SEE MAP AND SCHEDULE ON BACK PAGE

NADC

The Reflector

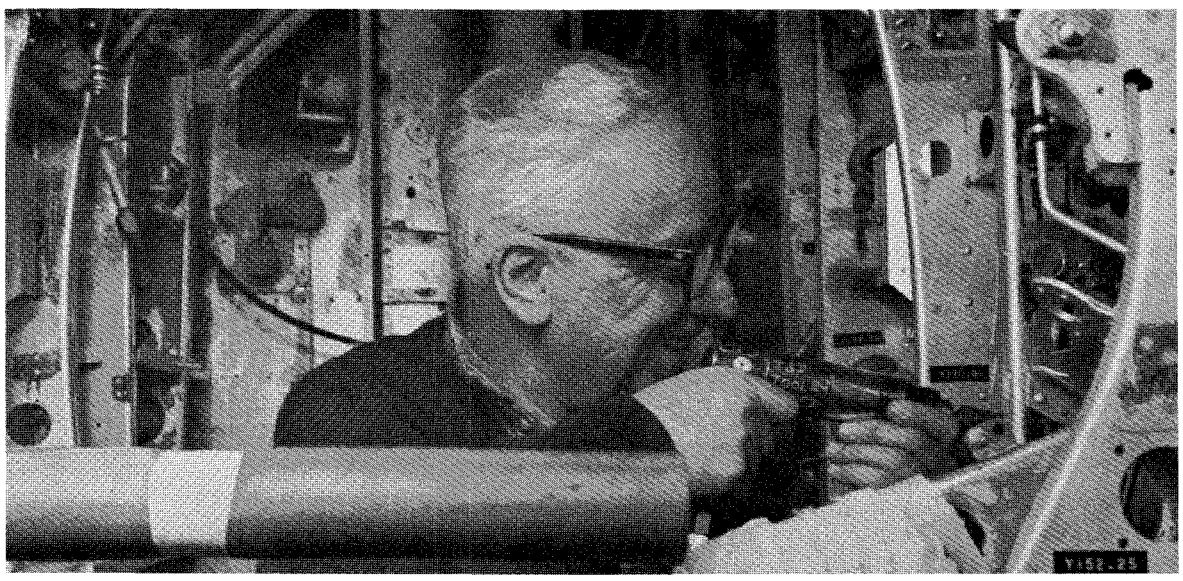
Volume 27, No. 7 | Naval Air Development Center, Warminster, PA | July 1983

The People at NADC Make it One of the Best Navy Labs

We are the Naval Air Development Center, the Navy's laboratory for the creation of aircraft systems. We also develop navigation systems for surface ships and submarines. From these two sentences grows jobs for over 2300 people and an impact that is felt from here in Warminster to the far flung reaches of the US Navy's Fleet.

The "We" is a diverse mixture of people, critical to the successful operation of not only this Center but the freedom of the world's oceans. NADC has both military and civilian personnel who have the ability to create, test, operate and maintain extremely complicated systems that help the United States keep its defensive edge in today's fast changing world.

We are electrical, mechanical, material and chemical engineers. We are research scientists, mathematicians and physicists. We're carpenters, sheet metal mechanics, secretaries, photographers, psychologists, computer scientists, modelmakers, supply clerks, contract administrators, accountants and personnel classifiers. We are operations research analysts, electricians, plumbers, aircraft maintenance mechanics, transportation drivers and mechanics and systems engineers. And, believe it or not, there are a whole lot more. We are project managers, division, branch and directorate heads, pilots and aircrew members, security officers, illustrators, writers and public relations practitioners. All working together smoothly. Working to build the most advanced aviation systems in the world.



Craftsman Nic Tursi works on an RF-18A prototype aircraft installation.

We are a research and development center. The people at NADC take concepts and turn them into reality. When you think about the future you can only visualize what it will be like but at NADC you can see the future right in front of your eyes.

If you look at any of the aircraft that the Navy flies today you will find a system that was conceived or enhanced by the people at NADC. These systems include computers and displays, life support equipment, avionics (controls), airframe construction, communications and navigation. NADC has some of the preeminent people in their fields of endeavor. We have to have these types of people if the Navy and the United States want to stay ahead in the fast changing world of technology. We develop things like communication systems that transmit and receive not only voice communication but digital, tactical and strategic information.

The United States really is, I'd say, more than ever in our history, counting on the products of Centers like this.

—Vice President George Bush

At NADC we analyze what the future needs of the Navy will be. Then we develop new concepts for airborne systems. When a new system is designed it must be integrated into the existing aircraft. Many different pieces of equipment may have to be changed to accommodate the new system. A computer reprogrammed, wiring modified, airframe restructured

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Navy Helps Army Inventory Weapons

By Carolyn Riemer

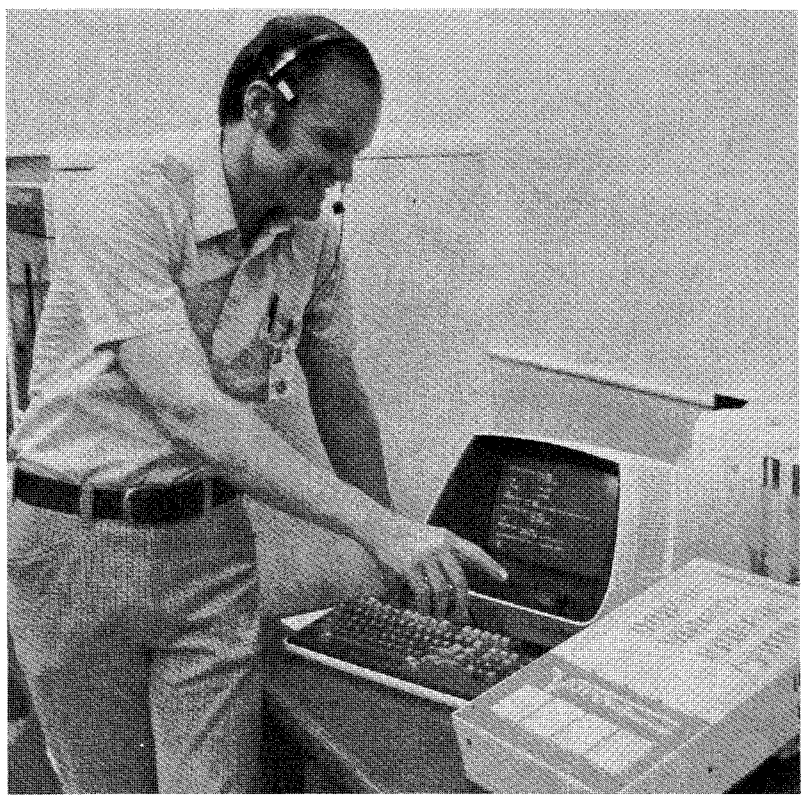
A voice recognition system, designed to provide greater ease in handling an inventory of a large number of small arms, is currently being developed at NADC by Dr. Christian Skriver.

The system, which is being developed under the sponsorship of the U.S. Army and is scheduled for delivery to the Army in July, is being designed to provide a more reliable and more efficient system for keeping track of a large volume of guns via their serial numbers.

In addition to providing the Army with this system, the system will also provide long-term information about voice recognition systems to the Navy, according to Skriver, who works in the Human Factors Division of the Aircraft and Crew Systems Technology Directorate.

After a Department of Defense-sponsored Technical Advisory Group meeting on Voice Technology, Skriver was approached by the Army to develop a voice recognition system to keep track of the two million small weapons that are remanufactured and stored at the Anniston Army Depot. Anniston is the Army's primary site for storage and remanufacture of small arms.

Currently, the Army requires five operators to inventory the weapons due to the systems of checks and cross-checks employed in its manual system of inventory. Using Skriver's system, only two operators will be needed—and the system will also be more reliable and more efficient.



Dr. Skriver demonstrates the voice recognition system.

By employing a voice recognition system, all that is necessary is for one operator to read the weapon's serial number into a voice recognition device using a headset and a microphone that cancels out the background noise of the depot's factory-like setting.

After the information is read in, it is transmitted to a computer system that first checks for errors by checking the serial number read in against a file of the serial numbers that should be found in the inventory.

A weapon is often inventoried three times when it is at the Anniston Army Depot. It is inventoried when it is received, inventoried during the remanu-

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Welcome to Our Family

On behalf of the entire NADC family of employees we would like to welcome all of you who are visiting the Center today. We all work here so we can give our families the comforts of life in the United States. We also work to help keep these United States and its friends free. Your support toward these goals is appreciated and welcomed. We hope that by seeing what your husband, wife, son, daughter or relative does here you can have a better understanding of why they work here and how important their work is to the future of this country. We wish you an informative and enjoyable afternoon.

Captain James B. Anderson

Mr. Robert S. Buffum

Talking to an F-18 Over the Phone Will Soon Be Possible

Wouldn't it be nice if we could call a repair person on the phone and just by talking to them determine what was wrong and a course of action to fix the problem. According to Richard De Sipio from NADC's Communication and Navigation Technology Directorate, the day of telephone diagnosis and repair is just around the corner. This past June, De Sipio demonstrated a Remote Site Avionics Support System that connected an F-18A aircraft based at the Naval Air Test Center, Patuxent River, Maryland and the BASIC Laboratory at NADC via telephone lines. This allows for a person located many miles away to maintain the digital system aboard an aircraft.

Using a modem that encodes and decodes digital information for transmission over the telephone and a Loral Serial Bus Analyzer tied into the F-18A aircraft at one end and another modem and analyzer at the other end, a person can check

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Various automated systems are now used by technicians to calibrate test equipment.

Automation Allows Greater Productivity

By Carolyn Riemer

Automation and update of the Naval Air Development has allowed the laboratory to achieve greater productivity and to increase its workload with a shortened turnaround time.

This automation of the laboratory, which is supervised by Joseph Griffin of the Electronic Test Equipment Branch of the Technical Services Department, has made it possible for the lab to convert from a manual system of calibration to an automated system that has greatly reduced the time needed to calibrate test equipment. The Center has an inventory of approximately $27 million of electrical/electronic equipment with about 6,000 items that require periodic calibration.

The automated system, which was installed in a newly refurbished laboratory, can be utilized for a full range of testing. The lab is capable of calibration oscilloscopes, meters, time and frequency systems, electro-mechanical signals, and signal analysis systems and generation systems.

Calibration time for calibrating equipment has been improved so that it can be completed three to five times faster than had been possible with the manual system previously used. For instance, calibration of the Hewlett-Packard 3400 RMS Volt Meter, which took more than five hours to complete manually, can be calibrated in less than half an hour using the automated system.

This shortening of turnaround time made it possible for the Calibration Laboratory to meet a mandate of the Secretary of the Navy that Testing and Monitoring Systems (TAMS) be certified at specified intervals. Equipment must be certified in accordance with this mandate and the MEASURE program (Metrology Automated System for Uniform Recall and Reporting).

For the past several years, operating under the manual calibration system, the laboratory had only been able to calibrate test equipment on a demand basis and was not able to comply fully with the Secretary of the Navy's mandate.

By switching to an automated system, the laboratory will be able to meet all current calibration requirements and all requirements for the foreseeable future, according to Griffin. In addition, the laboratory now can provide calibration services for other installations.

At this time, for example, the laboratory is doing some work for the Willow Grove Naval Air Station. Eventually, the laboratory, Griffin said, hopes to establish itself as the regional center for providing this kind of service.

Besides being able to calibrate instruments more efficiently and more quickly, the automated system provides greater reliability. Measurement repeatability is good and operator fatigue is reduced, Griffin said.

Accuracy is also improved since the computer generates a printout of the test results, whereas using the manual system operators had to transfer the results to paper. This printout can also be used to verify calibration procedures.

Installation of the automated system required that software be developed implementing the procedures necessary to calibrate test equipment. Over 770 programs, using Navy Instrument Calibration Procedures, have been developed this calendar year to be used in conjunction with the automated system.

In an effort to achieve this level of higher productivity in the Calibration Laboratory, Kenneth Clegg, former head of the laboratory and current head of the Technical Services Department, applied for funding through the Productivity Enhancement Capital Investment Award (PECI) program to provide money to update and automate the laboratory.

The money, totaling $386,000, was awarded in May 1982 and Griffin, who succeeded Clegg as head of the Electronic Test Equipment Branch, purchased two Fluke, two Tektronix and three Hewlett-Packard systems with the funding. Various systems were purchased to reduce the technological restrictions that any one system might impose and to reduce the operator fatigue, Griffin said.

Under the provisions of the PECI program it is required that the cost of the equipment be recouped within a three year period. It is projected that costs will be recovered well ahead of schedule, Griffin said.

Under the manual system previously in operation, 16 technicians would have been needed to fulfill the requirements of the Secretary of the Navy's Mandate and MEASURE. With the automated system, only eight technicians are

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NADC Fireman Rescues Boy from House Fire

By Jeannie Beans

Recently the borough of Norristown awarded Joseph Perkins a certificate for "bravery above and beyond the call of duty" for his rescue of a small boy when his home was swept with fire on April 20th.

Joseph Perkins is one of NADC's firemen but he is also a member of four volunteer stations in Norristown where he lives. Perkins was on duty as a volunteer on April 20th when at approximately 6:30 PM they rushed to the scene of a row home fire in Norristown. He was responsible for pulling little two-year-old Brandon Johnson from a burning second floor bedroom. The child was then treated for acute smoke inhalation and second degree burns at Suburban General Hospital.

Perkins has been a fireman for 11 years. He has been at NADC for a year and four months. He has also worked at the Frankford Arsenal. Perkins feels this was a fairly dangerous rescue as compared to others he has been involved with. He commented, "You always hope you don't have to do something like this, but that's why you constantly train so you can be prepared when the situation does occur."

The parents of Brandon Johnson were very grateful and wrote a letter to the editor of their Norristown newspaper commending Perkins and the fire company for saving their child.

Voice Recognition System Used For Inventorying Weapons

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facturing process if it is being rebuilt, and it is again inventoried before it is shipped.

Once the serial number is read in, the computer is programmed to have a keypunch produce a computer card, which is sent wherever the weapon is sent. These punch cards are used by the Army as the means for keeping track of its inventory of small weapons.

In addition to producing a punch card, the computer system is programmed to have a bar code printer print out a bar code symbol for the appropriate serial number. The second operator puts the bar codes with the appropriate weapons.

Software for this system is being developed separately under contract to Analytics. James Stokes, of Analytics, is designing the program that will be used in conjunction with the voice recognition system set up by Skriver.

This voice recognition system works by matching the voice patterns of the operator reading the serial numbers with those patterns stored in the computer's memory. In effect, the device is trained for a particular operator. Voice recognition technology, however, has not advanced to the point where patterns from any speaker can be recognized and matched.

The vocabulary to be used, in this instance, is limited to numbers, the international phonetic alphabet and several control words. Because the vocabulary is limited, there are a restricted number of patterns that the computer must recognize. Although the vocabulary is limited, it can be altered or expanded to fit any changing needs.

On occasion, the voice recognizer might have difficulty in recognizing a particular word or number. When this occurs, the system can be retrained until it does not have trouble in recognizing the word.

There were other possible alternatives to a voice recognition system for improving the system of inventorying small arms. One possibility was a keyboard and computer system. But because the inventorying of small arms at Anniston is an entry level position, the Army wanted a system that could be used by personnel with limited training and no keyboard skills.

A second alternative, labeling, could not be used because there is no type of labeling device that would adhere to a weapon throughout the remanufacturing process.

Potential Hazards With Two Types of Chairs

This note is to alert all personnel to a potential problem with two pieces of office furniture. The furniture in question are chairs identifiable with the following information:

NSN 7110-00-597-7959

High back, color orange/rust

NSN 7110-00-602-0263

Low back, color blue/black

There have been two recent incidents involving these chairs. Both chairs broke at the same spot causing the individuals sitting in the chairs at the time, to fall out of the chairs to the floor. The Command Safety Office and the Supply Department have jointly reported these incidents to GSA, in an effort to determine whether the chairs have a manufacturing defect or if these are just two isolated incidents.

All personnel who have these chairs should periodically check the backrest for excessive looseness. If anyone feels they have a problem with these chairs, they may contact the Command Safety Office.

The Reflector

Naval Air Development Center

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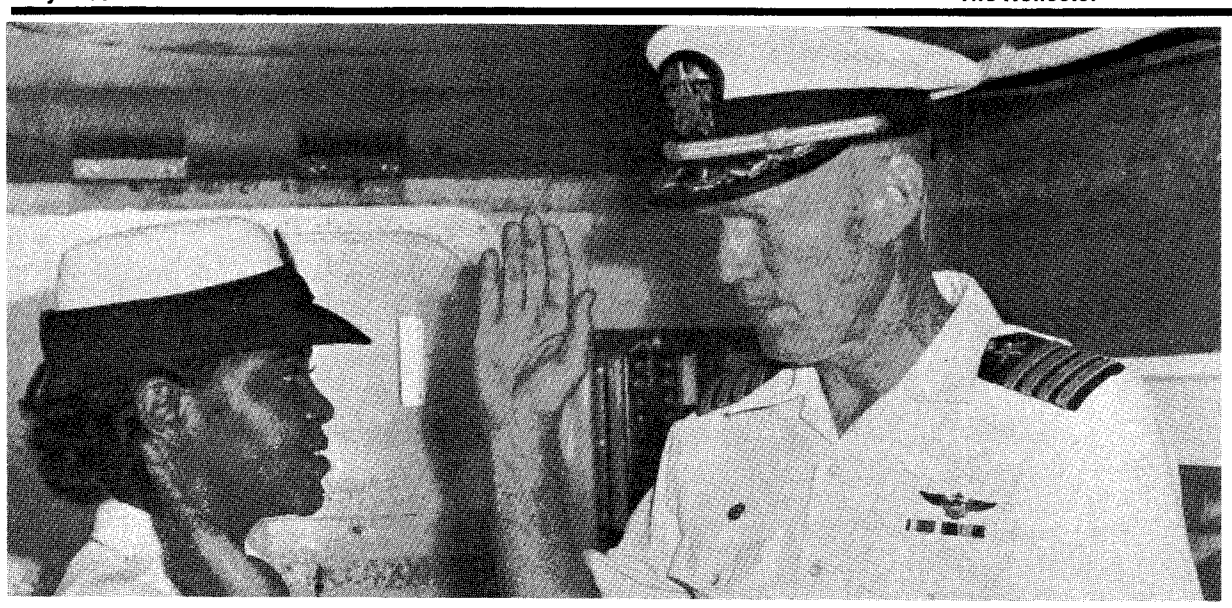

CAPT James Anderson reenlists AT1 B. Bailes on the Skyship 500 when it was at NADC last month. NADC's current reenlistment rate is 83.3 percent.

NADC Employees Make the Center What It Is

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or controls reconfigured: all of this is done here at NADC.

We're working on the future of naval aviation now. We test lighter and stronger materials, develop new protective equipment and monitor the performance of these developments as they transition into the Fleet.

A great deal of work done at NADC is in the area of sensor technology. We develop devices for the detection of submarines. They listen for noises, feel for temperature changes and detect current differences. Radar and sonar equipment for ships, submarines and aircraft are also conceived by the people at NADC.

The ability to detect and identify submarines, ships and aircraft is an important objective that our research helps the Navy accomplish. One of our main products is the entire line of sonobuoys—sophisticated sensors dropped into the ocean, to monitor temperature, current speeds and noises like those of submarines. We've developed various radars and sonars, and tailored them to specific aviation and anti-submarine warfare applications.

At NADC we perform basic and advanced research on new navigation concepts. We design entire systems and determine how they will be incorporated into the ship, submarine or aircraft. We propose what kind of navigation equipment will be needed in the future and how existing equipment can be improved.

We see long term growth in the importance of NADC to the Navy . . .
—SECNAV John Lehman

Computers play an ever increasing role in the control of naval platforms. The engineers and scientists at NADC in turn play an important role in designing the hardware and software that make up the Navy's computer systems. We design and test programs for many applications and update existing programs as changes need to be made.

All the materials and equipment that go into a Navy system really can't be effective without the human in ultimate control. For that human to be there a workable and comfortable environment must be designed. NADC's efforts in the area of life support and crew station equipment are known throughout the military communities. We develop and test survival apparel, seating systems, rescue equipment, work station configurations and display systems. We also do research into the human biochemistry and how a person reacts to stress and exposure.

NADC's people are involved in every aspect of the Navy's operation from creation of a system to the maintenance of existing equipment, from conserving resources to training personnel. All of us are involved in an exciting adventure helping the Navy keep the world free.

Command Inspection Complete

Within the Chief of Naval material corporate plan there is a plan that requires an inspection of each activity once every three years. NADC has just had its inspection completed by a team of experts drawn from other naval activities. The Inspector General (IG) for this most recent look at the Center was Captain Zeke Newcomb. He explained that for an R&D activity of this size a two week period is set aside for the inspection. "Most of the functional support areas take about one week to inspect," Newcomb said. The rest of the organization takes the whole two weeks.

Newcomb explained that there is a multi-purpose reason for an inspection. First the inspection insures that the organization is being run in accordance with the regulations, instructions and procedures that have been established. Sometimes changes are made in the rules that the activity may not be aware of or a gradual drift away from the approved way of doing business is discovered. Any minor discrepancies are discussed between the IG team member and their counterpart within the organization. These are constructive discussions helping to point out the right way of doing business and explain the reasoning behind the regulations. Secondly the IG team looks at organizational efficiency. The team will help point out better ways of doing business. The final reason for an inspection is to listen to people in the activity. "Sometimes," Newcomb said, "the organization may have a problem carrying out its business according to the rules." The IG can help solve the problem or feedback the information to NAVMAT for further help.

Newcomb stressed that the IG inspection is not an "axe hanging over our heads." "There's a lot of good that comes out of an inspection." All the strong points of the organization are also noted. If the Center has a better and more efficient way of doing business, the IG team takes it back to headquarters where it may be incorporated in changed regulations.

In his closing brief to the Center's management, Newcomb said that, "I appreciated the opportunity to take a close look at a very professional organization."

Talking to an F-18

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the status of the aircraft without having to be there. De Sipio said this could open up new horizons for maintenance and diagnosis of aircraft systems. For example, ships that might not have sophisticated maintenance equipment on-board could "dial" a ship or shore base that had the needed equipment and use that equipment to help fix the aircraft.

The Remote Site Avionics Support System is in the initial stages of development but it could mean lower cost and greater use of resources for the Navy.

Skyship 500: A Spectacular Ride through the Air

By David Polish

Almost all of us saw the big white airship parked at the Center during the week of 20 June but only a few got to ride in what only can be described as a seat hanging from a cloud. The blimp (an airship without an internal frame work) was called the Skyship 500. It carries a crew of two and five passengers in a gondola attached to a 164 ft. long helium filled bag. The motive power comes from two turbo charged Porsche engines driving ducted fans that tilt. Because the fans can tilt, the Skyship has the ability to hover, take off and land vertically and make some pretty tight turns.

Helium in the bag does the lifting so the power from the engines can be used almost entirely for maneuvering. The Skyship, despite its size, can fly fast, almost 72 miles per hour. It's almost like being in a helicopter but much different.

The only description I can use to convey how it feels is to say that it's like sitting in your living room but you're in the air. There is virtually no vibration and no sensation of movement. The view through the large windows is spectacular. The Skyship can hover in one spot or pivot on its own axis. It can move up or down to get a closer look at an objective. When flying over the local area the Skyship literally stopped traffic. People got out of their cars to take pictures or just stare. I just wish I could have been up there longer; it was a great feeling.

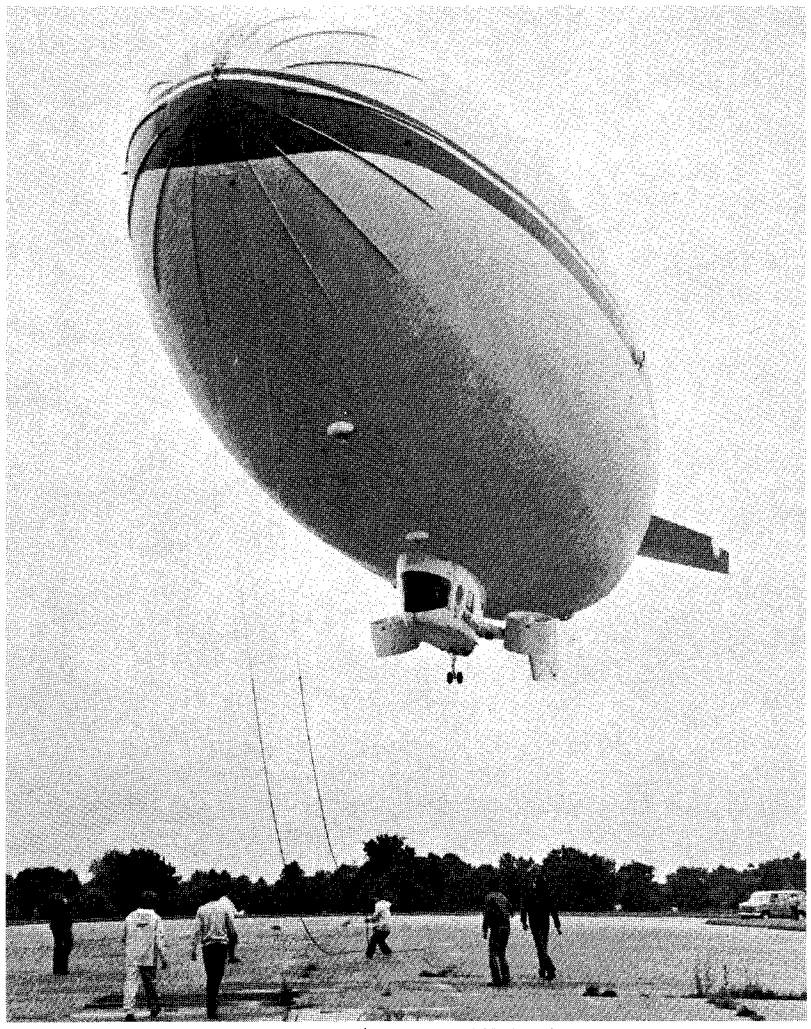
Sailors Man Airship Lines

Most of these sailors weren't even born when the Navy last flew airships but they were out there on the lines meeting the challenge of handling the Skyship 500 when it visited NADC. With instruction from the seasoned ground crew from Airship Industries Limited (the owners of the Skyship) some of NADC's sailors helped move the big ship when it was landing and taking off.

The experience apparently made a great impression on those sailors who held the lines. AMS2 William Reese said that if the Navy started flying airships again he'd "sign right up." "I'll follow it anywhere," added ATAN Vern Neal.

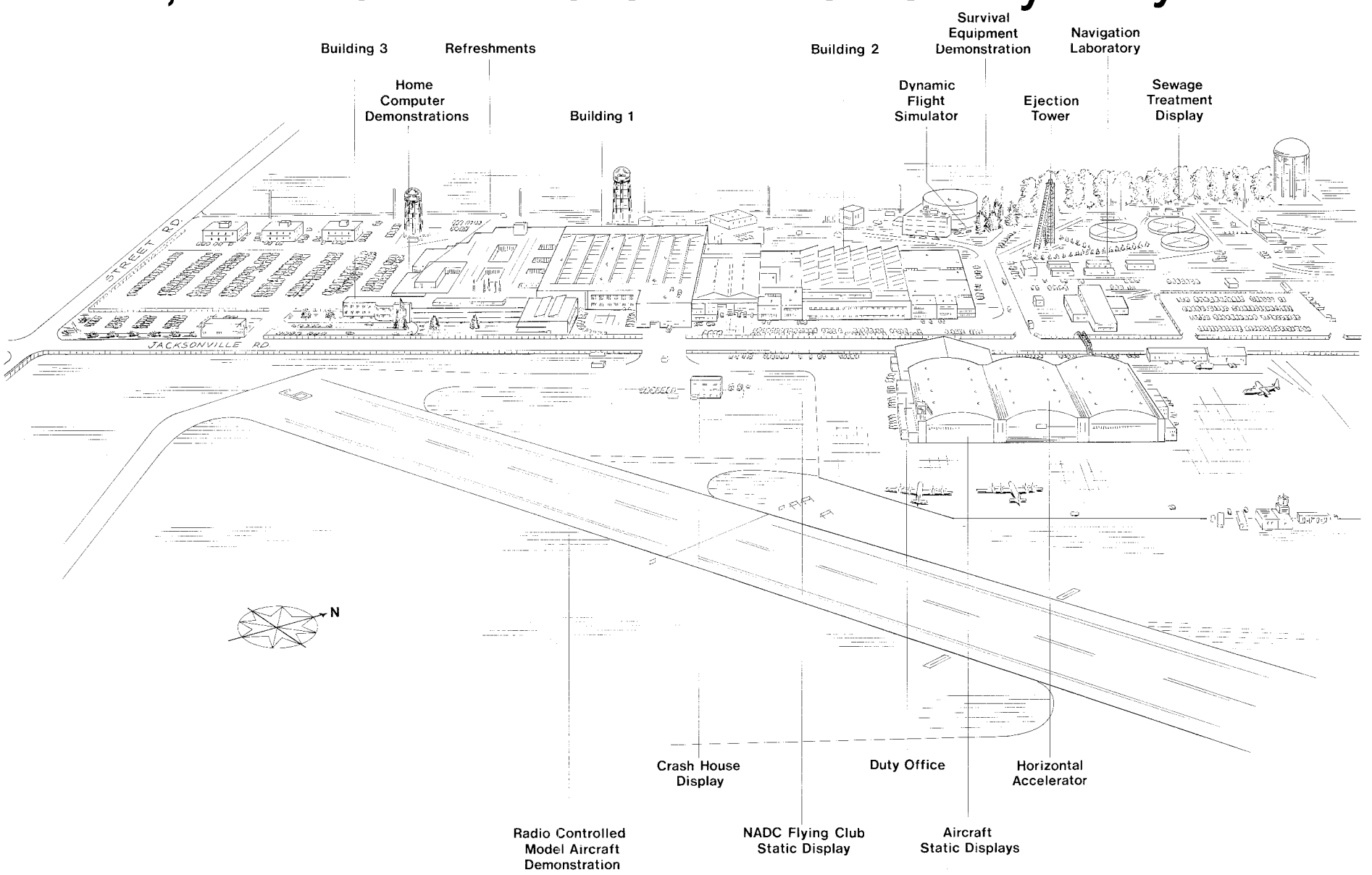
Maybe some time in the future the Navy will be back in the Lighter than Air business and when that happens these sailors could be teaching others just how it's done.

The rest of the ground crew included ADC Jerry McSwain, AD2 George Potter, AMS2 Stephen Lawson, AD2 Thomas Parkin, ADAR Martin Krueger, AD2 Curtis Miglionico and ADAN Richard Whittington.



The Skyship 500 at NADC.

When, What and Where: NADC Family Day 1983



SCHEDULE

THE FOLLOWING DISPLAYS AND DEMONSTRATIONS WILL BE CONTINUOUS

AIRFIELD RAMP AREA

Aircraft Static Display A-7, CH-53, P-3C, Flying Club Aircraft

INSIDE HANGAR ONE

Airship Model Demo

BUILDING TWO FIRST FLOOR

Laser Demo
Infrared Demo
Night Vision Demo
Photo Reconnaissance Display
Miniature Video Camera Demo
CREST Lab Demo
Computer Graphics

BUILDING TWO SECOND FLOOR

Electron Microscope Demo
Chemistry Lab Display

BUILDING THREE FIRST FLOOR

Civilian Personnel Displays
Public Works Master Plan Renderings
Software and Computer Directorate Display

BUILDING ONE FIRST FLOOR

S-3A Mechanical Room
Transportation Display
Structures Testing Demo
VS Program Film
CV-ASWM Film
VP Program Balloons, Games and Computer Graphics
Aircraft Energy Conservation Display
Central Computer Display
Simulation Display
BASIC Lab Display
Scorsby Test Area Display
Computer Users Club Demo, Cafeteria

BUILDING ONE GROUND FLOOR

Public Works Area
Machine Shop Display
Sheet Metal Shop Display
Electrical Safety Display
Air Conditioning Shop Display
Carpenter Shop Display

SCHEDULED EVENTS

BUILDING 70 LAWN

Flare Gun Demo 1400-1500
Life Raft Inflation 1400-1500
Helmet Communication System 1400-1500

BUILDING 70

Centrifuge Demo 1300 1345 1445 1515

EJECTION TOWER

Firing of Ejection Seat 1330 1430 1530

HANGAR BAY 2 BUILDING 4

Horizontal Accelerator 1315 1415 1515

AUDITORIUM

Command Presentation 1300-1400 1430-1530 (continuous)
Choral Group 1400-1430

RAMP AREA, AIRFIELD

Model Airplane Club Demo 1345-1445

FOOD

Hot Dogs 25¢, Soda 25¢, Waffles and Ice Cream 25¢ —Cafeteria

DEPARTMENT OF THE NAVY
NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PENNSYLVANIA 18974

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY
DOD-316

U.S.MAIL

FIRST CLASS

Calibration Laboratory

(continued from page 2)

needed to meet this requirement.

In addition to the savings on personnel, the laboratory will receive an increase in direct funding from the Naval Air Logistics Center as a result of the lab's compliance with MEASURE.

In fiscal years 1984 through 1987, a savings of over $1 million. Besides personnel savings, there is also a $100,000 in additional funding for fiscal year 1984 and $125,000 in additional funding for fiscal years 1985 through 1987 expected from the Logistics Center for compliance with the MEASURE requirements.