

M1A1 SYSTEM INTEGRATION LAB (SIL)



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The M1A1 Family of Vehicle (FOV) Embedded Diagnostics (ED) System Integration Lab (SIL) is a fully integrated electronics simulator for the M1A1 Abrams tank. The M1A1 FOV ED SIL resides in an environmentally controlled laboratory within the Vehicle Integration Facility at DRS Land Electronics, located in Huntsville Alabama. This congressionally funded project was created to provide a valuable resource for the development and sustainability of Embedded Diagnostics upgrades for the M1A1 Abrams tank. The M1A1 FOV ED SIL also provides the capability to support numerous research and development activities related to the electronics on the M1A1 tank platform.

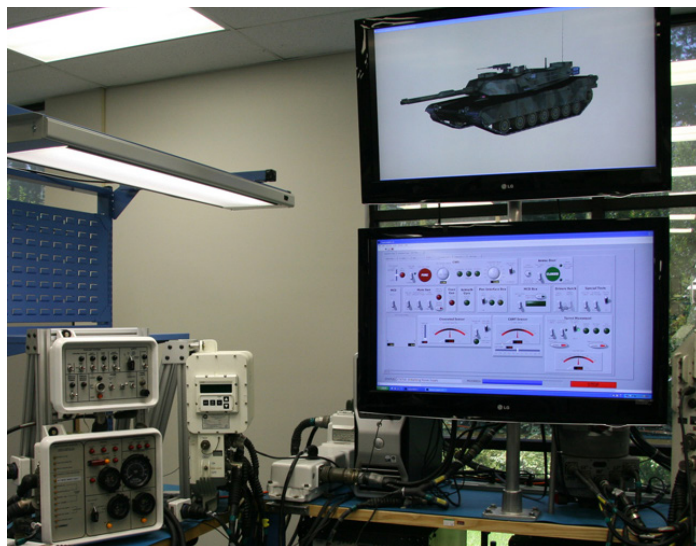
The M1A1 FOV ED SIL uses a combination of the following to simulate the M1A1 tank electronic environment: M1A1 Line Replaceable Units (LRUs), M1A1 system cables, Embedded Diagnostics hardware, an AGT1500 engine simulator, and a National Instruments data acquisition chassis for both turret and hull. The M1A1 FOV ED SIL uses both LRU signals and over 500 simulated complex signals to compose a system that emulates the electronics functionality and operation of the M1A1 tank. In essence, the M1A1 FOV ED SIL is a M1A1 tank on a bench that allows testing and development activity to be completed in a lab environment.

The M1A1 FOV ED SIL was developed to support two thermal variants of the M1A1 tank (with the hull being common to both thermal variants): the M1A1 Thermal Imaging System and the M1A1 Block 1 Second Generation Forward Looking Infrared thermal system. One major advantage the M1A1 FOV ED SIL provides is the time it takes to change from a TIS variant to a Block 1 Second Generation FLIR variant, which takes less than 2 hours. The M1A1 FOV ED SIL was designed so that other M1A1 variants can be easily integrated for future development. Future M1A1 variant candidates include the M1A1 Situational Awareness (SA) tank, the USMC M1A1 Firepower Enhancement Program (FEP) tank, the Assault Breacher Vehicle (ABV), and the Joint Assault Bridge (JAB), as well as any other vehicle configuration that utilizes the M1A1 platform.

M1A1 SIL

HIGHLIGHTS

- Full power control of all M1A1 LRUs in both turret and hull
- Full electronics simulation of both turret and hull functions and operations
- The only M1A1 electronics simulator in the world
- Easily adaptable/interchangeable to other M1A1 ED platforms (current TIS and Block 1 Second Gen FLIR variants)
- One person simulator operation
- AGT1500 engine simulation
- Safer operator/developmental environment (as compared to the actual M1A1 tank)
- Easy fault insertion and tank symptom simulation
- Easy LRU and system cable accessibility/change out
- 42" LCD display for GUI simulation software (simulation switches, gauges, and dials)
- Additional 42" LCD display for displaying a full M1A1 tank graphic (for main gun and turret positioning purposes)
- Controlled test environment
- Shorter Embedded Diagnostics testing times
- Zero fuel consumption (AGT1500 engine simulator allows testing and development activity to be completed in a lab environment).

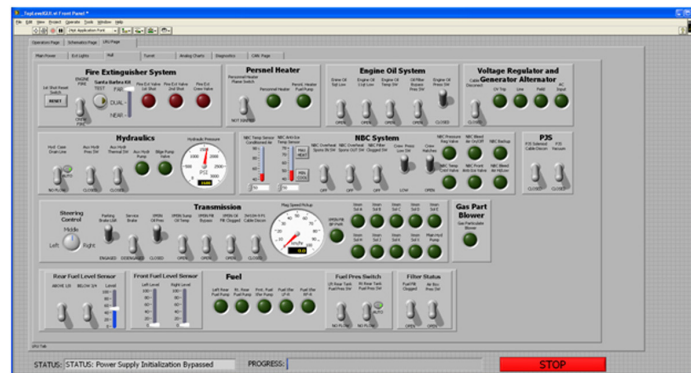


M1A1 FOV SIL in operation.

SYSTEMS/FUNCTIONS

The following systems/functions are simulated on the M1A1 FOV ED SIL (all other systems/functions are performed by the actual LRUs that make up the M1A1 FOV ED SIL):

- AGT1500 engine
- NBC system
- Fire detection and suppression system
- Transmission system
- Hydraulics system
- Gun trunnion resolver
- Azimuth and elevation servos
- Ammo door system
- Drivers's Hatch Interlock system
- Fuel level and automatic fuel transfer system
- Personnel heater system
- Engine fluid level detection system
- Internal and external lighting system
- Commander's Weapon Station (CWS)
- Main gun and turret movement
- Cant and Crosswind Sensor



Above is a screen capture that depicts the actual GUI simulation software that the operator would use when performing Embedded Diagnostic testing.



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