NAVAIR Aircraft Platform Interface Laboratory

Electronic Component-Level Diagnostic Development

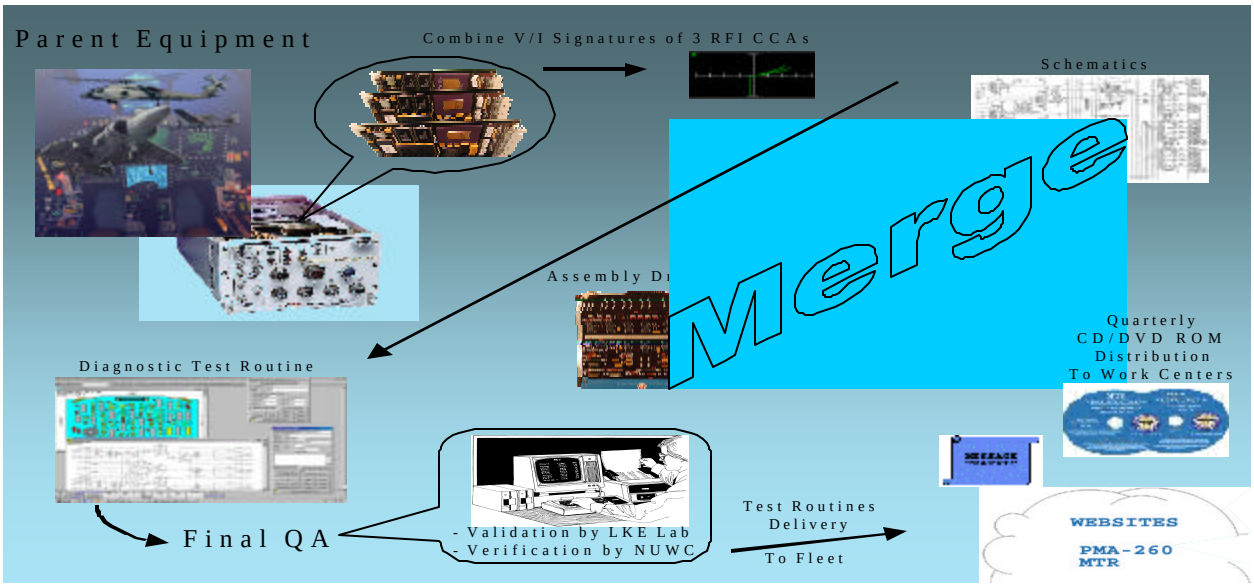
- Safe and effective short-term fault detection mechanism
- Provides flexibility in developing short-term solutions for managing life-cycle support
- Non-intrusive fault detection does not affect any components

This laboratory develops diagnostic troubleshooting routines that isolate faulty components in electronic modules and circuit card assemblies. The troubleshooting routines are known as “Gold Disks.” They contain analog signatures (graphical displayed sine waves) of each component from three ready-for-issue (RFI) circuit cards, which are then compared to components under test. The analog signature is generated by applying an AC stimulus to the component, creating a voltage-versus-current signature that is then used for analysis. The Gold Disks also contain troubleshooting instructions, engineering/technical documentation, and logistic information required for the acquisition of materials necessary for repair.

Development of the Gold Disks consists of:

- Obtaining schematics and layout drawings
- Compiling piece parts and the associated national stock numbers
- Acquiring three RFI circuit cards and capturing the unique analog signatures of the components. External stimuli can then be applied to each discrete component and compared to the unit under test
- Creating a disk template and database that contain all of the logistical tools needed to fault isolate to the component level

The Gold Disks are distributed in CD or DVD format and are also available for download from the web. Following step-by-step instructions, technicians can view a pass or fail indication when testing components. All identification and logistic data needed to complete the repair action are also provided for any component on the schematic and assembly drawings.



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Planned enhancements include integrating multi-functional dynamic testing of components with the analog signature analysis that is already being used in the development of Gold Disks. The improved test system will be able to perform functional tests of components, provide stimuli, acquire response measurements, and detect pass/fail operation on a circuit card assembly or component.

Gold Disk technology:

- Enhances operational readiness by sustaining intermediate level repair capability
- Increases inventory availability of ready-for-issue spares
- Offsets long lead times and costs in procurement and repair contracts
- Provides planned management for obsolescence by improving self-sufficiency of intermediate maintenance activities and less dependency on depot or manufacturing support
- Controls costs associated with technology integration

Partnering Opportunities

Several mechanisms exist for partnering with NAVAIR Lakehurst. These include cooperative research and development agreements (CRADAs), commercial services agreements (CSAs), and education partnership agreements (EPAs) Under a CRADA, Lakehurst engineers and scientists work cooperatively with their peers in industry or academia on mutually beneficial research and development. The Navy has been given statutory authorization, via CSAs, to use Navy facilities to perform specific types of work for private parties. EPAs allow collaboration between NAVAIR Lakehurst and educational institutions.

Potential Applications

The Gold Disk technology could also be used by commercial airlines, large communications systems such as those used by State and local agencies or Homeland Security, or the trucking industry.

For More Information

API Lab Manager:
732-323-7043, LKHR_API_Lab@navy.mil

Technical points of contact:
732-323-1065
732-323-7151

NAVAIR Lakehurst's Aircraft Platform Interface Facility was opened in August 2002. This 66,000-square-foot research and development facility supports the Navy's aircraft launch and recovery and support equipment missions. The technical capabilities covered by the 14 laboratories in this facility include power control systems; modeling, simulation, and data analysis/management; optical and lighting systems; integrated diagnostics; component evaluation; and applied technology. The synergism provided by collocating these teams of engineers, scientists, and technicians in one building further enhances this state-of-the-art facility.

NAVAIR Lakehurst researches, develops, tests, and procures aircraft launch and recovery systems and support equipment for Navy and Marine Corps aviation.