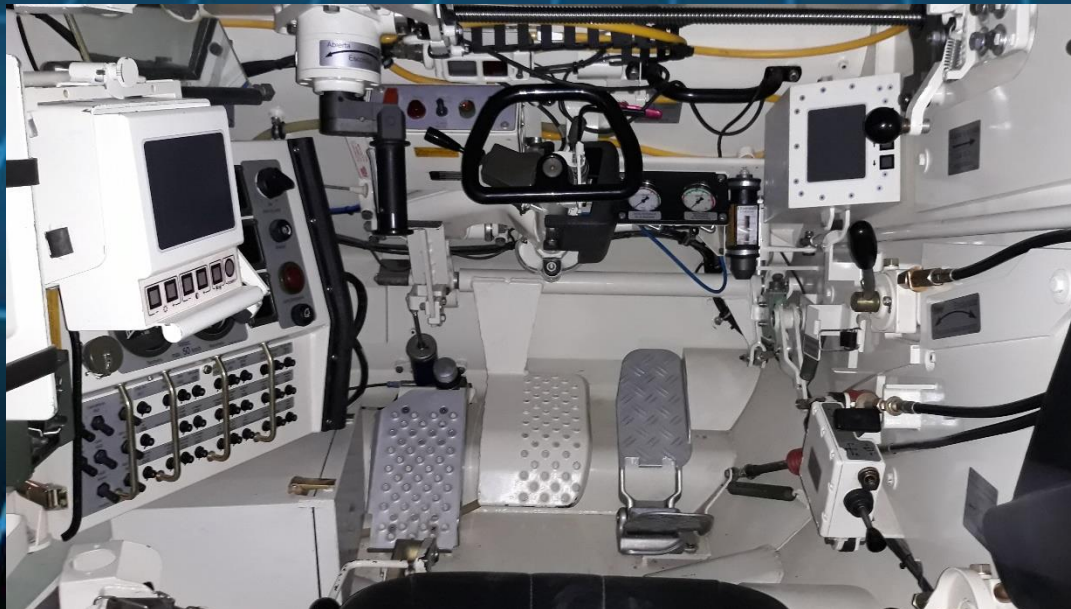
- Manometers for hatch sealing system (Original)
- Reverse drive monitor (Original housing modified to allocate a commercial TFT)
- Driver Display Control Unit (Original housing modified to allocate a commercial TFT)
- Emergency gear lever (Original)
- Speed windscreen wiper (Original)
- Auxiliary Power Unit panel (Simulated mock-up)

Some parts could be replaced by sim parts or touch Screens

Driving Simulator Software

Specific Simulation Software

- Full simulation of the driver station equipment.
- Tank dynamics and movement.
- Malfunctions
- Motion System control
- Control Loading System

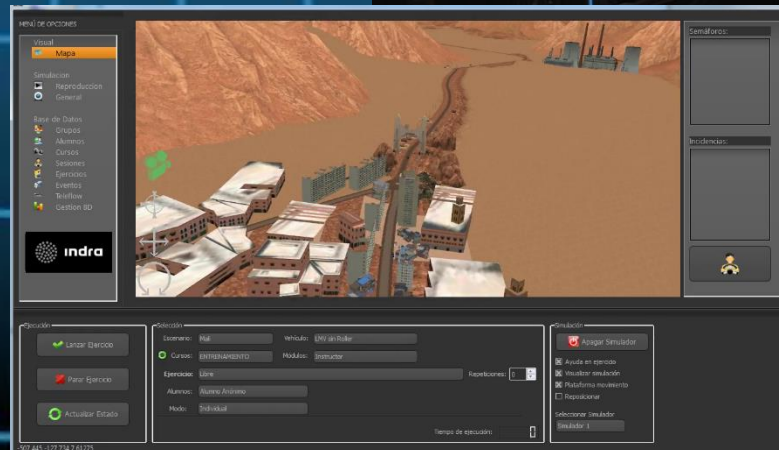


Simulated Software Modules

- Fuel
- Electrical System
- NBC System
- Light Intensifier
- Engine
- Transmission
- Movement
- Suspension and Tracks
- Controls: Steering, Accelerator, Brakes, Gear
- Communications (With IOS)
- Navigation
- Automatic Evaluation
- Malfunctions Simulation

Instructor Operational Station (IOS) Driving Simulator IOS Capabilities

- Creation and modification of exercises
- Full simulation control
- Database for exercises and lessons.
 - Assign a type to lessons (start, stop, fording, obstacles, urban circuit, road, cross-country,
- Database for trainees and crews
 - Individual Trainee reports
- Simulation control:
 - Start, stop and pause commands for record and replay
 - Load exercise and modify initial conditions.
 - Weather selection: rain, fog, ice...
 - Hour of the day selection
- Repeaters of driver visual channels.
- Display in real-time of driver cabin controls and panel status.
- Audio Comms with driver cabin

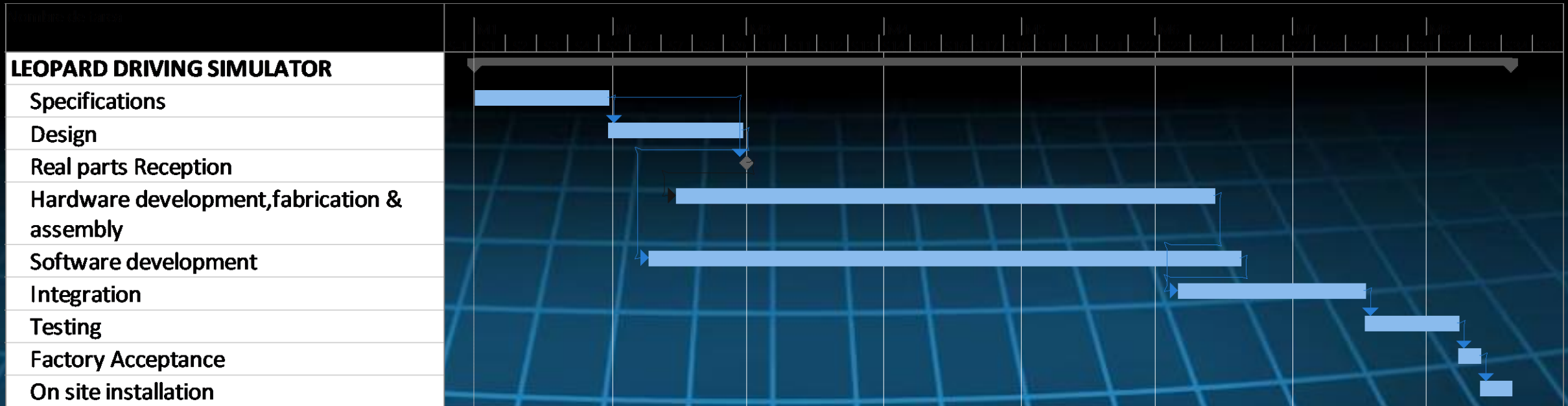


Driving Simulator Virtual Environment

- Wide variety of scenarios: countryside, desert, villages, bridges, two lane roads, highways, mountain roads...
- Different path surfaces: concrete, dust, mud, snow and sand.
- Realistic dynamic model for different ground conditions



Driving Simulator Schedule



The real parts reception at the factory is an important milestone. Program schedule depends on this milestone fulfillment.

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**LEOPARD
PROCEDURES TRAINERS**

COMMANDER - GUNNER

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TRAINERS

- “Procedure Trainer”: These devices are used to teach specific vehicle procedures. They can include a simulated cockpit and display and control systems so that trainees can practice specific procedures without having to use the actual vehicle.
- Training devices are used to teach and test student specific skills such as instrument use, normal operating procedures and emergency procedures.

COMMANDER - GUNNER Trainers



The training station (*COMMANDER - GUNNER*) will have a physical appearance similar to the real vehicle:

- A 3D scanner of the real position (*COMMANDER - GUNNER*) will be made.
- The training station (*COMMANDER - GUNNER*) will be reproduced with mock ups, sheet metal, plastic, simulated parts, 3D prints, touch screensand available real parts.

COMMANDER - GUNNER Trainers

Part of the panels, indicators and controls will be Touch Screens, simulated or emulated equipment, simulated controls, simulated instruments....



Real on board equipment



Equipment on a Screen

COMMANDER - GUNNER Trainers

The procedure trainer will allow the training of *COMMANDER - GUNNER* as it will allow the trainee to know and become familiar with all the control elements of the Leopard battle tank.



COMMANDER - GUNNER Trainers

Objective: In each training position the student will learn:

- *COMMANDER - GUNNER* panels, indicators, controls and knobs.
- Operation of each panels, controls and knob and how it is actuated.
- Procedures to be carried out in each operation.
- Procedures to solve malfunctions or incidents.



LEOPARD PROCEDURES TRAINERS PROGRAM

Hardware: *COMMANDER – GUNNER* Training cabin design, development and fabrication.

Software: Design, development and implementation:

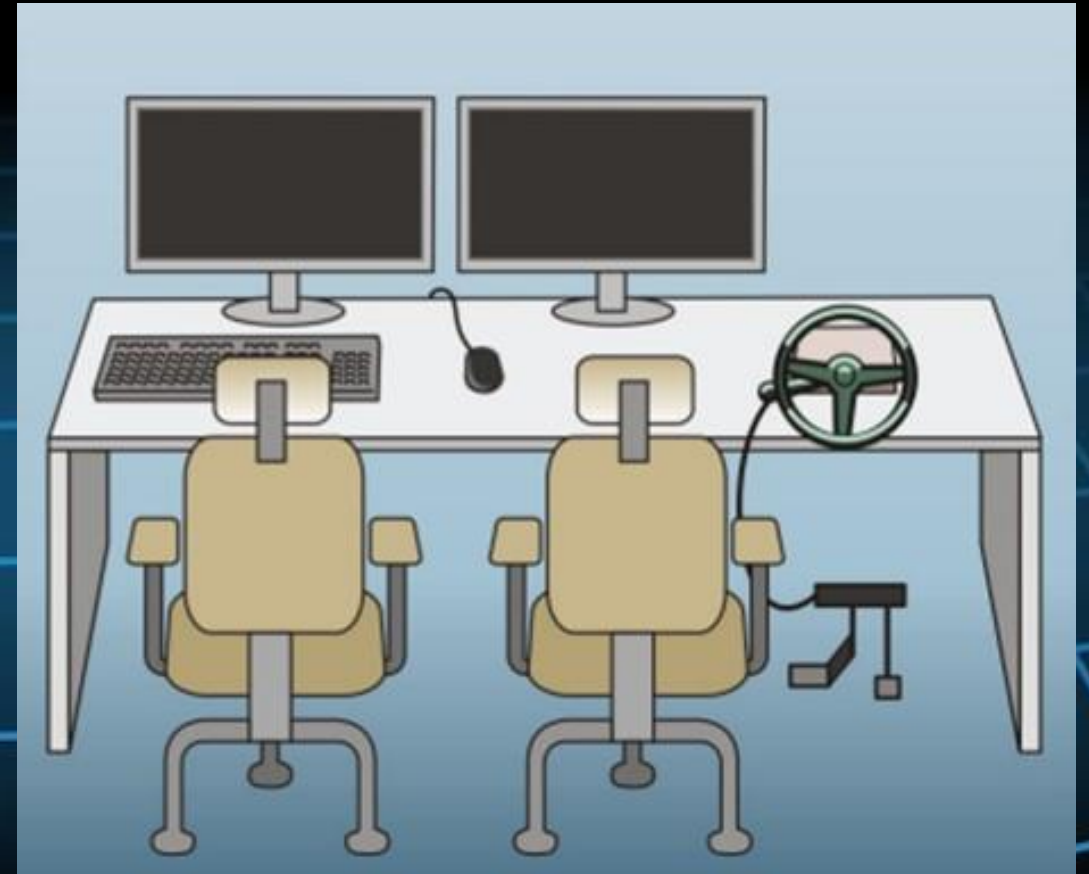
- Simulation of the operation of the indicators, controls and knobs.
- Required systems operation simulation.
- Necessary visual channels and sounds Simulation.
- Malfunctions.
- Instructor Station to control the exercises.
- Training procedures.



Instructor Operational Station (IOS)

Commander & Gunner Trainer IOS Capabilities

- Creation and modification of Procedures
- Full Training control
- Database for procedures and lessons.
 - Assign a type to lessons (start, stop, fording, obstacles, urban circuit, road, cross-country,).
- Database for trainees and crews
 - Individual Trainee reports
- Training control:
 - Start, stop and pause commands for procedure
 - Load procedure and modify initial conditions.
- Display in real-time of commander & gunner trainer controls and panel status.
- Audio Comms commander & gunner trainer cabin.



Procedure Trainers Schedule

