

THE FIRST FLYING PROGRAMMER

Prologue

Our August 'Article for the Month' [<http://vipclubmn.org/Articles/OceanSurveillance.pdf>] described a display about the Golden Anniversary of our Anti-Submarine Warfare (ASW) history. The article evoked:

Please consider adding Oscar's story to the ASW article. Oscar reported to Bob Blixt and was a software/systems team leader on Mod 1. He suffered a severe stroke and was on life support for a few days until the family agreed to remove the life support system. His death was a real shock to all of us who knew him. Capt. Ed Skidmore, NADC, broke down and sobbed when he learned of Oscar's death. I know; I was there. Ned Hunter was a friend of Oscar's and can provide more details, dates, etc. Regards; *Rapp*

The epilogue following the Oscar Lundbeck section contains summaries not in the Ocean Surveillance article.



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Oscar Lundbeck, The First Flying Programmer by Ned Hunter

Every now and then someone comes along who is determined to make a difference. Oscar Lundbeck was one of those people. Although Oscar contributed to many phases of the Anti-Submarine Warfare work done by UNIVAC, this article will focus on Oscar's contribution to the integration testing of the ANEW system at Patuxent River, MD in the 1960s. This testing was extremely critical to the continuance of the proliferation of digital equipment on-board aircraft.

There were many skeptics as to whether this concept was even feasible. Taking an existing P3¹ aircraft and cutting out eight feet of fuselage to compensate for the additional weight of avionics equipment that had never been airborne before did not have a lot of appeal to everyone, so this was a crucial time.

We convinced the Navy we needed an "on-site programmer" to provide liaison with the software group in St. Paul, but that was only half the issue. We had to provide someone who could quietly gain their respect and be an integral, contributing part of the team. Remember, this was early in the game, and most people didn't know who programmers were or what they did. Some were convinced that programmers had to have come from another planet! They were more skeptical of programmers than they were of the unproven system they were asked to test.



This was the environment Oscar walked into. He arrived with no job description in hand and had to hammer out his role on his own. This could have gone either way, but Oscar had the moxie and personality to make it work. His rapport with Cmd. Waller [later Admiral] was excellent! Oscar earned this rapport through showing a dedication to supporting the test team. Oscar not only spent many extra hours on the ground but also in the air because the system could only be integrated and tested in the air – mostly over the Atlantic Ocean at altitudes of two to three hundred feet. Some of these P3C flights lasted 12-16 hours. This was very stressful, as anyone belonging to the "Flying Programmer Club" can attest. Oscar's rapport with Cmd. Waller extended beyond work. He spent many weekends with the Waller family waterskiing and enjoying the water.

I could cite many testimonials regarding Oscar's contribution to the program, but the results speak for themselves. Oscar paved the way for other "on-site" programmers. When he completed his on-site assignment, there was no doubt a programmer had a definite spot on any future ASW Integration Team.

If this sounds like it was written by a friend and fan, it is. *Ned*

[Oscar died of a brain aneurysm on 25 March 1970, at the age of 35.]

¹ The 50 years P-3 logo is copied from the Lockheed Martin 'web site store'.

Epilogue

It's about the People by Tom Knops

Rapp: Thanks for passing this article along. It was great and provided a good descriptive evolution of a very remarkable program!

I vividly remember one of our annual sales meetings where you brought in a guest speaker who talked about “peak performance” and motivating people to perform above average work if they have a clear vision of the end result and believe in that vision. If I recall right, he told the story of a young engineer at NASA who went into his manager’s office late at night and asked why so many average workers that he knew were performing in an above average manner. The manager took the young engineer outside and pointed to the moon and said: “That is why”. Everyone can see the end result of putting a man on the moon and believe whole heartedly that it can be done.

I believe the ANEW project and the P-3 program were of the exact same qualities. You and others put together a team of people from around the country which clearly understood the mission and objective and believed whole heartedly that our nation’s defense depended on a successful outcome. I may not have told you and other Univac supervisors and management that I worked with in the past how I felt, but I want to thank you all now for the opportunity to have been part of history and thank you for the motivation to contribute, however small, to the success of a great program. Tom Knops

Summary of other Articles

Over the last five years we have summarized web site articles for our periodic newsletters. Those relative to our ASW history are copied hereunder:

Aviation Week – 1963 from Curt Nelson’s Archives

In October 2010 we posted “How was the CP-754/A associated with the Navy's Anti-Submarine Warfare Project ANEW in 1963? Read an [Aviation Week article](#) to find out. Scanned by Lowell Benson.” This July 8th, 1963 item was contributed by Curt Nelson. “PROJECT A-NEW; RECENTLY LAUNCHED Navy land-based ASW aircraft into more effective system for coping with high-speed nuclear submarines. Previously, Navy first bought able aircraft such as the P3A and S2d, then stuffed them full of avionic black boxes.” “Because of the key role planned for the airborne digital computer, Sperry rand’s Univac Div. is playing a major role in the A-New program. It is responsible for modifying an existing computer, originally developed by Univac under Air Force sponsorship for missile guidance, to suit the ASW mission. Univac also is developing the complex programs, ‘software,’ needed for this new ASW mission.” This AF computer was type 1020, the type 1824 predecessor. “The machine is a stored-program type rather than a wired-program computer which Navy currently is using on its Grumman E-2A and A-6A. The choice of a stored program machine will not only provide greater flexibility for evaluating different tactics and procedures during the early flight test phase, but also will make it easier to adapt an operational system to new ASW sensors or tactics, according to M.R. Clement, Jr., Univac’s A-New program manager.”

The rest of the story not in that article is that Mr. Clement convinced the Navy to use a UNIVAC 1206 computer as a simulator and software development and then the 1830 – CP-823 computer so that there would be software compatible with the fleets NTDS computers. Then it was the

1830A – CP-901 of which we built 499, there are still a few of these flying in P3C airplanes operated by other countries! Next month I'll review the systems specification authored by Bob Blixt. Submitted by LABenson

CP-754A Technical description by Bob Blixt [deceased]

In November 2010 we posted a high level [technical description](#) of the CP-754/A hardware and system design, authored by R. P. Blixt in 1963. The CP-754 was UNIVAC Type 1020, a modified AF type 1000 computer. "The first experimental version of the A-NEW data processing system, designated XN-1, was initiated by the Naval Air Development Center at Johnsville, Pennsylvania in December, 1962. Following the completion of a study program to determine the feasibility of the concept, UNIVAC was selected as a team member for the XN-1 program. UNIVAC's role on the SN-1 system was threefold: 1) to assist NADC in defining XN-1 functions, 2) to design and develop the required digital computing equipment, and 3) to develop the computer programs necessary to carry out the system functions. The target date for equipment delivery was 1 July 1963 and 31 October 1963 was established as the date for commencing the first flight tests with the equipment installed in a NP-3A aircraft (a modified Lockheed Electra). The delivery date was met by UNIVAC, the equipment being in operation at NADC on 2 July 1963."

"The digital computing equipment supplied by UNIVAC consists of the following: 1) CP-754/A

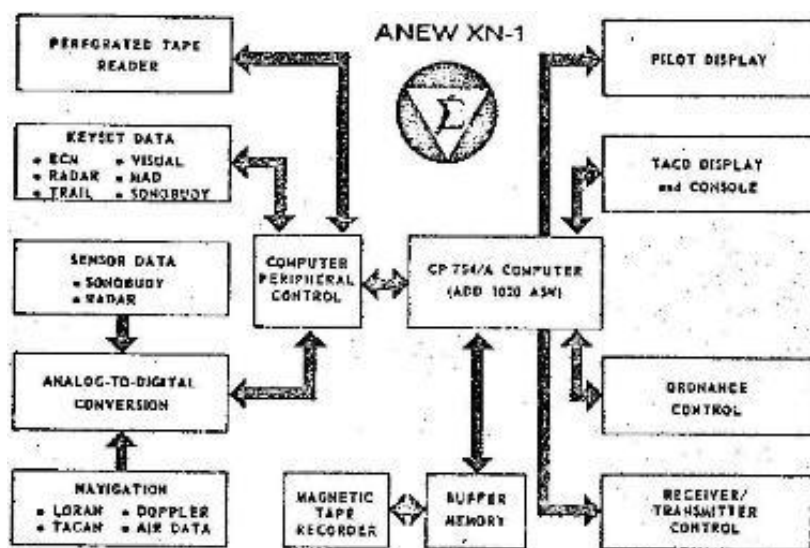


Fig. 1 Block Diagram of A-New XN-1 Equipment

Computer, 2) Computer Peripheral Control Unit (CPC), 3) Buffer Core Memory, 4) Perforated Tape Reader, 5) Magnetic Tape Recorder, and 6) Computer Maintenance Test Bench. The CPC logic chassis is physically the same as that of a UNIVAC 1218 Computer, employing the same type of logic cards except for a few special input-output matchers. The other major components of the SN-1 data-processing system include: 1) Tactical Situation Display with operator controls, 2) Sensor Operators'

Keysets, 3) Ordnance Display and Control, 4) Receiver/Transmitter Control, and 5) Pilot's Display."

The equipment installation in the YP-3 aircraft is illustrated in this drawing from the description document. “As in most data-processing systems, operation is centered around the digital computer. The computer software is responsible for integrating the inputs received from the various ASW sensors, determining the optimum tactics to employ, executing the tactic, computing the probability of success or failure, and navigating the aircraft. UNIVAC developed seven program modules: 1) navigation, 2) search and correlation, 3) contact conversion, 4) automatic tracking, 5) extend track, 6) attack, and 7) post flight analysis.” “At the completion of each flight, the magnetic tapes will be read on a ground-based UNIVAC 1206 Computer.” By L.A. Benson



CP-823 Discovery by Lowell Benson

In September 2010 we posted “[CP-823/U communications](#) reveals discovery of an intact 1963 computer.” A CP-823 was contracted by the Naval Air Development Center (NADC) in 1964 for 30-bit Anti-Submarine Warfare software development. This Univac 1830, CP-823/U was donated to Drexel University in Pennsylvania around 1970. Drexel put it into storage about 1973. A graduate student there rescued the computer and development documentation from a dumpster as Drexel was cleaning house in the winter of 2010. Mr. Todd J. Thomas bought the ‘scrap’ system in the spring of 2010. He contacted us 7/2010 after finding a tidbit about the CP-823/U computer on the VIP Club web site. The article chronicles the emails as we dug deep into the memories of Curt Nelson, Jim Rapinac, George Kydd, and M. R. Clement – Larry Bolton deftly provided archived data about the part numbers provided. Two follow on ASW system articles will be reviewed in the next newsletter issue. Document compiled by Lowell A. Benson.

CP-823/U SERIAL A1 COMPUTING SYSTEM, A-NEW MOD 3 (UNIVAC 1830). FROM LEFT TO RIGHT: 4 AIRBORNE I/O UNITS (SERIAL A1-A4), GROUND I/O, MEMORY, PROCESSOR, AIRBORNE POWER SUPPLY, CONTROL CONSOLE.



Marwood, Ray Clement Jr. - Passed away Oct. 21, 2011, at a Bangor health care facility. Ray was born Feb. 12, 1923, in Ontario. After retiring as a Navy Captain, he was employed by Univac until 1967.

Continuing Legacy:

Our first airborne Anti-Submarine Warfare contract was in 1963; systems design, the CP-754/A [type ADD1020], and demonstration software. The next contract, Mod-2, brought a 1206 ground support computer, the CP-823 [type 1830], and initial operational software. Contract Mod-3 was for the CP-901, S/N #1 delivered in September, 1967. Mod-3 also expanded software development at the Naval Air Development Center [Johnsville, PA] and systems test and support at Patuxent River, MD. Production CP-901 computers continued into the early 90's when the final S/N#499 was delivered. In 2012 there were still 40 CP-901s flying in Japanese P3Cs. The early 90's were the start of the CP-2044 replacement for the CP901s aboard the Lockheed P3C aircraft.

Shown here in the Eagan LMCO facility are Gary Reetz, Chuck Hobus, Pat Myhre, Les Nelson, Bob Pagac, and Art Francis – all of them have been part of this 50-year ASW systems history. They are standing in front of a CP-2044 which is now a part of our Lawshe Museum IT Legacy display.



We celebrate 45⁺ years of CP-901 operational life and 50 years of ASW experiences in 2013!
By LABenson

If you, the reader, were a part of this history, please consider writing and contributing a few paragraphs describing your ASW or surveillance systems involvement for insertion into our web site and/or future topical articles.

If you ever flew in a P3C or S3A or S3B or CP-140 airplane, let us add your name to the *flying programmers* list.

Thanks, *Lowell*