

ILAAS- INTEGRATED LIGHT ATTACK AVIONICS SYSTEM

by Lee Sheldon, BEE U of MN 1966 - formatted by LABenson

INTRODUCTION

ILAAS Type 1818 was an airborne 18-bit machine using mechanical technologies from the CP-823 30-bit computer. The characteristics were a 2-microsecond memory in 4k to 32k words. This unit had only 27 instructions with 3 index registers mapped onto core addresses. It also had just nine interrupt stimuli and one Real time clock. It had an Assembler and Utility Package for software generation and debugging. The Instruction Set Architecture (ISA) differed significantly from other UNIVAC machines of the time in that bit 0 of the registers was at the left and bit 17 at the right. There were 5-bits for the instructions versus 6-bits in other machines and there were just 2-bits for index registers versus 3-bits in the 'normal' 18-bit ISA used in the 1218, 1219, and 418 computer types.

Project start was March 1966, first delivery in May 1967. Gary Bosworth, Barbara Halvorson, and Lee Sheldon were engineers on this project, reference <https://vipclubmn.org/cp18bit.html#1818>. [lab]

ILAAS STORY

In the late 60's Sperry Systems Management Division (SSMD) being prime contractor, worked with Univac St. Paul to design and build several pieces of digital equipment for the Integrated Light Attack Avionics System (ILAAS) airborne system. The system was designed for use on the Navy A-4 aircraft for possible use in the Vietnam conflict. ILAAS consisted of advanced equipment including one of the first ever head-up displays (HUD) from Elliott Systems of England, an advanced carousel stabilizing platform from AC Delco Milwaukee, a terrain following radar also from Elliott, an advanced forward looking infrared (FLIR), and the digital processing system and fault sensing system from UNIVAC. The test bed for the system chosen was a Navy A-6 because the large area in the nose of the aircraft could accommodate the system equipment. In addition, the aircraft had a side-by-side two-man crew providing for a pilot and a system engineer to facilitate flight test.

Univac provided a navigation computer, a weapons computer, a Fault Sensing Unit (FSU), and Flight Test Memories (FTMs). The computers were 18-bit designated as 1818s and utilized the same 56-pin integrated circuit card layouts as CP-901 avionics computer with the 7901000 and 7901001 logic chips. The wire-wrapped card back panel was placed in the center of the chassis from front to back with the cards plugged in on both sides of the computer. It used the same cooling heat exchanger designs used in the CP-901 with a heat exchanger cover on each side contacting the T-bar of the card by compression. The covers were tightened to a specified torque to facilitate correct contact pressure.

Established in 1980

ILAAS001: Integrated Light Avionics Attach System US Navy A6 and Sperry Systems Management Division (SSMD) support van in the Grumman hangar, Bethpage, LI, NY. SSMD was the prime contractor on the system which was thought to be intended for use in the Vietnam war.



ILAAS002: SSMD engineers at work on the A6. The equipment including the Univac-supplied computers (1818), Fault Sensing Units (FSU) and Flight Test Memories (FTM) were housed in the nose of the aircraft. The FTMs were ground support equipment and were never intended to fly, but SSMD flew them, and they performed as well as the environmentally tested computers.

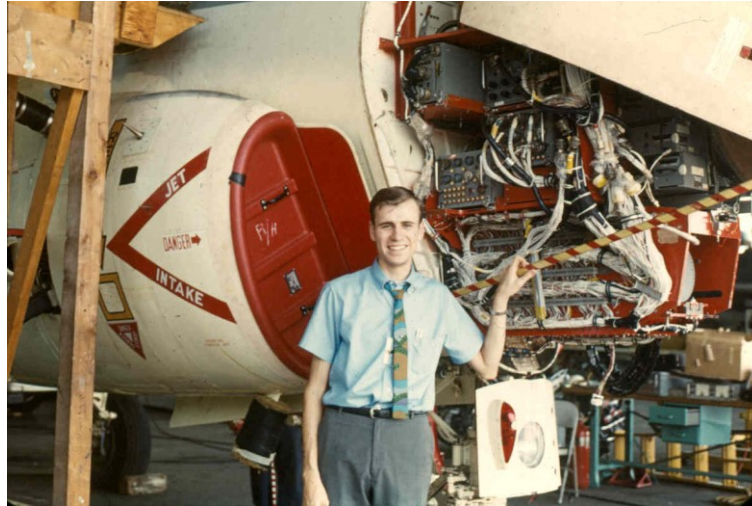


ILAAS003: Another A-6 view at the Grumman hangar. One of the SSMD technicians rode his motorcycle to work.



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ILAAS004: Lee Sheldon was the Univac field engineer supporting the Univac ILAAS equipment made in St. Paul. Two ILAAS computers are above right of Lee; the first one not cabled as yet with the cable connectors and fault indicators clearly shown; then another up to its right, cabled to the system, and then an FTM uncabled just above it.



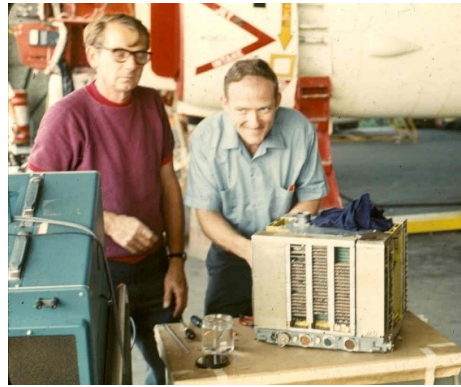
ILAAS005: Bob Wochinger, SSMD software engineer, probably entering a navigation software patch into the Univac Flight Test Memory (FTM) via its control panel (black). Above the FTM control panel is a Univac ILAAS computer Control Panel (gray) and connecting cables and to their right are two control panel isolation networks for connecting to the computer during ground support.



ILAAS006: Bob Wochinger congratulated the AC Delco Milwaukee field engineer supporting the Carousel Navigation Platform the day his platform seemed to be working.

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ILAAS008: An SSMD tech watched as an SSMD engineer changed a card in the AC Delco made carousel platform. The engineer could not touch the equipment unless a union tech was at his side!



ILAAS009: An SSMD engineer working on the ILAAS equipment he was responsible for in the nose of the A6. Note he is using the wrong side of the ladder.



ILAAS010: SSMD engineers working in the cockpit of the US Navy A6 Testbed Aircraft (Joe Whitefall in the left seat).



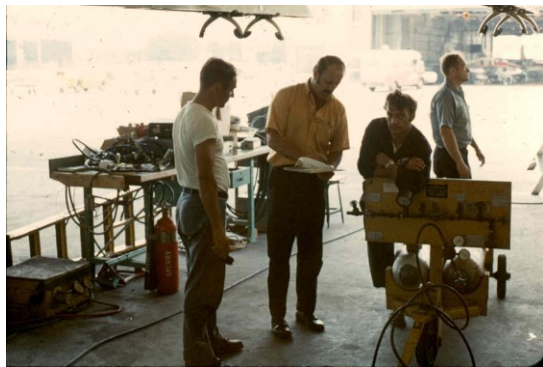
ILAAS013: The cockpit of the Navy A6 Testbed Aircraft. The system was intended initially for an A4, but the A6 was used as a testbed because of the spaciousness in the nose for equipment and the side-by-side two-person cockpit. Seen in the photo is one of the first, if not the first, Head-up display to be installed in a military aircraft. It was supplied by Elliot Systems of Great Britain who also had a field engineer on site at SSMD.



ILAAS014: The AC field engineer on the right was fun to work with. Being Midwesterners we had much in common. The platform, which was an electro-mechanical nightmare, never stayed up for very long.



ILAAS015: SSMD technicians at the hangar. Technician union rules required them to perform any tech type work including replacing printed circuit cards in the Univac supplied equipment.



ILAAS019: SSMD engineers watching the A6 at Grumman Airport.



ILAAS020a: SSMD engineers working the cockpit of the A6.



ILAAS022: Integrated Light Avionics Attack System (ILAAS) US Navy A6.



Thanks to Lee for the pictures and story. *LABenson*